F E D E R A L R A I L R O A D A D M I N I S T R A T I O N

PTC Collaboration Session

Final of Six in 2019 and 2020

October 14, 2020

To promote information-sharing, best practices, and collaboration between FRA and industry

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Topics

- Industry's Progress Toward Full Implementation as of June 30, 2020
- Statutory Notifications of PTC System Failures: Web Form Tips and Early Data Trends
- PTC Safety Plan Update
- Statutory and Regulatory Flexibility Following the December 31, 2020, Deadline: Addressing Industry's Follow-up Questions
- Requests for Amendments to PTC Implementation Plans, PTC Safety Plans, and FRA-certified PTC Systems

High-level Overview of Industry's Progress Toward Fully Implementing PTC Systems as of June 30, 2020

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Progress Toward Full Implementation

As of June 30, 2020

- **Status of Host Railroads' PTC-governed Operations**
  - As of June 30th, PTC systems were in operation or advanced testing (RSD) on 56,841 (98.8%) of the 57,537 required route miles—a 0.7% increase from March 31, 2020
  - Three (3) railroads placed all remaining route miles in RSD during Quarter 2 of 2020
  - Interoperability was achieved in thirty-three (33) host-tenant railroad relationships during Q2—bringing industry to ~65.5% complete (a 17% increase from Q1)
  - FRA received nine (9) PTC Safety Plans during Q2, and is reviewing twenty-four (24) new PTCSPs as of September 30, 2020

Interoperability Continues to Progress

As of June 30, 2020

- **Status of Interoperability**
  - 65.5% of the applicable host-tenant relationships have achieved interoperability (total 220)
    - Operational/Complete: 144 relationships
    - RSD: 2 relationships
    - Field Testing: 38 relationships
    - Pre-field Testing: 15 relationships
    - Installing: 13 relationships
    - Not Started: 2 relationships
    - Not Reported: 6 relationships
  - Interoperability achieved by host railroad type:
    - Class I Railroads: 79%
    - Intercity Passenger Railroads: 19%
    - Commuter Railroads: 51%
    - Other Mandated Host Railroads: 65%

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2020 'At-risk' Criteria

- **As of June 30, 2020:**
  - Two (2) railroads came off the at-risk list from March 31, 2020, reducing the list to two (2) railroads

- **Criteria:**
  - Expected date to submit PTC Safety Plan
  - Percentage of route miles governed by PTC (including RSD)
  - Severity of technical issues impacting testing and roll-out schedule
  - Percentage of interoperable tenant railroads

- **Measured:**
  - Quarterly (Q4 2019, Q1 2020, Q2 2020, Q3 2020, and then monthly)
  - Letters to railroads, primary suppliers and vendors, and governing bodies (for any commuter railroads)
  - List published when data is released

Statutory Notifications of PTC System Failures: Definitions, Web Form Tips, and Early Data Trends

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Reminders About the Statutory Notification of PTC System Failures Definitions

(Web Form FRA F 6180.177, OMB Control No. 2130-0553)

1. Failure to Initialize

- Any instance when a PTC system fails to activate on a locomotive or train, unless the PTC system successfully activates during a subsequent attempt in the same location or before entering PTC territory. For the types of PTC systems that do not "initialize" by design, a failed departure test is considered a "failure to initialize" for purposes of this reporting requirement, unless the PTC system successfully passes the departure test during a subsequent attempt in the same location or before entering PTC territory.

2. Cut Out

- Any disabling of a PTC system, subsystem, or component en route, including when the PTC system cuts out on its own or a person cuts out the system, unless the cut out was necessary to exit PTC-governed territory and enter non-PTC territory.

3. Malfunction

- Any instance when a PTC system, subsystem, or component fails to perform the functions mandated under 49 U.S.C. 20157(i)(5), 49 CFR part 236, subpart I, or the applicable host railroad's PTC Safety Plan.

See 85 Fed. Reg. 15022, 15025 (Mar. 16, 2020).

