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CSX TRANSPORTATION, INC.

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HOUSE COMMITTEE ON TRANSPORTATION AND

INFRASTRUCTURE

SUBCOMMITTEE ON RAILROADS

HEARING ON POSITIVE TRAIN CONTROL

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On behalf of CSX Transportation, Inc. (CSX), thank you for the opportunity to appear before you today to discuss positive train control (PTC).

CSX operates a freight rail network spanning approximately 21,000 miles, with service to 23 eastern states, the District of Columbia and two Canadian provinces. We are part of a 140,000-mile U.S. freight rail network that serves nearly every industrial, wholesale, retail, agricultural, and mining-based sector of our economy. Whenever Americans grow something, eat something, mine something, make something, turn on a light, or get dressed, CSX or another freight railroad is probably involved somewhere along the line.

In this testimony, I will describe what positive train control is; the extraordinary steps CSX and other freight railroads have taken to develop and implement this new technology, explain why – despite CSX's and other railroads' best efforts – the existing statutory deadline for nationwide PTC implementation is unrealistic and should be extended; and what some of the implications of not extending that deadline are – including the fact that the Rail Safety Improvement Act of 2008, for the first time in history, has the potential to make railroads' operations unlawful as of January 1, 2016.

Before I begin, I would like to emphasize that safety is CSX's highest priority, and zero accidents is our goal. We invest billions annually in technology and infrastructure to ensure that our network is suitable for the safe delivery of every load of freight consigned to us. In 2014, for example, we spent $2.4 billion of private funds on our infrastructure, including $300 million on PTC. In addition, our employees receive regular training aimed at creating a culture of safety populated by workers who feel empowered to take responsibility for protecting their health and the health and well-being of the communities where we operate.

What is Positive Train Control?

"Positive train control" (PTC) describes technologies designed to automatically stop a train before certain accidents occur. The Rail Safety Improvement Act (RSIA) requires passenger railroads and Class I freight railroads to install PTC by the end of 2015 on main lines used to

transport passengers or toxic-by-inhalation (TIH) materials.[1] Congress was single-minded in its mandate: PTC and only PTC was required. Other braking technologies such as Automatic Train Control or ATC was not deemed sufficient for purposes of the Act. Specifically, PTC as mandated by the RSIA must be designed to prevent train-to-train collisions, derailments caused by excessive speed, unauthorized incursions by trains onto sections of track where maintenance activities are taking place, and the movement of a train through a track switch left in the wrong position.[2] The PTC systems that will be installed to meet the statutory mandate are overlay systems, meaning they supplement – rather than replace – existing methods of operation and train control systems.

Positive Train Control is an Unprecedented Technological Challenge

A properly functioning PTC system must be able to determine the precise location, direction, and speed of trains; warn train operators of potential problems; and take prompt action if the operator does not respond to the warning provided by the PTC system. For example, if a train operator fails to begin stopping a train when approaching a stop signal, or slowing down for a speed-restricted area, the PTC system would apply the brakes and stop the train automatically, before the train passed the stop signal or entered the speed-restricted area.

Such a system requires highly complex technologies able to analyze and incorporate the huge number of variables that affect train operations. A simple example: the length of time it takes to stop a train depends on train speed, terrain, the weight and length of the train, the number and distribution of locomotives and loaded and empty freight cars on the train, and other factors. A PTC system must be able to take all of these factors into account automatically, reliably, and accurately in order to safely stop the train.

The development and implementation of PTC systems constitute an unprecedented technological challenge for railroads. The attached appendix illustrates the numerous interconnections between systems that must integrate in a PTC system, and the deployment process is described in some detail in the attached American Association of Railroads' white paper. Tasks involved include:

[1] *TIH materials are gases or liquids, such as chlorine and anhydrous ammonia, which are especially hazardous if released into the atmosphere.*

[2] *A switch is equipment that controls the path of trains where two sets of track diverge.*

- Create a series of novel software solutions that must work together to create the system referred to as PTC.

- A complete physical survey and highly precise geo-mapping of the approximately 62,000 miles of railroad right-of-way on which PTC technology will be installed, including geo-mapping of nearly 440,000 field assets (mileposts, curves, grade crossings, switches, signals, and much more) along that right of way.

- Installing PTC technology on more than 23,000 locomotives.

- Installing over 34,000 "wayside interface units" (WIU) that provide the mechanism for transmitting information to locomotives and the train dispatching office from signal and switch locations along the right of way.

- Installing PTC technology on over 3,300 switches in non-signaled territory and completing signal replacement projects at more than 14,500 locations.

- Developing, producing, and deploying a new, nationwide radio network and new radios specifically designed for the massive data transmission requirements of PTC at 4,000 base stations, 31,000 trackside locations, and on 23,000 locomotives.

- Developing back office systems and upgrading dispatching software to incorporate the data and precision required for PTC systems.

