DCA-12-MR-009

CSX Transportation Freight Train Derailment with Non-railroad Fatalities

Ellicott City, MD

August 21, 2012

Panel Interview of Sperry Rail Services Staff on February 21, 2013

92 pages, including cover & errata sheets

I, James K. O'Rourke, have read the foregoing pages of a copy of my testimony given during an interview into NTSB's accident investigation, DCA-12-MR-009, a freight train derailment with non-railroad fatalities on CSX Transportation on August 20, 2012, which occurred at about 11:56 p.m. in Ellicott City, Maryland; and that these pages constitute a true and accurate transcription of same with the exception of the following amendments, additions, deletions or corrections:

PAGE NO:	LINE NO:	CHANGE AND REASON FOR CHANGE
8	22	Add: "we engage in" …quarterly management
8	23	Change "meeting" to "meetings" and replace "- -" with "ongoing daily"…management meetings organized…
9	18/19	Delete: "scanning the railroad and seeing that there"
9	19	Add/change: track and seeing "if there is" a potential defect
11	17	Delete: "Well let's"
11	18	Period after "questions" Delete - - before maybe
11	18	Delete - - after clarification. Add period.
11	20	Add: "I think you asked" at the beginning of the line
11	21	Delete "and - -" after archived. Add period.
12	23	Replace "- - " with just to "clarify,"
13	7	Replace "- - " with itself will "generate data on its" computer
13	7	Delete "will have probably". Add period after system.
13	8	Add: "there are" before three key pieces of data
13	25	change "they" to "that"
15	10-12	Delete entire sentence "They're called…your question. Yes." Extraneous and does not add value
16	4	Replace "- - " with "is to allow either"
16	5	Add "who" could all answer those questions
19	12	Replace "crossfire" with "X-Fire"
19	14	same
19	19	same
19	21	same
19	23	replace "If you can't - -" with "You can not make a direct shot"
20	1	Replace "crossfire" with "X-Fire"
22	24	Delete "So it's - - sorry, Dick"
22	24	Replace "It remains, the summary statement, of" with "The goal is"
31	11	Delete "Yeah"
31	14	Add "a" between "managing" and "logistic"
31	15	Period after "vehicles" Add "It is a" before "common"
31	15/16	Delete "there's the run"
31	16	Delete "But bringing to the –"
32	2	Delete "you know"
32	3	Delete " - - the"

32	3	Add “we” between “that” and “went”
32	20	Change “yeah” to “yes”
33	4/5	Delete “That - - again, Jamie O’Rourke - - an important that”
41	6	Delete “I’m - - this is Jamie O’Rourke - - “
46	5	Delete “Yeah”
50	20	Delete “You know”
53	5	Delete “Yeah, and”
61	3	Delete “keep - -“
61	18	Period after the word “detection”
61	19	Delete “which was - - and”
62	21	Delete “that they will be - - “
62	25	Change “crossfire” to “X-Fire”
63	1	Change “you know” to “and a”
63	6	Delete “that - - “
65	1	Change “prorate all” to “paredo”
65	4	Add period after “throughout” Delete “- - “ Capitalize Certainly
72	18	Replace “ - - “ with “not many who”
82	16	Delete “just - - “
82	23	Change “Yeah” to “Yes”

I declare that I have read my statements and that it is true and correct subject to any changes in the form or substance entered here.

Date:____March 19, 2013_____ Witness:_____(sign name)_____

I, Frank W. Stillman, have read the foregoing pages of a copy of my testimony given during an interview into NTSB's accident investigation, DCA-12-MR-009, a freight train derailment with non-railroad fatalities on CSX Transportation on August 20, 2012, which occurred at about 11:56 p.m. in Ellicott City, Maryland; and that these pages constitute a true and accurate transcription of same with the exception of the following amendments, additions, deletions or corrections:

PAGE NO:	LINE NO:	CHANGE AND REASON FOR CHANGE
12	8	Correction -those with The
12	8	Correction -those with the
12	9	Correction- those with the
16	15	Correction -Vision instead of Division
22	11	Delete -Yeah
22	11	Correction –replace do a lot of with - perform
22	17	Delete- all
22	17	Correction- 17% to 20%
31	2	Delete -of those
31	3	Correction- replace-did make and replace with made
31	3	Correction- that with the
35	7	Correction- yep with yes
36	21	Delete- those are both
37	10	Delete- that
37	11	Correction -those replace with they
49	11	Correction- you aren't going to – you will not
49	12	Correction- replace you're with an
49	12	Correction – you're not going to – you will not
49	22	Delete-they've
59	13	Delete- entire line
67	4	Correction –those with the
68	20	Delete -it is a--
74	2	Delete – entire line
74	3	Delete-entire line
78	8	Correction – top with and
78	8	Correction- that with this
78	8	Delete – that
78	9	Delete – entire line
78	10	Delete – and the—I mean, you might—you know
78	13	Delete- so--

I declare that I have read my statements and that it is true and correct subject to any changes in the form or substance entered here.

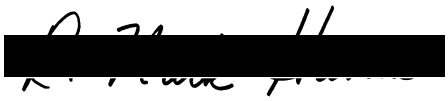
Date:_____ Witness:_____(sign name)_____

I, _Robert Mark Havira, have read the foregoing pages of a copy of my (our—Sperry panel) testimony given during an follow-up technical interview conducted at NTSB headquarters on February 21, 2013, into NTSB's accident investigation, DCA-12-MR-009, a freight train derailment with non-railroad fatalities on CSX Transportation on August 20, 2012, which occurred at about 11:56 p.m. in Ellicott City, Maryland; and that these pages constitute a true and accurate transcription of same with the exception of the following amendments, additions, deletions or corrections:

PAGE NO:	LINE NO:	CHANGE AND REASON FOR CHANGE
4	10	"R&D" instead of "RFD"
4	11	"R&D" instead of "RFD"
5	23	"R&D" instead of "RFD" Mr.Hipskind started with RFD
17	7	should be "fillet" –instead of "filled"
17	22	international "problem" missing word
20	25	"bolt' instead of "blow"
21	2	which is "normal to the rail that is" aims (missing text)
21	12	"head" instead of "bed"
21	21	through the "web" - (missing word)
43	18	most "common" instead of "reasonable" (clarification)
44	2	usually "do it" instead of "- -it's" (missing word)
44	25	just "a single value" it's (missing words)
45	3	" bolt hole" instead of "local" (pronunciation)
45	17	"out of alignment" (missing word)
46	14	"digital induction" instead of "- -" (missing words)
46	16	"rails" instead of " things"
54	4	"how this might affect" (missing words)
54	5	" have an effect" (missing words)
54	7	"effect" instead of "affect"
54	9	so they " " *the ultrasonic wheels*" "could (clarification)
54	10	" alignment but not misaligned" instead of "align- - not out of align" (missing word and clarification)
54	11	"face" instead of "space"
54	18	"more sensitive" (missing word)
55	7	Delete this line.
67	10	not "only that" layer of "filtering" (missing words)
67	23	"annotated and" (missing words)
68	1	"drop the sound." instead of "draw- -"

74	5	but “it is” instead of “if - -“ (not clear pronunciation)
78	19	can in “,” (missing comma)
78	21	“ “ instead of “—it’s not” (clarify)
78	23	“can .” Instead of “- - “ (missing word & punctuation)
78	23	“Do” instead of “do” (clarification)
78	24	“ input growth information” (missing words)
79	1	Delete this line.

I declare that I have read my statements and that it is true and correct subject to any changes in the form or substance entered here.



Date:___3/12/2013_____ Witness:_____

I, TerryWozney, have read the foregoing pages of a copy of my (our—Sperry panel) testimony given during an follow-up technical interview conducted at NTSB headquarters on February 21, 2013, into NTSB's accident investigation, DCA-12-MR-009, a freight train derailment with non-railroad fatalities on CSX Transportation on August 20, 2012, which occurred at about 11:56 p.m. in Ellicott City, Maryland; and that these pages constitute a true and accurate transcription of same with the exception of the following amendments, additions, deletions or corrections:

PAGE NO:	LINE NO:	CHANGE AND REASON FOR CHANGE
24	15	Remove ", you know,". Out of context
24	16	Change "saw-cutted" to "saw-cut". Misspelled
24	20	Remove "You know,". Out of context
24	21	Change "--" to "is". Missing word
25	2	Change ". So we're" to "because he's" Out of context
25	6	Remove "is -- and". Out of context
25	24	Remove ", you know, ". Out of context
26	1	Remove "from-- and". Out of context
26	3	Remove "it". Out of context
26	4	Remove "seemed very -- " Out of context
26	5	Change "in the -- you know," to "were". Out of context
26	8	Change "I guess to" to "I guess I forgot to". Missing word
26	11	Change "And" to "The". Wrong word
26	21	Remove ", you know," Out of context
27	9	Remove "to the -- down". Out of context
27	11	Remove "you know". Out of context
28	15	Remove "you know," Out of context
28	17	Remove "you know," Out of context
29	5	Change "angle-barred" to "angle-bar". Misspelled
30	22	Remove "he achieved -- you know,". Out of context
30	22&23	Change "the -- he got rid --" to "or". Out of context
30	24	Change "-- he" to "and". Word missing
35	12	Change "In" to "With" Out of context
35	10	Change "--" to ", or". Word missing
35	14	Change "is that" to "that is" Out of context
35	25	Change "of how" to "definitions how". Out of context
40	4	Remove "The -- I mean,". Out of context
40	5&6	Change "took -- you know," to "this". Out of context
40	7	Change "for" to "or". Misspelled

69	24	Change "Wozney" to "Spencer" Wrong person identified
70	4	Change "Wozney" to "Spencer" Wrong person identified
79	13	Remove "I mean". Out of context
79	14	Remove ", you know," Out of context
79	19&20	Remove "at -- you know," Out of context
79	20	Remove "you know,". Out of context
79	21	Remove "I mean". Out of context

I declare that I have read my statements and that it is true and correct subject to any changes in the form or substance entered here.

Date: 03/08/2013 Witness: [redacted]

UNITED STATES OF AMERICA

NATIONAL TRANSPORTATION SAFETY BOARD

Investigation of:	*	
	*	
CSX TRAIN DERAILMENT	*	
AUGUST 20, 2012	*	Docket No.: DCA-12-MR-009
ELLICOTT CITY, MARYLAND	*	
	*	

Interview of: Sperry Rail Services Panel:
Jamie O'Rourke
Mark Havira, Ph.D.
Frank Stillman
Terry Wozney

Thursday,
February 21, 2013

The above-captioned matter convened, pursuant to notice.

BEFORE: RICHARD HIPSKIND
Accident Investigator

APPEARANCES:

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BRUCE ROSE, CSX Spokesperson
Baltimore Division
CSX Transportation

CARL PATRICK, Staff Director
Rail and Infrastructure Integrity Division
Federal Railroad Administration

I N D E X

I N T E R V I E W

MR. HIPSKIND: Good morning, everyone. My name is Richard A. Hipskind. I am the Track and Engineering Group Chairman for the Ellicott City accident investigation. We are here today on February 21st to conduct an interview with Mr. Jamie O'Rourke, General Manager, and Mr. Frank Stillman, Operations Manager, and Mr. -- or Dr. Mark Havira, who is -- who also works for Sperry, and Mr. Terry Wozney, Quality Manager.

And, Mr. Havira, did I get your title wrong?

MR. HAVIER: It's Director of RFD.

MR. HIPSKIND: Director of RFD.

All who work for Sperry Rail Corporation. This interview is in conjunction with NTSB's investigation of a train derailment with non-railroad fatalities on CSX's Old Main Line Subdivision in Ellicott City, Maryland on August 20th, 2012. The NTSB accident reference number is DCA-12-MR-009.

Before we begin our interview and discussion, let's go around the table and introduce ourselves. Please spell your last name and please identify who you are representing and your title. I would remind everyone to speak clearly so we can get an accurate recording. I'll lead off and then I will pass off to my left. Again, my name is Richard Hipskind. The spelling of my last name is H-i-p-s-k-i-n-d. I'm the Track and Engineering Group Chairman for NTSB on this accident.

MR. INCLIMA: My name is Richard Inclima, I-n-c-l-i-m-a.

I'm Director of Safety for the Brotherhood of Maintenance of Way Employees Division.

DR. FOX: Matthew Fox, F-o-x. NTSB Materials Lab.

MR. ROSE: Bruce Rose, R-o-s-e, CSX Transportation, Director of Train Accident Prevention and Investigation.

MR. PATRICK: Carl Patrick, P-a-t-r-i-c-k, Federal Railroad Administration, Staff Director, Rail and Infrastructure Integrity Division.