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Tips for Navigating the Statutory Notification of PTC System Failures

(Web Form FRA F 6180.177, OMB Control No. 2130-0553)

URL: https://safetydata.fra.dot.gov/PTCSystemFailuresFRAForm177/

For questions, reach out to: PTC.correspondence@dot.gov

1. **Use a modern web browser like Google Chrome™ or Microsoft Edge™.**
   - Internet browsers like Internet Explorer™ will not properly load the Excel™ bulk upload template.

2. **Enter a whole number rounded to the nearest thousandth in the "Number of PTC-required Train Miles" field.**
   - This number should be reported as the number of miles in thousands. Additionally, the reported number needs to be a whole number – the web form will return an error if a decimal place is entered.

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Tips for Navigating the Statutory Notification of PTC System Failures

(Web Form FRA F 6180.177, OMB Control No. 2130-0553)

3. If you elect to use the bulk upload template, ensure that columns A and C ("IsTenant" and "IsPTCGoverning") have logical TRUE/FALSE data types. Otherwise, the data will not import.

- The web form will not load any data during the import stage if the format for these columns is incorrect. FRA has assisted a few users who have entered a text data type in these columns. This is usually a result of copying and pasting between documents.
- For example, to check the data type of cell A2, enter this tailored formula in an empty cell (not the cell you want to test) "=TYPE(A2)" and click "Enter." The desired output is "4" indicating that the cell is 'logical' data type; otherwise, it will be "2" if the cell is a 'text' data type. There is more than one way to change the data type to 'logical.' Perform one of the following:
  1. In the cell, type "TRUE" or "FALSE" and hit "Enter" on your keyboard. This will return a logical data type, which can be copied and pasted to every other cell with the same value; or
  2. Highlight all cells with a value in a column, and then click on the "Data" ribbon (near the top of your screen). In the "Data" ribbon, select "Text to Columns." In the popup box, confirm that "Delimited" is chosen and then click "Next." Ensure that "Tab" is selected as the delimiter, and then click "Next." Ensure that "General" is selected as the column data format, and then click "Finish." This process resets the "TRUE" and "FALSE" text from the selected cells to 'logical' data types.

Tips for Navigating the Statutory Notification of PTC System Failures

(Web Form FRA F 6180.177, OMB Control No. 2130-0553)

4. The "TotalTrainsOperatedOnHost" value in the bulk upload template should be the same value for every row for each unique tenant railroad.

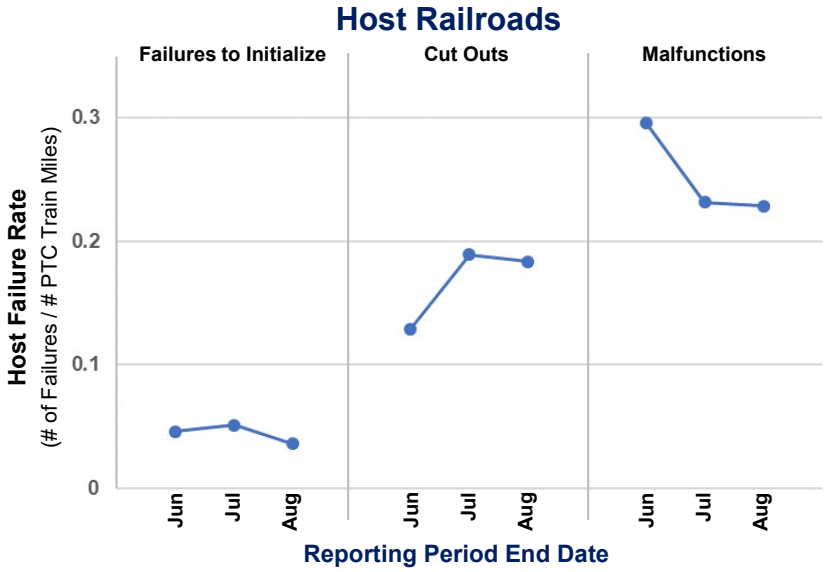
- The OMB-approved form requires the total number of trains an applicable tenant railroad operated on a host railroad, and it does not require this to be broken down by subdivision. The web form was built accordingly and will load only the first value for this row for each individual tenant railroad. Fill out the form accordingly, so data is not misrepresented during the import stage.