For CSX the tasks are slightly smaller but still monumental:

- A complete airborne laser-imaging survey of our entire 21,000-mile network was required with all assets mapped to within 7 feet of their precise location

- Installation of 5,202 wayside units

- Replacing signals along 7,500 miles of track

- Installing 1,285 base stations

- Equipping 3,900 locomotives

- Training 16,000 employees

I'm proud to report that CSX has made great progress in all of these areas, and we have more than 1,000 employees who are dedicated to extend our achievements, over half of whom were hired directly as a result of the PTC mandate. As of May 15, 2,676 locomotives were at least partially equipped with PTC; some 2,200 WIUs are deployed; and 466 radio base-stations were installed. In addition, we have completed field qualification testing on the first territory type on

our network, and we're starting a revenue service demonstration in late July – using the system on a 480-mile segment of our network, or roughly the equivalent of the Northeast Corridor or Metrolink's system.

These statistics represent the significant progress CSX and other railroads have made toward installing the nationwide, interoperable PTC network. Notwithstanding these significant achievements, much more design, development, testing, training and installation work remains. We continue to find safety critical defects in the software that must be corrected and retested prior to revenue service.

More Time is Needed to Ensure Safe and Effective Implementation

CSX and other freight railroads have been working tirelessly, and spending tremendous amounts of money, to meet the PTC mandate. In fact, for the period of 2009-2014, PTC was CSX's third largest capital expense behind track maintenance and freight cars. CSX spent more on PTC in this period than it did on locomotives, intermodal terminals, bridges or commercial facilities. As of the end of 2014, CSX had invested $1.2 billion in PTC. We expect to spend another $300 million this year. Our current estimate for the total cost of PTC on our railroad is at least $1.9 billion. Freight railroads together have so far spent well over $5 billion – of their own funds, not taxpayer funds – on PTC development and deployment, and expect to spend at least $9 billion by the time PTC is fully operational nationwide. This does not include the hundreds of millions of additional dollars that will be needed each year to maintain the railroads' PTC systems when they are complete.

Despite these huge expenditures, PTC's complexity and the enormity of the implementation task – and the fact that much of the technology PTC requires simply did not exist when the PTC mandate was passed and has had to be developed from scratch – as the railroads have said since 2012, more time is needed for full implementation.

Much of CSX's and other railroads' efforts to date have been directed toward development and initial testing of technology that can meet the requirements of the legislation and can be scaled to the enormous requirements of a national, interoperable system. For example, production and installation of the new radios was possible only after a long period of development and testing.

Essential software and hardware for many PTC components are being designed and developed, and rigorous testing of these components is being performed. Only after this work is completed and the technology has been installed can the task of lab testing each of the individual parts, and then field testing the system as a whole, be completed.

This task is made particularly complex by the need to ensure that PTC systems are fully and seamlessly interoperable across all of the nation's major railroads. It is routine for one railroad's locomotives to operate on another railroad's tracks. When that happens, the "guest" locomotives must be able to communicate with, and respond to commands from, the "host" PTC system. Put another way, a CSX locomotive has to behave like a Norfolk Southern locomotive when it's traveling on NS's tracks; a BNSF locomotive must be compatible with Union Pacific's PTC system when it's on UP tracks, and so on. That's much easier said than done, and ensuring this interoperability has been a significant challenge.[3]

It is also critical that the many potential failure points and failure modes in PTC systems are identified, isolated, and corrected – all without negatively impacting the efficient movement of goods by rail throughout the country. This is incredibly important. The PTC systems the railroads ultimately deploy must work flawlessly, day in and day out, or risk seriously impairing operations on of the U.S. freight rail network. The damage that would cause to our nation's economy would be enormous if implementation were forced prematurely.

In addition, the Federal Railroad Administration must review each railroad's PTC safety plan and certify each railroad's PTC systems after the development and testing of the components are complete. Only then can a railroad's PTC installation be completed and placed into operation. You have heard from the FRA about the enormity of their task to review the railroads' safety plans. In a world of constrained resources, that timely review becomes more challenging. FRA has stated that it has received and reviewed one of the roughly 40 safety plans that need to be submitted by railroads. The railroad that submitted the plan coordinated extensively with FRA over more than a year, meeting informally to discuss and review the plan so that the formal review process would move as quickly and efficiently as possible. Once the plan was submitted

[3] *Some have questioned why railroads don't all implement identical PTC systems, thereby ensuring interoperability. That's not possible because a railroad's PTC system must function within the parameters of that railroad's existing communication, signaling and dispatching systems, and operating rules.*

formally, it still took more than 11 months for FRA to review the plan, and the plan has thus far only received conditional approval.

Railroads knew when the PTC mandate was passed in 2008 that the technological challenges related to PTC would be immense. But railroads have also faced significant non-technological barriers to timely PTC implementation.