MR. KISH: Larry Kish, K-i-s-h, with the FRA, and I'm the Deputy Regional Administrator.

MR. SPENCER: Brad Spencer, S-p-e-n-c-e-r, CSX Transportation, Engineer, Rail Services.

MR. HIPSKIND: Okay. And then for purposes of this interview discussion, let us now record name and title of our four panelists from the Sperry Corporation.

MR. WOZNEY: Terry Wozney, W-o-z-n-e-y, Quality Manager at Sperry Rail.

MR. O'ROURKE: My name is Jamie O'Rourke, and I am the General Manager of Sperry Rail Service.

MR. STILLMAN: Frank Stillman, S-t-i-l-l-m-a-n, Operations Manager, Sperry Rail Service.

DR. HAVIRA: Mark Havira, H-a-v-i-r-a. I am Director of RFD of Sperry.

MR. HIPSKIND: And first off, let me thank all of you gentlemen for being here. It has been a pleasure working with you

yesterday and we greatly appreciate your support and expertise that you've added to our investigation. So thank all of you for speaking clearly for the record. For Mr. O'Rourke and for your companions from Sperry, I'll just ask you as a group, do we have your permission to record our discussion, our interview today?

MR. O'ROURKE: Yes, you do.

MR. HIPSKIND: And for all four of you, again, do you wish to have a representative with you at this interview?

MR. O'ROURKE: No, we do not.

MR. HIPSKIND: Okay. Thank you very much.

INTERVIEW OF SPERRY RAIL SERVICES EMPLOYEES

MR. HIPSKIND: Mr. O'Rourke, you and I have communicated here on and off for the last couple of weeks and, again, I appreciate your group being here. And I did provide you kind of a road map, so let's cover some of those topical points.

How about just give me just a general description in your own words about what it is that you do for Sperry and how you come about to provide services for CSX.

MR. O'ROURKE: Again, my name is Jamie O'Rourke, General Manager of Sperry Rail Service. And our business is primarily centered around providing equipment and personnel working under specific procedures to conduct rail flaw detection in the railroad industry.

For CSX specifically, and per a long-term contract of several years and a long history of work, we provide vehicles,

people, our proprietary technology, to the railroad on a per day fee basis. Those assets that we deploy to the railroad are instructed where to work, where to conduct testing by the railroad themselves. Our main contact is Mr. Brad Spencer.

MR. HIPSKIND: Okay. And Sperry is global in its outreach. I mean, it's not just services provided here in the United States, but around the world?

MR. O'ROURKE: Sperry is the leading, by size, rail flaw detection company, the founder of the industry, from 1928. We do work around the world, primarily providing service in all of North America, much of Europe, and selling our system technology for use in Asia, predominantly China.

MR. HIPSKIND: Okay. And just from your perspective, why do we do all this? I mean, what's the goal here? Is it all about rail risk management? Is it about going out and finding that thing that's a rail flaw before it becomes a bad thing, or how would you characterize it?

MR. O'ROURKE: Characterizing it from Sperry's perspective, it is all about railroad safety, and our mission and sole purpose of our business is to increase the safety of the railroad by finding internal flaws and defects that are not visible by the naked eye or other means of detection. That is our mission and that is our objective, and it is those services and technologies that we provide to all of our railroad customers, CSX included.

As it relates to risk management, that obviously brings in the variables of how much risk is to be accepted, what other means, such as rail replacement, are better methodologies or different methodologies to reduce risk. So those become both economic and business decisions based on the infrastructure owner's management process.

MR. HIPSKIND: Okay. And --

MR. O'ROURKE: So, for Sperry, we really stick to finding the defects.

MR. HIPSKIND: Okay. Sorry to interrupt you, but the other thing I want to kind of bring forth, you and CSX have had an ongoing business relationship, ultrasonic testing for them for how long?

MR. O'ROURKE: CSX and Sperry have worked together for decades. I will ask Mr. Frank Stillman, do you know how long?

MR. STILLMAN: I do not know the exact years.

MR. O'ROURKE: Though I don't have the exact year, it has been a decades long partnership, really, in that I happen to know CSX is very focused and per our contract requires that we have the most up-to-date technology deployed on their infrastructure. And CSX and Sperry work collaboratively on a daily basis with a periodic, for the most part, quarterly management meeting -- management meetings organized to make sure that Sperry and CSX are doing all they can together to maximize the rail flaw detection.

MR. HIPSKIND: Okay. Let's move on to our next topic, then. Let's talk a little bit about how the rail testing and all that data associated with that, how that's communicated and managed between Sperry and CSX. Include things about the daily records and how you archive and --

MR. O'ROURKE: Sure.

MR. HIPSKIND: -- what is your comment about just that general topic?

MR. O'ROURKE: Sure. And I think it's best understood at the highest level, in that CSX has the requirement for testing of the railroad track. They determine the frequencies, the locations of such testing. We provide the assets that I mentioned earlier -- the technology, the people, the process -- and conduct the work. When Sperry conducts the rail flaw detection inspection work, we have the responsibility of providing every day at the end of the day to CSX Transportation the locations that we had tested and any defects that we have identified. And those defects are identified by our vehicle scanning the railroad and seeing that there -- scanning the rail track and seeing there's a potential defect, and eventually our chief operator going outside of the vehicle and with hand test equipment identify and verifying that the defect exists.

So once we complete our daily work, we provide to the railroad our car movement report, which accounts for our time and location of testing that we have completed, as well as our defect

rail report which identifies the defects that have been detected. Furthermore, we house all that data in our proprietary Sperry data management system and make that available to the railroad, specifically, Mr. Brad Spencer and the RFD team, should they want to look at historical data, aggregate data, trend data, or any of those type of items. For the most part from a contractual standpoint, our responsibility is to provide the end of day report of where we tested and what we found.

MR. HIPSKIND: Okay. And NTSB requested, received, and read a copy of the contract between Sperry and CSX, but it's my understanding that in terms of here's what we want you to do in performance, there may be another document, and the name of that escapes me. Do you know what I'm referring to?

MR. O'ROURKE: I do know what you're referring to, and that document is called, and the terms we and the railroad use, the customer file, the customer being CSX. So really the governing documents are, certainly, the contract from a high level in terms of terms and conditions, commercial terms and conditions, especially; and then secondly, Sperry operates to a playbook using our procedures, equipment, and processes that are well understood and trained into our workforce to follow through. And then the next most narrow part of the instruction is this customer file specific for CSX Transportation, which we will keep on file and have on every vehicle and operate to while on their property.

MR. HIPSKIND: Okay. Well, rather than getting in all

the particulars of something that NTSB has not requested or received or read, I will just say to you, and I know Mr. Bruce Rose is in the room, should I pass along some correspondence? I think NTSB would like to request that, to receive it, and if you're okay with that, you can let Sperry know and then we'll have an exchange about that sometime here in the near future. Is that --

MR. ROSE: That would be fine.

MR. HIPSKIND: You're agreeable with that?

MR. ROSE: Yes.

MR. HIPSKIND: Okay. Thank you, Mr. Rose.

How about, let's talk a little bit about a brief description of how the testing is achieved and how the results are conveyed and archived. I know Sperry has a hand in that and I know you're active in exchanging the data, but let's just talk about that briefly.

MR. O'ROURKE: Well, let's -- I think you asked two questions -- maybe I could ask for clarification --

MR. HIPSKIND: Okay.

MR. O'ROURKE: -- how the work is done and then how the data is archived and --

MR. HIPSKIND: Yeah. Let's tackle how the work is done or how you know to be where you're going to be, and then we'll talk about the data and the archiving second.

MR. O'ROURKE: Okay. Well, I think, if I may, I think

Frank Stillman would probably be the best person to answer the operational question and then I will come back and answer the second question on the data.

MR. HIPSKIND: Okay. Frank, take it away.

MR. STILLMAN: The rail test vehicles, they're given a weekly schedule. That's provided by Mr. Brad Spencer from CSX Transportation. The vehicle schedules are transmitted to the vehicles via e-mail. Those schedules are followed by those vehicles and if there's any deviation to those schedules, the chief operators on the rail test vehicles are to call Mr. Spencer and get permission to deviate from any of the schedules.

MR. HIPSKIND: And just a ballpark figure on how many Sperry test vehicles might be out on the CSX system in a given day?

MR. STILLMAN: Around 18.

MR. HIPSKIND: Eighteen. So quite a logistical thing to manage from day to day, week to week?

MR. STILLMAN: Yes.

MR. HIPSKIND: Okay. And let's come back to how do you archive the data, how long do you archive it, and is that something that you share back and forth with CSX?

MR. O'ROURKE: I'll take that. This is Jamie O'Rourke again. And just to -- the only thing I would add to Mr. Stillman's comment about the logistics of managing 18 vehicles, certainly it is important to understand that Sperry very

much is in the business of managing the logistics and operates, for instance, today 86 vehicles on different properties in North America. So we have an investment in infrastructure to make sure we understand where our vehicles are and what they're accomplishing.

And then in terms of taking the data and archiving it, the vehicle itself will -- computer system will have probably, I think it's important to say, three key pieces of data that we'll be using throughout this interview. One is the test system data itself where we record the ultrasonic signals rendered on the B-scan to the customer. The second is the vision system or the pictures that are taken from the cameras on the vehicle at any time there's an ultrasonic indication. And the third is the logistical data of car movement report, where the vehicle has been by GPS location, where it stops and operates.

In every case, that data is retained on the vehicle. It is provided in a report, as we mentioned earlier, the car movement report and the defect rail report to provide the railroad the information they need to address any defects found by the rail inspector vehicle.

But then subsequent to that, we take the test data and we electronically transfer to our location, to our headquarter location in Danbury, Connecticut where we have the servers that track and keep that data and are backed up through our disaster recovery system. We take the vision systems, they are burned onto

a CD by the operator and those are also returned to Danbury, Connecticut. And the purpose of that data is so that they are available, as have been in this case, should we look to review the test data after the fact. But also managed by Mr. Terry Wozney, who's with us today, we routinely audit near 10 percent of all inspection work to make sure as part of our quality program. So that data will then be housed in our servers and we have that data, both the vision system in terms of CDs and computer servers with the test data, for numbers of years, certainly more than 5 years of data.

And I mentioned, again, the logistic and the management information of the car movement report and the defect rail report, that is also transmitted to our servers in Danbury, Connecticut and as well is made redundant in a database environment we call, and I referenced before, the Sperry data management system. That allows us to have a, what's called, Microsoft SQL, S-Q-L, Standard Query Language, database available to us to look through data to aggregate, to trend, and that same system is made available, again, to CSX as a management tool.

MR. HIPSKIND: Okay. And kind of in all of this, Jamie, here's where I'm going with it, you provide a service for ultrasonically testing the rail to find rail flaws; it's all about safety. But the point I think I want to be sure to get on the record is, at some point Sperry's responsibilities end, you complete the testing, you satisfy the logistics, you're at a

certain place at a certain time testing the rail as CSX wants you, but the point is that when it comes to managing the data and making the repairs and decisions about rail and all that stuff, that's where the CSX responsibility picks up and you don't get involved in that next stage. Is that correct?

MR. O'ROURKE: That is correct. And one point I should mention for everything I've said is that when I refer to our ultrasonic testing, we also use induction as a very important methodology of testing, and I really meant to have bundled those two together. They're called UT -- they're called ultrasonic testing just because that's the provenance of what we do, but -- but back to your question. Yes. And at the end of the day at a high level, our vehicle goes where it's told to go and it is our responsibility to make sure that we test that area or report if there's any area that's not tested, and provide the railroad the defect information. And that's where it starts and stops for us.

MR. HIPSKIND: Okay. Well, that was a great segue because I think where I'd like to take the discussion now, and include a couple of your other associates from Sperry is, let's get into a discussion of the technology and equipment used in the testing, specifically, on the Old Main Line from about 2009 to 2010, and in our discussion as we describe the equipment, the truck or whatever vehicles were used, let's talk about that technology and stuff first, kind of give us the layman's understanding of it and then eventually later on in our discussion

we'll talk about the strengths and weaknesses. So if you can help direct that discussion, I'd appreciate that.

MR. O'ROURKE: Sure. And I think the best way to do this and to be able to be most effective to the reader -- Mr. Wozney, Stillman, and Dr. Havira, could all answer those questions adequately. I think it's best to have Mr. Stillman start with the technology that's deployed, the outcome, the objectives, and his history working with the technology, and then hand it over to Dr. Mark Havira when we talk about the limitations of ultrasonic or induction testing and other opportunities.

MR. HIPSKIND: That would be fine.