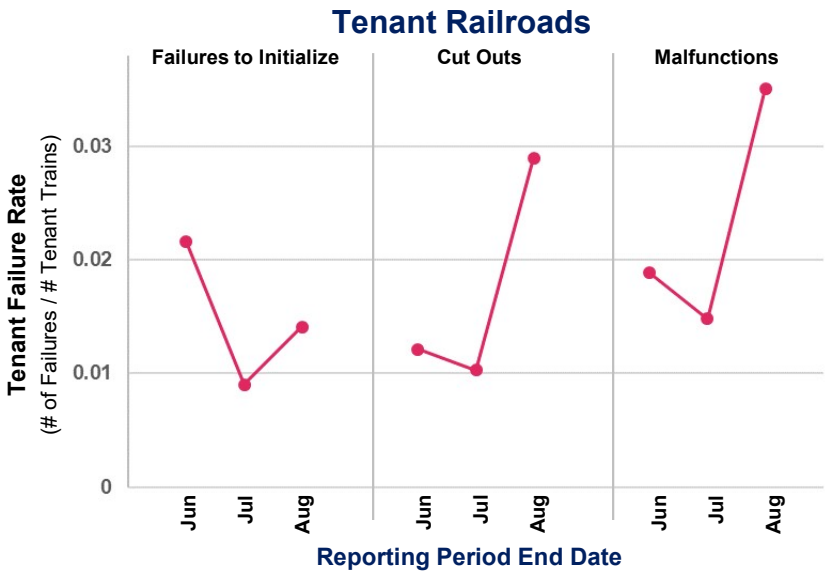
- For example, if Tenant Railroad X operated on Subdivision A and Subdivision B, the "TotalTrainsOperatedOnHost" for all rows of Tenant Railroad X should be the same (i.e., the total # of trains that X operated on the host railroad's PTC-governed main lines during the reporting period). See the "Sample Submission" sheet in the bulk upload template for an example.

PTC System Failure Data Trends

As of September 30, 2020

**Note: Host railroads and tenant railroads use a different metric for rate calculations on Form FRA F 6180.177, and therefore the specific numbers should not necessarily be compared to each other.*





Failure Type	Failures to Initialize			Cut Outs			Malfunctions		
Reporting Period End	6/30	7/31	8/31	6/30	7/31	8/31	6/30	7/31	8/31
# of Failures	3,466	486	345	9,759	1,797	1,759	22,430	2,200	2,190
# of Railroads	10	6	7	10	6	7	10	6	7
# PTC Train Miles (in thousands)	75,675	9,501	9,579	75,675	9,501	9,579	75,675	9,501	9,579

Failure Type	Failures to Initialize			Cut Outs			Malfunctions		
Reporting Period End	6/30	7/31	8/31	6/30	7/31	8/31	6/30	7/31	8/31
# of Failures	1,864	228	152	1,047	260	312	1,628	373	378
# of Railroads	43	18	18	43	18	18	43	18	18
# Tenant Trains	86,469	25,216	10,776	86,469	25,216	10,776	86,469	25,216	10,776

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PTC Safety Plan Update

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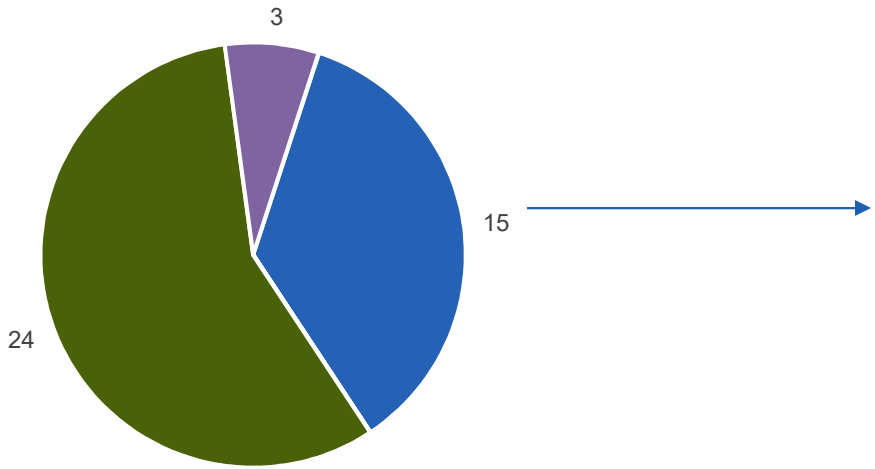
PTC Safety Plans and FRA Certification Status

