



U.S. Department
of Transportation

**Federal Railroad
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

December 17, 2020

Mr. James Sincaglia
Acting Senior Vice President & General Manager of Rail Operations
New Jersey Transit
One Penn Plaza East
Newark, NJ 07105-2246

jsincaglia@njtransit.com

Re: New Jersey Transit's Positive Train Control Safety Plan – Conditional Approval, Conditional Certification of Its Advanced Speed Enforcement System II, and Certification of Its Interoperable Electronic Train Management System (Docket Number FRA-2010-0033)

Dear Mr. Sincaglia:

The Federal Railroad Administration (FRA) reviewed New Jersey Transit's (NJT) Positive Train Control Safety Plan (PTCSP), dated June 30, 2020,¹ requesting FRA's certification of NJT's Advanced Speed Enforcement System II (ASES II) as a vital overlay system. Specifically, NJT's request for PTC System Certification is for the ASES II system identified under Type Approval FRA-TA-2013-03. In addition, NJT's PTCSP contains information regarding the operation of the Interoperable Electronic Train Management System (I-ETMS) identified under Type Approval FRA-TA-2011-02-C.

Based on FRA's review of NJT's PTCSP, FRA finds that NJT's ASES II and I-ETMS comply with the technical requirements for PTC systems under 49 CFR part 236. FRA hereby conditionally approves NJT's PTCSP, dated June 30, 2020, and conditionally certifies NJT's ASES II as a vital overlay system, under 49 U.S.C. § 20157(h)(1) and 49 CFR §§ 236.1009 and 236.1015(e)(2). FRA also certifies NJT's I-ETMS as a mixed PTC system under 49 U.S.C. § 20157(h)(1) and 49 CFR §§ 236.1009 and 236.1015(e)(4).

These PTC System Certifications are subject to NJT's compliance with the general conditions in Enclosure 1 to this letter, and contingent on NJT's satisfactory resolution of the four specific ASES II issues identified in Enclosure 2, within the specified timeframes. As FRA previously confirmed

¹ FRA's records indicate that NJT submitted its PTCSP to FRA's Secure Information Repository on June 30, 2020.

in industry-wide meetings, conditional PTC System Certification is generally sufficient to meet the statutory certification requirement.²

FRA will consider noncompliance with any condition of this certification as a violation of the underlying requirement under 49 CFR part 236, subpart I, and 49 CFR § 236.1009(g)(1). FRA reserves the right to modify or rescind these PTC System Certifications upon receipt of information about ASES II or I-ETMS adversely affecting the safety of rail operations³ or noncompliance with any applicable regulatory or statutory requirement. *See, e.g.*, 49 CFR § 236.1009(g). Also, under 49 CFR § 236.1009(h), FRA reserves the right to continue to review and evaluate the safety analyses and supporting documentation associated with ASES II and I-ETMS, and to ask questions or provide comments regarding such documentation.

If you have any questions regarding this letter or the conditions in the enclosures, please contact Mr. Gabe Neal, Deputy Staff Director, Signal, Train Control, and Crossings Division, at 816-516-7168 or gabe.neal@dot.gov.

Sincerely,

Karl Alexy
Associate Administrator for Railroad Safety
Chief Safety Officer

Enclosures

² The only instance in which a conditional PTC System Certification would not be sufficient for purposes of full implementation by the statutory deadline is where a railroad's PTC system otherwise did not meet the technical requirements under FRA's PTC regulations and one or more of the conditions related to such noncompliance.

³ As a reminder, 49 CFR § 236.1009(g)(2)(ii) specifies that FRA may reconsider a PTC System Certification based on, for example, the following: "Potentially invalidated assumptions determined as a result of in-service experience or one or more unsafe events calling into question the safety analysis supporting the approval."

Enclosure 1: General Conditions of Positive Train Control (PTC) System Certification

This enclosure lists the conditions applicable to the Federal Railroad Administration's (FRA) certification of New Jersey Transit's (NJT) Advanced Speed Enforcement System II (ASES II) as a vital overlay system and certification of NJT's Interoperable Electronic Train Management System (I-ETMS) as a mixed PTC system. These PTC System Certifications apply to NJT's ASES II identified under Type Approval FRA-TA-2013-03, and NJT's I-ETMS identified under Type Approval FRA-TA-2011-02-C. FRA is issuing these PTC System Certifications to NJT under Title 49 United States Code (U.S.C.) § 20157(h)(1) and Title 49 Code of Federal Regulations (CFR) §§ 236.1009 and 236.1015.

