NATIONAL TRANSPORTATION SAFETY BOARD

IN RE:	
THE HEAD-ON COLLISION THAT OCCURRED NEAR PANHANDLE, TEXAS ON JUNE 28, 2016	NTSB Accident No. DCA16FR008

Interview of: MARK SCHULZE AND OREST DACHNIWSKY

Friday,
July 1, 2016

Pampa, Texas

BEFORE:

TOMAS TORRES, NTSB
DAVID FREEMAN, BNSF
RYAN RINDELMAN, BNSF
AARON RATLEDGE, BNSF
STEVE DUPONT, FRA
ERICH JESKE, BLET
RAFAEL MARSHALL, NTSB
STEVE FACKLAN, BLET
KAMRON SAUNDERS, SMART TD

This transcript was produced from audio provided by the National Transportation Safety Board.

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

(Time not disclosed)

MR. SCHULZE: Mark Schulze. It's a pleasure.

MR. DUPONT: Steve Dupont.

MR. SCHULZE: Steve, it's a pleasure.

MR. DUPONT: I'm probably not aware of what (inaudible).

MR. SCHULZE: Yes. Yes. And we've, that we have.

MR. DUPONT: You and I ran across it, yes.

MR. SCHULZE: Steve, this is Orest.

MR. DUPONT: Okay. Thank you, Mark.

MR. SCHULZE: That's the other card. Absolutely.

MR. TORRES: Okay, we'll get started here. This is the NTSB informal interview. It's going to be a presentation of question and answer. My name is Tomas Torres, T-O-M-A-S, T-O-R-R-E-S. Today's date is July 1, 2016, and we are at Pampa, Texas in the Holiday Inn Express interviewing --

MR. SCHULZE: This is Mark Schulze, M-A-R-K, S-C-H-U-L-Z-E, of BNSF Railway here to speak on positive train control or PTC.

MR. DACHNIWSKY: Orest Dachniwsky, O-R-E-S-

T, Dachniwsky, D-A-C-H-N-I-W-S-K-Y, also of BNSF to speak on PTC, positive train control.

MR. TORRES: And --

MR. SCHULZE: Dave?

MR. FREEMAN: So I'm not going to testify or do you want me to still introduce myself?

MR. TORRES: Yes, just introduce yourself.

MR. FREEMAN: My name is David Freeman. I'm the executive vice president of operations for BNSF Headquarter in Fort Worth, Texas.

MR. RINDELMAN: Ryan Rindelman, system safety. Ryan and Rindelman, R-I-N-D-E-L-M-A-N.

MR. RATLEDGE: Aaron Ratledge, BNSF, operating practices, Fort Worth. A-A-R-O-N, R-A-T-L-E-D-G-E.

MR. DUPONT: Steve Dupont, Federal Railroad Administration. S-T-E-V-E, D-U-P-O-N-T.

MR. JESKE: Erich Jeske. E-R-I-C-H, J-E-S-K-E, BLET safety task force, primary investigator.

MR. MARSHALL: Rafael Marshall with the NTSB. R-A-F-A-E-L, M-A-R-S-H-A-L-L.

MR. FACKLAM: Steve Facklam, F-A-C-K-L-A-M, BLET, party spokesman.

MR. SAUNDERS: Kamron Saunders, Smart TD, party spokesman. K-A-M-R-O-N, S-A-U-N-D-E-R-S.

MR. TORRES: Okay. This is Tomas Torres. This is connection with the accident that occurred near Panhandle, Texas on June 28, 2016. NTSB accident number is DCA16FR008.

The purpose of investigation is to increase safety, not assign fault, blame, or liability. Do you understand that this is being recorded?

MR. SCHULZE: I do. Yes.

MR. TORRES: Okay. So if you can go ahead and state your name I guess. Start in and, you know, explain to us why you're here.

MR. SCHULZE: Sure. This is Mark Schulze, and, of BNSF, and I was asked to attend here to speak on the positive train control implementation on the BNSF railway system.

I've been involved with positive train control for at least a decade. BNSF has been very involved in the development of positive train control dating back to even the 1980's, with a system called ARES or the advance railway electronic system.

The system we currently use, the electronic train management system, or ETMS, is our positive train control system. It was developed out of the ARES system.

We're currently in development of PTC across

a large part of our network. We will implement it on 86 of our subdivisions of about 117 subdivisions. It will cover about 55 percent of our network, or about 70 to 80 percent of our train traffic.

We have been, worked on this very hard over the past many years. We are the leaders in the industry.

We've had well over 100,000 trains that have been operated with PTC engaged successfully, and we continue to march towards the mandate to have it implemented across those mandated subdivisions by the end of 2018.

MR. TORRES: Yes, how many subdivisions you said PTC's active in?

MR. SCHULZE: We will implement on 86 mandated subdivisions as part of the Rail Safety Improvement Act of 2008, and currently we are active on 20 of those 86 subdivisions.

MR. TORRES: How do you, how do you make the decision as to where PTC is going to be installed or activated?

MR. SCHULZE: A lot of it, this is Mark again. This, a lot of it follows our signal plan because PTC is really a large signal project, and so there's a lot of greenfielding that we had to do on our

signal system and so a lot of work had to be done.

It's a very, very complex project, going across, you know, our vast system of, you know, 28 states, 30,000 plus miles. And so we've got to marshal the resources based on where they're, they can best be used.

We did focus on California originally. As you know, the 2008 RSIA stemmed from an incident in Chatsworth, California, and we've actually focused it on what's known as our San Bernardino subdivision there in Los Angeles, perhaps one of our most complex operating territories, and got it implemented there. Got it implemented throughout California and are now implementing it across the rest of our system.

MR. TORRES: So you, do you have priorities, you know, of which territories are going to be PTC? Or is it just, how can I say it, a better choice of words, railroad convenience, like traffic volumes, you know, where it's, where you can do it?

MR. SCHULZE: It's a mixture of a lot of complex factors. Again, the, based on our signal construction plan, and also our expansion plan.

As you know, rail traffic has grown tremendously over the last 5, 10 years, and part of what's known as the Rail Renaissance. And so we are

doing a lot of expansion work on our railroad, where we've gone from single track to double track, gone from double track to triple track.

Any time you have major expansion projects like that, you've got to go back in, install the PTC system, and then re-map everything. It's a very difficult and challenging environment.

And so there are some of those locations that were sequenced based on where we were doing expansion work, some based on the signal system type that was, that needed to be changed out. Some based on the risk profile.

The commuter territories are areas that we've tried to focus on first in order to make sure that we're covered in those areas.

MR. TORRES: And who makes those decisions, you know, as to where the priorities are? I mean, like, I mean, I know you look at a lot of data, but you know, who eventually makes that final decision?

MR. SCHULZE: Well, we file a positive train control implementation plan with the FRA and there's risk categories or risk weighings that are part of that implementation plan that are assigned to each of the subdivisions and are passed to the FRA for their review and approval.

MR. TORRES: Okay. At this time I'll pass it on to Steve.

MR. DUPONT: Okay. Steve Dupont. In this division down on this end, how many subdivisions would you have PTC active on that you currently run? I know you run them on one and two that I'm aware of. I'm not aware of all of them.

MR. SCHULZE: Yes. We run it on 20 subdivisions currently.

MR. DUPONT: Right.

MR. SCHULZE: Three of those are in the pacific northwest. There are, four of those in the mid-west southeast, so there's seven.

So the other 13, I believe, are along or near the, what we call the transcon, which runs from Chicago to southern California. So I believe 13.

