BROTHERHOOD OF LOCOMOTIVE ENGINEERS AND TRAINMEN

A DIVISION OF THE RAIL CONFERENCE
INTERNATIONAL BROTHERHOOD OF TEAMSTERS

SAFETY TASK FORCE

INDEPENDENCE, OHIO

BEFORE THE NATIONAL TRANSPORTATION SAFETY BOARD

NTSB Accident Number: RRD-18MR003

Class: Major

Proposed findings, probable cause, and safety recommendations, in connection with the head-on collision, derailment and subsequent employee fatalities involving a CSX Transportation ("CSXT") freight road switcher Train No. F777-03 and a National Railroad Passenger Corporation ("Amtrak") passenger Train No. P091-03 near Cayce, South Carolina on February 4, 2018

S.J. Bruno, BLET-Safety Task Force, National Chairman
B.T. Aldridge BLET-Safety Task Force, Party Spokesman

Final Submission

Accident Synopsis:

As part of an eight (8) phase Positive Train Control ("PTC") installation the signal system of the CSXT Florence Division was temporarily suspended during the relevant period of each phase of the project.[1] The location of the accident was within phase seven (7) of the project which had the signal system suspended between milepost ("MP") 362.5 and 385.01 beginning at 8:00 a.m. Eastern Standard Time on February 3, 2018.[2] In accordance with CSXT operating rule 505, movements within the area of the designated signal suspensions were performed under the authority of EC-1.[3]

On February 3, 2018 at 3:00 p.m., the crew of CSXT local freight Train No. F777-03 ("F777") was called to duty and were instructed to perform switching operations on the Silica Storage Track which is located within Florence Division/Columbia Subdivision of the CSXT Railroad. The Silica Storage Track is near Cayce, South Carolina. To complete their switching operations the switch to the Silica Storage Track at MP 367.1 was placed into the "reverse" position which means it was aligned for movements into and out of the Silica Storage Track. The "normal" position of that switch is aligned for straight movements on the Single Main Track. Upon completing their work, the Conductor contacted the CSXT FF Train Dispatcher and reported in the clear of the single main track at MP S 367.0 in the Silica Storage Track.

On February 4, 2018 Southbound Amtrak Train No. P-91 ("P-91") was issued an EC-1 authority from the CSXT FF Train Dispatcher via the radio. At 2:27 a.m. P-91 collided head-on with stationary CSXT F777 on the Silica Storage Track in Cayce, South Carolina. Amtrak P-91 was travelling at approximately 50 MPH at the moment of impact. The Locomotive Engineer and Conductor on Amtrak Train No. P-91 were fatally injured in the accident, 92 passengers and crew were transported to local hospitals with injuries. The Conductor on CSXT Train No. F777 sustained cuts and lacerations. The Locomotive Engineer on CSXT Train No. F777 was uninjured.

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[1] Signal suspension refers to operations when wayside signals are temporarily not in effect.

[2] All times throughout this report reflect Eastern Standard Time.

[3] EC-1 is a form used to record specific instructions to train crews or train dispatcher messages regarding movements on controlled tracks. *See* Appendix 1 for the CSX F-777's hand written directive (placing an X through the document is required upon completing (fulfilling) the required task).

The weather was clear the temperature was 39° Fahrenheit[4] with limited visibility due to nighttime conditions. Damage for all equipment and track is estimated at $39 million.

The Collision:

Amtrak P-91 collided with the CSXT F777 at MP S 367.0 after entering the north switch at Silica Storage Track which was left in the reverse position. The southbound P-91 entered the switch three (3) seconds before impact at an estimated speed of 57 MPH. The event recorder download established the train was placed in emergency braking at 53 MPH, and a final speed of 50 MPH was recorded when data from the event recorder ended. Post-accident investigation indicated that the Amtrak P-91, travelled 660 feet into the Silica Storage Track.