These certifications supersede any prior approval FRA granted to NJT for the testing or operation of ASES II and I-ETMS. Subject to the conditions in this enclosure, NJT and its tenant railroads may operate ASES II and/or I-ETMS in revenue service on all NJT's PTC-mandated main lines and any other lines where NJT elects to voluntarily implement a PTC system.

These PTC System Certifications are granted to NJT and are valid only for track segments that are owned and/or controlled by NJT. NJT must implement ASES II and I-ETMS in accordance with its FRA-approved PTC Safety Plan (PTCSP). *See* 49 CFR § 236.1009(d)(3).¹ In addition, any tenant railroad that operates ASES II or I-ETMS on NJT's PTC-governed main lines must comply with all applicable provisions of NJT's PTCSP and the conditions FRA placed on its certification of NJT's ASES II and I-ETMS.²

FRA reserves the right to attend any ongoing tests and perform relevant audits. *See, e.g.*, 49 CFR § 236.1009(h). FRA also reserves the right to add, modify, or rescind any condition of these certifications upon receipt of information about the safety of rail operations or noncompliance with any of the certification conditions or any applicable statutory or regulatory requirement. *See* 49 CFR § 236.1009(g).

1. NJT shall provide written assurances to FRA that interoperability has been achieved with each current and future tenant railroad before allowing the tenant railroad to operate ASES II or I-ETMS on NJT's PTC-governed main line(s). If NJT has actual or constructive knowledge that a tenant railroad is not operating equipment with an onboard PTC apparatus that is interoperable with NJT's ASES II or I-ETMS, it shall not allow the tenant railroad to operate on its track where operations are governed by a PTC system, unless one of the regulatory exceptions under 49 CFR § 236.1006(b) applies to that tenant railroad's operations. NJT has the right of refusal regarding non-equipped trains, subject to the restrictions and exceptions of 49 CFR §§ 236.1005(g), 236.1006, and 236.1029, and 49 U.S.C. § 20157(j), as applicable. In the event of errors or malfunctions, the requirements of 49 U.S.C. § 20157(j)(1)–(4) and/or 49 CFR §§ 236.1023 and 236.1029, as appropriate, will apply.

¹ Moreover, NJT is required by statute to fully implement an FRA-certified and interoperable PTC system by December 31, 2020, and in accordance with its revised PTC Implementation Plan, including "any amendments or any alternative schedule and sequence approved by FRA." 49 U.S.C. § 20157(a)(2)(D), (e).

² Unless a tenant railroad's operations are subject to an exception under 49 CFR § 236.1006(b).

2. NJT shall not discontinue or materially modify ASES II or I-ETMS before obtaining any FRA approval required under 49 CFR § 236.1021, *Discontinuances, material modifications, and amendments*.
3. NJT must comply with the processes and procedures established in its Operations and Maintenance Manual, configuration management control plan, and PTCSP, including all processes and procedures relating to maintenance and testing. *See* 49 CFR §§ 236.1015, 236.1039.
4. NJT must operate ASES II and I-ETMS in compliance with all applicable Federal regulations.

With respect to 49 CFR §§ 236.76, *Tagging of wires and interference of wires or tags with signal apparatus*, 236.109, *Time releases, timing relays and timing devices*, and 236.552, *Insulation resistance; requirement*, NJT must comply with these regulatory requirements to the extent practical—for example, to the extent compliance would not damage the equipment. NJT shall comply with 49 CFR § 236.76, unless the wiring or tagging of PTC-related equipment is impractical or impossible given the physical configuration of ASES II or I-ETMS. In addition, NJT shall comply with the insulation resistance requirements of 49 CFR § 236.552, except for testing the parts of the PTC onboard apparatus (*e.g.*, microprocessor) where the insulation resistance test would damage the equipment. Finally, as the type of testing under 49 CFR § 236.109 is not practical for, or applicable to, the current physical configuration of ASES II or I-ETMS, calibration is required once every 12 months, using an approved time source maintained by the National Institute of Standards and Technology or its military counterpart, the U.S. Naval Observatory.

5. For purposes of ASES II, mandatory directives, including movement authorities and temporary speed restrictions (TSRs), must be provided in writing, or must be copied and retained per 49 CFR part 220, *Railroad Communications*, in accordance with applicable operating rules and instructions. NJT's ASES II is not approved for digital transmission of authorities as the sole means of conveying authorities to the train crew.

