



PTC and “Full Implementation”

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Outline

1. PTC Deployment
2. Elements of PTC “Implementation”
3. Industry Status
4. Alternative Schedule
5. Funding
6. Enforcement
7. Contacts



Where PTC Systems are Being Implemented

PTC Route Miles, Host Railroads Per State, and FRA S&TC Safety Inspectors

REGION 8

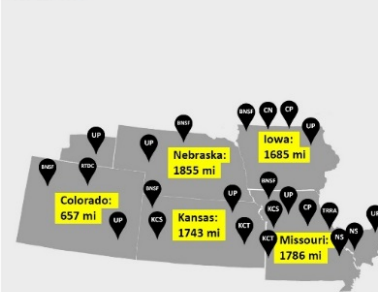
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11
Inspectors

REGION 6

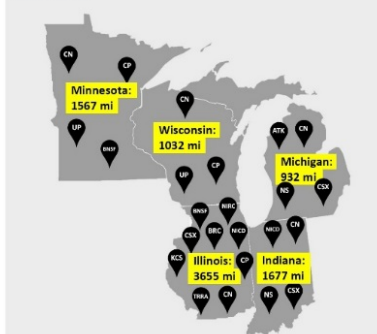
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7
Inspectors

REGION 4

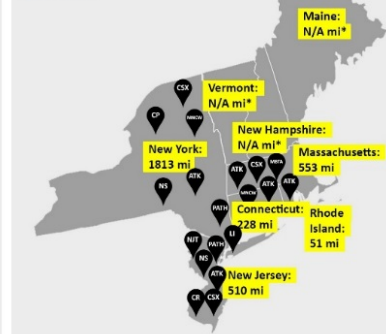
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9
Inspectors

REGION 1

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9
Inspectors

REGION 7

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Key	
State X: 1000 mi	Indicates the PTC route miles per state
Host Railroad	Indicates the host railroad operates PTC-regulated track in the state
Inspector	= 1 Inspector

8
Inspectors

REGION 5

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9
Inspectors

REGION 3

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Inspectors

REGION 2

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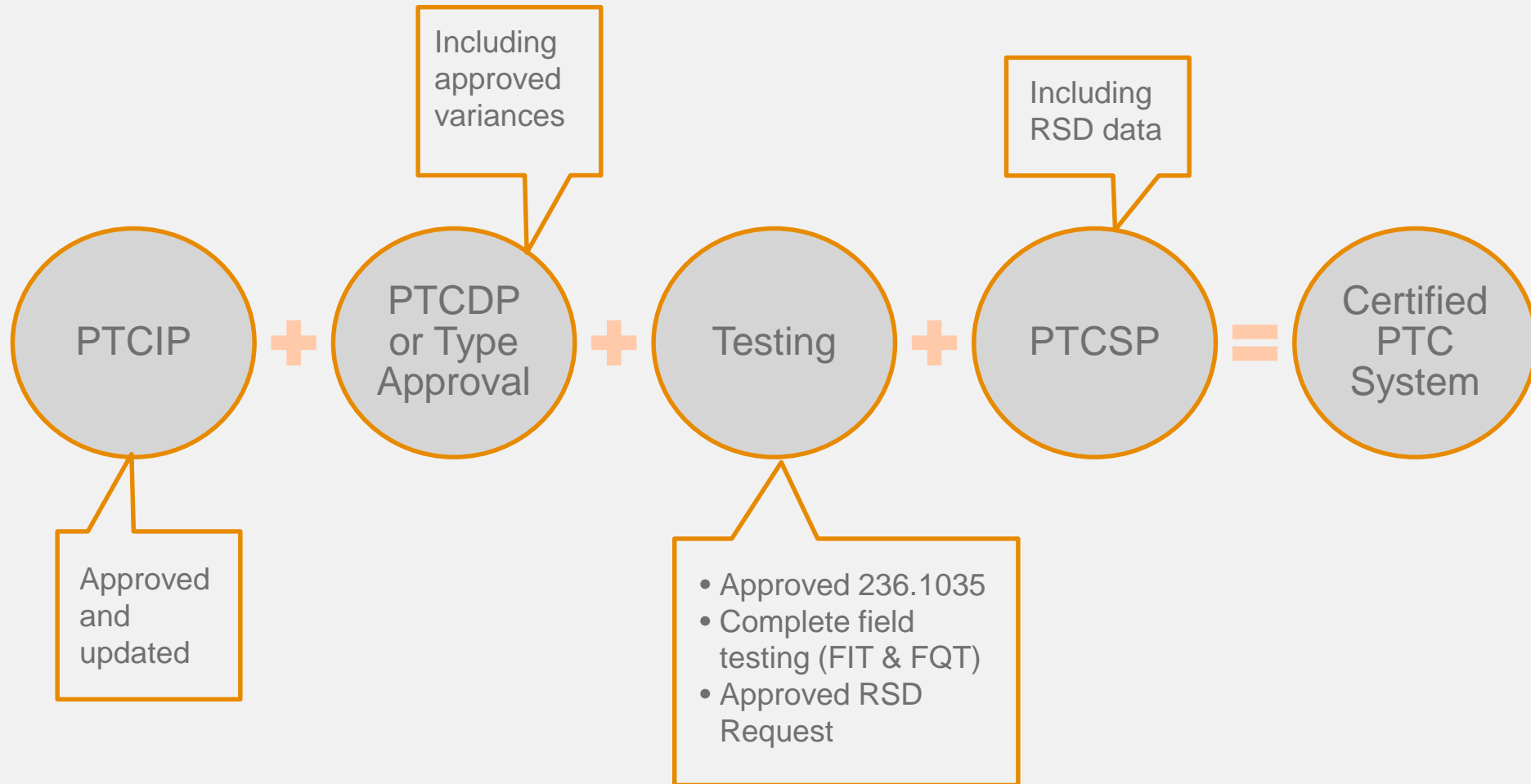