Method of Operation:

CSXT operates on average of twenty-two trains daily over the Columbia Subdivision. Of which, Amtrak operates two passenger trains, one northbound, one southbound, seven days a week. Typically trains operate under a Traffic Control System ("TCS") in accordance with CSXT Operating Rule 510.[5]

The signal suspension caused train operations to occur under the authority of Track Warrant Control ("TWC").[6] On the date of the accident, the temporary signal suspension was in place per Columbia Subdivision Bulletin No. 105.[7]

Figure 1 below recreates the map provided by CSX reflecting the limits of the signal suspension area the day of the incident.

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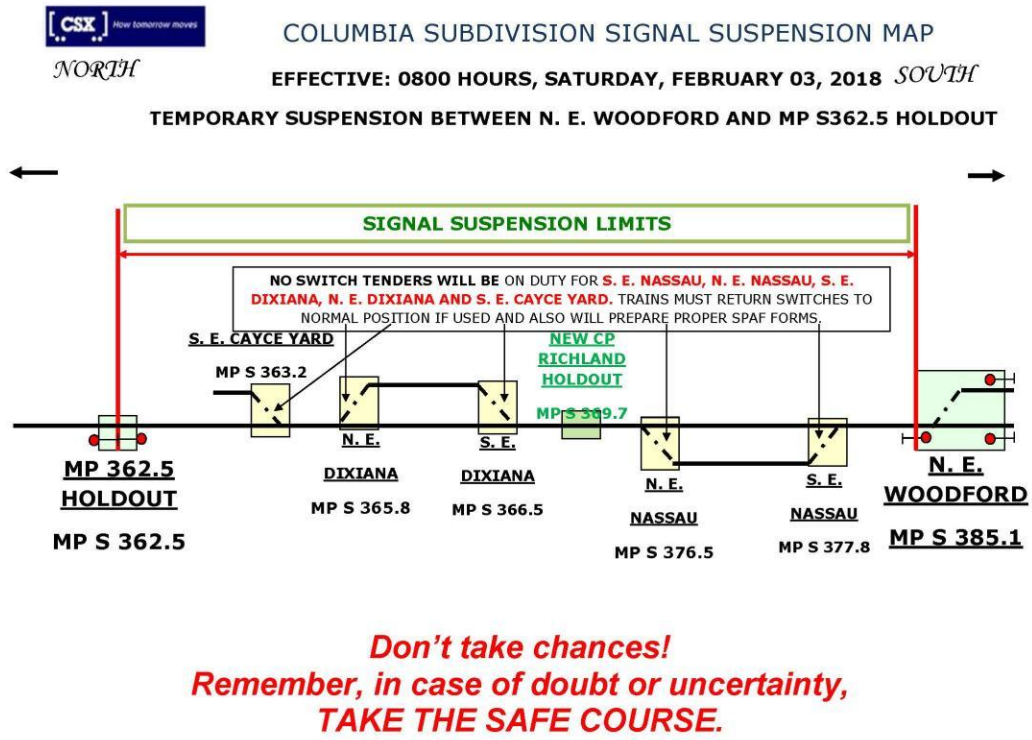
[4] According to the Columbia Metropolitan Airport.

[5] CSXT rule 510.1: when the authority for movement on controlled tracks is designated in special instructions, dispatcher messages, or Form EC-1 as Traffic Control ("TC"), general signal rules are also in effect and signal indication authorizes and governs train movements in either direction.

[6] Track warrant is a method of authorizing movements or protecting employees or on-track equipment in signaled or non-signaled territory on controlled track within specified limits. These movements are under the jurisdiction of the train dispatcher. *See* Appendix 2 regarding TWC-D movements.

[7] *See* Appendix 3 regarding signal suspension per CSXT Bulletin No. 105.



Don't take chances!
Remember, in case of doubt or uncertainty,
TAKE THE SAFE COURSE.