However, NJT may transmit mandatory directives—including movement authorities and TSRs—digitally or electronically via I-ETMS. NJT may use I-ETMS as the exclusive method of transmitting mandatory directives only if NJT has confirmed—by design, data (*e.g.*, data collected during testing, revenue service demonstration, or operation), or other analysis—that transmission of mandatory directives is performed in a fail-safe manner as defined under paragraph (b)(4)(V) of Appendix C to 49 CFR part 236.

6. NJT must operate ASES II and I-ETMS consistent with the conditions specified in NJT's FRA-approved PTCSP. Operations must not exceed any operational limits established by testing, and under no circumstances may operations exceed any manufacturer's design recommendations. All mandatory directives associated with credible reports of warning system malfunctions and all TSRs associated with conditions requiring the restriction of train speeds must be entered into the PTC system without undue delay. These mandatory directives and TSRs must remain in place until the associated defective conditions are

repaired. NJT's use of ASES II and I-ETMS must comply with 49 CFR § 236.1005, including 49 CFR § 236.1005(a)(4), regarding the PTC system's enforcement of mandatory directives. Applying alternative means of warning highway traffic does not constitute the repair of the defective condition. This condition does not restrict the use of any PTC system mandatory directive override functionality (as previously proposed to FRA) for individual train movements.

7. NJT must identify, in writing, to FRA any changes to the ASES II or I-ETMS software that change the concept of operations or the system architecture, introduce new or remove safety-critical functionality, or modify the target safety levels or the human-machine interface. For example, prior to making any changes, as defined under 49 CFR § 236.1021(h)(3)–(4),³ to NJT's FRA-certified ASES II or I-ETMS or the associated PTCSP, NJT must comply with the applicable request for amendment process under 49 CFR § 236.1021.

8. ***Permanent Failure-related Reporting Requirements***

To ensure PTC system failures are properly communicated to all affected parties, FRA's PTC regulations require coordination among, and reporting by, railroads, vendors, and suppliers, under 49 CFR §§ 236.1023, *Errors and malfunctions*, and 236.1029, *PTC system use and failures*.

For example, pursuant to 49 CFR § 236.1023(e) and the instructions under § 236.1023(f), NJT must notify FRA and the applicable vendor or supplier if the frequency of a safety-relevant hazard exceeds the thresholds in NJT's PTCSP or has not been previously identified in the appropriate risk analysis.

Under 49 CFR § 236.1023(k), NJT must comply with the standard reporting requirements under 49 CFR part 233 if it experiences a failure of its PTC system resulting in a more favorable aspect than intended or other condition hazardous to the movement of a train. *See, e.g.*, 49 CFR §§ 233.5, *Accidents resulting from signal failure*, and 233.7, *Signal failure reports*. For example, pursuant to the deadlines established under 49 CFR part 233, NJT must report, in writing, to FRA any problem with ASES II or I-ETMS, including a Category 1 or 2 software issue⁴ or any other critical anomaly, if it results in: (1) a more favorable aspect than intended or (2) any other condition hazardous to the movement of a train.⁵ If any of these conditions occur, NJT must cut out ASES II and/or I-ETMS on all

³ *I.e.*, proposed changes to a safety-critical element of ASES II or I-ETMS or proposed changes to ASES II or I-ETMS that affect the safety-critical functionality of any other PTC system with which it interoperates.

⁴ A Category 1 software issue is any deficiency that, if uncorrected, has no known and acceptable workaround (*i.e.*, repair necessitates taking the system offline until repairs are completed and the system is tested and returned to normal functionality), and may: (1) cause death, severe injury, or severe occupational illness; (2) cause major loss or damage to equipment or a system; (3) prevent the accomplishment of an essential capability or required interaction with other mission-critical functions; or (4) adversely affect an essential capability or negatively impact operational safety, suitability, or effectiveness. A Category 2 software issue is any deficiency that adversely affects an essential capability or negatively impacts operational safety, suitability, or effectiveness, but where adequate performance may be achieved through significant compensation or an acceptable workaround.

⁵ This includes submitting:

trains that may be affected until the issue is resolved to FRA’s satisfaction.

Examples of critical anomalies that may affect the safety of train operations, and are therefore reportable, include, but are not limited to:

- Failure to enforce required braking applications and speed restrictions;
- Overrun of an authority boundary due to late braking or an inaccurate braking algorithm; and
- Authority sent by the dispatcher to the train crew, where such authority is either not promptly transmitted, not recorded, or erroneously modified by the system.