MR. STILLMAN: So on the CSX property, on the Old Main Line, from 2009 through 2012, CSX has employed what we consider a full technology vehicle, which is equipped with ultrasonics, including the crossfire technology, induction and division based. These vehicles have been operating on the Old Main Line for longer than these 3 years and the CSX has recently put the new vehicle, I believe it was a 919, on this most recent test in 2012, which is one of our newest vehicles added to their CSX fleet.

MR. HIPSKIND: Okay. And, Frank, you mentioned the term x-fire, and I know you and I had a little sidebar yesterday. Can you just briefly go into -- I know there may be a misnomer or myth about the development of the x-fire technology, so could you comment on that?

MR. STILLMAN: I think Dr. Havira would be the best one

to answer that question.

MR. HIPSKIND: Okay.

DR. HAVIRA: Well, the crossfire technique was developed to do two things: one was to not get rid of surface conditions, but be less affected by surface conditions; and, secondarily, to be able to look under shells. It basically uses reflection off the bottom of the filled area, which allows it to get down under the gauge-side surface conditions. And it also is more sensitive to what I'll call odd angle transverse defects, in other words, ones that aren't actually across the rail, but may be oriented at some angle to it.

MR. HIPSKIND: So let me kind of decode that with my experience and offer this. It just gives a more expansive, thorough look at the rail section?

DR. HAVIRA: Correct. On the gauge side specifically.

MR. HIPSKIND: On the gauge side specifically. Okay.

So a lot of people seem to think that we had -- or the technology and the development of that had to go that direction because of some of the shelling and some of the gauge corner surface conditions. So that's not the case or you came about it in a different way?

DR. HAVIRA: Well, it's an international came about, in a way, because China and other places had the same issue. One of the issues for shells was we needed -- it's kind of a Catch 22, if you don't have a sample to find out how to find a defect. And so

they were using a similar technique in China. And what we did was looked at what they were doing and kind of adapted it to a wheel.

MR. HIPSKIND: Okay. And I guess we ought to take the reader to a shell is a surface condition that may help mask an underlying rail flaw?

DR. HAVIRA: It's basically a cap on top of the rail that's made of steel that has -- it's like a lamination and you can't penetrate ultrasonically through it. The same is somewhat true of when you have the head checking. It maybe can penetrate through some of it, but it creates a lot of interference. And those two conditions don't allow the gauge side to be easily inspected in some cases.

MR. HIPSKIND: Okay. So we've had this x-fire or Sperry's had this x-fire for about how many years now?

DR. HAVIRA: Is it 4, 4 or 5?

MR. O'ROURKE: Five I think.

MR. HIPSKIND: So 4 or 5, and fair to say it's still relatively new technology?

DR. HAVIRA: It's relatively new, but pretty well used.

MR. HIPSKIND: Okay. And --

DR. HAVIRA: It's in all our vehicles.

MR. HIPSKIND: But where I'm going with this is do you feel that the development and addition of the x-fire has served its purpose and helped to capture more -- a more thorough scanning of the rail section?

DR. HAVIRA: Absolutely. The initial results we had was a 50 percent increase in DF, detail fractures, in gauge side. And then it leveled out and it ran around 30 percent for a long time. I don't know what it's at now. So it's a significant improvement, not a minor one, but a significant improvement in transverse defect detection.

MR. HIPSKIND: So a good thing for a good cause?

DR. HAVIRA: Absolutely.

MR. HIPSKIND: Okay. All right.

MR. O'ROURKE: This is Jamie O'Rourke again. Two quick additions to that. As Dr. Mark Havira said, we did track very closely the defect count when the crossfire was implemented and the amount of additional defects that we determined through crossfire technology started at 40 percent when we implemented that technology, and over time is now closer to 20, 25 percent, primarily for the reason of detecting defects through the crossfire and then repairing them so that they were not there again. But it is stable and we're finding 20 to 25 percent of our defects with the crossfire technology, which is an ultrasonic technology. Again, the term UT, ultrasonic testing, would incorporate crossfire.

And then for the very layman reader, it's similar to a bank shot playing basketball. If you can't -- if the defensive team has a blocker and you're not going to go right over him, you can bank it off the rim and put it in. And that's really exactly

what's happening with the crossfire technology.

MR. HIPSKIND: But, again, in all this, what that x-fire technology brings, if we think of a slice, a profile of the rail, it's just giving you another channel, another bit of input that corroborates the presence of rail flaws in a certain section of the rail?

MR. O'ROURKE: Yes.

DR. HAVIRA: Yes.

MR. HIPSKIND: We're in agreement on that. Okay. Good.

So anything else to add on how the testing's achieved? And we've talked about how the data's conveyed. In terms of the technology, I know you were kind enough, Dr. Havira, to provide us a PowerPoint -- and forgive me for the mispronunciation of your name. But in some of that, as the vehicle moves down the track, you have an assembly that comes in contact and can you talk a little bit about that and the arrays?

DR. HAVIRA: Yeah. The configurations of a standard truck that's used on CSX has 30 channels. There's 15 different transducers per rail oriented at various angles. There's a set that specifically have full-head coverage, aside from the crossfire, that look for transverse defects. There's an array of actually six transducers: three forward looking, three reverse looking for the head area. In addition, there's what's called a 37-degree transducer, which looks all the way down to the base and it's primarily for finding web defects and blow hole defects,

although it aids sometime in finding rail defects. And then there's a zero degree transducer, which is -- aims straight down. It looks, again, for horizontal defects and it's a control channel for all other channels that actually finds the surface of the rail and then controls all the other channels to say, start all your information from this point.

MR. HIPSKIND: Okay. And, again, this array of transducers or bouncing signals off, again is the point that Sperry is after here, is to get a full, thorough scan of the rail section?

DR. HAVIRA: It's an attempt to get every part of the rail bed that can be obtained from the top of the head of the rail.

MR. HIPSKIND: And I think we should say, generally speaking, there are no rail flaw technologies that capture the base of the rail?

DR. HAVIRA: Well, there's none that do the wings of the rail.

MR. HIPSKIND: The wings?

DR. HAVIRA: Right.

MR. HIPSKIND: It does go down through --

DR. HAVIRA: Right.

MR. HIPSKIND: -- the head, the ball section, and the web.

DR. HAVIRA: We're actually --

MR. HIPSKIND: But out in the wing of the base of the rail, no --

DR. HAVIRA: We're actually working with CSX to improve the base detection.

MR. HIPSKIND: Okay. All right.

Anything else any of you gentlemen would like to add on that?

MR. O'ROURKE: I think it's just important to also add the use of induction technology, which is used by Sperry on CSX. And maybe if Frank Stillman would talk about that for a moment?

MR. STILLMAN: Yeah, we constantly do a lot of quality auditing and we do a lot of data mining, and working with CSX, we bring all the best technology that's available in the rail testing market to CSX. And with the induction system, the numbers that we have calculated, it's between 17 to 20 percent of the defects that are marked on CSX are induction assisted. So what we're saying about induction assisted, is all 17 to 20 defects that are detected on CSX, the operator may not have made a stop and marked that defect without the induction technology.

To speak a little more on the induction technology, the induction technology is not as influenced by surface conditions as the ultrasonic systems can be.

MR. HIPSKIND: Okay.

MR. O'ROURKE: So it's -- sorry, Dick. It remains, the summary statement, of trying to get as best view of as much of a

comprehensive area of the rail under any type of condition as possible.

MR. HIPSKIND: But, again, the layman's general understanding that I take away is you're using multiple approaches, but again to ensure the thoroughness of the rail examination, the rail testing?

MR. O'ROURKE: That is correct.

MR. HIPSKIND: I mean, that's the takeaway goal, is that you want to get a good test and provide good data?

MR. O'ROURKE: That is correct and that is, again, going back to where we started, our agreement with CSX Transportation to always have the most available technology on our vehicles testing their railroad track.

MR. HIPSKIND: Okay. And in our day yesterday, we spent a great deal of time reviewing some data and looking at screenshots. Let's take our discussion there. And let me add a few definitions here. The broken rail that became the focus of our attention at Ellicott City was in a curve. It was the north rail. And a couple of -- and we did a tag for physical evidence and brought some rail pieces to D.C. and we examined some of that yesterday. And just for orientation and so that we're all on the same page, at the west end of that north rail was a saw cut with two bolt hole drillings. And as you go east along that section of rail, there were various rail pieces, shattered rail, and the point being at the other end, we had a set of joint bars with

three bolts in it and we call that location the bar defect and we call the other, west end, the saw cut. So having discussed that, let's talk a little bit about some of the things that we saw in the June, July, and August screenshots of that kind of spot-on-the-spot area.

MR. O'ROURKE: Okay. I think whether you lead with questions or not, Mr. Wozney, who's our quality manager, is going to be the best person to address this and was the person that ran us through the tape yesterday as a team.

MR. HIPSKIND: Okay. And, Terry, why don't you take us through some of the highlights as you see them? I know you have your screen, and please proceed.

MR. WOZNEY: We'll start looking at the August 3rd test, which was the test before the incident occurred. Starting from the saw cut, we see, you know, evidence of the alarms on the bolt hole drillings where the angle bars were applied to the saw-cutted end. So the joint was made at that point.

There's a little bit of positive zero response through that area because of a transition, possibly a little bit of mismatch on the rail head area that caused that. You know, the whole idea of the carriage -- as the carriage tracks over that area, is to keep the zero degree centered in the center of the rail, which is in line with the web of the rail. So if that fluctuates or varies as a result of a change in profile or a mismatch of such, it's going to cause a little bit of positive

zero, which is what the operator uses to monitor his alignment. So at that point, he corrects it. So we're seeing a little bit of that.

And as we proceed from the saw cut to the defect indication, there is four hole drillings and the defect itself is present with both ultrasound and induction, which is -- and our vision actually identified that the angle bar was present at the time of the test, August 3rd.

MR. HIPSKIND: And in our review yesterday, we did look at previous screenshots of the same area, the saw cut to the identified defect or the bar -- eventually bar defect. And can you comment on the July run?

MR. WOZNEY: Okay.

MR. HIPSKIND: I know we had a discussion and there was nomenclature at the bottom of the screenshot with abbreviations AR and DF, and can you talk about what our understanding should be of those multiple codings at the bottom?

MR. WOZNEY: Okay. I'm just going to bring it up here as I'm talking.

MR. HIPSKIND: Take your time.

MR. WOZNEY: Yeah.

(Pause.)

MR. WOZNEY: Okay. The operator proceeded from the saw cut and, you know, virtually same responses as I described in the August run occurred at the saw cut end with the drillings and the

rail end information from -- and the vision data identified a joint was applied at that area.

As we proceeded eastward from that saw cut end, it seemed very -- we saw very similar responses to the -- positive zero responses, which in the -- you know, under the same conditions that were mentioned in the August test, that there was some alignment issues. The operator received a response within that area and the truck stopped. He re-ran -- oh, and I guess to mention to your point the AR, which is ascending reverse, at that point. So there was an inhibit line placed which references when the car stops. And AR, ascending reverse movement -- or AR abbreviation pops up with that inhibit line stating that it's an ascending direction in a reverse movement.

So the operator reverses over the saw cut end again and proceeds -- reverses and then another inhibit line pops up.

MR. HIPSKIND: Top --

MR. WOZNEY: That's right. With the abbreviation DF, which is descending in a forward direction. So descending mileage in a forward direction.

Okay, at that point, he goes over the saw cut end again. He still has, you know, very similar alignment issues with positive zero and there's some intermittent loss of bottom through there as well. So he's doing everything he can to try to correct the alignment issue with the wheel.

MR. HIPSKIND: And let me interrupt you just for a

minute. When you use the phrase "alignment issues" --

MR. WOZNEY: Yes.

MR. HIPSKIND: -- let's just add a little bit more detail to that. What we're really talking about is the array, the center arrays, and when we say alignment what we're really talking about is not being positioned centered over the web of the rail. Is that fair to say, or do you want to clarify that?

MR. WOZNEY: The zero degree is centered down the web of the rail, so virtually from the rail surface down to the -- down through the center of the web to the base. So if it runs off course there a little bit, you're going to get a -- either -- you know, as stated earlier, that's where the positive zero comes in. Because the reflection as it moves off center, you'll get a reflection from the fillet area in the web. And that's what causes positive zero. So the operator then goes to a lateral switch and adjusts that accordingly to get it centered again.

MR. HIPSKIND: Okay. And let's just briefly talk about positive zero. Positive zero isn't necessarily a good thing or a bad thing. It's just an indication to the operator on the car to know or understand that maybe the alignment of the carriage could be improved?