CSXT Stationary Train No. F777-03 ("F777"):

The crew of CSXT F777 went on duty February 3, 2018 at 3:00 p.m. CSXT Train No. F777 — consisted of two (2) locomotives (lead locomotive CSXT 130) and thirty-four (34) empty automobile racks[8]. After assembling their outbound train on the Silica Storage Track the crew completed a Class 1 air brake test. Upon completion of their switching moves they reported to the CSXT FF Train Dispatcher they were in the clear of the Single Main Track at MP S 367.0 in the Silica Storage Track and released their EC-1 authority (track warrant), as well as completing their switch position awareness form ("SPAF") requirements,[9] at 1:51 a.m. approximately 45 minutes prior to the collision. During post-accident interviews of the Conductor and the Locomotive Engineer of

[8] Automobile racks are articulated rail cars that carry trucks, automobiles, etc.

[9] A switch position awareness form "SPAF" (per CSXT Rule 505.12 - since modified) is a form the Conductor fills out and signs as the Locomotive Engineer initials regarding mainline hand-operated switches in non-signaled territory that are operated (reversed and/or locked normal position), location of switches operated, who operated the switches, and the time (s) all this transpired. This information is then conveyed to the Train Dispatcher who in turn, repeats it back to the crew. This is a requirement by the FRA - Emergency Order No. 24, Docket No. FRA-2005-22796. https://www.federalregister.gov/d/05-23303/p-3

No. F777, each stated that the Locomotive Engineer questioned the Conductor if he, had returned all switches involved in their switching moves to their normal position for mainline movement. The Conductor suggested turning on the locomotive headlight to bright in order to check the switch alignment for the North End of Silica Storage Track. Although they did this, they could not tell if the switch was properly lined.

As the crew members were sitting in the locomotive waiting on transportation due to them approaching the Hours of Service limitation at 3:00 a.m., the Locomotive Engineer took it upon himself to personally check the alignment of the mainline switch. As the Locomotive Engineer walked toward the switch, the headlight from the oncoming Amtrak P-91 was approaching. The Locomotive Engineer began to evacuate the area when he realized the imminent collision.

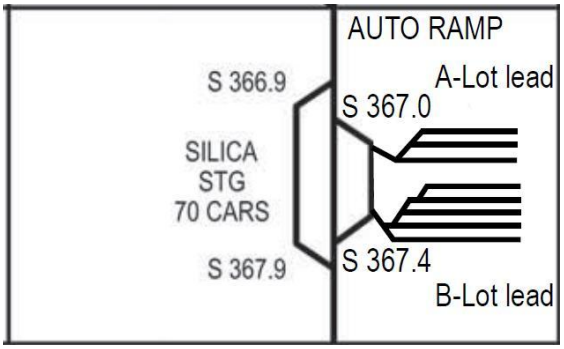


Figure 2. Diagram of the tracks at Silica Storage Track and A and B Lots tracks (graph courtesy of CSXT Timetable)

Southbound Amtrak Train No. P091-03 ("P-91"):

Amtrak Train No. P-91 — operating between New York City, New York and Miami, Florida — consisted of one (1) locomotive (Amtrak locomotive No. 47) and seven (7) cars. The crew went on duty at Hamlet, North Carolina at 10:43 p.m. Amtrak Train No. P-91 made a station-stop at Columbia, South Carolina (MP S 360) to board and discharge passengers. Before departing Columbia, the Conductor boarded the locomotive cab compartment to assist the Locomotive Engineer with the signal suspension requirements that began at MP S 362.5 by calling the CSXT FF Train Dispatcher on the radio. After receiving their EC-1 (track authority warrant) from the CSXT FF Train Dispatcher, Amtrak Train No. P-91 entered the limits of the signal suspension in a southward direction, continuing until it encountered the misaligned switch and was diverted off the Single

Main Track at MP S 366.9 and onto Silica Storage Track. In the subsequent collision at MP S 367.0, the Locomotive Engineer and Conductor were fatally injured.