FRA’s regulations also require NJT to submit a report by the deadline(s) set forth under 49 CFR § 236.1029(h) regarding PTC system failures—including locomotive, wayside, communications, and back office PTC system failures—that occurred during the applicable reporting period. *See* 49 CFR § 236.1029(h).

Temporary Failure-related Reporting Requirements

In addition, as required by 49 U.S.C. § 20157(j)(4), during the period specified by the Positive Train Control Enforcement and Implementation Act of 2015 (PTCEI Act):

. . . if [ASES II or I-ETMS] fails to initialize [including a departure test], 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.

Pursuant to the PTCEI Act, this *temporary* failure-related reporting requirement applies only to FRA-certified PTC systems that are in operation and is effective only from October 29, 2015, until approximately December 31, 2021.⁶

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- (1) A False Proceed Signal Report (Form FRA F 6180.14, Office of Management and Budget (OMB) Control No. 2130-0006) within 15 days of each “failure of an appliance, device, method, or system to function or indicate as required by part 236 of this title that results in a more favorable aspect than intended or other condition hazardous to the movement of a train.” *See* 49 CFR § 236.1023(k) (citing 49 CFR § 233.7, *Signal failure reports*); and
 - (2) A report within 24 hours to FRA via its toll-free telephone number ((800) 424-0201) whenever the railroad learns of the occurrence of an accident or incident (as defined in 49 CFR § 225.5) arising from “the failure of an appliance, device, method, or system to function or indicate as required by part 236 of this title that results in a more favorable aspect than intended or other condition hazardous to the movement of a train.” *See* 49 CFR § 236.1023(k) (citing 49 CFR § 233.5, *Accidents resulting from signal failure*).

⁶ 49 U.S.C. § 20157(j)(4). Specifically, the PTCEI Act states that this temporary reporting requirement ends one year after the last Class I railroad obtains PTC System Certification from FRA and finishes fully implementing a PTC system on all its required main lines.

On December 30, 2019, and March 16, 2020, FRA published a proposed framework for host railroads operating FRA-certified PTC systems to submit a Statutory Notification of PTC System Failures to fulfill this reporting requirement under the PTCEI Act.⁷ On June 5, 2020, OMB approved the Statutory Notification of PTC System Failures (Form FRA F 6180.177, OMB Control No. 2130-0553),⁸ and NJT must utilize that mandatory form and adhere to its instructions to comply with 49 U.S.C. § 20157(j)(4).

Specifically, as 49 U.S.C. § 20157(j)(4) authorizes, FRA is requiring a host railroad to submit **monthly** notifications regarding any PTC system initialization failures, cut outs, and malfunctions that occur on its PTC-governed main lines, if the host railroad has fully implemented an FRA-certified and interoperable PTC system on all required route miles. However, if a host railroad is operating an FRA-certified PTC system but is still in the process of fully implementing the PTC system on its required main lines, it must submit such failure-related notifications on a **quarterly** basis, during the ongoing implementation process.

Such host railroads must transition from submitting the Statutory Notifications of PTC System Failures (Form FRA F 6180.177) on a quarterly basis to a monthly basis, when they finish fully implementing their FRA-certified and interoperable PTC systems on their required main lines. For simplicity, in general, this two-tiered reporting framework means that most host railroads that have obtained PTC System Certification must submit quarterly Statutory Notifications of PTC System Failures throughout 2020, and then monthly notifications throughout 2021.

Only host railroads subject to the statutory mandate must submit the Statutory Notification of PTC System Failures (Form FRA F 6180.177), and these notifications must encompass both a host railroad's and any applicable tenant railroads' PTC system initialization failures, cut outs, and malfunctions that occurred during the reporting period. This approach is consistent with the existing regulatory requirement specifying that a tenant railroad must report a PTC system failure or cut out to "a designated railroad officer of the *host railroad* as soon as safe and practicable." See 49 CFR § 236.1029(b)(4) (emphasis added).

9. NJT must track any ASES II or I-ETMS anomalies that may have a bearing on identifying any applicable known or new safety hazards for conformity with the mitigated hazard frequency rates identified in its PTCSP. FRA's acceptance of the various hazard rate estimates associated with ASES II or I-ETMS is predicated upon NJT's continued implementation of the subsystems and components FRA approved.
10. Before recommencing revenue service following any critical anomaly, or any software or hardware modification of the PTC system that may affect a safety-critical function, NJT must conduct appropriate tests. The results of such tests—as well as a report identifying

⁷ See 84 Fed. Reg. 72121, 72123–26 (Dec. 30, 2019); 85 Fed. Reg. 15022, 15025–27 (March 16, 2020).