As of September 30, 2020

- **Safety Plan & Certification Status***



Not included in this chart are two (2) I-ETMS Addenda that have RSD data outstanding
****Includes Conditional Approvals and Certifications***

Certification Type

(49 CFR § 236.1015)

- I-ETMS:
  - Non-vital Overlay 7
  - Mixed System 1
- ACSES II / ASES II:
  - Vital Overlay 3
- E-ATC:
  - Vital Overlay 2
- ITC (Vital Overlay): 1
- CBTC (Mixed System): 1

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Statutory and Regulatory PTC Flexibility Following the December 31, 2020 Deadline:

Addressing Industry's Follow-up Questions

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Overview of Certain Post-deadline Flexibilities

I. Background

- **The Positive Train Control Enforcement and Implementation Act of 2015 requires an FRA-certified and interoperable PTC system to govern operations on all main lines subject to the statutory mandate by December 31, 2020.**

- However, the Early Adoption subsection of the statute recognizes that certain PTC system failures (e.g., initialization failures, cut outs, and malfunctions) may occur after December 31, 2020. *See* 49 U.S.C. § 20157(j).

  - **When Is the Early Adoption Period?** Oct. 29, 2015 → *One year after* the last Class I railroad obtains PTC System Certification and finishes fully implementing a PTC system on all its required main lines

- **Reminder:** A railroad must comply with the safety assurance and reporting requirements under 49 U.S.C. § 20157(j)(1)–(4). For example, if an FRA-certified PTC system fails to initialize, cuts out, or malfunctions, the affected railroad shall make reasonable efforts to determine the cause and adjust, repair, or replace any faulty component causing the failure in a timely manner.

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Overview of Certain Post-deadline Flexibilities

II. Early Adoption Provisions

Full Text of 49 U.S.C. § 20157(j)(1)–(4) – Slide 1 of 2

(j) EARLY ADOPTION.—(1) OPERATIONS.—From the date of enactment of the Positive Train Control Enforcement and Implementation Act of 2015 through the 1-year period beginning on the date on which the last Class I railroad carrier's positive train control system subject to subsection (a) is certified by the Secretary under subsection (h)(1) of this section and is implemented on all of that railroad carrier's lines required to have operations governed by a positive train control system, **any railroad carrier**, including any railroad carrier that has its positive train control system certified by the Secretary, **shall not be subject to the operational restrictions set forth in sections 236.567 and 236.1029** of title 49, Code of Federal Regulations, **that would apply where a controlling locomotive that is operating in, or is to be operated in, a positive train control-equipped track segment experiences a positive train control system failure, a positive train control operated consist is not provided by another railroad carrier when provided in interchange, or a positive train control system otherwise fails to initialize, cuts out, or malfunctions**, ***provided that such carrier operates at an equivalent or greater level of safety than the level achieved immediately prior to the use or implementation of its positive train control system.***

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Overview of Certain Post-deadline Flexibilities

II. Early Adoption Provisions

Full Text of 49 U.S.C. § 20157(j)(1)–(4) – Slide 2 of 2

(2) SAFETY ASSURANCE.—During the period described in paragraph (1), if a positive train control system that has been certified and implemented fails to initialize, cuts out, or malfunctions, the affected railroad carrier or other entity shall make reasonable efforts to determine the cause of the failure and adjust, repair, or replace any faulty component causing the system failure in a timely manner.

(3) PLANS.—The positive train control safety plan for each railroad carrier or other entity shall describe the safety measures, such as operating rules and actions to comply with applicable safety regulations, that will be put in place during any system failure.