CSXT FF Train Dispatcher Actions:

The CSXT FF Train Dispatcher (located in Jacksonville, Florida) is responsible for eleven (11) Subdivisions that consist of approximately 800 miles of track. The second shift train dispatcher issued CSXT train No. F777 their EC -1 at 8:30 p.m. on February 3, 2018 which authorized the crew to proceed south from CSXT's Cayce Yard to switch automobile racks at the TDSI facility located at MP S 367.0. The third shift train dispatcher reviewed his turnover from the second shift train dispatcher between 10:30-10:45 p.m. Shortly thereafter, the third shift Train Dispatcher radioed the CSXT F777 crew to see how they were progressing with their work, and to see if they would be in the clear of the Single Main Track as Amtrak P-91 was on the approach. At 1:51 a.m. on February 4th, CSXT train F777's crew responded and reported clear of the Single Main Track.[10] During the conversation, the third shift FF Train Dispatcher asked the Conductor of CSXT F777 if everything was in the clear, to which the F777's Conductor replied, "That's right and we locked up in Silica."[11]

[10] Per radio transcripts between the third shift Train Dispatcher and F 777 crew, p. 1.

[11] Per radio transcripts between the third shift Train Dispatcher and F 777 crew, p. 2.

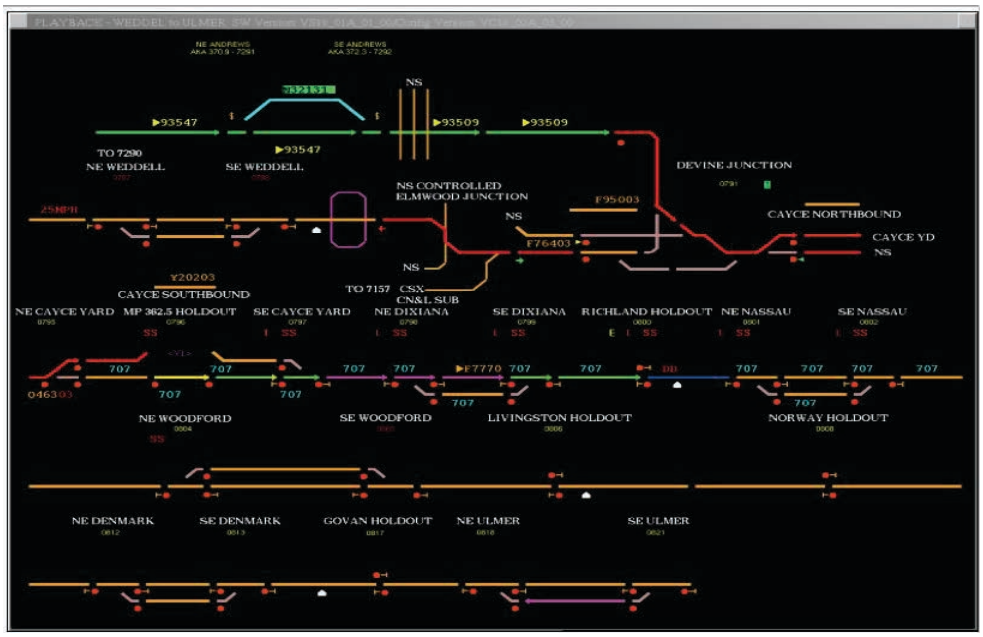


Figure 3 depicts Train F777-03 occupying track segments between S.E. Cayce Yard and S.E. Dixiana. (Courtesy of NTSB)