MR. DUPONT: Thirteen.

MR. SCHULZE: I'd have to verify that, if that's okay, at a later time.

MR. DUPONT: That's fine, yes. Okay. And you do run it on the Hereford south down on this end, don't you?

MR. SCHULZE: We run it on the Hereford and the Emporia on the other side. Correct.

MR. DUPONT: Has the Panhandle sub ever been

active, or it's still in progress?

MR. SCHULZE: It is still a work in progress. We have all the assets in place. As of now we are waiting for three programmatic or system programs to, that we needed.

The last one, we received on June 20th, and so we're beginning, we began on June 20th the, what's known as verification and validation of the system. And then we would go to end to end runs or end to end testing, and then we would do implementations in thereafter.

MR. DUPONT: Okay. That's all I have.

MR. SCHULZE: Thanks.

MR. JESKE: Erich Jeske, BLET safety task force. Currently in previous discussions, we've heard that PTC backroom data is being collected. Does that mean the system is somewhat operational at this time, or how does that play in that possible data could be being retrieved via PTC?

MR. SCHULZE: I'm not sure of the context of the understanding or the question. I apologize. Are you, yes, I'm just not sure of what --

MR. JESKE: Through other interviews that we've done, and meetings, what we've determined or what has been mentioned is that documents that are being

gathered are from dispatching as well as PTC, and when I say backroom, I don't mean anything hidden.

MR. SCHULZE: No, no, no.

MR. JESKE: But rather the --

MR. SCHULZE: The back office.

MR. JESKE: The back office operations that crews and field managers probably would not see immediately. That data, what would be being collected right now from the system, or what is it monitoring at this point, if anything?

MR. SCHULZE: There is nothing I'm aware of that, on the Panhandle subdivision that's being collected from a PTC perspective. Obviously PTC is a very complex system of a myriad of subsystems, so there's 40 plus subsystems that make up PTC.

So there might be some of those that have data that could be utilized in different ways.

MR. JESKE: Okay.

MR. SCHULZE: But PTC as a system, no. There's --

MR. JESKE: As a whole, it's not operational, but --

MR. SCHULZE: No.

MR. JESKE: The piece, certain pieces may be online retrieving --

MR. SCHULZE: They could be. Like as a, the signal system was upgraded through the greenfield process. I'm not aware of exactly what was done on specifically the plain view.

There might be some information that's garnered from the signal system. There might've been some upgrades to the locomotive that we can utilize in different ways.

But as a system, the PTC system as a whole, there's nothing that we're utilizing or collecting at this time.

MR. JESKE: Okay. You did say that you were waiting on three software updates or changes to be implemented on the system for, testing could begin.

How is that delivered to the system? Does it have to be manually installed at each location, or is it a Wi-Fi transmission that can go and remotely update the operating controls at those locations that would require that system?

MR. SCHULZE: Yes. There, of those three systems, one is a database tool.

MR. JESKE: Okay.

MR. SCHULZE: A collection tool that is a systemwide used tool. The other one is a validation and verification tool, which is, again, a systemwide

tool. And then the last one is part of the onboard software.

So the actual eTMF software that would be onboard a locomotive. We could, most of those are done as a manual download to the individual locomotives.

MR. JESKE: Okay. So when those go in for 184 inspections or 92 day inspections, depending on if they have the waiver or not, that's when that would be addressed?

MR. SCHULZE: It could be then, it could be during initialization attempt of PTC, it could, it could be a lot of different ways --

MR. JESKE: Okay.

MR. SCHULZE: -- where that software would be engaged.

MR. JESKE: Okay. And the last bit that you received on 6/20, that was, which piece was that for the --

MR. SCHULZE: The verification tool.

MR. JESKE: That was the verification tool?

MR. SCHULZE: That's correct.

MR. JESKE: Now, is that the only tool that will need to be utilized across the systems, so as more subdivisions become PTC-equipped with all of the hardware out in the field, that would mean that more

subdivisions could be turned on sooner?

MR. SCHULZE: Oh, it's a tool that we had utilized in the past. As you know, this is a brand new system, positive train control. And they're, we're constantly going through changes, improvements.

And so those three tools needed some changes or improvements to be utilized for various territories. And so it's a system tool that's been utilized on the 20 subdivisions, and will be used for the next 66.

MR. JESKE: Okay.

MR. SCHULZE: And then on.

MR. JESKE: Okay.

MR. SCHULZE: I hope that helps.

MR. JESKE: That does, that does clear up some information there. I believe I'll pass it off to Rafael now.

MR. SCHULZE: Thanks.

MR. MARSHALL: Rafael Marshall with the NTSB. Can you tell me how you're preparing crew members for the implementation of PTC?

MR. SCHULZE: Crew members go through a training program. Each conductor and each engineer, or any crew member on a PTC locomotive has to be trained, and that's verified when they initialize the system in order to run across a given territory.

Before they're able to do that the first time, the conductor would go through a two hour training program, and then the engineer, I believe, is a four hour, which would also include two hours of simulation-type time.

And then there's numerous briefings thereafter. There's specific training for each employee in the cab.

MR. MARSHALL: Okay. When you implement PTC, is it, is it pretty much equal or consistent across all of your subdivisions, the way it's implemented?

MR. SCHULZE: Could you clarify that just a bit more? I apologize. I mean, there's --

MR. MARSHALL: I didn't know if there was differences between each subdivision when --

MR. FACKLAM: Rafael, you may want to speak up just a little bit more.

MR. MARSHALL: Okay. I just didn't know if there was any differences in how PTC is implemented in each subdivision, and whether that could --

MR. SCHULZE: Yes. Yes.

MR. MARSHALL: -- affect how the training is done, or how it, how crew members experience certain areas?

MR. SCHULZE: That, okay. So PTC is a system to be utilized on our system, and so there is the base PTC system. There's an onboard system, there's the signal system, the waysides that it utilizes. There's the back office system.

But obviously there are operating characteristics across each of our territories that would require the PTC system to operate somewhat differently based on those characteristics. You know, multiple main track, track warrant ABS, CTC. I mean, it's got to take in all of those type of inputs, train characteristics, braking algorithms.

So there's got to be variation based on those unique characteristics that could be found on a given subdivision.

That said, the training for a conductor or engineer is fairly basic, except for there might be some specific things on an operating subdivision that would be very unique to that subdivision that PTC, you know, getting used, the engineer getting, and conductor, getting used to the system might be a little bit different in a, in a specific area. I'm sorry.

MR. FACKLAM: Steve Facklam, BLET safety task force. Has the PTC ever been turned on for testing for train use on the Panhandle sub? I work on

the Emporia sub.

MR. SCHULZE: Yes. Yes.

MR. FACKLAM: And we've had it on for a while, for a few months, then they shut it off to make some updates, then they've turned it back on and we're in full use again now. I was wondering, has that ever been done on the Panhandle sub, any kind of usage by the crews?

MR. SCHULZE: I'm not aware of any testing that's taken place on the Panhandle sub. What you do refer to on like the Emporia and other territories, again, this is a brand new system. It's had its reliability issues.

MR. FACKLAM: Right.

MR. SCHULZE: There's been a couple of times in the evolution of PTC and the use of ETMS that we've had to basically pull back the whole system in order to improve some of these reliability characteristics.

Any time you've got 42 subsystems trying to work together, you're going to learn new things as you implement it and as you utilize it.

And so Emporia is one of those that we had it out there, had everybody trained, we were utilizing it, but there were enough reliability issues that we weren't pleased with the performance, that we brought

it back down.