⁸ Available at <https://safetydata.fra.dot.gov/PTCSysFailuresFRAForm177/>.

and describing the anomaly or modification, the corrective action taken, the technical justification for that action, the regression testing accomplished, persons who witnessed the testing, the rationale for the testing selected, and the relationship of the anomaly or modification to the assumptions made—must be made available to FRA for inspection during normal business hours. FRA reserves the right to attend any ongoing tests and perform relevant audits. *See, e.g.*, 49 CFR § 236.1009(h).

11. Upon request, NJT must provide to FRA a copy of its PTC Product Vendor List, which must be continually updated under 49 CFR §§ 236.1015(b)(1) and 236.1023. NJT must also maintain, in a format acceptable to FRA, documentation that each vendor or supplier from which NJT is procuring PTC system equipment has established and can maintain a quality control system that meets the requirements of 49 CFR § 236.1015(b)(2). NJT must provide this documentation to FRA upon request. *See* 49 CFR § 236.1023(a).
12. When ASES II or I-ETMS safety-critical component outputs must be verified on a particular track segment (*e.g.*, during component installation, rearrangement, or replacement), a signed auditable copy of the results must be kept on file and made available to FRA for review and duplication during normal business hours consistent with 49 CFR §§ 236.1037, *Records retention*, and 236.1009(h).
13. If FRA provides any comments to NJT regarding its PTCSP, the supporting documentation, and/or any associated technical issues, NJT must update its PTCSP to address FRA's comments and incorporate the railroad's resolutions to FRA's comments, within the timeframe FRA specifies. In addition, NJT must maintain its PTCSP to reflect its as-built PTC systems, consistent with Condition #7 and the request for amendment process under 49 CFR § 236.1021. *See also* 49 CFR § 236.1009(d)(3).

Furthermore, FRA is aware that NJT's PTCSP includes and/or references certain common industry or vendor/supplier documentation for its PTC systems, which other railroads with the same PTC systems likewise utilize. To help promote and maintain PTC system interoperability, FRA encourages NJT to coordinate with other railroads implementing I-ETMS and/or ASES II⁹ to ensure NJT's PTCSP (and any other PTCSP to which it refers) remain consistent with the current version of any common industry or vendor/supplier documentation.

14. NJT must ensure that all host and tenant railroad operations on NJT's PTC-governed main lines comply with the requirements under 49 CFR § 236.1033, *Communications and security requirements*, by the statutory deadline of December 31, 2020.¹⁰

⁹ Or the Advanced Civil Speed Enforcement System II.

¹⁰ Unless a tenant railroad's operations are not governed by PTC technology pursuant to an exception under 49 CFR § 236.1006(b).

Enclosure 2: Specific Issues Requiring Resolution for PTC System Certification

This enclosure lists the specific issues New Jersey Transit (NT) must resolve—within the timeframe specified in each condition—to retain the Federal Railroad Administration’s (FRA) certification of NJT’s Advanced Speed Enforcement System II (ASES II) as a vital overlay system. When NJT submits a letter to FRA demonstrating it has resolved each issue set forth in the conditions and comments in Enclosure 2, to FRA’s satisfaction, FRA’s conditional PTC System Certification of ASES II will automatically cease to be categorized as “conditional,” and this PTC System Certification will be subject only to NJT’s ongoing compliance with the general conditions in Enclosure 1.