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Inspectors

*Host railroad(s) in this state have FRA-approved mainline track exception addendum (MTEA) over their entire track



PTC Implementation – Regulatory Requirements



PTC Implementation – Practical Considerations



“Full PTC Implementation”

Summary of Critical Steps:

1. All wayside hardware installed on ALL routes
2. Sufficient locomotives and cab cars equipped and tested to support operations
3. The back office, dispatch, and communications systems are fully operational
4. Training programs in place and sufficient staff trained to support testing and operations
5. Functional and RSD testing satisfactorily completed
6. Submitted PTCSP to FRA
7. Obtained PTC System Certification from FRA
8. Satisfactorily completed interoperability testing with all required tenant railroads
9. ALL non-exempt (or otherwise required) tenant railroads operational
10. Operating the PTC system in revenue service on all required route miles



Interoperability Considerations

To achieve **full implementation**, all required tenant operations and foreign power must be interoperable

Notable exceptions (see 49 CFR 236.1006(b) for full explanations):

- Certain switching or freight yard movements,
- Exempted short line operations or limited operation passenger rail service (see next slide), and
- Operations under allowed system failure scenarios.

Note: a locomotive with a non-functioning onboard computer is not considered an “en route” or initialization failure.

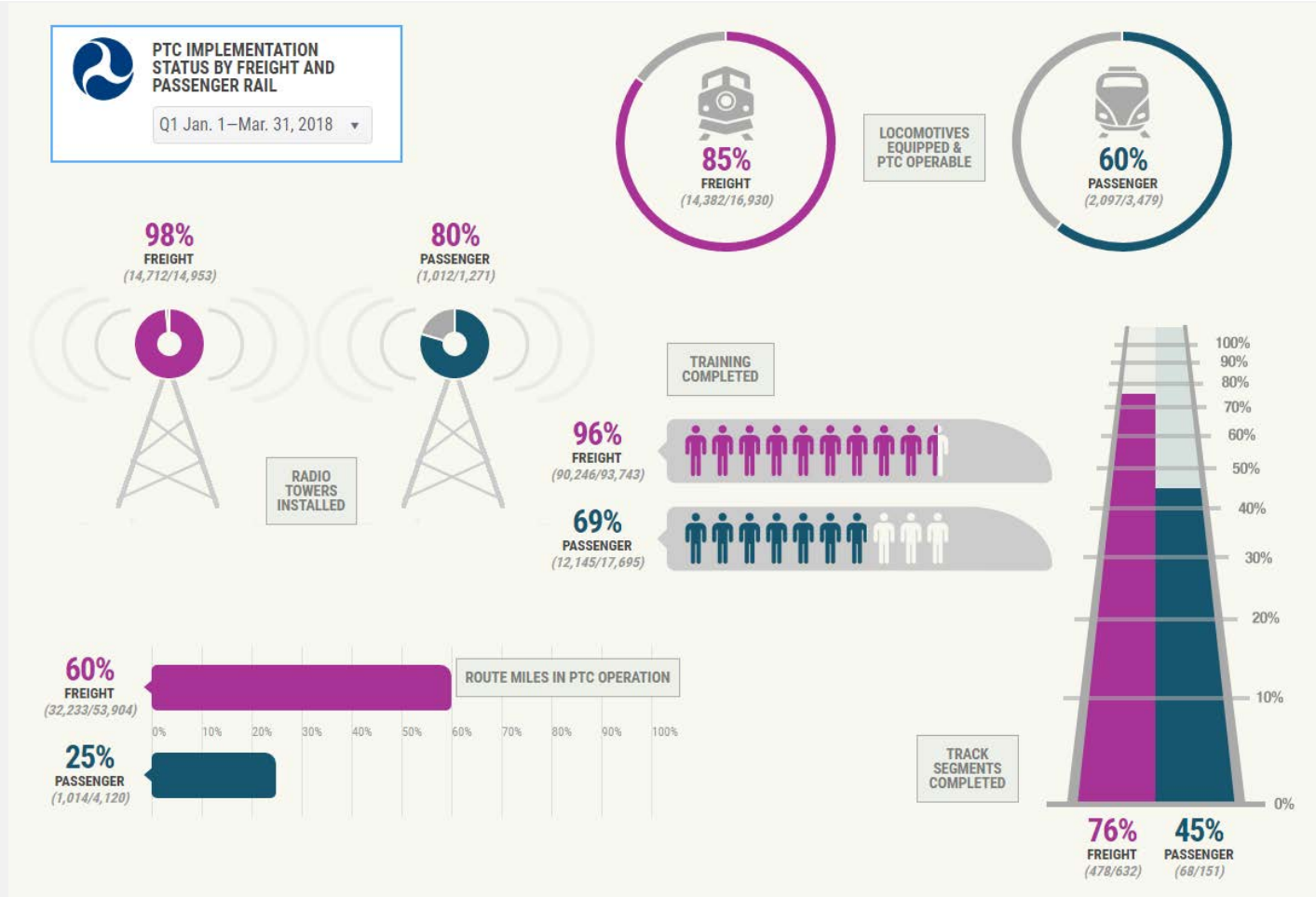
Tenant Railroad Considerations

A host railroad's PTCIP (an enforceable document) should accurately reflect the tenant railroads' operations and schedule for equipping controlling rolling stock with onboard PTC technology. Possible categories include:

1. **In Tandem** – Tenant railroad is required to implement in accordance with a host railroad's final implementation date (general rule).
2. **Exempt** – Limited passenger service that has received an FRA-approved main line track exception under 49 CFR 236.1019, or a Class II or Class III railroad (including a tourist or excursion railroad) has 4 or fewer unequipped movements per day and each movement does not exceed 20 miles in length.