But again, on the Panhandle specific, I'm not aware of any time that we've had it engaged or even tested.

MR. FACKLAM: Okay. And would you have any idea if they've done any, that crews had been trained on it on the Panhandle sub for any preparation for it yet at this time?

MR. SCHULZE: I would have to verify that.

MR. FACKLAM: Okay.

MR. SCHULZE: There are crews that are PTC trained that operate on the, on the Panhandle.

MR. FACKLAM: Yes. But if, I was just --

MR. SCHULZE: If you're working off the Hereford, if you, yes.

MR. FACKLAM: If you were targeting the Panhandle for training yet.

MR. SCHULZE: I don't know if I can find out and get back to you on that.

MR. FACKLAM: Okay.

MR. SCHULZE: I don't believe we've started training on this subdivision yet.

MR. FACKLAM: Okay. And this just, the Hereford sub and the Emporia sub Panhandle and Hereford sub all in the transcon, like, this just, for my mind,

was there, the Emporia sub and the Hereford sub have it active, but then the Panhandle in the middle doesn't.

Was there some challenges specific to the Panhandle sub where it couldn't be implemented at the other two, as, at the same time as Panhandle and Emporia? Or, I'm sorry.

MR. SCHULZE: Yes.

MR. FACKLAM: Hereford or Emporia.

MR. SCHULZE: Yes. There were really two large or primary challenges that the Panhandle introduced. One of it was those, the expansion project. The double tracking that we've done.

Extensive double tracking on the Panhandle, which has been great for the subdivision and the transcon. We didn't finish the last major double tracking projects until late last year, September or October of 2015.

So we needed and wanted to get that into place so that we could update all the assets at the same time and make sure that the system was working as a unit appropriately.

The other one was those three system programs that I was talking about. The database, the validation verification, and the onboard system.

The Panhandle is one of those unique

operating subdivisions. It's a large subdivision, as you all know. It has a large number of assets, wayside devices that it needs to talk to.

So when a crew initializes their locomotive at the start of a PTC operation going from point A to point B, it's got to download an immense amount of information from the back office in Fort Worth in this case.

It's got to make sure, if the right crew is onboard, it's got to make sure that it understands, you know, any of the, any of the form As, form Bs, anything that, restrictions that might be ahead.

It's got to know that all the wayside assets are working correctly. The Panhandle has a great number of wayside assets, as you can imagine the length of it and the complexity of the operating territory.

And that number of wayside assets exceeded what was programmed in the initial, those three initial programs.

And so we had to have rewrites of those programs to be able to accept the vast number of assets that are here on the Panhandle system.

MR. FACKLAM: So it was mainly the rebuilding of the sub, the, and then the number of assets, greatly higher than the rest of some of the

other subdivisions.

MR. SCHULZE: Exactly.

MR. FACKLAM: Okay. Thank you. That's all I have for you now.

MR. SCHULZE: Thanks, Steve.

MR. SAUNDERS: All right. Kamron Saunders. I guess, I was going to ask about implementation. I know there's been at least a couple extensions on a, on the congress-mandated deadlines, and so not just with the Panhandle, what do you say are the biggest hurdles in needing those extensions and, then I'll follow up after that.

MR. SCHULZE: No. Thanks, thank you, Kamron. The, as I had mentioned earlier, BNSF has been involved in train control related to positive train control for decades, and we're very proud that we are the industry leaders in this.

We feel like we know quite a bit about the technology, how to operate it, and even at that, I mean, it's a very, as I mentioned before, it's a very, very complex system.

You know, it's a system of multiple subsystems and how they all work together is very difficult.

As you can imagine, it's a system that's

mandated by congress, and so all of the railroads, the UP, the KCS, the CSX, C&S, all those railroads have to operate with a common system.

And so the need for all of those major railroads to come together and come up with interoperable operations, you know, to make sure that we could use a CSX or a UP locomotive on our territory, that our train could traverse, you know, in a foreign territory.

Immense amount of complexity in and around that. And so while we marched hard towards the original implementation deadline, there was still enough reliability issues, even as late as middle of last year, that there was just, it was just an impossibility to meet that December 31, 2015 extent, deadline.

And so, as part of the latest legislation, it extended it to 2018 or 2020 under certain conditions.

We filed a positive train control implementation plan known as a PTCIP, a revised one, in January of this year, stating that we would meet the 2018 deadline.

MR. FACKLAM: Okay. So without asking you to give me dates, do you all have a plan that says,

we're going to have this subdivision by this date, this, or, is there anything in place like that that you're, or that you're working towards?

MR. SCHULZE: Yes. The revised PTCIP that was filed in January has a rollout plan, an implementation plan of which, right now, the Panhandle subdivision is listed on that in, for 2017.

And we have been doing, and we had intended to get that in service prior to that time.

MR. FACKLAM: Okay. That's all I have.

MR. TORRES: Okay. Any questions?

MR. RATLEDGE: Aaron Ratledge, no questions.

MR. TORRES: Yes, I was just going to ask again, can you explain for those that don't understand PTC, what its intent is? You know, how it, you know, as a, as a train's traversing the territory?

MR. SCHULZE: Absolutely. PTC, as currently designed, is designed to meet the federal mandate that came out of the 2008 RSIA, the Rail Safety Improvement Act.

As mandated, there's four characteristics that PTC is designed to prevent. Train to train collisions, over speed derailments, switches, encouraging into an area where a switch was left in the wrong position, and areas where maintenance way

employees might be working.

And so the system, ETMS, is designed to work with those four operating characteristics.

MR. TORRES: Steve?

MR. DUPONT: No.

MR. JESKE: Erich Jeske, BLET safety task force. As you mentioned earlier, the PTC system will look at the crew that's supposed to be on the train.

When a situation occurs where a crew is going to go dead online, how will the system respond, or how will crews be trained to handle that when they get on the train and it has already been initialized and it's under a different crew's name? Is that going to impact them or what will be the outcome of that situation?

MR. SCHULZE: As currently utilized today, the new crew would have to reinitialize in order to verify that they are able to operate that train.

MR. JESKE: Okay.

MR. SCHULZE: And that's the way our safety plan is currently formulated. Is that a hard requirement as part of the regulation? No it's not. That, today you would have to get on, reinitialize and --

MR. JESKE: Okay.

MR. SCHULZE: -- verify you as a crew.

MR. JESKE: And to get to this, I guess in this area would be a fine way of describing it, very rural and possibly, I'm assuming that these work with cell phone towers to relay that information, or how is that actually relayed to the locomotive so that if a crew did have to get on and there was no coverage of cellular transmission, is it a railroad radio system that will relay all that information? How does that work?

MR. SCHULZE: Great question. Again, getting to the complexity --

MR. JESKE: Okay.

MR. SCHULZE: -- of the system, so PTC relies on a vast communication network. As you know, railroads have very strong and good communication networks.

But because of the rural areas, we've basically had to recreate a new communications network utilizing 220 megahertz, a low bandwidth communication network.

And so all of our PTC operations should, could operate under 220. It does utilize cellular as a backup if needed.

MR. JESKE: Okay.

MR. SCHULZE: So you have communicated, for some reason 220 doesn't go through, it would pick a cellular.

All of the radios that we utilize to communicate between locomotives, waysides locomotives, back office, whatever it might be, there's software to find radios.

And they're designed to find the best communication path. So it could be, at a terminal it could be 802.11 or Wi-Fi.

MR. JESKE: Right.