MR. WOZNEY: Whether the wheel is accurately centered in the rail.

MR. HIPSKIND: Okay.

MR. WOZNEY: Yeah.

MR. HIPSKIND: And I know some of what we talked about yesterday, all the operators on the cars go through a rigorous training; is that correct?

MR. WOZNEY: Yes.

MR. HIPSKIND: And they do become certified. But the point I want to bring out is that in your training, some of these conditions and challenges that you know they're going to run into, you train them on how to overcome them or what the expectation is to do a re-run; is that --

MR. WOZNEY: Correct. Yep, that's right.

MR. HIPSKIND: Okay. Sorry to interrupt. Please proceed.

MR. WOZNEY: So if the operator runs into this type of condition and he -- just to expand on what you said there. When he runs into this type of condition and, you know, it extends for a certain period of time and he can't attribute it to anything, he has to go back and, you know, reverse the vehicle over that area, correct whatever issue he had to get the wheel centered in the rail, proceed over and clear it up.

MR. HIPSKIND: Okay. And so one of the things about the July test, when we talk about this spot on the spot beginning at the saw cut, in that test we don't see -- we see the presence of the detection of the detail fracture, but the point is there's no bars applied in that test. And one of the things that we noted in the August test was, well, that had changed at that end of the

kind of spot on the spot and there was a set of bars there with -- and we know that because of the drilling pattern in the data. Would you agree with that or what's your comment on that?

MR. WOZNEY: Yes, that's absolutely right. From the saw cut to the angle-barred -- or the defect that was angle-barred in the August test, the measurement was about 17 feet. And when we look at the July run the measurements are exactly the same, taking the measurements off the data for that location.

MR. HIPSKIND: Okay. Is there anything that you would like to add?

DR. HAVIRA: You also had a vision picture showing the actual joint bar.

MR. WOZNEY: Yeah.

MR. HIPSKIND: Okay. And that was Dr. Havira.

DR. HAVIRA: Mark Havira.

MR. HIPSKIND: Mark Havira. And point taken that in each of these stops and in each case where a defect is noted, the software automatically takes a visual photo of that location.

DR. HAVIRA: That's correct.

MR. HIPSKIND: And then that's archived on file back to you, Jamie. That's just part of the agreement, that's part of the procedure about how you go about capturing and documenting each and every one of these locations?

MR. O'ROURKE: That is correct.

MR. HIPSKIND: Okay.

MR. O'ROURKE: And then just to add, in the process as you keep going, yesterday we identified complete repeatability between each run of the saw cut of the defect to the angle bar and on also another 100 feet or so from that point, and the tests on each day indicate exactly as we would have expected looking at each other, and were verified by the vision picture whenever we expected there to be a joint bar.

MR. HIPSKIND: Okay. And, Terry, to get back to your comments about the July run and we were explaining about AR indication, the DF, kind of a long story short, there was the first run through there, a reverse movement, a run through again, a stop, a reverse movement, a third run through, and one of the characterizations that you would make is -- or let me ask you, there was kind of that positive zero in all three of those initial runs. Correct?

MR. WOZNEY: Correct.

MR. HIPSKIND: But characterize the fourth and final run through there.

MR. WOZNEY: The fourth and final run, as the operator kept repeating the area trying to correct the alignment issues that he was seeing, and some of the intermittent loss of bottom, he achieved -- you know, the fourth run the achieved the -- he got rid -- he really got rid of the loss of bottom and the positive zero through the area. And at that point he took -- he identified the defect, got out on the ground, hand-tested it and marked it.

MR. STILLMAN: I'd like to add to that comment there. This is Frank Stillman. On all four of those runs that the operator did make, that defect did indicate regardless of where the alignment was on that carriage.

MR. HIPSKIND: Okay. And that's an important point.

Gentlemen, let's slow down and let's get a couple of terms that we've been using. We talk about Sperry tests and we've been using this other term "run." And who would like to just, again, in layman's terms just explain the little bit of a difference in nuance with those two terms?

MR. O'ROURKE: Yeah, I would like to explain that. Again, this is Jamie O'Rourke. In the vernacular that we use, we use the run and test interchangeably and we, of course, are managing logistic organization of sending people to work in the field on vehicles, common term for us to use a run, there's the run. But bringing to the -- our responsibility to CSX is to actually conduct a test. And so it is not until that operator in his qualified judgment determines that there is a valid test based on the ultrasonic, induction signal that he sees, that it is really the test, the record of test. And so, as we've been talking about commonly looking at the four runs, really the first three are the opportunity for him to go to the spot, scan, get himself in a position to conduct what is really a complete test or a qualified test. So that's how we would make that distinction between run and test. We would use the term interchangeably, but

in this case I think it's a good moniker to call the test, which is what is our contractual obligation and what we're, you know, set out to do, to be the last -- the time that went over the rail, which was the time that precipitated the operator coming out of the vehicle and doing the hand test.

MR. HIPSKIND: Okay. And I know that none of us can speak about what was going through the mind of the operator who made the July test through that area. But fair to say that most likely the initial three runs, stops, backups, and go through there, and the final fourth one, that was all to most likely improve the quality of that final run or test through that area?

MR. O'ROURKE: That is correct.

MR. HIPSKIND: And, again, that was based on getting some of that positive zero and wanting to get a better scan or test?

MR. O'ROURKE: That is correct.

MR. HIPSKIND: You're nodding your heads, but --

MR. O'ROURKE: Yes, correct.

MR. HIPSKIND: -- we're all saying -- okay.

MR. O'ROURKE: Yeah.

MR. HIPSKIND: Let's, before we move on, we also brought up the term loss of bottom, and I'll just throw that out there for somebody from Sperry to respond to maybe just educate us, to bring us to a greater understanding of what that is and is that something that we should be scared of, is that something to be

excited about? How should we think of that? Because inherent in that term is like loss, so I'm not getting something. So let's talk about that a little bit.

MR. O'ROURKE: Sure. That -- again Jamie O'Rourke -- an important that either Mr. Wozney, Dr. Havira, or Mr. Stillman could talk about technically, and I think it's probably best if Frank Stillman addressed that, as he's the operations manager of the vehicles on CSX.

MR. HIPSKIND: Frank, we keep coming back to you. You must know a lot of things.

MR. STILLMAN: This is Frank Stillman. A loss of bottom is saying that the signal is not reaching the base of the rail. A loss of bottom does not mean that a complete test is not performed in that area. Loss of bottom can be caused or influenced by several different things, contaminants on the rail such as grease or leaves or sand. A loss of bottom also can be caused by surface conditions on the rail such as center spalling. And so there's a misconception out there that a loss of bottom means an incomplete test. And just to the record, that is -- it is a misconception.

MR. O'ROURKE: And I think, Frank, it's important that you talk about the term of lack expected response, the similarity, the interchangeability of those terms, because I think that readers often will see one term or the other.

MR. HIPSKIND: Okay.

MR. STILLMAN: So as far as LER, which is called lack of

expected response, that means that the signal did not reach the base of the rail and get a return, so it's the same as a loss of bottom.

MR. HIPSKIND: Okay. And let's put ourselves in the position of an operator and think about the training or instruction guidance that you may have provided that operator in preparation for being on the truck and conducting these tests. Is there a certain distance or a certain amount of loss of bottom that he may get on his screen and do you give him any guidance and say, look, if you're -- if you just keep getting this loss of bottom and it's not intermittent and it just seems to be sustained, we want you to do X, Y, and Z? So let's talk about that just a little bit.

MR. O'ROURKE: Sure. That's an important point and I think again, Frank, you might as well continue on. But I think the introductory statement is that rail testing is both an art and a science. And Sperry's objective and mission is to continue to increase the scientific part, the quality control, but there is an element of operator dependency that does require that person to be expertly trained to make judgment calls based on the circumstances and the variables that they're encountering that day. With that said, Frank, I think you can speak to the procedures and the instruction of those chief operators.

MR. STILLMAN: As we started out in the beginning here, Mr. O'Rourke talked about it. We have what we call the playbook

and we have a customer file. And then within the playbook there is rules of what the operators must do and in the customer file there is exceptions that the customer has required from Sperry. It could be lesser restrictive or more restrictive than what the Sperry playbook recommends. So --

MR. WOZNEY: Can I just comment, Frank?

MR. STILLMAN: Yep.

MR. HIPSKIND: Terry?

MR. WOZNEY: This is Terry Wozney. In loss of bottom in areas of surface conditions, it's up to -- the operator's responsibility to determine attributing cause of that response. So, therefore, it requires a visual examination of what actually caused that response. Now, at that point there's several things that can happen if a valid test can't be achieved, is that an SSC location can be marked or if it's --

MR. HIPSKIND: SSC. You have to slow down and tell us --

MR. STILLMAN: Shelling, spalling and corrugation.

MR. WOZNEY: Yeah, shelling, spalling, corrugation.

MR. HIPSKIND: Okay. Thank you.

MR. WOZNEY: So that can be something that can be applied in that type of area. LER, CSX also has an LER designation that can be put in play for areas of contamination, such as grease, leaves, dirt, debris and such. So those are a couple of how those instances can be dealt with.

MR. HIPSKIND: You know, in our discussion about July and the stops, the ARs, DFs, the reruns to obtain the best test possible, do we get -- do you expect the chief operator to get into that similar judgment call that if he should see or she should see a sustained loss of bottom to maybe stop and do a rerun or something of that nature? Is that part of the standard operating procedure?

MR. WOZNEY: If the operator cannot see attributing cause, then he will do a rerun.

MR. O'ROURKE: It is required to do just as you said.

MR. HIPSKIND: Okay. And then let's talk about the most challenging scenario. If, for whatever reason, surface conditions, dirt, grease, what have you, if in that attempt to test the rail you just come up with a test that you're not happy with, it's not in your control, is the next option there is just to declare that an invalid test or to note that with some icon that we just didn't achieve the best -- would someone want to comment on that?

MR. STILLMAN: This is Frank Stillman. Yes, that's what the SSC designation and the LER designation is for. That's a -- those are both CSX terms in the CSX customer file that we do follow and that's similar to the NT, non-testable, locations to the FRA regulations that were implemented and -- Mr. Carl Patrick or Larry, you can answer that one, what year that term was implemented.

UNIDENTIFIED SPEAKER: 1998.

MR. HIPSKIND: And, Larry, we're coming to you very shortly here just in the next minute, if you want to carry on with that.

Okay, so again, retesting, rerunning is the first option to get the more valid test or more thorough test, but, Frank, to your point, the chief operator has the latitude to encode or imprint these icons into the data to show the conditions that he met with on that particular run test.

MR. STILLMAN: Yes. And that, like I stated before, those are defect codes. Those get assigned a defect number and a length in a defective rail report.

MR. O'ROURKE: And the location is provided to CSX of those indications.

MR. HIPSKIND: And again, this is all part of the communication process of, look, you hired us to do this, we went out there, we're just giving you an up front, this is what we encountered?

MR. O'ROURKE: Right. And let me just verify with Mr. Stillman, that is in the defective rail report?

MR. STILLMAN: That is correct.

MR. HIPSKIND: Okay. All right.

DR. HAVIRA: And it's also generally commented on the tape. You can see that where we had the defect number. This is Mark Havira.

MR. HIPSKIND: Okay.

DR. HAVIRA: In the things where we showed the defect number on that defect that was marked, the same kind of information would be entered for that condition at that location.

MR. HIPSKIND: Thank you. I have had a request for a break, so we will go off the record here for just a minute and resume here shortly.

(Off the record.)

(On the record.)

MR. HIPSKIND: Okay. This is Dick Hipskind. We're back on the record. We've been talking about elements and observations from the June, July, and August screenshots, and I just quickly want to ask Terry, you know, when we did look at the June screenshot, my big takeaway from there -- and we did go back and spot in or locate some of the landmarks of bar joints, field welds, and plant welds, and that kind of thing, and I've got all that noted down. But the main thing is that when we talk about the spalling spot, the saw cut, to the eventual detail fracture that was located in July, the point about the June screenshot, and I'd like for you to comment or confirm this, there was no defect at the other end of what we call the spalling spot?

MR. WOZNEY: That's correct.

MR. HIPSKIND: Okay. And with that, I thank all of you gentlemen for all your candor and comments thus far. Let me pass it off to Mr. Kish. And, Larry, please continue.

MR. KISH: Larry Kish, K-i-s-h, with the Federal Railroad Administration. We talked about the latest technology, the crossfire. Since the crossfire was introduced, you stated the detections of detail fractures had increased, correct?

MR. O'ROURKE: That is correct.