(4) NOTIFICATION.—During the period described in paragraph (1), if a positive train control system that has been certified and implemented fails to initialize, cuts out, or malfunctions, the affected railroad carrier or other entity shall submit a notification to the appropriate regional office of the Federal Railroad Administration within 7 days of the system failure, or under alternative location and deadline requirements set by the Secretary, and include in the notification a description of the safety measures the affected railroad carrier or other entity has in place.

[Note: Form FRA F 6180.177 implements this temporary notification requirement.]

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Overview of Certain Post-deadline Flexibilities

II. Early Adoption Provisions

Based on Industry Questions, Zeroing in on One Provision in 49 U.S.C. § 20157(j)(1)

(j) EARLY ADOPTION.—(1) OPERATIONS.—From the date of enactment of the Positive Train Control Enforcement and Implementation Act of 2015 through the 1-year period beginning on the date on which the last Class I railroad carrier's positive train control system subject to subsection (a) is certified by the Secretary under subsection (h)(1) of this section and is implemented on all of that railroad carrier's lines required to have operations governed by a positive train control system, **any railroad carrier**, including any railroad carrier that has its positive train control system certified by the Secretary, **shall not be subject to the operational restrictions set forth in sections 236.567 and 236.1029** of title 49, Code of Federal Regulations, **that would apply where** a controlling locomotive that is operating in, or is to be operated in, a positive train control-equipped track segment experiences a positive train control system failure, **a positive train control operated consist is not provided by another railroad carrier when provided in interchange**, or a positive train control system otherwise fails to initialize, cuts out, or malfunctions, *provided that such carrier operates at an equivalent or greater level of safety than the level achieved immediately prior to the use or implementation of its positive train control system.*

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Overview of Certain Post-deadline Flexibilities

II. Early Adoption Provisions

Answering Follow-up Questions

- **Recent Industry Question: Which, if any, exception-related criteria are impacted by the interchange-related clause in 49 U.S.C. § 20157(j)(1) (prior slide) and, therefore, are not effective until ~January 1, 2022?**

- **Answer: Only the exceptions that would otherwise require compliance with 49 CFR § 236.1029.**

  - The statute provides the same temporary relief—from the operational restrictions under § 236.1029—to **any Class II or Class III railroad operating pursuant to an exception under 49 CFR § 236.1006(b)(4)** (≤4 non-PTC-governed movements per day), which otherwise would require "that movement [to] be made in accordance with § 236.1029." *See* 49 CFR § 236.1006(c).

  - Also, if a railroad **provides a non-PTC-governed locomotive or consist in interchange—specifically pursuant to the temporary rerouting provisions under 49 CFR § 236.1005(g)–(k)** (emergency and planned maintenance rerouting)—the operational restrictions under 49 CFR § 236.1029 would likewise not apply until after the Early Adoption period ends. *See* 49 CFR § 236.1005(j)(1).

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Overview of Certain Post-deadline Flexibilities

II. Early Adoption Provisions

Answering Follow-up Questions

- **Not Covered by the Early Adoption Provisions:** The statute does *not* provide any relief—to a host railroad or a tenant railroad—from complying with the regulatory criteria to qualify for:

  - **The *de minimis* exception** under 49 CFR § 236.1005(b)(4)(iii);
  - **The freight yard movement exception** under 49 CFR § 236.1006(b)(5); and
  - **The main line track exceptions** under 49 CFR § 236.1019.

  - **Why not?** The qualifying criteria for these exceptions are separate and distinct from the operational restrictions under 49 CFR §§ 236.567 and 236.1029, which the Early Adoption subsection is specifically focused on. In other words, exceptions (where the required restrictions/criteria are not tied to 49 CFR §§ 236.567 or 236.1029) are *not* affected by the Early Adoption provisions.

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Overview of Certain Post-deadline Flexibilities

III. Timeline Applicable to Railroads with a 2020 Deadline*

For illustrative purposes, the table below summarizes the pertinent authorizations and prohibitions under the Early Adoption subsection (49 U.S.C. § 20157(j)) and/or FRA's regulations, including 49 CFR §§ 236.1006(b)(3) and 236.1029(g).