MR. SCHULZE: Is how you'd initialize because that is a lot of, a lot of data that that locomotive has to have in order to begin, or it could be over that 220 megahertz network, or it could be over cellular.

MR. JESKE: Okay. Another question, will this improve crew lineup accuracy?

Will PTC be a more stable platform for informing the crews when they'll be going to work or possibly be going to work since it will have realtime knowledge of where every train is, because I know currently, going by control points, or AEI readers, that's when the system will update only if that reader or control point is designated as a system update,

unless done manually? Will this improve those accuracies and get those on a much narrower window?

MR. SCHULZE: Erich, as you can imagine, I'm not an expert on crew management, so I really can't address that, but I can talk about location precision.

If you're on a CTC network, I mean, you generally have pretty good accuracy and you know where the train is within a close enough period to have specific GPS accuracy for, you know, whether it's shipment information that a, that a customer might want to have.

MR. JESKE: Okay.

MR. SCHULZE: Or crew information. It's not going to, it's not going to get that much more accurate if you're in a block versus if you're to a --

MR. JESKE: Okay.

MR. SCHULZE: -- to a centimeter.

MR. JESKE: Okay.

MR. SCHULZE: Hope that helps.

MR. JESKE: That does help some, yes. I believe that's all. Rafael?

MR. MARSHALL: Okay, this is Rafael Marshall with the NTSB. Even after PTC is fully implemented, there's still going to be areas of dark territory.

How do you, how is BNSF planning on sharing

crew vigilance and attention, especially in those areas?

MR. SCHULZE: Yes. Let me first say, PTC is designed to also operate in dark territories. So I believe you might've meant that there will be areas that won't be PTC-equipped.

MR. MARSHALL: Okay.

MR. SCHULZE: Okay. So in those areas that aren't PTC-equipped, or if they are PTC-equipped, PTC is designed as a safety overlay.

You know, it's, the crews are still, the intent is that they will operate their trains as they, as they've been trained, and our crews are very well trained through extensive training programs.

As you know, both at the beginning of employment, and all throughout their employment. And so railroading's a very safe industry, and our employees, our crews are some of the best in any industry out there.

And so we will continue to rely on the experience and professionalism of the crews to operate their train and we will continue to train, educate, and have them, have them ready to operate in any situation.

MR. MARSHALL: Okay, thank you.

MR. FACKLAM: Steve Facklam, BLET safety

task force. Just, I think one more question. I know in the southwest have been reports that you're having, BNSF was having trouble installing towers with maybe tribal lands or access to put in the towers.

Was there any such delays like that on the Panhandle sub? Any maybe regulation that you ran up against, lands that you couldn't get your towers on that delayed this.

MR. SCHULZE: Yes. As background, again, part of the challenge of the whole PTC implementation program, we did run into issues with the Federal Communications Commission, the FCC, in getting some of our towers installed, the towers that we talked between the locomotives and the waysides. The waysides, the locomotives and the back office.

And that, we incurred almost a two year delay in some areas of implementation because of the construction of those towers.

That said, I'm not aware of any issues specific to the Panhandle subdivision that's related to any of those FCC delays.

MR. FACKLAM: Last, just a comment, having used PTC, it's already helped me, saved me out there. And I know BNSF is the leader in it.

I've seen it firsthand that this railroad is

the quickest, develop it and get it out there. And from workers' perspective, thank you and keep it up because we need it.

MR. SCHULZE: We appreciate hearing that. We really do. That means a, means a lot.

MR. FACKLAM: I don't have anything else.

MR. RINDELMAN: Steve, Ryan Rindelman, Steve made me think of something, and you talked about the ARES program and the history, and then the Chatsworth. How, if at all, did that mandate change approach to PTC on the inside?

MR. SCHULZE: It's Mark Schulze again, BNSF. The biggest change was the 2008 RSIA, the Rail Safety Improvement Act, mandated interoperability.

So our previous developments, the ARES, the advanced railroad electronic system through earlier versions of electronic train management system or ETMS, were basically being designed to just operate on the BNSF system.

When there was the congressional mandate to ensure interoperability of these systems, that increased the complexity many, many times.

Just to be able to ensure that this system, this positive train control system could talk to the different back offices that each of the railroads had,

the different signal systems that each of the railroads had, the different operating characteristics, the different operating rules, we had to have one system that was able to, you know, seamlessly traverse, whether it's through Chicago, Atlanta, Kansas City, wherever it might be, or utilize locomotives on different territories.

That was definitely the biggest challenge. We came together as an industry immediately after the RSIA was enacted, created an interoperable train control committee, the ITC, came up with groups to come up with interoperable standards, created those standards, as you can imagine the difficulty in creating very technical standards.

Those were created, those were published, and that gave the vendors the opportunity to start producing equipment that would meet those interoperable standards.

So you can just imagine the complexity and the time frame that was required for all of that, and then to ensure that all those different vendors' systems would work together seamlessly as a train was going across a territory, from territory to territory, from crew to crew, from railroad to railroad, is extremely complex.

We, at BNSF, we've got 20 of our 86 subdivision implemented. We're not running every train on those 20 divisions with PTC.

There might be a locomotive that's not yet equipped with PTC. There might be a crew member that's not yet trained for PTC because we have a lot of crews moving around the different territories. There might be other issues. There might be a reliability issue.

And so while BNSF, we're getting a grasp on our system on how that works, we still have to, you know, work with the other railroads and make sure that this is going to work from an interoperability perspective.

MR. RINDELMAN: Okay. That's all I had.

MR. TORRES: Tomas Torres with the NTSB. Have you identified any potential drawbacks or negatives of the PTC?

MR. SCHULZE: I would say, I wouldn't say a negative or a drawback because it is a safety system that works, and we're very proud of that. We appreciate the comments that, you know, the employees like it, they want to use it.

That said, like any human technology, you know, program that interact, in our area we have red light cameras, you know? And where I know there's a

red light camera, I'm a little more cautious on hitting the brakes a little sooner. You know, I'm operating a little bit differently.

On our system we have drive cams. They're cameras, you know, that focus on the, on driver behavior and they take video if there's G-forces that are exceeded, and our employees are, I believe, better drivers because of those, because they operate differently knowing that the technology is there.

With positive train control, the braking algorithms are more conservative than what a very, very, very qualified engineer would operate his or her train, and so there's some getting use, there's some of that engineer system interaction that is being learned, both by the engineers and by the PTC system and improvement in the braking algorithms that, you know, we're trying to continue to perfect that.

Like any human system project, you know, there is, there is some learnings in that, and so I think that's one of our biggest challenges.

MR. TORRES: Can this system, say a crew's onboard and, this is kind of off the wall maybe, can it tampered with, you know, like can they override it?

You know, say, you know what, maybe I don't want to, I mean, somebody makes a bad decision, can

they override the PTC even though it's on the recording for, or nullify it in some form?

MR. SCHULZE: Yes. You're not able to, you're not able to override it. You, before the full implementation date, you can, you could disengage it.

But beginning in 2020, when the mandate is fully in effect, we would have to run at restricted speed or medium speed. There would be certain changes to operations that we'd be required to make if PTC were not engaged.

MR. TORRES: So if a locomotive has a failure, electronic failure or something, you know, and it's not working, they'll just knock it down, I mean, like manually on the computer screen and then can run it conventional, or you know --

MR. SCHULZE: If there was a PTC-related problem on the locomotive, it would disengage the PTC operation today, and the train crew, because it is a safety overlay system, the train crew would continue to operate with the operating rules that are in place.