MR. KISH: Okay. Do you have any data or anything saying if the detail fracture derailments has decreased?

MR. O'ROURKE: Sperry does not keep track of that data.

MR. KISH: Yeah, okay. Okay, you also mentioned that the induction assists the ultrasonic channels in finding 20 percent of the defects. Does the induction find defects on its own?

MR. O'ROURKE: Yes, it does find defects on its own. A very small percentage, in the range of 3 to 5 percent, of defects are detected by induction only.

MR. KISH: Very good. Thank you. Now during the data we were looking at yesterday and you were talking about today, we talked about the positive zero and the alignment. By looking at the rail yesterday, could you state or say why -- what was the condition of the rail that possibly could have caused the positive zero or the LER that he had to back up three different times?

MR. O'ROURKE: So to respond to that, and obviously none of us were there on that particular day and time. I think it is probably best to let Mr. Terry Wozney, Larry, address that question.

MR. KISH: Okay.

MR. O'ROURKE: That is his responsibility and does this for a living.

MR. WOZNEY: So -- this is Terry Wozney. The -- I mean, there was the wear on the gauge face of the rail obviously took -- you know, would have allowed the wheel to be off center a little bit for the wheel to be directly -- for the zero to be directly in line with the web of the rail. So, therefore, you know, a little bit of adjustment had to be made at that point to keep continuity throughout the specimen at that time. So, that's really the cause.

MR. KISH: Okay. Now going back to the positive zeros and the loss of equipment response --

MR. O'ROURKE: Expected response.

MR. KISH: Or expected response. Yeah, I get those terms -- when you do align the equipment, what does this add for the test or take away from the test? Is there anything that would add -- of course, it would add getting a better, cleaner test, but does it take away anything from all these different transducers?

MR. O'ROURKE: There again I think, Terry, if you respond to that question?

MR. WOZNEY: Yeah. It doesn't take away. It influences them. I would say it influences them and, you know, depending on the characteristics of the rail, I mean, it can influence them.

MR. KISH: And the characteristics, meaning -- I mean,

just like Frank stated earlier --

MR. WOZNEY: Well, I mean, it could be surface-related conditions. It can be contaminants. It can be wear. There could be -- you know, all those characteristics can influence the detection.

MR. O'ROURKE: Okay. And although I'm -- this is Jamie O'Rourke -- not an expert in this field, to my knowledge it does not take away at all. And as a matter of fact, that process of re-running and going over the same area often, as you think common sense, is done at a slower pace. It's done with the focus of detecting a particular issue. So to the best of my knowledge, there's no take away or reduction of the process.

MR. KISH: Okay, thank you. Okay, it was brought up that there's terms SSH and LER, terms that are used by the CSX.

UNIDENTIFIED SPEAKER: SSC.

MR. KISH: Or SSC, okay, that are used as defect codes by the CSX. When these are marked, I'm assuming -- or you can explain it to me, is there a LER, LOS, or loss of bottom, involved with this type? Of course, the LER, yes. And the shelling, I would assume there would be a loss of bottom?

MR. STILLMAN: There doesn't necessarily have to be.

MR. KISH: Okay. Would these two tests or these two indications on your inspection sheets or defect sheets, would this mean that this is a non-test?

MR. STILLMAN: I'll let Brad Spencer from CSX answer

that question.

MR. SPENCER: This is Brad Spencer. We treat them as a non-testable section. These are actually -- we assign defect codes, but we don't consider them defects, SSCs or LERs. We consider them a non-testable area. And the reason that we assign two different codes to them, SSC and LER, is we wanted to actually pull out what was important for the rail grinder and to kind of say, hey, we're having some issues here, we'd like to move this -- you know, it might be something we want to review with our rail grinder. You know? So as I said, we don't treat them as defects, just a non-testable area, which pretty well fits the description of the FRA, you know, from the regulations. So most times it does mean that there is a loss of bottom, but there are times when that's not necessarily the only criteria.

MR. O'ROURKE: So, Larry, this is Jamie O'Rourke. And I would only add that Mr. Brad Spencer's comments are exactly what we would have expected and that's how we operate and provide that information to CSX. And so in layman's term, what we are saying is not that there is a defect there, we don't know or didn't detect a defect, but that it is not a complete test that's been accomplished at that location.

MR. KISH: Okay. Now I want to get into something I don't know nothing about. Yesterday, a presentation was given to us on the gates and gains. Now correct me if I'm saying this wrong, but the gates are pretty much generated from the system?

MR. O'ROURKE: I think what we'll ask, Larry, is that you address your questions to Dr. Mark Havira.

MR. KISH: Okay.

MR. O'ROURKE: He's probably the -- although all are capable of answering those questions, it is his responsibility to address this specifically.

MR. KISH: Right. So the gates are generated from the system. They're not adjusted by the operator?

DR. HAVIRA: They are -- they can be adjusted via operator, but we have fixed sets of values for specific railways, and then the system keeps them at that those values.

MR. KISH: Okay. Now going with the gains, what would be the purpose of adjusting the gains? And describe what a gain is, what you're doing when you're adjusting your gains?

DR. HAVIRA: Well, first of all, a gain is equivalent to turning your volume up on your radio. It's just -- it's an amplifier. Okay? So that's the simplest explanation.

The most reasonable reasons is if when you have some sort of surface contaminant, and the biggest one is grease, would require some adjustment in gain. But the other one, which maybe a lot of people don't think about, is temperature. Because of the materials we use in front of the transducer, the wheel fluid and the membrane itself, especially when it gets colder, it becomes more attenuative and so they need to adjust for that. Now that may not seem like a lot, but in the course of a day, you could

have a 30, 40-degree temperature change. And so you're not constantly adjusting this gain. They're usually -- it's two or three times maybe. I guess it's only maybe two times a day that they may adjust a gain. But that's the main reasons for adjusting.

MR. KISH: Now when you adjust a gain, and I'll go back to basics, does it add to the testing or does it take something away from the test? Meaning, by adjusting your gain, are you going further into the rail with the noise or not?

DR. HAVIRA: You're going the same distance no matter what; you're just amplifying the signal better.

MR. KISH: Okay.

DR. HAVIRA: So the distance you go in the rail, it's adjusting, in a sense, the sensitivity. Not in a sense, it is adjusting the sensitivity.

MR. KISH: Okay, thank you. That's helped me out a lot.

Okay. And getting back to the equipment, can you explain the pattern recognition?

MR. O'ROURKE: Yes, and I think that's another area for Dr. Mark Havira to address.

DR. HAVIRA: Well, you've -- again, this is Mark Havira. You've all seen the B-Scan images. Now those B-Scan images actually have a little bit more processing before it gets there. There's something called a spatial transformation. When we get information, it's just -- it's a time measurement. We convert

that into a distance for presentation on the B-Scan. But we also have a module called a recognizer. And if you look at those B-Scans you'll see a certain pattern. For example, a local pattern looks like an "A". It has 37 on each side, front and rear, and it has the zeros in the middle. So it looks just like an "A".

Well, with knowledge of that pattern -- and it varies a lot. I mean, it may look simple, but it actually is quite loosey-goosey in a sense that some of those things aren't quite there. But we have a module that actually goes in and looks for that pattern and identifies that as a bolt hole. So the reason you don't see boxes around every one of those as a defect is it's been recognized and processed and it's not showing to the operator because it detracts away from a real defect. And similarly, for like the transverse defect, they're -- almost all transverse defects are in the head and they could be composed of multiple channels, but they're almost always out of a vertical line. And so it's looking for that pattern. If it's -- if they're horizontal, 70s, it's usually, for example, alignment effect of some kind.

So the pattern recognition goes through with knowledge of all these different conditions and actually does a recognition and says -- classifies it even as the type of defect it thinks it is, you know, a horizontal, a vertical type defect, a transverse defect. And if you look at the icons, it'll also tell you how many channels hit, for example, for the transverse defect. So its

cues -- not only does the number indications that he sees on the B-Scan, but that little icon also tells him the extent of how much, for specifically a transverse defect, that's going across the rail.

MR. O'ROURKE: Yeah, this Jamie O'Rourke. It might be helpful for the reader as well in layman's terms to take that term pattern recognition and look at it the other way around, that the system is recognizing the ultrasonic indications and seeing patterns so that it advances the science and reduces the operator dependency, so that the system, through routinely and reliably and repeatably seeing the same patterns, is able to make the judgment or the assessment of what that particular indication is.

DR. HAVIRA: And I keep forgetting on the induction there's -- you saw the analog portion of the induction. This is Mark Havira again. There's a little, what they call digital induction. They're just lines above the things. When the induction crosses a specific threshold, it'll put those up. But those thresholds are used in combination with the ultrasonics to, you know, strengthen the type of recognition. And that's how we know in a lot of cases how much the induction is being used for defect detection.

MR. KISH: Okay, good. That's all I have. Thank you.

MR. HIPSKIND: Thank you, Larry. And let me turn the questioning over to Mr. Inclima.

MR. INCLIMA: Thank you, Dick. I just have a few

questions. I want to just go back to some of the earlier comments for clarification. I think it was said that there's 18 vehicles, Sperry vehicles on CSX or assigned to CSX? Is that correct?

MR. O'ROURKE: Generally speaking, yes.

MR. INCLIMA: Okay.

MR. O'ROURKE: There's likely 18 today and it fluctuates between 17 to 20, based on the frequencies and the requirements of CSX.

MR. INCLIMA: Okay. Now are these, you know, 17 to 20 vehicles, are they all hi-rail trucks or are they --

MR. O'ROURKE: They are all hi-rail trucks.

MR. INCLIMA: Okay. They're similar in that sense. And they all have the same level of technology?

MR. O'ROURKE: They all have the same level of technology.

MR. INCLIMA: Okay. When -- and I don't know if this a question for CSX or for Sperry, but do you normally assign the same vehicle to the same territory? I mean, is that the desired process?

MR. O'ROURKE: For the most part, it is generally the same vehicle and the same operator applied to the same territory, really for two or three very pragmatic reasons. Number one, logistically, it's the least expensive way to accomplish the work, including the opportunity to get chief operators close to home so that they have less hotel expenses. But secondly, and

pragmatically, it develops the relationship of our workforce with CSX on that property to understand the layout and how to most effectively get the work done.

MR. INCLIMA: Okay. These various vehicles, I know they're all similar in technology, would you expect the variations between vehicles going over the same territory based on the system or the operator or perhaps both?

MR. O'ROURKE: No, we would work to them being interchangeable. The vehicles are completely interchangeable and we do so. And the operators are trained and certified to the same way. Like anything else, as I said, is there's an element of science, an element of operator dependency. When you have operator dependency, certainly, you would have the issue of efficiency or style, but that's very narrow and it is of no consequence to Sperry in our planning to move a vehicle or an operator from one property to another.

MR. INCLIMA: Great, thank you. There was some discussion about loss of bottom does not mean a complete test cannot be made. That was a statement, I believe, that someone made. Could you explain just for me and maybe for the record how does an operator verify a test in the presence of loss of bottom? I mean, is it that he has to clear the loss of bottom or are there other reads, if you will, that they can refer tom to say, well, yeah, it's still a good test?

MR. O'ROURKE: Sure. There again I think it's going to

be easiest to have Mr. Frank Stillman answer the question. And to probably specifically focus on during the time of loss of bottom, there are other signals and other recognized indications that we'd expect to see.

MR. INCLIMA: Yeah, and I would like to hear a little bit about that, Frank, please.

MR. STILLMAN: This is Frank Stillman. That's absolutely correct what Mr. O'Rourke just said. There are other means to validate a test. If you have a known track feature in the immediate area where you're receiving these loss of bottoms, they're going to reflect -- you know, you're aren't going to get you're A's on your bolt holes and you're not going to see your rail-end responses. And also, with Sperry, we have the induction method that is not affected the same as the ultrasonics. So you take all your methods and all the tools that you have available to you to make a decision on if you could perform a valid test.

MR. INCLIMA: Okay. So that decision then ultimately through various efforts to verify, that ultimate decision is the judgment of the operator, did I or did I not get a test; is that correct?

MR. STILLMAN: That is correct. Through their training, they've --

MR. INCLIMA: Great. Thank you.

There was some discussion about scheduling, you know, and I imagine this is a pretty complex issue with all the

variables. But I think it might be helpful for the readers to understand, perhaps, or if you can give some examples of what are some of the types -- you know, what are some of the types of issues that would affect your, you know, keeping a schedule that is put together between CSX, in this case, and Sperry?

