

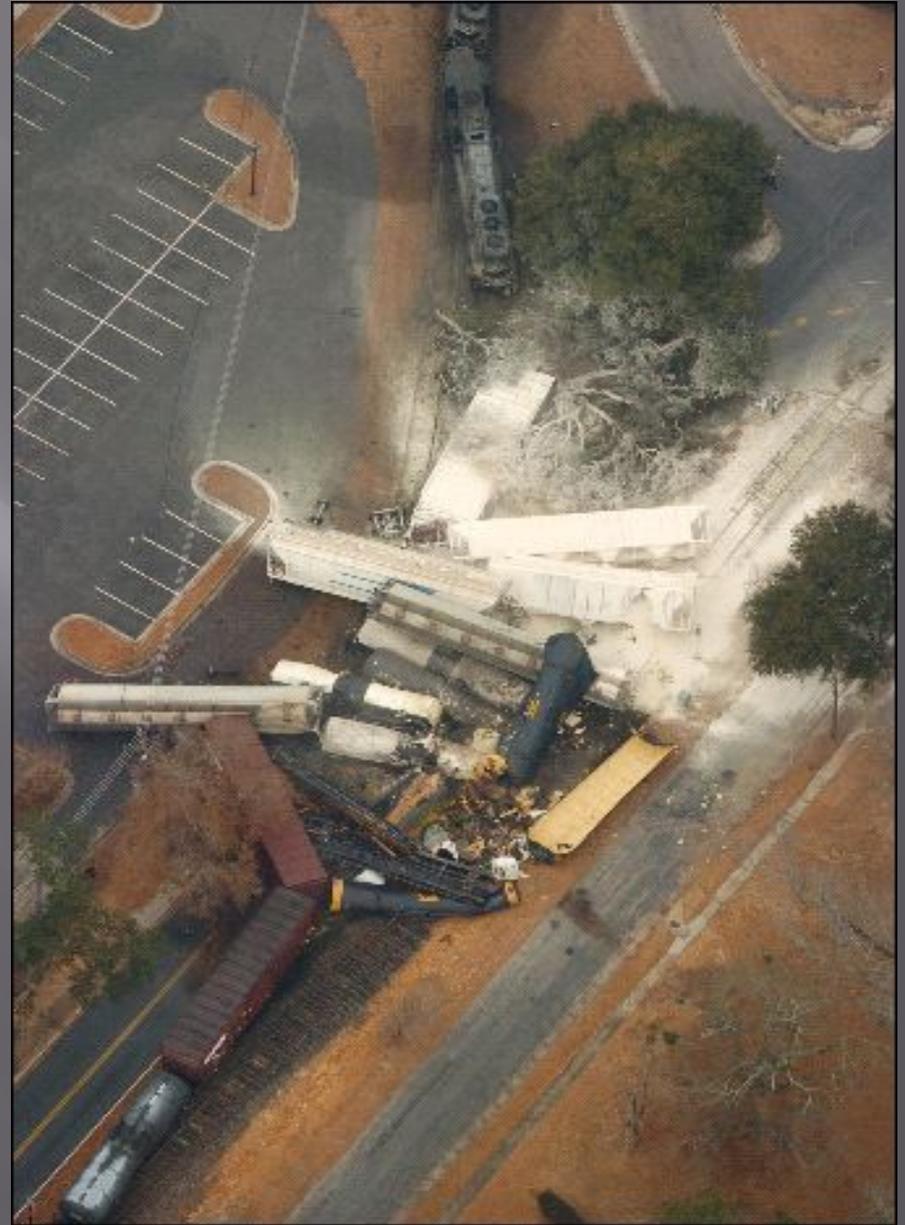
ASSOCIATION OF STATE RAIL SAFETY MANAGERS MEETING

San Antonio, Texas

August 29, 2013

WHY PTC?

Graniteville, SC
January 5, 2006



WHY PTC?