Calendar Year 2021 *(Last Year of Early Adoption Period)*	**Calendar Year 2022**	**January 1, 2023 and Thereafter**

• A train may operate on a PTC-mandated main line even if:
  ○ The PTC system failed to initialize; or
  ○ The PTC system failed en route (including malfunctions and cut outs).
• The operational restrictions under 49 CFR §§ 236.567 and 236.1029 ***do not*** apply.
	• A train may operate on a PTC-mandated main line even if:
	  ○ The PTC system failed to initialize; or
	  ○ The PTC system failed en route (including malfunctions and cut outs).
	• The operational restrictions under 49 CFR §§ 236.567 and/or 236.1029 ***do*** apply.
		• A train may operate on a PTC-mandated main line even if:
		  ○ The PTC system failed en route (including malfunctions and cut outs).
		• The operational restrictions under 49 CFR §§ 236.567 and/or 236.1029 ***do*** apply.

This overview focuses on the framework applicable to railroads that obtained FRA's approval of an "alternative schedule and sequence" with a December 31, 2020, deadline, under 49 U.S.C. § 20157(a)(3).

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Overview of Certain Post-deadline Flexibilities

IV. Timeline Applicable to Railroads with a 2018 Deadline*

For illustrative purposes, the table below summarizes the pertinent authorizations and prohibitions under the Early Adoption subsection (49 U.S.C. § 20157(j)) and/or FRA's regulations, including 49 CFR §§ 236.1006(b)(3) and 236.1029(g).

Calendar Year 2021 *(Last Year of Early Adoption Period)*	**January 1, 2022 and Thereafter**

• A train may operate on a PTC-mandated main line even if:
  ○ The PTC system failed to initialize; or
  ○ The PTC system failed en route (including malfunctions and cut outs).
• The operational restrictions under 49 CFR §§ 236.567 and 236.1029 ***do not*** apply.
	• A train may operate on a PTC-mandated main line even if:
	  ○ The PTC system failed en route (including malfunctions and cut outs).
	• The operational restrictions under 49 CFR §§ 236.567 and/or 236.1029 ***do*** apply.

This overview focuses on the framework applicable to railroads that fully implemented an FRA-certified and interoperable PTC system by December 31, 2018.

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Requests for Amendments (RFAs) to PTC Implementation Plans, PTC Safety Plans, and FRA-certified PTC Systems

Maintenance of and Compliance with FRA-approved PTC Plans

I. Reminders

- **Compliance with the Governing PTC Implementation Plan**
  - A railroad must implement a PTC system in accordance with the applicable FRA-approved PTC Implementation Plan (PTCIP) (i.e., the one that governs implementation on the particular main line). 49 U.S.C. § 20157(a)(2)(D).
- **Compliance with the Governing PTC Safety Plan and PTC System Certification**
  - A host railroad *and* any other railroads that operate on the host railroad's main lines subject to the statutory mandate must also comply with:
    - ✓ All applicable provisions of the **host railroad's** PTC Safety Plan, and
    - ✓ The conditions FRA placed on its PTC System Certification for the specific PTC system at issue.

    See 49 CFR § 236.1009(d)(3), (g).

    Exception: Unless the operations are subject to an exception under 49 CFR § 236.1006(b).

Maintenance of and Compliance with FRA-approved PTC Plans

II. RFAs to PTC Implementation Plans

Slide 1 of 5

- **A railroad must submit an RFA to its FRA-approved PTCIP, for FRA review and approval, prior to:**

1. Initiating a new category of service—this might include, for example, adding or removing a passenger or freight tenant railroad from the interoperability sections of a railroad's PTCIP;

2. Discontinuing a PTC system or decreasing the PTC system's limits (e.g., by excluding or removing a PTC system from a track segment); or

3. Adding, subtracting, or otherwise materially modifying one or more lines of railroad for which implementation of a PTC system is required.

See 49 CFR §§ 236.1009(a)(2)(ii), 236.1021(h)(1)–(2).