MR. O'ROURKE: Sure. And this is again Jamie O'Rourke and I'm happy to address that. So it's a process that you would naturally expect from a field service organization. Primarily, CSX provides Sperry advanced notice of the areas to test to give us time to get the vehicles and operators to the right location. There's very little variability in that test schedule. It's a routine process. Sperry is well informed on the days of frequency, when to have the work there. So we do not have a challenge in having the amount of assets ready for CSX to do the work.

I would say probably where the variants or variability comes in, more than anything else, is in the case of equipment down time, when a vehicle has a mechanical problem or should an operator or a crew member have a sickness. And that's a very important measure of our, you know, service offering to CSX and is an area that we spend a great deal of time working on, and over the last several years have seen our, what we call, availability move from 95 percent to 98 percent. So 2 percent of the time potentially we'll have a vehicle or operator not where it's supposed to be. I do not remember a time when that would have

created a territory going out of a frequency of test. There's some slack built into the system and Sperry maintains additional resources should something catastrophic, a vehicle be in an accident or something like that, happen so that we can meet CSX's needs.

MR. INCLIMA: Okay. In other words, you can reallocate another vehicle to that location to meet a frequency and a customer --

MR. O'ROURKE: And we do.

MR. INCLIMA: Yeah, okay, great. Very good.

I just really have one more question essentially. When you have SSCs or other issues that cause a non-test, and maybe this is best addressed to Brad, at that point, do you as a railroad more or less fall back to the FRA frequency maximums? You know, I mean, is that how you do it?

MR. SPENCER: Yeah, 40 MGT in one year.

MR. INCLIMA: Okay. So you're testing at, say, a once-a-month frequency, but where you have areas of --

MR. SPENCER: Repeatable.

MR. INCLIMA: -- non-verified test, then you basically use the default of the FRA as your measure of what you need to do?

MR. SPENCER: We do. And then at that point, if we still haven't got it clear, because, you know, the research -- you know, you're talking in most cases rail grinding, and you can't have a rail grinder everywhere and every moment that you want.

So, you know, that's why there's some time there. But if we don't clear it within, you know, 1 year, the rail gets changed or we put a speed restriction on it, 25.

MR. INCLIMA: Okay, great. And you use that -- again, just to make sure I understood. When you have a non-test like that that might be SSC related, maybe your first course of action would be to get a grinder in there, remove the SSC surface condition, and then hopefully on the next frequency test you can verify that --

MR. SPENCER: Yes.

MR. INCLIMA: Okay.

MR. SPENCER: Yeah, and in fact that's when -- like I said, it's not really a defect, but that's when we clear that defect number is when we have a valid test. And that's when the remediation date is, is when we have a valid test, not when we grind it.

MR. INCLIMA: Right. Okay. Well, thank you, gentlemen. That's all I have.

MR. HIPSKIND: Thank you, Rick. And, Brad, I know we didn't set this up to interview you, but I appreciate the candor of your comments and getting in here.

Let's go to Dr. Fox. He's been with our group yesterday and again today. And just for the record, Dr. Fox on NTSB's behalf was part of our New Brighton, Pennsylvania accident investigation. And I know he has some thoughts on his mind, so,

Dr. Fox, take it away.

DR. FOX: Well, I just had, you know, a few questions about how rail condition, particularly rail wear and head profile, can influence delectability of defects. I don't know who --

MR. O'ROURKE: Yeah, and again, this is --

DR. FOX: -- would be the best to address that.

MR. O'ROURKE: -- Jamie O'Rourke. And I think my three colleagues could all address that, but since it seems you're coming from a railroad real-world environment event, I think again Mr. Frank Stillman, who is very familiar with over 25 near 30 years of experience, and much of it on CSX property, is probably one of the ranking experts in the room to answer those questions for you.

DR. FOX: Okay.

MR. STILLMAN: This is Frank Stillman. Rail surface conditions and contaminants influence the rail testing more so than rail wear and rail profile.

DR. FOX: Could you maybe elaborate on how you would expect, you know, a rail profile to influence -- I mean, is there -- I mean, certainly, there is some influence on, you know, particularly ultrasonics. And I guess specifically looking at, say, the crossfire technology where you're getting some additional, you know, bouncing off the fillet region, do you have any kind of maybe data or -- you know, that you can share that would describe that type of influence or how that is affected?

MR. STILLMAN: I think I'm going to hand that over to Mr. Havira. He's done some research on this.

DR. HAVIRA: Well, the one thing that he didn't say is (indiscernible; noise) alignment so, but that usually the carriage can take care of. But it does -- if you just count on staying where you're at without the ability to change the position of the wheels, then it would have a big affect.

DR. FOX: Okay.

DR. HAVIRA: But the carriages are built so they could be out of align -- not out of align, but moved over to the center of the rail, but that's largely gauge space wear. Now back to your question, is what --

DR. FOX: I'm looking at, let's say, the profile and particularly for the crossfire technology.

DR. HAVIRA: The crossfire was designed -- we were actually discussing this -- when we were designing it, there's actually an optimal position, which isn't quite where it's at, which would make it -- I could compare it to like a Ferrari and a Chevy. A Ferrari you can do really great with, but don't mistune it or you're dead. The Chevy will continue working. So we sort of made this more like a Chevy where it was less sensitive to alignment and it'll find most defects very easily. It maybe wouldn't find the smallest ones the optimal way, but it required optimal rail conditions to do it. So what we try to do is design something so that it's kind of more robust in real rail

conditions. And the same thing is true for the side-looker, by the way. That was designed for really poor rail conditions.

DR. FOX: So what I'm hearing, in a case where you have good alignment and, you know, where your zero degree is aligned with the web, you would not necessarily affect -- or expect a strong influence from --

DR. HAVIRA: No, it --

DR. FOX: -- from the rail wear or the rail profile to --

DR. HAVIRA: It would be some influence, but minor.

DR. FOX: Okay. And, specifically, for the rail that you've seen downstairs, would you expect to see any kind of challenges with the detect-ability of defects with new equipment based on the rail condition, rail wear --

DR. HAVIRA: The spalling on the gauge face wasn't over far enough to affect the crossfire.

DR. FOX: Okay.

DR. HAVIRA: So I don't really see that as any particular influence.

MR. STILLMAN: I'd like to comment on that question. This is Frank Stillman. As we've plainly seen in the data review, the induction responded very well to that defect that was detected in that rail that you feel has surface conditions and rail wear.

DR. HAVIRA: And the ultrasonics did too.

MR. STILLMAN: That is correct.

DR. FOX: Okay. Well, that's -- those are the questions that I had.

MR. HIPSKIND: Thank you, Dr. Fox.

DR. FOX: Thank you.

MR. HIPSKIND: Brad, you have been patiently waiting. Are there any points of clarification or some comments that you want to get the group to respond to?

MR. SPENCER: Yes, this is Brad Spencer. I just had -- you were done, Matt?

DR. FOX: Yes, I'm done. Thank you.

MR. SPENCER: Okay. You said about 25 percent of the defects found from crossfire, but that is -- you were referring to crossfire assisted, not just crossfire, right?

MR. O'ROURKE: That's correct.

MR. SPENCER: Okay. And same with the induction, 17 to 20 percent was induction assisted; it wasn't induction alone. So I just wanted to make sure that was clear.

Some of the questions I had here had been answered, but I didn't -- or had already been asked here, and it was about the SSCs and the LERs not being defects. And what I would like to say is I don't think we're finished with the positive zero and the loss of bottom, and I wanted to ask a quick question on that. So when you have a positive zero, I just wanted to be clear that it wasn't an indication of not getting a valid test; it was only an indication that your alignment is off. And usually the positive

zero that you're getting is mostly from beam spread because you're -- if you don't lose your bottom, you're still reaching bottom and not having a loss of bottom at the same time. Is that correct?

MR. WOZNEY: Yes.

MR. STILLMAN: That is correct.

MR. SPENCER: So typically, when we back up to rerun an area, it's not because of a false positive, but mostly because of a loss of bottom. The loss of -- or the positive zero is usually only an indication for them to start thinking about changing their alignment, the operator?

MR. WOZNEY: That's correct.

MR. STILLMAN: That's correct.

MR. HIPSKIND: Terry and Frank both said that's correct.

MR. WOZNEY: Yeah.

MR. SPENCER: So on our most latest run that we looked at in August, we do have some positive zero but we never lost bottom and that's -- I'm not going to put, you know, thoughts into what we think the operator's doing, but he didn't have a reason to back up because he never lost bottom through there, even though we did have some false positive -- or positive zero, I'm sorry.

MR. WOZNEY: The last rerun, that's correct, he did not have loss of bottom.

MR. HIPSKIND: That's commented by Terry Wozney.

MR. SPENCER: Okay. We talked briefly about the gains, and the idea of the gains is basically to stay consistent. So you

adjust the gains not to amplify something larger, you amplify it to keep it consistent at the same amplitude, right?

DR. HAVIRA: This is Mark Havira. That's correct.

MR. SPENCER: Okay. How many indications on, say, a typical test -- our average test averages approximately 19 miles a day. Could you tell me how many things are marked with pattern recognition and say -- I don't need a specific answer, but roughly, how many indications do they look at that are pattern recognized?

MR. STILLMAN: This is Frank Stillman. I could answer that. It depends on the territory they're operating on and if it's a main line or a secondary main line. On a main line piece of track, you could see upwards of 2,000 indications with pattern recognition.

MR. SPENCER: Okay. And that's just in a 19-mile segment, for instance, roughly?

MR. STILLMAN: That is correct.

MR. SPENCER: I know these are estimates. So in a 19-mile segment, there would be over -- there could be as much as 2,000?

MR. STILLMAN: That is correct.

MR. SPENCER: And we've seen more than that at times depending on the locations.

MR. STILLMAN: Depending on the locations, yes.

MR. SPENCER: We cover approximately almost -- over

70,000 miles of track with Sperry a year. So they're looking -- if you related that to how many indications, it's an astronomical amount of indications that the operators are looking at; is that correct?

MR. STILLMAN: That is correct. And to add to that comment, I'll ask a question of Mr. Wozney, if it's to his recollection if he can remember the vision photo number from the indication that was marked on the July test?

MR. WOZNEY: It was -- I think it was 1800, 1880, I believe. Or 1080? It was well over 1,000.

MR. STILLMAN: And that was at that location --

MR. WOZNEY: Yeah, I think --

MR. STILLMAN: -- more after that.

MR. WOZNEY: Yeah.

MR. O'ROURKE: The point being that Frank is identifying that the picture count is a way to look at --

MR. SPENCER: Yes.

MR. O'ROURKE: -- answer the question. It's in the thousands.

MR. SPENCER: So this operator, would you say at this point on the July test when he did four reruns of -- or three reruns of the area, one original run, he was being extremely thorough in this area at that time of the test, you would say, considering how much they're looking at how much track they cover?

MR. O'ROURKE: This is Jamie O'Rourke. I would say yes,

he was working to the procedure and was completely diligent in doing so.

MR. SPENCER: Okay. That's all I have. I don't have any other questions.

MR. HIPSKIND: Thanks, Brad. And I -- listening to your comments and questions and responses, I want to cover a couple of administrative things and I want to try and tie up some loose ends in my mind. One about -- and I'll just give an open opportunity to you, Jamie. In all of our discussion here, NTSB's purpose is to look at transportation-related things and for our discussion and for the track group's investigation to provide information, understanding, a greater knowledge about the ultrasonic testing, but to the Board for their consideration about safety recommendations. I mean, that's our final product, and just to help us out in the accident investigation.

So in everything that we've talked about here today, in the coming days, if you find some documentation or anything that you want to provide or send to us that maybe we have not covered because of some of our time constraints, I would just -- we would welcome that. And that's something for you to consider and send us any or all of what you think might be helpful for us.

On the point about documentation, two terms were brought up earlier in our discussion about car movement reports and defect rail reports, and I would request -- and I will make this formally through Bruce Rose to send to you, but just as a heads up, we

would like to get the daily reports for those three test runs, July -- or June, July, and August that we've examined. Okay?

MR. O'ROURKE: And on that point, keep -- I believe Brad Spencer is going to provide those to you.

MR. HIPSKIND: Okay. And that'd be fine. Just to give you a heads up about that.

And one of the things that we've been talking about is from the perspective of the operator in the truck conducting the test. And we've been talking about stuff that we've seen on the B-Scan, which the B-Scan is just data displayed on a screen from the testing, from all the stuff that was recorded. And I just want to make the point that before these gentlemen, ladies get to be a chief operator, would somebody comment or characterize the training that goes on and how that progress is handled before they become a chief operator?