One such challenge with which the committee may be familiar involved regulatory barriers to the construction of antenna structures. As you may know, the Federal Communications Commission initially required historical and Native American review of proposed antennae sites, and the system that was in place at the time to process those applications was overwhelmed by the volume of sites that needed to be reviewed. To its credit, the FCC worked with the railroad industry and now a path forward has been put in place on this issue. Unfortunately, diagnosing the problem and designing a new process ultimately cost railroads more than a year's construction season toward meeting the PTC deadline. We continue to work closely with the FCC on other PTC-related issues.

Despite these setbacks, railroads' aggressive implementation of PTC will continue. However, it is simply not possible to complete a nationwide, interoperable PTC system by the end of 2015. Adjusting the implementation deadline would more accurately reflect railroads' considerable efforts to design, test, approve, produce, distribute, install and train 100,000 employees on the use of this incredibly complex technology. Rushing PTC development and installation and foregoing a logical plan for sequencing its implementation would sharply increase the likelihood that the system would not work as it should, and potentially lead to degradations in safety and efficiency, which is an outcome that serves no one's purpose.

Some have suggested that the railroads have somehow not tried hard enough to meet the existing statutory deadline, and that there are so-called "good actors" and "bad actors" with PTC implementation. Not only is that not true, it is a gross mischaracterization of all the hard work that all the railroads have performed to date. CSX, as I mentioned, will have as many miles of PTC-equipped track in service at the end of 2015 as Amtrak or Metrolink will. I'm proud of CSX's and other railroads' efforts and I'm sure that those involved in PTC at other freight

railroads would say the same thing. We in the railroad industry are fully committed to PTC, but it must be done correctly. That's simply not possible by the end of this year.

Implications of Not Extending Deadline

While some attention has been focused on the potential implications of not extending the deadline for PTC installation, there are issues that we do not believe have received adequate exposure. Many assume, for example, that the Federal Railroad Administration will use discretionary fines, emergency orders and other tools to enforce compliance with the RSIA. Other implications of which the subcommittee should be aware could have more profound impacts on freight railroads, their freight customers and the thousands of passengers across the United States who daily rely on rail service provided over freight railroads' tracks.

The most immediate impact of the existing deadline is the fact that, for the first time in history, RSIA has the potential to make certain rail operations illegal. Because the law requires that tracks carrying passengers or TIH freight be equipped with PTC, operating any trains carrying passengers or TIH freight on tracks without PTC would be in conflict with the law.

This creates a significant dilemma for CSX: shall we operate in violation of RSIA, in fulfillment of our Common Carrier obligations to transport freight on reasonable request? Or, does the impossibility of operating lawfully render a request to transport unreasonable? If so, is our only choice to refuse to transport passengers or TIH materials so we are in compliance with the PTC requirements?

As you might expect, many lawyers are considering the potential commercial, operational and legal implications of these choices, and CSX is not today making any announcements about any conclusions of those reviews. But we would be irresponsible if we did not focus on and alert this committee to the potential consequences of this conflict.

For example, on CSX tracks alone, approximately 120 commuter and Amtrak passenger trains operate daily. Many are operated in the Washington DC metropolitan area, by the MARC and VRE commuter services. All told, an average of 42,000 passengers per day ride trains on CSX-owned tracks which the law requires to be PTC-equipped by year-end. Other freight railroads also support passenger operations, in metropolitan areas across the country.

If the PTC deadline is not extended, is CSX placing itself in legal jeopardy by continuing to allow passenger trains to operate on our tracks? Could CSX afford the liability of operating passenger trains in violation of the law? Would CSX be in violation of our fiduciary responsibility to our shareholders to assume such risks? More fundamentally, is it ever right to do something that is contrary to law? These are among the questions faced by CSX and each railroad that supports passenger operations.

For other railroad customers, such as those industries that require a reliable supply of essential but dangerous toxic-by-inhalation chemicals, the implications are equally dramatic. If railroads cannot transport those commodities, what alternatives are available? Will we see more trucks on the highways carrying TIH substances, introducing additional risks to the public and uncertainty to the supply chain? Are enough trucks available to support those needs, including the critical supply of chlorine and other additives that purify the nation's drinking water?

At this point there don't appear to be easy answers to these questions, but they are questions that clearly must be addressed and deserve the committee's attention. Operating certain trains on non-PTC-compliant tracks could be an unacceptable choice for some railroads, and the impact of railroads' decisions on commuters and industries that rely on rail service could have significant effects that have not yet been fully examined.

Conclusion

Since enactment of the RSIA, CSX and other railroads have devoted enormous human and financial resources to develop a fully functioning PTC system, and progress to date has been substantial. However, despite railroads' best efforts, the immense technological hurdles are such that a safe, reliable, nationwide, and interoperable PTC network will not be completed by the current deadline. Railroads remain committed to implementing PTC as early as possible and are doing all they can to address the challenges that have surfaced, but more time is needed to ensure safe and effective implementation on the nation's vast freight and passenger rail networks.

APPENDIX

POSITIVE TRAIN CONTROL – SYSTEMS DIAGRAM