1. As conveyed to other railroads implementing the Advanced Civil Speed Enforcement System II (ACES II), to which ASES II has similar operating characteristics, FRA observed in 2015 that under certain circumstances when the ACES II onboard computer (OBC) does not receive valid transponder data for any number of reasons (*e.g.*, physically missing data, corrupt data, or partial data), any active Permanent Speed Restriction (PSR) alert curve, line-specific maximum authorized speed, and braking curve are improperly purged from the onboard PTC apparatus. This results in the PTC system not enforcing any PSR until the system receives the next valid transponder data, and enforcement is at the limit of the vehicle speed. When this occurs, it represents a single point of failure which 49 CFR part 236, subpart I prohibits for purposes of vital overlay PTC systems, and NJT must correct this issue to retain FRA’s certification of NJT’s ASES II as a vital overlay system. FRA is aware that a proposed solution to this issue involves moving the track database, which currently resides in the wayside transponders, to the locomotive OBC and will require all ACES II/ASES II users to implement this solution simultaneously to ensure system interoperability is maintained. To that end, FRA requires NJT to: (1) work with all ACES II host railroads to develop interoperable specifications for a solution; (2) provide FRA a schedule by June 30, 2021, for the full implementation of this technology on NJT’s equipment without undue delay; and (3) implement that technology in accordance with the schedule NJT submits to FRA.
2. To further reduce the likelihood of an erroneous use of the Positive Train Stop Release (PTSR) button to pass an absolute signal displaying a stop indication, or where an absolute signal fails due to known circuit problems, FRA required the National Railroad Passenger Corporation (Amtrak) to upgrade its ACES II PTC system. In an August 9, 2016 letter, FRA required Amtrak to promote the development of a keypad at the train engineer’s station that would receive a short, unique code generated automatically by the dispatcher’s Computer Aided Dispatching system or the PTC server. The engineer’s oral request to receive permission to pass the absolute signal would be answered by the dispatcher with the code that the engineer would enter on the keypad. If the codes aligned, the PTSR button would then be enabled for the engineer to activate it. If the codes did not align, the PTSR button would not be enabled, and the positive train stop would remain in effect. FRA considers this technology an important enhancement to the overall safety of the ACES II and ASES II PTC systems, and as such, FRA is requiring all ACES II/ASES II users to implement this technology. *See* 49 CFR § 236.1009(g)(1). To that end, within 90 days of the date that Amtrak has developed and implemented this technology on all its ACES II

PTC-mandated main lines, NJT must submit to FRA a schedule for the full implementation of this technology without undue delay, and implement it in accordance with that schedule.

3. Given the September 2020 discovery of a new temporary speed restriction (TSR) interlocking hazard whereby an adjacent track TSR may not be enforced by ACSES II or ASES II when a train is crossing over to that track under certain circumstances, FRA requires NJT to work with all ACSES II host railroads to develop interoperable specifications for a solution and provide FRA a schedule, by February 15, 2021, for the full implementation of this technology on NJT's PTC-mandated main lines without undue delay. NJT must then implement that solution in accordance with the schedule it submits to FRA. In the interim, NJT must provide FRA with the temporary mitigation measures NJT will implement prior to December 31, 2020.
4. With NJT's implementation of ASES II, NJT installed the Siemens ACSES II OBC on a portion of its locomotive fleet. While the core ASES II/ACSES II functionalities of the Alstom and Siemens OBCs are similar, the following behavioral differences have been identified. Accordingly, FRA requires NJT to work with its PTC system suppliers to develop a solution to alleviate or resolve these behavioral differences, as necessary to ensure safety, and provide FRA a schedule, by February 15, 2021, for the full implementation of this solution on NJT's locomotive fleet without undue delay. NJT must then implement that solution in accordance with the schedule it submits to FRA. In the interim, NJT must provide FRA with the temporary mitigation measures NJT will implement prior to December 31, 2020:
 - a. If a complete set of transponders is not read by the Alstom OBC, the locomotive will delocalize and discontinue enforcement of any TSR currently in its list until reading the next set of transponders. The Siemens OBC will neither delocalize nor discontinue enforcement of its TSR list until the locomotive has traveled a distance of 15,300 feet without reading a valid transponder set.
 - b. Under NJT's Rule 135, *Track Obstructed for Maintenance*, NJT requires that stop signs be posted on adjacent tracks where an active work zone is established. Trains approaching the established work zone on an adjacent track must either receive permission from the Roadway Worker in Charge (RWIC) to proceed through the work zone limits (with or without a speed restriction) or stop the train at the stop sign until receiving permission to proceed from the RWIC. The Siemens OBC enforces these movements by placing a single Stop-and-Release TSR into the TSR Safety Server (with or without a speed restriction). The Alstom OBC requires the input of three separate and discrete TSRs, which includes placing a unidirectional, zero-speed TSR at each end of the work zone limits and an additional TSR to govern any speed restriction throughout the work zone limits.
 - c. NJT's PTC System Interoperability and Compatibility Analysis for ASES II, ACSES II, and I-ETMS, Revision 2.0, dated June 2, 2020, does not include a Human Factors Analysis (HFA) that analyzes an engineer's interactions with the onboard system, specifically the differences between the ASES II and ACSES II

display units and how the engineer is warned of a degraded mode of operation. By March 31, 2021, NJT must submit an HFA analyzing an engineer's interactions with the onboard systems and certify that all engineers have received the proper training to address the operational differences of the display units of the ASES II and ACSES II onboard systems.