3. **Deferred installation** (Deadline: December 31, 2023) – A Class II or Class III railroad (including a tourist or excursion railroad) has 4 or fewer unequipped movements per day and the movements exceed 20 miles in length.

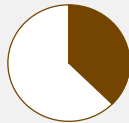
For full criteria and information regarding requesting a Class II or Class III tenant railroad exception, please see 49 CFR 236.1006(b)(4) and 236.1021.

Overview of Industry Progress



Overview of Industry Progress

Of 40 Railroads:



14 have installed all required PTC system hardware



15 have initiated PTC Revenue Service Demonstration



25 have all spectrum for PTC operation, 13 do not require spectrum

Measure	Locomotives	Track Segments	Radio Towers	Employee Training	Route Miles in PTC Operation
Freight Railroads					
Percentage Complete	85%	76%	98%	96%	60%
Units Complete	14,382 of 16,930	478 of 632	14,712 of 14,953	90,246 of 93,743	32,233 of 53,904
Passenger Railroads					
Percentage Complete	60%	45%	80%	69%	25%
Units Complete	2,097 of 3,479	68 of 151	1,012 of 1,271	12,145 of 17,695	1,014 of 4,120



Alternative Schedule Requirements

49 U.S.C. § 20157(a)(3)(B)

Overview of the main statutory criteria (to qualify for an alternative schedule), extending the PTC deadline to no later than December 31, 2020:



Installed All Positive Train Control Hardware
by December 31, 2018.



Acquired All Necessary Spectrum
by December 31, 2018.



Made Sufficient Progress on Revenue Service Demonstration
Class I railroads and Amtrak must have implemented a PTC system or initiated FRA-approved RSD on the majority of territories (e.g., subdivisions or districts) or route miles that the railroad owns or controls and that require PTC-governed operations. Any other railroad must have initiated FRA-approved RSD on at least one territory required to have PTC-governed operations, or have met any other criteria FRA previously established for that railroad.



Made Sufficient Progress on Employee Training
A railroad must have completed PTC training for all applicable personnel in any territory, or segment thereof, where a PTC system is currently being operated in RSD or revenue service.
See 49 CFR §§ 236.1041–236.1049.