But again, when the mandate's fully in effect, that train would be, would have operating restrictions imposed upon it if PTC were not, were not engaged.

MR. TORRES: Okay. With Trip Optimizer, are

you familiar with it?

MR. SCHULZE: Slightly. I know what it is, but I'm not familiar with the, I'm not real familiar with the technology.

MR. TORRES: Even with the PTC and Trip, they use a Trip Optimizer. How's that going to be equated together, because this, Trip Optimizer's kind of like a cruise control.

So how are they going to combine those, or how's it going to affect it, you know? Do you have --

MR. SCHULZE: There are development projects in order to make sure that they are integrated, but I'm not really up to speed on exactly what those integration projects are.

MR. TORRES: Okay. Steve?

MR. JESKE: Erich Jeske, BLET safety task force. So you did mention that there will be operation restrictions if a PTC failure occurs en route.

If a failure occurs en route, what does that do for the opposing trains that still have fully functioning PTC?

Do they also receive a restrictions so that, since the system is designed to prevent a head-on collision, if one hard target cannot talk to another hard target, such as locomotive to wayside signal, how

does that affect the opposing train that can still talk to a wayside signal?

MR. SCHULZE: That train would still be operating with PTC fully in effect. If the other train, say the other train disengaged, reduce their operating speed or whatever operating restriction was put in place on that train, if it exceeded a hard target or a red signal, you know, that would immediately signal to the other train.

MR. JESKE: Okay.

MR. SCHULZE: And cause it to stop.

MR. JESKE: Okay.

MR. SCHULZE: So there would be that.

MR. JESKE: Now, it will know that there, the functioning train is going to know that there is a hard target ahead of it, or I guess, maybe let's say a second hard target ahead of the control point. So it's going to know that it's out there coming at it?

MR. SCHULZE: The other train would not be affected from a technology perspective.

MR. JESKE: Okay.

MR. SCHULZE: There are probably nuances to the regulation that I can't think of right now, that might change some of the operating paradigm, but as of right now, those other trains would be operating with

fully functional PTC.

MR. JESKE: Okay. All right. Rafael?

MR. FACKLAM: I've just, I've got one thing, I don't even think we've gotten this on the tape or on the record because I know that it's probably going to come up because we kind of, a lot of us understand how it works.

Real briefly, and as basic as you can for people that will maybe read the transcript, can you explain how the PTC works, the conductors and engineers interaction with PTC, in the use of a trip, and how it's, they're, you know, they're still running the train, but it's there to throw up safe, or stop them if something. Run, just I guess a brief overview of --

MR. SCHULZE: Sure. Sure. Yes. PTC is a technology system that only acts as a safety overlay to the crew. The crew is still in control of the train.

If a human factor or a system issue might take place, the train could stop or brake the train prior to exceeding a restriction, for instance.

PTC has four major components to it, as designed. It's a locomotive centric system. So PTC has to have that onboard system that takes in all of the wayside information, is a second system, so it knows all of the switch positions, all of the signals

on a given territory that that train would be operating.

That information goes over a communication network. That's the third part of the system. The communications system is that 220 megahertz cellular or Wi-Fi, the 802.11, that talks between those various assets, and also the fourth part is the back office.

The back office knows the restrictions on a given operating territory, knows the crews that have been trained, knows, has all that PTC-specific information that's required for that train to operate from point A to point B. So those four major systems are designed to work together.

So what happens is, a crew comes on duty. They have all of their existing paperwork, all of their existing information that they're required to know and acknowledge. They go onboard of a locomotive.

There is a positive train control or ETMS screen on, interactive on the engineer's side that could show all of the restrictions, can acknowledge that they are the right crew.

It's employee identified, PIN identified to make sure that that is the right crew. There's also a screen on the conductor's side that is not interactive. It's informational, has all of the same information

that the engineer would or might see.

They initialize the train, getting all of their operating restrictions for that given trip, every aspect of that given trip and they're able to start.

The screen that's in place of each of the employees will show the operating characteristics that are up to five miles ahead of them, what type of track operations, what type of terrain, grade, what type of restrictions might be out ahead.

And so that will be a good indicator, then it will show them the speed as they're increase or decreasing, and also what speed they should be at and what their next speed target would be.

And so it's a screen that provides a lot of information but the crew is still expected operate that train as they normally would.

MR. FACKLAM: And the way it's worked for me, if the crew does not react to an upcoming restriction, does not slow down, does not prepare to stop, would it be correct to say the system gives an audible warning at first, and then --

MR. SCHULZE: That's correct.

MR. FACKLAM: And then will set penalty brake, amount of air to slow or stop that train, or is it --

MR. SCHULZE: Yes. It, PTC would give information and know that based on the braking algorithms, whether or not that train was going to exceed a restriction, whether it's a stop signal or end of a track warrant territory. Whatever it might be.

And based on those braking algorithms, it would first warn the crew that, hey, based on what I, the computer, or ETMS knows, it looks you're going to exceed that target unless you slow down.

And so it's audibly warning, slow down, slow down, slow down. If it gets past a point where it can tell that the crew hasn't slowed down enough to meet that restriction, whether it's end of a territory, a signal, or even a speed restriction, it'll do a full service brake application in order to stop that train.

It doesn't have any slowing characteristics, like if you're going a little too fast or something, it's not going to automatically slow the train down.

If your speed target for a given territory is, say 30 miles per hour, it would give you an audible warning at 33 miles per hour, and then it would enforce that penalty brake application at 35 miles per hour when you exceed any of the speed targets by five miles per hour.

MR. FACKLAM: Okay. Thank you. That is

important to get the basic, on the record, how it works.

MR. SAUNDERS: This is Kamron Saunders. Are you aware, either during implementation or after implementation, on the 20 subdivisions, of any issues with, you know, on those four things you talked about, the train to train over speed switches or maintenance, as far as it not working properly?

MR. SCHULZE: No.

MR. SAUNDERS: Or has it worked?

MR. SCHULZE: No, I'm not, I'm not aware of any that would be considered by the FRA to be a critical defect or something reported, and it would be significant, there would be significant addressing of that type of issue. It has worked.

There's, we've had a, again, we're talking about the reliability of this system. There's been a significant amount of time, you know, three percent or so say that PTC has enforced a braking application. Fifteen percent of those three percent have been good applications.

You know, something with a signal, something where the crew was going to pass, something that, but the other 85 are reliability issues that we're working through.

But we've never had one that I'm aware of that, where the train, PTC did not operate as intended.

MR. SAUNDERS: Okay. Thank you.

MR. JESKE: Erich Jeske, BLET safety task force. Just one other question. You did mention that the 802.11 Wi-Fi, cellular, or the 220 megahertz bandwidth for communication.

Will there be two of those systems active at any given time, and how will the system know, let's say leaving Amarillo, Texas, which we're closest to, when you leave there and you depart on the Wi-Fi, will another one of those radio systems kick in?

Because I know as currently set up with the distributive power on locomotives, there are two radios. Both get tested during initialization, and it's a back office type thing that happens, you know, in the computer system, and only if a failure occurs, do you know this.

But the two radios are there functioning side by side so that if one does fail en route, you have a failsafe for communication to the rear of your train.

Is there a failsafe among the communication networks for PTC where at least two of those networks will be operable at any time?

MR. SCHULZE: Great question. That's another area that we should be proud of as a company and as of an industry.

What we utilize is something called a software-defined radio, SDR. It's a company that we've had, and it's called Mediacom or MCC, that developed this software-defined radio for the industry and for other industries.

And so what a software-defined radio does is it finds the best communication path based on a given territory or given location or given time of day, whatever it might be.