MR. O'ROURKE: Yes, I'd be happy to do that. Again, this is Jamie O'Rourke. And most important, I think it is to set a line in the sand between the history of rail flaw detection, which was -- and I would say for sure Mr. Stillman and Mr. Wozney, who have both been chief operators, learned their trade, it was a process of going to the field and learning from an experienced chief operator, assimilating and imitating and learning themselves how to become a chief operator. Several years ago now, near 10 years ago, Sperry determined, though, while that had been proficient, a better methodology was to conduct and develop its

own Sperry school of rail testing, which we have done, which is organized and run under the professional mentorship and leadership of a gentleman named George Quinn, who is our Level III ultrasonic inspector, who had been previously a professional and paid trainer for a company called Hellier Inspection, which our company now owns. And under George Quinn's guidance, all chief operators come to Danbury, Connecticut to achieve their Level II ultrasonic testing certification.

Backing up from that, let me just give you a very simple road map for how someone becomes a chief operator today. We hire people and we put them in the field and we start them as a driver or a driver mechanic on our vehicles. We identify those people that have the aptitude and the attitude to become chief operators, a very significant and important job in railroad safety. Those people are identified by not only their chief operator, but also the field manager level of supervision that will qualify, will also look into these people's opportunity to advance.

Once we've identified a candidate as a potential chief operator, we start to engage with them to provide the content, give them a little bit of instruction. We let the chief operator know that they will be -- they've been elected and chosen to come to our 10-week class in Danbury, Connecticut. And in that 10 weeks, they are taught virtually, though much more, everything that we discussed today, from gates to gains to pattern recognition, ultrasonic induction, crossfire, vision, how to

create the CMR or the DRR, you know, a number of items. And upon completion of that course, there is a practical exam that is very difficult and lengthy to accomplish. If we were looking at the content on these tables in front of us, we would see three binders each of three or four inches thick that has that content.

Once those people achieve that -- completion of that curriculum and the testing that is accompanied with that, they go back to the field as a chief operator candidate. And there they are, for the most part, made or put on the vehicle to be the third person, someone to just shadow the chief operator, somewhat similarly to what I said years ago was the primary way to go. And we've elected chief operators who are proficient in their operation, but also proficient in training to mentor those individuals. At that point, they will be on the radar of not just Frank Stillman, who's running the operation, or Terry Wozney, who manages the qualification, certification, the routine eye exams of all of our chief operators. And upon achieving time in the field that proves to us that they are able to do so and become a chief operator, we will certify them, they will go into our records. Today we have near 100 chief operators in the U.S., certified and qualified in that way.

We follow the ASNT, American Society of Nondestructive Testing, curriculum in regards to ultrasonic testing and the testing for those, which is how they become UT, ultrasonic test -- ASNT, UT, ultrasonic testing, Level II. So that's the process

that these people will go through to become a chief operator.

MR. HIPSKIND: Okay. And I think the natural follow-on is, you've progressed in your training -- and I remember the days when it was OJT. I remember those well. And that was years and years ago, and you've developed it to a more formal, sophisticated training. Let's talk then about, okay, you've developed the chief operators. They're out there helping you to do all the testing, multiple vehicles, different railroads, whatnot. Jamie, if you could, speak about how you achieve the desired internal oversight of this entire operation then.

MR. O'ROURKE: Sure. And I think really that I'll take you down two quality paths, one routine and then one by exception. So in the routine quality path, once that chief operator is in place and doing his job, Terry Wozney is here today, has a staff of near a half dozen tape auditors that will randomly, though systematically, audit, I believe it is 10 percent, Terry, of the chief operators' work every week. And so we will take those B-Scans the same that we looked at yesterday, and bring them in to review by people qualified to review a second time to make sure that the chief operators' indications, the dispatching, the disbursing of any pattern recognition is done to the best of our ability given the vision system and the B-Scan as opposed to being on the property. So that routine process happens every day, every week.

We score our chief operators relative to any suspect

indications we might see. We prorate all (ph.) them to make sure that we are focusing on anybody that needs any type of work to increase their level of competency. Again, the science is for the most part the same throughout -- certainly keeping this with CSX, CSX runs the same technology. But we're really looking to advance. We're not looking to use that process to get people up to being a qualified chief operator, but continue to get them to be better. So that happens under Terry's watch and he is in direct contact then with the field management, where we will go and meet with any chief operator on their vehicle should there be any issues we see from that standpoint.

The second element of our quality control, as you would expect, is by exception. If there are any service failures, and all service failures are rail breaks that occur on CSX, that data is provided to Sperry. We investigate every single one of those service failures or rail breaks by doing what we did yesterday, pulling up the tape, pulling up the vision system, and making sure there were no misinterpretations, our system or operator errors.

So between those two, first routine and second by exception, processes, we are able to feel confident that everyday those 18 to 20 people out on CSX property, or those 90 people out in North America, are able to do the job. And I think that's evidenced in what we saw yesterday with that type of discipline. And we will certainly evaluate the tapes for that type of discipline and follow-up.

MR. HIPSKIND: Okay. And I want to tie up a couple of loose ends too. When Brad was talking about pattern recognition, see if I've captured this correctly, and Dr. Havira, is the layman's understanding of this is you have pattern recognition to assist the operator and to bring to his attention or her attention there is something on the screen, you need to take a look at it, you need to make that judgment, you need to make that assessment? It that --

DR. HAVIRA: That is correct. And that's why I brought up the bolt holes. You don't want to look at things that aren't defects.

MR. HIPSKIND: And you want those thrown out?

DR. HAVIRA: Right.

MR. HIPSKIND: Okay. But one thing that we missed there, I recall way back in the day there used to be an audible alarm go off. So with pattern recognition today, do you have that same thing? I mean, how do --

DR. HAVIRA: Yes.

MR. HIPSKIND: How does the software then say -- bring to the human's attention, okay, hey, wait a minute, you've got something?

DR. HAVIRA: There is an alarm every time a recognition goes off.

MR. HIPSKIND: Okay. And just to -- Brad, you mentioned a 2,000 figure, and, Frank, you confirmed it. That doesn't mean

that there's an alarm, an audible alarm going off 2,000 times a day, it just means that the software is recognizing things, correct?

MR. STILLMAN: There is an alarm going off on those 2,000 indications that are pattern recognized that day.

MR. WOZNEY: Things of a specific size, though. That's built around the acknowledgment, the acknowledgment software.

DR. HAVIRA: No, the alarm goes off all the time.

MR. STILLMAN: Every time.

DR. HAVIRA: I think not -- there's another layer of -- it's not quality, but -- I don't know what to call it. It's called acknowledgment software. When there's indications of a specific size that we feel are really important, the operator has to -- physically has to annotate it, saying I did see this, to make sure that he doesn't go by it.

MR. HIPSKIND: The handshake from the human back to the software --

DR. HAVIRA: Right.

MR. HIPSKIND: -- yes, you told me; yes, I saw it --

DR. HAVIRA: Right.

MR. HIPSKIND: -- and I've acknowledged it by typing in a code or whatever.

DR. HAVIRA: But every one is -- every one dings on it.

MR. WOZNEY: The ding, yeah. But the acknowledge is a buzzer that kind of goes out. Yeah, I guess, you're right.

DR. HAVIRA: We actually had to draw --

MR. WOZNEY: Yeah.

DR. HAVIRA: We tried a submarine dive and that drove people crazy, you know.

MR. WOZNEY: Yeah.

DR. HAVIRA: Really --

MR. STILLMAN: So to answer that question, there is two levels of confirming.

MR. WOZNEY: Right. Go ahead, Frank.

MR. HIPSKIND: Let's proceed with that.

MR. STILLMAN: The first level of alarming is a ding that goes off. It's an audible ding that the operator hears on every indication of those 2,000. And then there's a second level, which is called the acknowledgment, and as Mark Havira had spoken, the acknowledgment goes off when an indication meets a certain criteria or a certain ultrasonic or an induction response in the system.

MR. O'ROURKE: Is that an audible as well?

MR. WOZNEY: Yes.

MR. STILLMAN: Yes. It is a --

MR. HIPSKIND: Both are audible?

MR. STILLMAN: Yes. A car horn, or whatever you want to call it.

MR. O'ROURKE: I think maybe a simple important point in the context of the report and what the reader will see in perhaps

B-Scan images, that B-Scan will not advance until the operator is responding to that, the second one.

MR. HIPSKIND: It's a fail-safe, then?

MR. O'ROURKE: Right.

MR. WOZNEY: Yeah, it's not the sound as much as it is the screen that they're looking in really brings their attention to everything in the boxes.

MR. HIPSKIND: Okay. Another thing, I have requested, received and read a lot of annual defect data. And one of the things that I learned is that somewhere around 2011, the -- and I'm going to use the term cycle, the cycle of tests -- a cycle meaning you start at one end of the Old Main Line Sub and over a multiple-test day, you continue through to the other end of the Old Main Line Sub -- that the cycle of test increased. In the previous years we saw indications of four to six tests a year, but for whatever reason, in 2011, it almost achieved a every 30-day, an every monthly cycle. And just to say I think somewhere in our conversation, I think Brad said, well, our regulatory obligation is once a year or every 40 million gross tons. So if I'm correct, from about 2011 forward, the Old Main Line Sub was being tested at, I'm going to say, a factor of 10 times the regulatory prescription -- or, I mean, not prescription, but expectation. Anybody want to comment on --

MR. WOZNEY: Our speed right there was 25 through that area. So --

MR. HIPSKIND: So technically, it didn't even require that. But in terms of the cycle of testing you decided, that factor of 10 is correct?

MR. WOZNEY: Yeah, that -- and that's correct. We were doing it at 31-day interval, which is approximately 12 times a year. And in this case, we were at an 18-day test to test. So we were -- sometimes we're often -- it's impossible to hit those targets exactly. So, you know, the way we scheduled it is we go on a percentage system, below or above, and we try to stay within a certain percentage either way. And in this case we happened to be early because we reached our targets and, as we talked about before, there's a lot of things that influence how much production you get in a day, whether it be down time or traffic or -- our average is 19 miles a day, approximately, but we could do a 40-mile day or we could do a 10-mile day. So the average is -- so it's very difficult to hit targets exactly and -- but, yes, we're at a 31-day cycle and we approximately do it 12 times a year.

MR. HIPSKIND: Okay. And just a kind of stickler for a point here. When we reviewed the screenshots, the B-Scans, for the June, July and August test, some of what we did there was to help us validate the length of the rail from the saw cut to the bar defect. And, Terry, I'll just ask you, you were kind enough to use your computer and to place some lines on there and come up with some measurements that were helpful in us validating some. But just to say that when you use that yardstick tool, that

measurement tool in the software, there is some subjectivity to it and that your measurement tool does go down to the sixteenth of an inch, and the point being that in the placement of that there is a plus or minus to the accuracy of it. Not that the tool doesn't measure accurately, but just that there is subjectivity about where the lines are placed.

MR. WOZNEY: That's correct.

MR. HIPSKIND: Okay. All right.

And the final thing, I just a curiosity. I'm involved in some other efforts with the FRA through their various meetings on various topics, and would anyone like to comment on the strengths and weaknesses that you all see with your testing? What are you good at, what do you feel comfortable with, and what do you see at some of the challenges that you're still trying to overcome, if not now, but in the future?

MR. O'ROURKE: I'd be happy to respond to that and maybe take a little bit of an open-ended invitation to thank you, Dick, for the opportunity to have the four of us here today.

MR. HIPSKIND: You're quite welcome. The pleasure is all mine.

MR. O'ROURKE: And to clarify that Sperry really has two primary objectives that we are passionate about and take seriously. One is to help advance railroad safety in the United States, North America, and around the world; and the other is to serve our customers that own and operate railroad infrastructures.

And as such, from a commercial term, from a relationship to do the most good, we work for railroads. And our objective is always to talk to the railroad, provide our expertise, work collaboratively with them. Each of those relationships I'm very proud of, and certainly CSX very much so. The only gating factor we have in discussing our performance with CSX, with anybody other than CSX, is that we are the stewards of their data and their information. So I appreciate you respecting that and making this an easy process for us. But CSX instructs us to provide data at any time, which they have done without limit in this case, or really at any time that I've been working with them, we're ready to do so.

It's a risk management issue for the railroad. They have a commercial economic infrastructure ownership aspect to deal with and I, from my years in the railroad industry now, I think that's an industry well capable to handle that significant challenge. So that then brings me to the passions Sperry has, and Mark Havira, Terry Wozney, and Frank Stillman with me today, there are -- know more than those three people of railroad safety. So we open ourselves, we're available to talk to the NTSB, certainly the FRA, at any time about our processes, our technologies. And I just want to keep that door open, if there's any time we can help in any way, provide our own expertise.