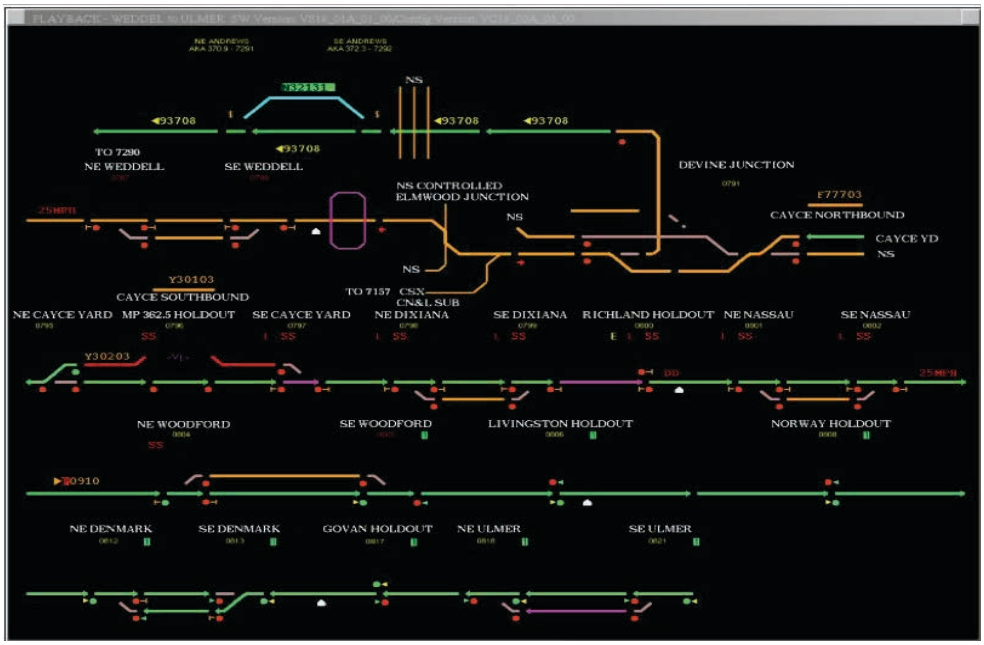


Figure 4 depicts train P091-03 entering the OS track at the S.E. Cayce Yard while the track segment where collision occurred is still reflecting occupied without train designation. (Courtesy of NTSB)

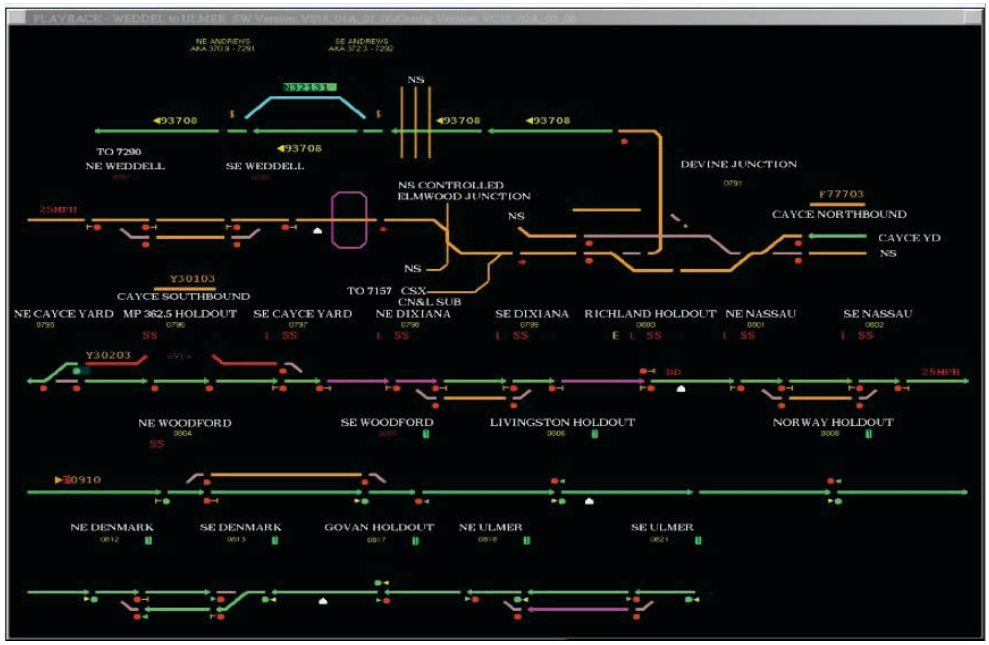


Figure 5 depicts train P091-03 entering the OS at the N.E. Dixiana with the track segment at Silica Storage Track still indicating occupied. (Courtesy of NTSB)

Post-accident interview with the third shift CSXT FF Train Dispatcher established there were visual aids on the dispatcher's screen for the temporary signal suspension in effect. He stated that there was an "SS" on the screen denoting the territory was under a signal suspension. The Train Dispatcher also stated that a track occupancy light (track light) would not be displayed if a derail or switch were left open in the signal suspension track segment.