Railroads' Progress Toward Meeting Statutory Criteria Required for an Alternative Schedule as of March 31, 2018

Railroad Name	Total Hardware Installed	Onboard Hardware Installed ²	Wayside Hardware Installed	All Spectrum Acquired?	Sufficient RSD Initiated?	Employees Trained
Class I Railroads						
BNSF Railway (BNSF)	100%	20,000/20,000	13,735/13,735	Yes	Yes	21,877/21,877
CSX Transportation (CSX)	96%	3,600/3,600	5,616/5,964	Yes	Yes	15,634/15,634
Canadian National Railway (CN)	96%	2,837/2,930	4,718/4,950	Yes	No	5,198/5,614
Kansas City Southern Railway (KCS)	95%	1,648/1,876	3,021/3,021	Yes	No	1,939/2,158
Union Pacific Railroad (UP)	95%	19,392/22,060	29,661/29,661	Yes	Yes	24,776/25,767
Norfolk Southern Railway (NS)	94%	5,188/5,800	10,733/11,193	Yes	No	18,438/18,832
Canadian Pacific Railway (CP)	91%	1,799/2,020	2,591/2,824	Yes	No	1,965/2,775
Intercity Passenger Railroads						
Amtrak (ATK)	94%	1,879/1,968	655/727	Yes	Yes	2,929/2,929
Commuter Railroads						
Southern California Regional Rail Authority (SCAX) "Metrolink"	100%	448/448	631/631	Yes	Yes	330/330
North County Transit District (SDNX)	100%	68/68	86/86	Yes	Yes	97/98
Southeastern Pennsylvania Transportation Authority (SEPA)	100%	1,525/1,525	152/152	Yes	Yes	1,192/1,192
Regional Transportation District Commuter (RTDC) "Denver"	100%	264/264	228/228	Yes	Yes	120/120
Sonoma-Marín Area Rail Transit (SMART)	100%	45/45	75/75	N/A	Yes	76/76
Northstar Commuter Rail (NSCR)	100%	48/48	N/A	N/A	Yes	18/18
Alaska Railroad (ARR)	100%	216/216	301/301	Yes	No	263/472
Denton County Transportation Authority (DCTA)	100%	44/44	121/121	N/A	No	0/50
Virginia Railway Express (VREX)	100%	164/164	N/A	N/A	To Be Determined	46/108
Utah Transit Authority FrontRunner Commuter Rail (UFRC)	100%	120/120	137/137	N/A	No	0/200
Long Island Rail Road (LIRR)	98%	584/584	332/361	Yes	No	1,859/3,194
Sounder Commuter Rail (SCR)	96%	155/164	49/49	Yes	To Be Determined	4/4
Northeast Illinois Regional Corporation (NIRC) "Metra"	90%	1,850/2,112	770/789	Yes	No	1,181/1,801
Port Authority Trans-Hudson (PATH)	86%	1,100/1,150	2,005/2,448	N/A	No	910/910
Metro-North Commuter Railroad Co. (MNCW)	86%	1,706/1,880	164/292	Yes	No	2,474/2,915
Peninsula Corridor Joint Powers Board (PCMZ) "Caltrain"	74%	134/268	246/246	Yes	No	0/199
Massachusetts Bay Transportation Authority (MBTA)	71%	834/1140	516/760	Yes	No	215/932
Central Florida Rail Corridor (CFRC) "SunRail"	53%	2/48	93/105	Yes	No	0/114
Northern Indiana Commuter Transportation District (NICD)	53%	132/292	51/51	N/A	No	259/259
Maryland Area Regional Commuter (MACZ) "MARC"	52%	54/156	N/A	N/A	To Be Determined	0/100
Altamont Corridor Express (ACEX)	25%	13/52	N/A	N/A	To Be Determined	0/28
South Florida Regional Transportation Authority (SFRV) "Tri-Rail"	25%	48/156	9/76	Yes	No	0/230
New Jersey Transit (NJTR)	13%	175/2,200	147/334	Yes	No	172/1,100
New Mexico Rail Runner Express (NMRX) "Rio Metro"	9%	0/72	21/162	No	No	0/88
Capital Metropolitan Transportation Authority (CMTY)	0%	0/68	0/35	N/A	No	0/148
Trinity Railway Express (TRE)	0%	0/68	0/89	Yes	No	0/80
Other Railroads						
Portland & Western Railroad (PNWR) and TriMet (TMEV)	100%	68/68	20/20	N/A	No	32/32
Terminal Railroad Association of St. Louis (TRRA)	100%	68/68	43/43	Yes	No	153/230
Kansas City Terminal Railway (KCT)	100%	16/16	50/50	No	No	0/14
Florida East Coast Railway (FECR)	92%	438/483	288/304	N/A	No	24/347
Consolidated Rail Corp. (CRSH)	86%	138/164	20/20	Yes	No	153/303
Belt Railway Company of Chicago (BRC)	80%	8/8	16/22	N/A	No	57/160