As you know, operating in this area or wherever you might be, you lose your cell coverage every now and then. You lose, 220 is the primary communications network.

MR. JESKE: Okay.

MR. SCHULZE: And we've, that's why we're creating all these towers that we've had some challenges with, but we've got a 220 megahertz system out there and that should be the primary way that it's communicating.

But if it did go out, the software-defined radio is looking for that best path of communication. It will utilize, you know, cellular 4G network or the

220 or if Wi-Fi is the best method in a given terminal or area, it will utilize that.

MR. JESKE: Okay.

MR. SCHULZE: It looks for the best path.

MR. JESKE: I guess one other question, moving just along these lines. If 220 fails and it finds Wi-Fi, is it able, is this system able, if there were a Wi-Fi hotspot, is it going to identify an open network and acquire signal on that, or is it going, is it an encrypted network that it's only going to be looking for, such as at a railroad terminal? How does that play into things?

MR. SCHULZE: I don't know the specifics on that, but I can only imagine it's only a BNSF encrypted network. Yes.

MR. JESKE: Okay.

MR. SCHULZE: That's the only, these are, these are encrypted messages that are going across.

MR. JESKE: Okay.

MR. SCHULZE: I would say absolutely. It's not going to go find a McDonald's. It's --

MR. JESKE: Right. Yes. Well, that was kind of the --

MR. SCHULZE: Yes.

MR. JESKE: -- concern was that it would

find that and, you know --

MR. SCHULZE: No.

MR. JESKE: -- would there be a vulnerability to the system by that?

MR. SCHULZE: No. Yes, the security of the system is taking, is taken very --

MR. JESKE: Only Starbucks, right?

MR. SCHULZE: Yes, only Starbucks. It's taken very seriously, and so that's --

MR. JESKE: Okay.

MR. SCHULZE: That's been a big part of this program is the security of those messages.

MR. JESKE: And while the software-defined radio is searching for the best path to communicate, how does it store information?

Does it, does it hold transmissions so that if it loses the 220 and it's searching for cellular and it finds that, how does the communications continue, or do they pause?

MR. SCHULZE: Yes.

MR. JESKE: I can only imagine --

MR. SCHULZE: The communications wouldn't hold or store anything. It's only looking for that best path to transmit data from one source to another.

So onboard, you'd have a, either a GPS, you

know, sensor, or something on the train management computer or a back office computer in Fort Worth. That's where the data's actually being stored.

The communication is only to pass data between those two sources, source and receiver. So there's no need for storage on a communication network.

MR. JESKE: Okay. And that, while it would be searching for a new communications path, that would not affect the system as far as --

MR. SCHULZE: Oh, no. Yes.

MR. JESKE: -- as a hard target, it's still going to be able to communicate hard target to hard target, and each other will know so that if, while it were communicating or trying to find a communications path --

MR. SCHULZE: Yes, yes.

MR. JESKE: -- and a red signal was passed, it would still be able to notify?

MR. SCHULZE: It's keeping that communication.

MR. JESKE: Okay.

MR. SCHULZE: That is correct. I see what you're thinking. Yes. Steve?

MR. DUPONT: If you said, and I didn't write it down, the T&E individuals on this subdivisions, you

got a feel for how much of those, how many are trained? Where you all are standing with the training side of the field training side?

MR. SCHULZE: I --

MR. JESKE: What was your question? I didn't hear it.

MR. DUPONT: The T&E employees.

MR. JESKE: Oh, okay.

MR. DUPONT: On the Panhandle sub.

MR. JESKE: That's what I'm asking. The T&E piece.

MR. DUPONT: Did he have a feel of the, yes.

MR. JESKE: Okay.

MR. DUPONT: For the PTC.

MR. SCHULZE: That's one I'm going to have to go back and look. I'm not aware of any active training program.

MR. DUPONT: I'd like to get that.

MR. SCHULZE: Absolutely.

MR. DUPONT: If you could.

MR. SCHULZE: If, I'm not aware of any active training program on the Panhandle sub. That said, there are crews that operate on this subdivision that have been trained that might operate on the, on the Hereford sub or the Emporia sub. I know that could

definitely take place.

So there would be crews that operate on this sub that have familiarity with the system.

MR. DUPONT: Right. And I'm assuming, just like engineer certification with territorial qualifications, that BNSF has a system that identifies who is PTC trained and who's not?

MR. SCHULZE: Absolutely. Absolutely. We're required to --

MR. DUPONT: So crew management would know that?

MR. SCHULZE: That's correct. And the PTC system knows who's been trained and who hasn't.

MR. DUPONT: Okay.

MR. SCHULZE: Yes.

MR. DUPONT: What happens if you and I are called for a job. You're PTC trained as the engineer, I am not. What can we do?

MR. SCHULZE: Today, we would operate that train in conventional mode. We would not operate it in PTC mode. You need a fully trained crew to operate that train.

Post-mandate, say it's 2020, we would not be able to operate that train. We would have to wait until there was a qualified train, a trained crew.

MR. DUPONT: Full crew. Full crew that's going out.

MR. SCHULZE: That's correct. That's correct.

MR. DUPONT: Okay.

MR. SCHULZE: Yes.

MR. DUPONT: Okay. Thanks.

MR. SCHULZE: Yes.

MR. TORRES: Tomas Torres with the NTSB. I've just got a question. So if you're trains on a PTC-equipped subdivision and you have a conventional train and a PTC train, so how is the train that's equipped with PTC being protected from a train that's not PTC? I mean, I mean, where's that gap filled? How is it filled or --

MR. SCHULZE: Yes.

MR. TORRES: How is other train protected?

MR. SCHULZE: Yes. And today, in that instance, there isn't peer to peer communication. That, the trains don't talk to each other.

So today that, those trains don't know, the PTC-equipped train doesn't know exactly where that other train is.

If you were on a signalized territory, CTC, and the conventional train exceeded an authority and

went through a red signal, it would, you know, it would change the signal system so that the train that was equipped would know it right away and would enforce braking at that time. So it's, I would say partially protected at this time.

MR. TORRES: Okay. On the subdivision Panhandle, do you say it's, you pretty much installed all the equipment that's required for PTC, but you haven't completed it because you're still working, extending track or you're adding track to it? Is that it?

MR. SCHULZE: No. I believe all the expansion work has been done on the Panhandle that we intend to do at this time.

We have everything in place. We've received that last of the three software system upgrades that we need. Did that on June 20th, and now we're going through what's known as the verification and validation process, V&V is how the FRA knows it.

We'll get through that to ensure that the system is working, that everything is communication as it's intended over the subdivision.

And then we go to true end to end testing where we would test locomotives on the subdivision, and then once that's done, concurrently we're training the

employees, and then once that's done, what we would, cut it over and implement PTC.

So right now we're in this verification and validation process.

MR. TORRES: So when was all that hard, you know, all the stuff that's supposed to be on the field installed?

MR. SCHULZE: I believe it was when the double track expansion project was done, fall of 2015.

MR. TORRES: So last year?

MR. SCHULZE: Yes. Yes.

MR. TORRES: So while the extension was going on, there's no way you could've, you know, initialized or put PTC in effect?

I mean, I guess I don't understand, you know, because you're expanding or you're adding track, you know, another track, you know, why couldn't that, the segment of track that, assuming you're operating on, why couldn't PTC be put into effect?

MR. SCHULZE: Yes. I hope you can imagine the challenge. The amount of capital expansion work that we've been doing across the system.