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Maintenance of and Compliance with FRA-approved PTC Plans

II. RFAs to PTC Implementation Plans

Slide 2 of 5

- **Important Reminders re: Adding Track Segments to PTCIPs**
  - **Host railroads must continually monitor their track segments and any associated traffic to ensure:**

1. Any *new* PTC-mandated main lines—including existing lines that become subject to the statutory mandate given new or changed circumstances—are promptly added to their PTCIPs via the RFA process; and

2. PTC technology is timely implemented on such main lines. *The applicable deadline would depend on the type of traffic that newly triggers the mandate*—e.g., regularly scheduled intercity passenger or commuter rail transportation versus PIH/TIH transportation. *See* 49 CFR § 236.1005(b)(3), (7).

Maintenance of and Compliance with FRA-approved PTC Plans

II. RFAs to PTC Implementation Plans

Slide 3 of 5

- **First Scenario – Voluntary Implementation of PTC Technology**
  - **49 CFR § 236.1011(d)** specifies that a "railroad that elects to install a PTC system when not required to do so may elect to proceed under this subpart [subpart I] or under subpart H of this part."
    - For any railroad that already has a PTCIP on file, it is likely simpler to account for any "voluntary" track segments in a railroad's PTCIP (for example, in a separate table or section)—rather than comply with the additional subpart H filing requirements.
  - There is no governing deadline for lines where railroads are voluntarily implementing a PTC system. That can be stated explicitly in the pertinent section/table of a railroad's PTCIP.

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Maintenance of and Compliance with FRA-approved PTC Plans

II. RFAs to PTC Implementation Plans

Slide 4 of 5

- **Second Scenario – New Regularly Scheduled Passenger Service**
  - After December 31, 2020, an FRA-certified and interoperable PTC system must be fully implemented on any PTC-mandated "main lines," as defined under 49 CFR § 236.1003(b), BEFORE any *new* intercity or commuter rail passenger service may commence on that main line.
  - ***Regulatory Provision:*** 49 CFR § 236.1005(b)(6) provides that "[n]o new intercity or commuter rail passenger service shall commence after December 31, 2020, until a PTC system certified under this subpart has been installed and made operative."

Maintenance of and Compliance with FRA-approved PTC Plans

II. RFAs to PTC Implementation Plans

Slide 5 of 5

- **Third Scenario – Increased Freight Traffic Triggering the Mandate**

49 CFR § 236.1005(b)(3) – To the extent increases in freight rail traffic occur subsequent to CY 2008 that might affect the requirement to implement a PTC system on any line not yet equipped, the railroad shall seek to amend its PTCIP by promptly filing an RFA under § 236.1021. The following criteria apply:

(i) If rail traffic exceeds 5 million gross tons (MGT) in *any* year after 2008, **the tonnage shall be calculated for the preceding 2 calendar years and if the total tonnage for those 2 calendar years exceeds 10 MGTs**, an RFA is required.

(ii) If PIH traffic is carried on a track segment as a result of a request for rail service or rerouting warranted under part 172, **and if the line carries in excess of 5 MGTs of rail traffic**, an RFA is required. This does *not* apply when temporary rerouting is authorized in accordance with 49 CFR § 236.1005(g).

(iii) The railroad shall equip the line with a PTC system by December 31, 2015, or within 24 months (of the date FRA approves the applicable RFA), whichever is later.

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Maintenance of and Compliance with FRA-approved PTC Plans

III. RFAs to PTC Safety Plans and/or PTC Systems

- **A railroad must submit an RFA to its FRA-approved PTCSP or FRA-certified PTC system, for FRA review and approval, prior to:**

1. Modifying a safety-critical element of a PTC system; or

2. Modifying a PTC system in a way that would affect the safety-critical functionality of any other PTC system with which it interoperates.

See 49 CFR § 236.1021(h)(3)–(4).

FRA lists several applicable scenarios in the conditions FRA attaches to its certification of railroads' PTC systems. For example, an RFA would be required under 49 CFR § 236.1021(h)(3)–(4) (above) for: (I) proposed changes to the concept of operations or the system architecture, or (II) proposed changes that would involve either (A) adding new safety-critical functionality or removing safety-critical functionality, or (B) modifying the target safety levels or the human-machine interface.

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Questions and Feedback

Thank you!