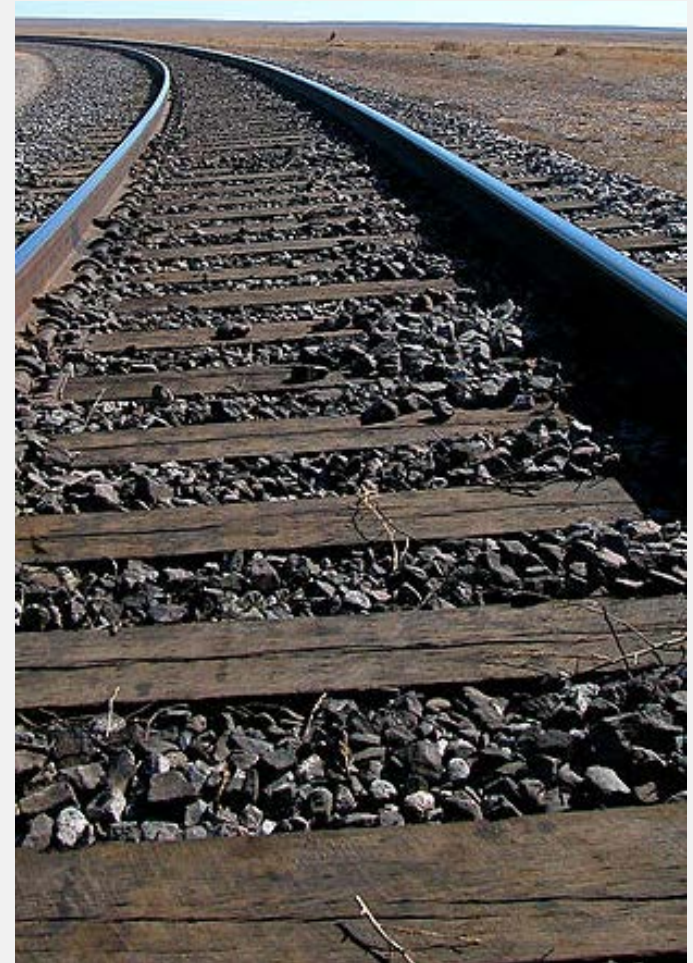
Available PTC Grants & Other Financing

- **Railroad Rehabilitation and Improvement Financing (RRIF)**
 - \$967.1 million loan to Metropolitan Transportation Authority for Long Island Rail Road and Metro-North Railroad
 - \$220 million loan to be issued to the Massachusetts Bay Transportation Authority.

- **CRISI – Consolidated Rail Infrastructure and Safety Improvements Program**
 - Notice of Funding Opportunity (NOFO) – May 18, 2018; applications due July 2, 2018
 - Eligible Projects – Deployment of PTC Systems
 - Funding Available in this NOFO – \$250 million
 - Federal Share of Total Costs – Not to Exceed 80% (20% Match Required)

Enforcement of Statutory Mandate & FRA's Regulations

- **PTC Safety Plan – 49 CFR**
§ 236.1015(d)(7): a complete description of the specific procedures and test equipment necessary to ensure the safe and proper installation, implementation, operation, maintenance, repair, inspection, testing, and modification of the PTC system
 - 49 CFR § 236.1009(d)(3) – A railroad that has received PTC System Certification from FRA shall implement the PTC system according to its PTCSP.
- **Operations and Maintenance Manual – 49 CFR § 236.1039:** ... documents, plans ... for installation, maintenance, repair, modification, inspection, and testing of the PTC system ...



Enforcement of Statutory Mandate & FRA's Regulations



- **Records Retention** – 49 CFR § 236.1037: Type Approval, PTCDP, PTCSP, OMM, ... database of all safety-relevant hazards ...
- **Errors and Malfunctions** –
 - 49 CFR § 236.1023: PTC Product Vendor List; hazard database; safety-critical failures; defects; reporting ...
 - 49 U.S.C. § 20157(j)(4): Beginning Oct. 29, 2015, when a certified PTC system cuts out, fails to initialize, or malfunctions, the railroad must notify FRA (regional office) within 7 days, but FRA may establish alternative location and/or deadline requirements.
- **Appendix A to Part 236** – Schedule of Civil Penalties (as Guidance)

Contacts



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