If, and with a limited number of resources to implement PTC, people that are knowledgeable of the system in the, in the whole nation, in the whole world,

there's not a, there's not a lot.

And so if we would have to go back and redo everything. Every time we build these significant track infrastructure projects, we have to go back and redo the whole, the whole subdivision.

And so we would've expended an immense amount of resources, get it in place, and then have to come back, which would take away resources from implementing it potentially somewhere else.

And so to the original questions on the sequencing of the subdivisions, I mean, we have to take into account, you know, what is the logical implementation path based on some of those expansion characteristics or territory characteristics like that?

And so the immense complexity of the project, the massive scale of it, the scope, and the time line that we're committed to, we just couldn't hopscotch like that. It just wouldn't be a good use of our resources in order to get this done.

MR. TORRES: Okay. Can you explain the, those software updates? You mentioned three software updates. What is it, or is it, why would they need it, or --

MR. SCHULZE: Yes. They're, as I had mentioned before, just the immense number of assets

that are on the Panhandle sub, the way those three systems were initially designed, they weren't able to take in that many.

When the crew initializes the PTC system on a given territory to go from point A to point B, the Panhandle is a very big and complex subdivision. And so it wasn't initially designed to acquire as many assets as what is on this territory.

And so these system changes need to just take place so that it, the system, the PTC system would be able to acquire all of that asset information.

MR. DUPONT: Going back and just looking out, and those, and I'm 40 something years on the railroad, the fluctuation in business.

You got some territories that won't have PTC, you have some territories will. And the labor forces is all generated on seniority.

So we get people off of, because of the fluctuation in business, be it from one territory to another, and I'm looking out in the future, which you had said, if it's not a full qualified crew, is BNSF outlook long-term, is to get everybody qualified?

Because you really don't control where these guys move around. So you have people bidding off of territories that doesn't have PTC. So maybe they're

the last group to be trained because you want to, which is the first group too.

But now you start having a flood across, on another territory in the US. And when you get to the mandate and because I don't have all of the answers to PTC as anybody else does, it seems it's going to create a mass problem.

So what, and I guess what I'm asking is, what is your vision, BNSF vision going forward, how are you going to address the people that currently today that are on non-PTC territories, what are you going to do with them?

MR. SCHULZE: In regards to train, being trained on PTC?

MR. DUPONT: Yes.

MR. SCHULZE: Yes. That is, when we started out, I had mentioned that 55, about 55 percent of our operating territory will have PTC.

MR. DUPONT: Okay.

MR. SCHULZE: But that covers 70 to 80 percent of our train traffic. So you can also probably extrapolate that would be about the number, percentage of crews that would need to be trained at a given time on PTC, leaving a fairly small percentage that might never see PTC, might see it very infrequently.

And so before they would be able to operate on a PTC territory, if they bid into a different territory, they would have to be, you know, trained.

MR. DUPONT: Right.

MR. SCHULZE: To that --

MR. DUPONT: And you get insane situations through detours, you have push-outs. We just saw it in Houston, but the UP, when the bridge went out.

MR. SCHULZE: Yes.

MR. DUPONT: So I mean, that's going to be a pretty good task for you guys now.

MR. SCHULZE: We would have to prioritize the resources, including training resources for those type of contingencies. So there will be some people that will probably never be trained on PTC.

MR. DUPONT: Right. So if that situation was to arise looking forward, and we had a crew onboard and they're not qualified, but you had a manager that was qualified, say a road foreman, a DSLE, they still would not be able to function?

MR. SCHULZE: If you didn't have a fully qualified crew to operate that train under --

MR. DUPONT: Can't do it.

MR. SCHULZE: -- under regulation or collective bargain or whatever it might be, I'm not a,

I'm not an expert on --

MR. DUPONT: I'm not either.

MR. SCHULZE: -- in that territory.

MR. DUPONT: That's what makes it a question.

MR. SCHULZE: In that area, you need a qualified crew to operate PTC post-mandate.

MR. DUPONT: Okay. That's going to be a task.

MR. FACKLAM: Let me follow up with a question. Steve Facklam, BLET safety task force. What does the training for the engineer and conductor consist of, and roughly how long of a training is it for PTC qualified?

Just, the conductors are only qualified conventionally and the engineer is qualified conventionally. They just need the PTC bit to be qualified on a, to operate PTC.

MR. SCHULZE: Yes.

MR. FACKLAM: What is that training and how long does it consist of, just to maybe help you out?

MR. SCHULZE: Yes. The conductor training for PTC is a two hour classroom interactive training program.

The engineer would have that same two hours,

and then an additional two hours of simulator-type training so that the engineer would be familiar with the operation of the system through simulation, which is a very effective type of training that we utilize extensively on the BNSF.

MR. JESKE: Erich Jeske, BLET safety task force. I just have a question about the implementation. So we've heard that June 20th you received that last update. Has that changed the implementation date or advanced the validation and verification of the system in light of the events that have brought us all here to Texas today?

Will the system, now that that software is in hand, is there a plan in place to speed up implementation to fill this gap between the two subdivisions that do have it, or what's the outlook on that?

MR. SCHULZE: Our plan right now is to implement as we, as we had planned. To utilize our resources where they are currently deployed and keep with our existing schedule.

MR. JESKE: Okay.

MR. MARSHALL: Rafael Marshall with the NTSB. Do you keep data on how PTC has affected the number of adverse events that you've had, before and

after the implementation of PTC in certain subdivisions? And also, in adjoining subdivision that may not have PTC?

MR. SCHULZE: We keep, we keep any data that we are mandated to through regulation or any other FRA purposes.

I'm not aware of any studies that have been done as of late, if we were looking at engineer de-certifications or any of that type of information, PTC versus non-PTC.

The system is relatively new, having only been in place for the last, less than a year really from any extensive implementation. And so we're still working through a lot of that.

MR. SAUNDERS: Kamron Saunders. We've talked a lot about the initial, or the implementation of PTC on different subdivisions, and then we started talking about, I guess when we have locomotives that aren't retrofitted or whatever need, whatever they need to handle it, what's the outlook on, you know, having every locomotive prepared, or every consist, but making sure that that leader is good to go.

MR. SCHULZE: We're still working towards the mandate to ensure that we have every train that's mandated to be PTC-equipped, PTC-equipped by the firm

implementation date.

As of today, we have about 4,300 locomotives PTC-equipped, PTC commissioned, out of a fleet of 6,500 or so. It's, the active fleet is less than that due to business climate, business volumes.

Of those 4,300, there, some of them could be offline, used foreign, the UP might be still, I mean, using them.

Just, some of them might have a defect that doesn't allow it to be, you know, lead enabled. Some of them might have PTC defect because of all of the complexities.

Some of them might not have, you know, everything that's needed to be run with PTC and so we're looking to close that gap as we, those gaps as we can, as we move forward.

But, and then to your point, there might be a PTC-equipped locomotive that's not in the lead that we could maybe move up, and so we've got active, active management practices in place that, you know, tries to move that power to the lead where we can.

And so there's a big program to make sure that where we have PTC-equipped locomotives, that we are utilizing them.

MR. SAUNDERS: Okay. So I guess, so is

there actually any kind of policy or anything to that, you know, I look at, just say, and I'm very unfamiliar.

I'm assuming they, a train, like one of these two in this accident, would've run, the westbound would've run the Emporia to the Panhandle to the Hereford.

So, you know, where you were PTC, and I think, I think one of the trains wasn't equipped with Trip Optimizer, not that this is a thing, but there was another unit that was.