Chatsworth, CA
September 12, 2008



Timeline

- ❑ **PTS placed on NTSB “Most Wanted List” in 1990**
- ❑ **FRA issued Subpart H Final Rule March 7, 2005**
- ❑ **RSIA 2008 becomes law October 16, 2008**
- ❑ **Final Rule effective March 16, 2010**
- ❑ **PTC must be installed by December 31, 2015**

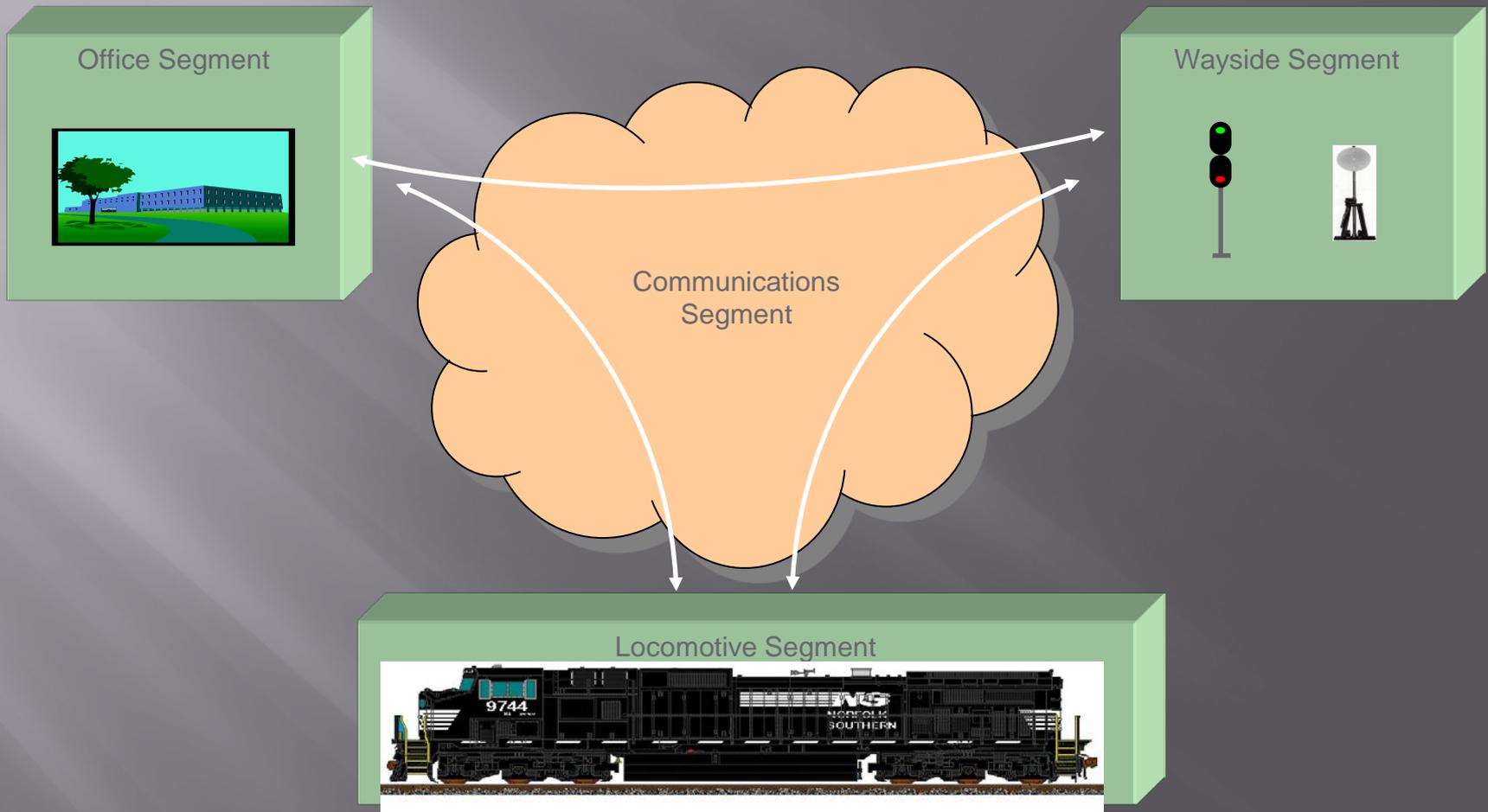
PTC - Four Core Functions

- ▣ Prevent “Train-to-Train Collisions”
- ▣ Prevent “Overspeed Derailments”
- ▣ Prevent “Incursions into Established Work Zone Limits”
- ▣ Prevent “Movement of train through switch in the wrong position”