MR. HIPSKIND: And I appreciate that, Jamie.

Let's -- I think we're close to the end of this and so let me go around and -- Larry, I'll start with you. Any follow-up

or any loose ends you want to tie up?

MR. KISH: No. We're good.

MR. HIPSKIND: You're good to go. And, Rick, I think you had a question?

MR. INCLIMA: Yeah, just one, and it's very straightforward. When you're talking about the alignment issue, is it always the desire to align directly over the center of the web regardless of gauge face wear or field side wear? Is that always where -- is that the optimum spot?

MR. WOZNEY: Yes.

MR. INCLIMA: Okay. So it's not the surface of the ball, it's the center of the web. That's my last question.

MR. WOZNEY: Good question.

MR. INCLIMA: Thank you.

MR. HIPSKIND: Okay. And, Dr. Fox, any follow-up?

DR. FOX: I guess one follow-up on the wear. Is there a, maybe a limit to where you would expect to see a significant effect on ability to detect defects as far as, you know, wear or profile geometry?

MR. HIPSKIND: Say, for example -- this is Dick Hipskind. Say, for example, an extreme gauge face wear, almost to where you're over to the web, does that present a challenge or --

DR. HAVIRA: It's a challenge, but you're still inspecting the rail. Some of the transducers --

MR. HIPSKIND: Less of it?

DR. HAVIRA: Some of the -- well, there's not there --
MR. STILLMAN: Well, (indiscernible) essentially. Yeah, okay.
DR. HAVIRA: Some of the transducers may not be over the head of the rail but if -- because there's no head.
UNIDENTIFIED SPEAKER: Right.
DR. HAVIRA: But other than that, it may be a little bit noisier. But the actual type has really no effect on it.
MR. HIPSKIND: Okay.
DR. FOX: That's all I had.
MR. HIPSKIND: Thank you. Brad, anything you want --
MR. SPENCER: I don't have anything further.
MR. HIPSKIND: And I do appreciate you pitching in there. I hope we didn't confuse the transcriptionist, but I'll be in touch with them if --
MR. SPENCER: And we'll send you a copy, too.
MR. HIPSKIND: And we've had two other gentlemen who have been back in the back observing. Mr. Rose, anything that you'd like to add?
MR. ROSE: Just a couple things, Dick. I would like to express receiving (indiscernible) thanking the Sperry Corporation, Jamie and your counterparts, you know, for taking the time out of your-alls busy schedule and bringing your expertise here to be able to address the questions from the organizations here. Like I say, I really, really appreciate the presentation yesterday with

actually showing the screens. I think that just was huge in helping everybody understand the process, going back over a 3-months' test period and all that. I think it really clarified a lot of things for everybody. And, like I say, I just appreciate you-all showing that professionalism and cooperation to come down and be part of this. Thank you.

MR. HIPSKIND: And, Mr. Patrick?

MR. PATRICK: I'm good with everything. One question that I did was confirmed or passed on by Mr. Kish during his interview, so --

MR. HIPSKIND: Thank you. Well, let me to get to where we're going to button this up. And I would be remiss -- again, I allude to the fact I'm involved with some other things and we're talking about some rail wear limits and rolling contact fatigue and things of that nature. And I know you guys see a lot of data and there's a couple things I want to add to the record here and I'm going to ask your professional opinion. You know, one of the most challenging things in my experience of accident investigation at FRA and in the industry is the darn detail fractures. And some seem to have a set progressive nature to them, and they grow at almost a predictable rate, very small, and they stay small, but their growth -- and I want to characterize it correctly, it just progresses incrementally. And I think we've all experienced -- and I'll ask your opinion -- there seems to be a second variety or type of a detail fracture that may start out like the one that I

just described, but for whatever reason, and I think it's part of the mystery of the industry and the manufacturing of rail, that just in a very short amount of time, grows exponentially; or to say it another way, it has a very rapid growth. And so, with that kind of as a background, anybody or everybody from Sperry, if you want to comment on some of the experiences in service rail failures and things that you've experienced, do you think that's a real world challenge in something that's out there, or is it just unexplainable?

MR. O'ROURKE: Let me start out with that, and then I think it's a good question to let my colleagues respond to if they'd like to --

MR. HIPSKIND: Sure.

MR. O'ROURKE: -- as well. But, and at a high level, in having the global perspective that we do, through looking at the miles and miles of tests we do, a half of million miles of tests a year we do, we see a number of indications that were not there, very soon before we found those indications, though we have every bit of confidence that the system and the operator was working correctly because we see indications all around that. But probably it was best manifested when we went and did a project in Australia and a coal line there and to working for a mine that wanted to evaluate testing on a weekly basis. We could see defects propagate within 7 days under a great tonnage.

So I think your point is an excellent one, that

absolutely the issue for the industry is those defects that grow rapidly. And to the best of our ability right now, Sperry, or as what the industry brings, frequency is our number one tool to address that.

Secondly, not to not address wear rates and the effect of that on railroad, is not ours, at Sperry, area of expertise. We're not metallurgists, we're ultrasonic and induction testing scientists and operators. But certainly, we are looking and looking to look at with the industry how can we get to a more predictive process. And that may be a combination of statistical analysis, looking at clustering of defects, factoring in an advanced model beyond what's available today, with tonnage, climate, rail weight, many different applications. So it's really and only an answer to say that, Dick, there's no doubt you are on to the right and most important point. And our company is addressing that now and looking to how we can advance from a technological standpoint with our global view over the future.

You asked earlier about what are the challenges. One of the big challenges at Sperry is to be able to test faster and more frequently to less disruption of the railroad to enable frequency of testing to be a tool to be used. There are other technology hurdles and that is the defects that we don't detect, as you mentioned earlier. And we use our quality process as much to provide engineering those items, as we do to review the operator in detecting what he should.

So just a statement on the vision of where we're going for those exact points you mentioned and then any of these three experts that want to talk about historically of what they've seen on growth of defects are certainly welcome to do so.

MR. STILLMAN: There's been some studies that have been done on defect growth, and pretty much what I've read in the studies is it all hinges on tonnage, weather, track conditions, top grade. There's several variables that are put into that, that if you look at -- and steel -- on the defect growth, and the rapid and the -- I mean, you might -- you know, in my years in the railroad and the rail testing industry, you might see one defect in a curve that has very slow growth and go 30 feet up the tracks and see one with very rapid growth. So --

MR. HIPSKIND: Okay. Thank you, Frank.

DR. HAVIRA: I can't do anything more than Frank. But one suggest is, and I don't know if you have access to all of the data, but if you use principal component analysis, because I have no idea why one grows faster than another, but if you put all the information you can in rail profile, the type of rail, location, rail manufacturer, whatever you can put in there, and then start to get -- it's not a cluster, but you can actually start pulling out the commonality of why certain ones grow faster. I don't think we -- do we record from service failures which is rapid growth? There might be a comment on there, but we don't --

MR. WOZNEY: Yeah, no. No --

DR. HAVIRA: We don't consider the --

MR. STILLMAN: We have a lot of data points that we use and -- in service analysis when we do run them.

DR. HAVIRA: No, but I mean, to try to get the information, you need to start recording specific information.

MR. HIPSKIND: But, Mark, to your point, and I think what you were alluding to is, that there are organizations, companies out there that have created adaptive models that do gather a lot of data, back to Frank's point, about a whole host of different variables to build out that adaptive model and to make recommendations and things of that nature. And so, but Terry, anything to add?

MR. WOZNEY: Well, very similar Frank. I mean, we have -- you know, there's -- it's the variability with this, you know, industry that we're in. You know, we have rail, we have different temperatures, we have different conditions, tonnage. It's the cars, the way they move around the -- over the rail. It's, you know, heat. You know, it's very difficult -- I think that's the challenge, is learning more about each thing that occurs at -- you know, in each event, you know, and how you capture that data and how do you analyze it. Until we can do that, I mean, there's really, you know, no magic bullet to figure that out, so --

DR. HAVIRA: This is Mark Havira. I don't think any railroad watches a defect grow in North America. So if one is detected, it's not a matter of saying how long it takes to grow;

it's out of there.

MR. HIPSKIND: Right. Exactly. And that's a great point. Your whole business is about find the rail flaw, identify it, locate it, document it, and notify people. And as we said earlier, that next phase, the railroad operator then takes over and, to your point, Mark, they get rid of it. They remove it, they repair it.

MR. O'ROURKE: Right. And to wrap up this comment, for Sperry, anyway, we are now talking about a mission that Sperry's on. And for point of clarification, we do, do testing in parts of the world where defects are left in track, and we are able to monitor. So Sperry is into this process of how to come to this productive, more preventative way of testing. It's just not something we're ready to provide to the North American railroads yet with confidence that it will increase safety. But it is certainly in the direction that the company's going, that we are going.

MR. HIPSKIND: So you are looking at all angles and you are taking a scientific approach about how best to manage rail risk?

MR. O'ROURKE: Yes. We believe that's the next evolution for us from a value proposition, to serve both those passions: how to make the railroad industry safer and how to provide more value to our customers.

MR. HIPSKIND: Okay.

MR. O'ROURKE: But Sperry's a, in the case of ultrasonic testing, a longstanding company. We're very careful to make sure that what we come up with will work, and will work in the economy and environment of a railroad before we'll suggest it as a tool. So we are monitoring that and in our own way determining how we can best add to that collective wisdom from the industry.

MR. HIPSKIND: Okay, very good. One last request. Mr. Rose, I know when I've accessed some of our NTSB dockets where Sperry has been involved post-accident, sometimes Sperry has taken on to produce their review and a short report about their involvement with NTSB. And should I make that request to you, is that something that you would be agreeable to make on our behalf with Sperry?

MR. ROSE: I think we can do that. Sure.

MR. HIPSKIND: Okay. Just so you can hear that conversation as a heads up, because I know in the past you have. I don't know where you're at in terms of in this particular accident, but should you get that request, we would like to be copied on that.

MR. ROSE: Sure. I understand. To the best of my knowledge we have not provided a report on this, and I'm getting the nod from Terry Wozney, I guess it is --

MR. WOZNEY: You're not saying create a new report, you're -- just one that they've already done?

MR. HIPSKIND: Just --

UNIDENTIFIED SPEAKER: They haven't done one.

MR. HIPSKIND: -- whatever their process would be. And let me share with you my thinking. And, certainly, in the New Brighton NTSB investigation, there was a document produced and the gentleman is in the room with us, and what a great job he did with that, so I'm sure you have a record of that and just in terms conceptually of what it is I'm talking about.

MR. O'ROURKE: Sure.

MR. HIPSKIND: It is that type of -- and I'm sure that behind any of these incidents/accidents, you guys do a very thorough internal review. We talked about that earlier in our discussion. So if also part of that may be to produce a report with Sperry's perspective about some of the things that you are involved with, with NTSB and some of your follow-up, that would great. And I will make that request with CSX.

MR. O'ROURKE: Sure. So, for clarity, just -- and because, of course, I'm familiar with the New Brighton incident and the reports that we routinely write. On this incident we have not written that formal report, and this process probably usurped us doing that. But if CSX requests us, we will do so.

MR. HIPSKIND: Okay. And, yes, I totally understand. The request wasn't made and so --

MR. O'ROURKE: Yeah. Sure.

MR. HIPSKIND: That's fine. Just to close this up, I just want to say I think we have done safety a very good deed

today, and I appreciate the candor and openness and thoroughness of Jamie, of you, assigning with your colleagues here the best answer of the questions and I thought we got some terrific responses. I think we've made some real headway for people to understand some of the work that we do when follow up with the accident investigation, all the understanding of the B-Scans. Maybe one final request. I know we have some labeling to do, and when we share our files on the B-Scans, I will try and reach out as a follow-up, to use you as a check, did I get this label right, and to make sure that we get this done factually and accurately. But a final comment, I really appreciate the panel approach that we took today. I know it's a little bit out of the norm for us to do the interviews this way, but I think it added value. It added value to our investigation and I'm very thankful to all of you and to all the people on the Track Group who participated in that. So if there are no other comments, we will close the interview. And, again, my sincere thanks.

(Whereupon, the interview was concluded.)

CERTIFICATE

This is to certify that the attached proceeding before the

NATIONAL TRANSPORTATION SAFETY BOARD

IN THE MATTER OF: CSX TRAIN DERAILMENT
AUGUST 20, 2012
ELLICOTT CITY, MARYLAND
Interview of Sperry Rail Services

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was held according to the record, and that this is the original, complete, true and accurate transcript which has been transcribed to the best of my skill and ability.

_____
Kay Maurer
Transcriber