So I, you know, is that a, I look at it as, a crew brings a train. They get on it at 6:00 p.m. The air conditioner doesn't work, they didn't worry about it because it was going to be night, but they didn't think about, you know, the next day, or you know, who they were going to hand it off to.

So things in that, where you know, a crew, and you know, I guess the train would've been made up or whatever on the Panhandle sub, didn't need PTC, so they didn't worry about making sure we had a PTC-equipped locomotive on the head end. But now it gets to Amarillo to go beyond, and now we are PTC-equipped.

So are there, is there anything out there that, you know, makes sure that they're trying to get a PTC-equipped locomotive on the head end?

MR. SCHULZE: We definitely make efforts to ensure when a train is operated on PTC-equipped territory that we would have a PTC functional locomotive in the, in the lead. And we watch that, we track it.

These two locomotives were operating in PTC mode on other territories prior to entering the Panhandle sub. They had PTC-equipped locomotives.

MR. SAUNDERS: Okay. All right. Thank you.

MR. DUPONT: One last question. So you got PTC on both sides of the Panhandle, right? Can you give us a, and you may not have it with you, but I'd like that at a later time, give us how many interactions and PTC that those two subdivisions would've took over the train.

Because I'm assuming, and I went through somewhat training on the UP, and the way the UP was doing it is any time that the PTC overrode the train, putting it in emergency, that aspect, that report was generated to someone like Aaron's group where they would get with the road foreman or the MoP, and they would have a consultation with engineer and try to figure out what happened.

So I'm assuming, and I would think for sure that you're tracking that because you want to know how

many interactions you're having between the system overriding the crew.

MR. SCHULZE: We are aware of every braking enforcement on a PTC-equipped train.

MR. DUPONT: Okay. Can I get a copy, not a copy but a number on each subdivision on the side of the Panhandle?

MR. SCHULZE: Okay. I'm, what's your, on, for these specific trains, or for --

MR. DUPONT: No, no, no. Just any train. Any train on the two subdivision on the side of the Panhandle where PTC did an override.

MR. SCHULZE: At any time, any day?

MR. DUPONT: Any time, any day. What's the number.

MR. SCHULZE: Okay. And what, how would we use that? I'm just curious more than anything.

MR. DUPONT: I'm just trying to get an understanding in this division.

MR. SCHULZE: Yes.

MR. DUPONT: You know? What is the override percentage. What, you know, what does it look like?

MR. SCHULZE: How many braking events?

MR. DUPONT: Yes.

MR. DACHNIWSKY: In a certain time period,

or --

MR. DUPONT: They can go back the last six months.

MR. SCHULZE: Last six months. Okay.

MR. DUPONT: Yes. Just a, just a ballpark analysis for me.

MR. SCHULZE: Okay. Okay. We have, we have --

MR. DACHNIWSKY: I'm trying to think when we turned the Emporia and Hereford on, I don't that we'll have six months, but --

MR. SCHULZE: We'll have six on the Hereford.

MR. DUPONT: Well give me --

MR. SCHULZE: We'll have six --

MR. DUPONT: Just give me what you've got.

MR. SCHULZE: Yes. Yes.

MR. DUPONT: It's just a, analyze everything.

MR. SCHULZE: Yes.

MR. DUPONT: Just to look.

MR. SCHULZE: Yes. Yes.

MR. DUPONT: For no particular reason.

MR. SCHULZE: We'll just have to be careful how we use that. I'm not sure how, again --

MR. DUPONT: Right. Right.

MR. SCHULZE: -- how we would use the number of braking events.

MR. DUPONT: It not going to be used. It's to just be looked at.

MR. SCHULZE: Yes. Yes.

MR. DUPONT: In this area.

MR. SCHULZE: Okay.

MR. DUPONT: It doesn't apply to Panhandle. So, I mean --

MR. SCHULZE: No, yes. Yes.

MR. DUPONT: It's not going to amount to anything.

MR. SCHULZE: Yes.

MR. DUPONT: But it just gives an idea.

MR. TORRES: I guess, Tomas Torres with the NTSB. I guess what Steve's asking is trying to see how effective it is. How many times did it stop a train, you know?

MR. SCHULZE: I don't know if you would, I don't know if you would consider that to be effective though. I think the question, the better question was, has it ever not done what it's supposed to.

MR. TORRES: And that's what he's saying. Did it, did it ever stop a train where the --

MR. SCHULZE: Oh.

MR. DUPONT: You're saying the opposite of what I'm saying. Yes. You're saying, had it not ever stopped? I would want to know --

MR. SCHULZE: Yes. Yes.

MR. DUPONT: -- how many did it stop?

MR. SCHULZE: Okay.

MR. DUPONT: How many did it do an override on?

MR. SCHULZE: Okay.

MR. TORRES: And that's what he's asking.

MR. SCHULZE: Yes. And my question though is, I just don't know how or why. It's, yes. It's --

MR. TORRES: Yes, he wants to know why you're asking that.

MR. SCHULZE: Oh, no, no, no. We, no, no, no.

MR. DUPONT: Yes, we already, we discussed that. I was just, it was just an overview of PTC on this division to see how much interaction's taking place.

MR. SCHULZE: Yes. And when I get that to you, I'd like to have a conversation with you and just --

MR. DUPONT: Absolutely.

MR. SCHULZE: -- to really talk through it. I mean, it --

MR. DUPONT: Right.

MR. SCHULZE: The details are --

MR. DUPONT: Right.

MR. SCHULZE: Yes. I don't know what it's going to show or what it's --

MR. DUPONT: Right.

MR. SCHULZE: But we can talk about how we've remediated any defects that might be, or whatever it might be. So --

MR. DUPONT: Okay.

MR. FACKLAM: Steve, that's the Panhandle and Hereford?

MR. SCHULZE: No. Emporia. Emporia.

MR. DUPONT: Well, not Panhandle. The two Emporia sides.

MR. FACKLAM: I'm sorry. Sorry. The Emporia. My bad. Emporia, Hereford.

MR. TORRES: Anybody have any questions?

MR. SAUNDERS: No.

MR. TORRES: I don't have any. Thank you for the information --

MR. SCHULZE: Thank you.

MR. TORRES: -- and answering our questions.

Appreciate it.

MR. SCHULZE: Appreciate the opportunity.

MR. TORRES: Thank you.

MR. SCHULZE: Thanks.

MR. TORRES: (Inaudible), nobody asked me any questions. Oh, oh, what are you?

MR. SCHULZE: Wait a minute.

MR. TORRES: Are you crew management?

MR. SCHULZE: He's next.

MR. TORRES: Okay.

MR. FACKLAM: Good for you.

MR. TORRES: You all know that.

MR. FACKLAM: Thank you.

MR. SCHULZE: Great questions too. Thanks, I appreciate it. Yes, I appreciate that.

MR. FACKLAM: It was, I appreciate the --

(Whereupon, the above-entitled matter went off the record at an undisclosed time.)

C E R T I F I C A T E

MATTER: Head-on Collision that Occurred
Near Panhandle, TX on June 28, 2016
Accident No. DCA16FR008
Interview: Mark Schulze and Orest Dachniwsky

DATE: July 1, 2016

I hereby certify that the attached transcription of page 1 to 67 inclusive are to the best of my professional ability a true, accurate, and complete record of the above referenced proceedings as contained on the provided audio recording; further that I am neither counsel for, nor related to, nor employed by any of the parties to this action in which this proceeding has taken place; and further that I am not financially nor otherwise interested in the outcome of the action.

[redacted]