PTC System

- ▣ **Provide an Appropriate Warning or Enforcement when:**
- ▣ **Derail or switch protection per § 236.1007**
- ▣ **Mandatory directive is issued for highway-rail grade crossing system malfunction per §§ 234.105, 234.106, or 234.107**
- ▣ **After-Arrival Mandatory Directive has been issued**
- ▣ **Drawbridges protection per § 236.312**
- ▣ **Hazard Detectors integrated into PTC system**

WHAT PTC LOOKS LIKE?



System Segments

Types of PTC Systems

- ▣ **Non-Vital Overlay** - A PTC system proposed as an overlay on the existing method of operation and not built in accordance with the safety assurance principles set forth in Appendix C
- ▣ **Vital Overlay** - A PTC system proposed on a newly constructed track or as an overlay on the existing method of operation and built in accordance with the safety assurance principles set forth in Appendix C

Types of PTC Systems

- ▣ Stand-Alone - A PTC system proposed on a newly constructed track, an existing track for which no signal system exists, as a replacement for an existing signal or train control system, or otherwise to replace or materially modify the existing method of operation.
- ▣ Mixed - a PTC system combining overlay, stand-alone, vital, or non-vital characteristics.

Testing & Implementation Status

Railroad	System	Type	Status
BNSF	ETMS	Non-Vital Overlay	<ul style="list-style-type: none"> • Approved for Use • Additional Modifications for I-ETMS Transition in Progress
CSX, NS, UP, CN, CP, KCS, Non NEC Passenger/Commuter	I-ETMS	Vital Overlay	<ul style="list-style-type: none"> • Type Approved • Product Under Development
Amtrak/NEC Carriers	ACSES /Cab Signals	Vital Overlay	<ul style="list-style-type: none"> • Type Approved and Certified • Additional Modifications Under Development
AMTRAK (Michigan)	ITCS	Vital Overlay	<ul style="list-style-type: none"> • Approved for Use • Type Approval and Certification
PATH	CBTC	Vital Overlay	<ul style="list-style-type: none"> • Under Development • Type Approval Issued
CALTRAIN	CBOSS/I-ITCS	Vital Overlay	<ul style="list-style-type: none"> • Under Development

Where is PTC Required

- ▣ **Class I railroad main lines with 5 million or more gross tons of railroad traffic and**
- ▣ **Any PIH/TIH**
- ▣ **Each entity providing regularly scheduled intercity and passenger transportation.**
- ▣ **Other such tracks as the Secretary may prescribe by regulation or order.**

What Railroads are Required to Install PTC

- ▣ All Class I railroads: UP, BNSF, CSX, NS, CN, CP, & KCS
- ▣ Terminal railroads: BRC, KCT, TRRA, Conrail Switching & Terminal Railroad, maybe others
- ▣ Railroads providing regularly scheduled intercity and passenger service such as Amtrak, ARR, Metra, & Metrolink
- ▣ A few Class II & III railroads that have commuter operations on their track

What Railroads are Required to Install PTC (cont.)

Commuter operations such as

- ▣ R1 - LI, MBTA, MNCW, NJTR, & PATH
- ▣ R2 - MACZ (MARC), SEPTA, & VREX
- ▣ R3 - CFRC, NRTX (Music City Star), NCDOT & SFRV
- ▣ R4 - NIRC (METRA) & NICTD

What Railroads are Required to Install PTC (cont.)

- ▣ R5 - CMTY, DCTA, NMRX, & TRE
- ▣ R6 - RTD
- ▣ R7 - PCMZ (Caltrain) SDNX (NCTD), SCAX (Metrolink), Altamont Commuter Express, & UFRC (UTA)
- ▣ R8 - TMEV (TriMet) & SCR (Sounder)

What Railroads are Required to Install PTC (cont.)

Some of these operations are on Class I railroads

There may be some additional commuter operations that were not listed on previous slides in some regions

PTC Railroad Document Numbers

Alaska Railroad (ARR)	FRA-2010-0054
Amtrak (ATK)	FRA-2010-0029
Belt Railway Company of Chicago (BRC)	FRA-2010-0062
BNSF Railway (BNSF)	FRA-2010-0056
Buckingham Branch Railroad (BB)	FRA-2010-0063
Canadian National Railway (CN)	FRA-2010-0057
Canadian Pacific Railway (CP)	FRA-2010-0058
Capital Metropolitan Transportation Authority (CMTY)	FRA-2010-0072
Central Florida Rail Corridor (CFRC)	FRA-2011-0104
Conrail Shared Assets Corporation (CRSH)	FRA-2010-0064
CSX Transportation (CSX)	FRA-2010-0028
Denton County Transportation Authority (DCTA)	FRA-2010-0074
Kansas City Southern Railway (KCS)	FRA-2010-0059
Kansas City Terminal Railway (KTC)	FRA-2010-0065
Long Island Railroad (LI)	FRA-2010-0031

PTC Railroad Document Numbers

MARC Train Service (MACZ)	FRA-2010-0038
Massachusetts Bay Transit Authority (MBTA)	FRA-2010-0030
Metro North Commuter RR Co (MNCW)	FRA-2010-0032
Minnesota Commercial Railway (MNNR)	FRA-2010-0066
Nashville Regional Transportation Authority (NRTX)	FRA-2010-0040
New England Central Railroad (NECR)	FRA-2010-0067
New Jersey Transit Rail Operations (NJTR)	FRA-2010-0033
New Mexico Rail Runner Express (NMRX)	FRA-2010-0045
New Orleans Public Belt Railroad (NOPB)	FRA-2011-0051
Norfolk Southern (NS)	FRA-2010-0060
North County Transit District (SDNX)	FRA-2010-0049
Northeast IL Regional Commuter Rail Corp. (NIRC)	FRA-2010-0042
Northern Indiana Commuter Transportation District (NICD)	FRA-2010-0043
Pan Am Railways (GRS)	FRA-2010-0068
Peninsula Corridor Joint Powers Board (PCMZ)	FRA-2010-0051

PTC Railroad Document Numbers

Port Authority Trans Hudson (PATH)	FRA-2010-0034
Portland & Western Railroad (PNWR)	FRA-2010-0073
Regional Transit District Commuter (RTDC)	FRA-2011-0106
Saratoga and North Creek (SCR)	FRA-2012-0004
Souder Commuter Rail (SCR)	FRA-2010-0053
South Florida Regional Transportation Authority (SFRV)	FRA-2010-0039
Southeastern Pennsylvania Transportation Authority (SEPA)	FRA-2010-0036
Southern California Regional Rail Authority (SCAX)	FRA-2010-0048
Terminal Railroad Association of St. Louis (TRRA)	FRA-2010-0070
Tri-Met Westside Express Service (TMEV)	FRA-2010-0055
Trinity Railway Express (TRE)	FRA-2010-0044
Union Pacific Railroad Co. (UP)	FRA-2010-0061
Utah Transit Authority FrontRunner Commuter Rail (UFRC)	FRA-2010-0052
Vermont Rail System (VTR)	FRA-2010-0071
Virginia Railway Express (VREX)	FRA-2010-0037

Railroad PTC Documentation



PTC Railroads submit their required PTC documentation to FRA's Secure Information Repository (SIR) Site. Access to the SIR site is restricted to certain persons.

Account most documents are marked and contain Proprietary and Confidential information.

Several documents are marked and contain security sensitive information (SSI).

Railroad PTC Documentation

- ▣ **PTC Implementation Plan (PTCIP)**
- ▣ **Notice of Product Intent (NPI)**
- ▣ **PTC Development Plan (PTCDP)**
- ▣ **PTC Safety Plan (PTCSP)**
- ▣ **Railroad Safety Program Plan (RSPP)**

Railroad PTC Documentation

- ▣ **Product Safety Plan (PSP)**
- ▣ **Main Line Track Exclusion Addendum (MTEA)**
- ▣ **Request For Amendment (RFA)**
- ▣ **Request For Expedited Certification (REC)**
- ▣ **Type Approval Deviation Request**

Railroad PTC Documentation

- ▣ **Annual Report**
- ▣ **Test Request**
- ▣ **Test Plans**
- ▣ **Software Release Notes**
- ▣ **Etc., Etc., Etc.**

Railroad PTC Documentation

PTC Branch reviews all of these documents and works with railroads to resolve issues with each document.

Numerous meetings with railroads and suppliers to review their various system document submissions:

Preliminary Design Reviews; Critical Design Reviews; Lab Testing; & Status Meetings

PTC Documents

- ▣ Received and approved 44 PTCIPs
- ▣ Seven railroads received total MTEA exceptions (BB, MNNR, NECR, NOPB, GRS, SNC, VTR)
- ▣ 37 railroads will install PTC
- ▣ 8 PTCDPs issued
- ▣ 2 PTCDPs pending
- ▣ 3 System Certifications issued (ACSES II, ITCS, & ETMS VII)

Railroad Test Request



§ 236.1035 requires railroads to submit a test request prior to testing their PTC system

Railroad Test Request

- ▣ **FRA approval will allow PTC testing that may require relief from some FRA regulations, but only on PTC equipped trains and only when a test is in progress.**
- ▣ **Upon submission of an adequate test request, FRA approves the request with conditions.**

Types of PTC Tests

- ▣ **Track Database (Critical Features)V&V**
- ▣ **Wayside Interface Unit V&V**
- ▣ **Brake Distance Testing**
- ▣ **Message Testing**
- ▣ **Functional Feature Testing**
- ▣ **Route Navigation**
- ▣ **End-to-End Runs**

Personnel Requirements

Numerous personnel are required for PTC testing.

- ▣ Railroad Dispatcher
- ▣ Railroad Back Office
- ▣ Railroad Signal Department
- ▣ Railroad Train Crew
- ▣ Railroad PTC Test Manager
- ▣ PTC System Supplier
- ▣ FRA PTC Specialist

FRA Monitored Testing

- ▣ Illinois - BNSF, UP, Amtrak, & Metra
- ▣ Oklahoma - BNSF
- ▣ Texas - BNSF
- ▣ North Dakota - BNSF
- ▣ Montana - BNSF
- ▣ Washington - BNSF
- ▣ California - BNSF & Metrolink
- ▣ Iowa - BNSF & CP
- ▣ Minnesota - BNSF

FRA Monitored Testing (cont.)

- ▣ Michigan - Amtrak
- ▣ New Jersey - Amtrak
- ▣ New York - Amtrak
- ▣ South Carolina - CSX
- ▣ North Carolina - NS
- ▣ Alaska - ARR

Test Results

The results of all field testing shall be submitted to FRA prior to commencement of the revenue service demonstration phases.

Revenue Service Demonstration Runs

The railroad may begin revenue service demonstration upon completion of the preconditions outlined in their respective conditional approval letters, review and approval of the reported results, review and approval of the submitted documentation, determination that the system is functioning as intended, successful mitigation of all identified problems and critical anomalies, and the concurrence of the FRA test monitor.

Revenue Service Demonstration Runs

The minimum number of train runs required through the test bed territory with PTC active during this Phase will be **XXX** consecutive runs (95 percent confidence level, 5 percent confidence interval) without a critical anomaly.

Revenue Service Demonstration Runs Currently

- ▣ Illinois - BNSF, Mendota Sub
- ▣ California - BNSF, San Bernardino, Bakersfield, Mojave, Stockton, Needles Subs
- ▣ Michigan - Amtrak
- ▣ NEC - Amtrak

Pre-revenue Service Testing

Pre-revenue service testing encompasses approximately 90% to 95% of the testing PTC systems will ever receive.

Very little formal periodic testing will be conducted after a PTC system is placed in service.

That's All

Questions?