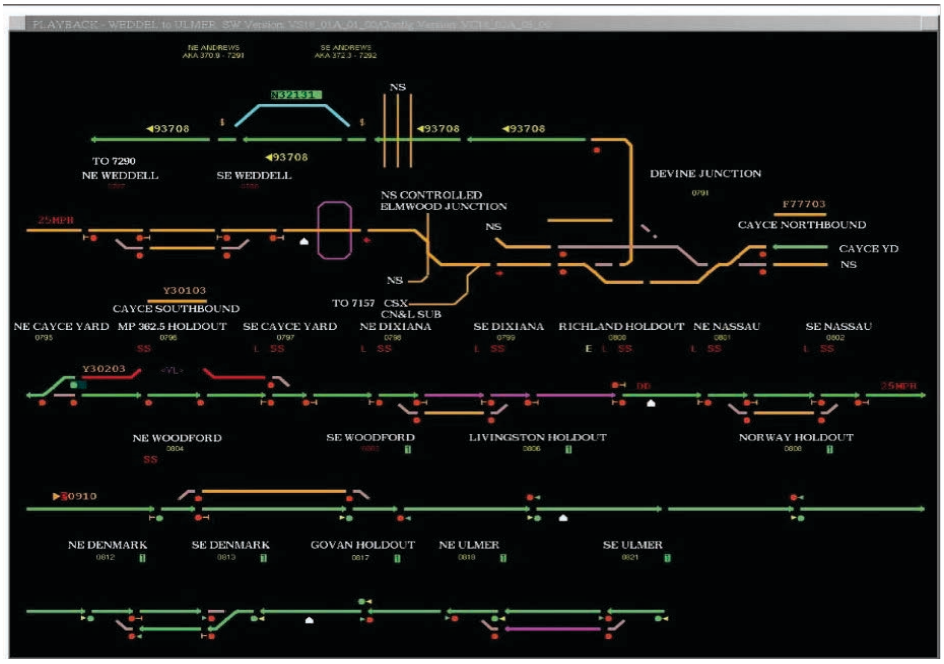


Figure 6 depicts P091-03 entering the already occupied track occupancy circuit at the South End of Dixiana (Courtesy of NTSB).

A field test conducted at CSXT's Dispatcher Center in Jacksonville, Florida by NTSB and the Federal Railroad Administration ("FRA") revealed that a track occupancy circuit is displayed on the Train Dispatcher's Computer Aided Dispatch ("CAD") system screen even during a temporary signal suspension. The third shift Train Dispatcher stated that he did not recall seeing a track light on his CAD screen. He also stated that, during his job briefing concerning the signal suspension, no one mentioned anything about track occupancy circuits being valid or invalid.

Personal Electronic Devices:

No improper cellular phone activity was detected on the part of either crewmember on the Amtrak P-91 or the CSXT F777 immediately prior or during the accident.

Toxicological Results:

Post-accident toxicological testing performed on both the Amtrak P-91 and CSXT F777 crewmembers were negative for prohibited substances.

Rule modifications by CSXT Post-Accident:

Rule Modifications: TWC-D[12]

401.14
Previous Rule read: Do not unlock or operate a switch or derail that provides access to a controlled track unless authorized by:

a. Verbal authority from the train dispatcher, or

b. Signal indication.

Revised Rule reads:

401.14 THE EMPLOYEE WHO RESTORES A HAND-OPERATED MAIN TRACK SWITCH TO THE NORMAL POSITION FOR THE PURPOSE OF RELEASING AN AUTHORITY OR REPORTING BY A SPECIFIC LOCATION WHERE TWC-D RULES ARE IN EFFECT MUST:

[12] See Appendix 4 at the end of this report for the CSXT June 22, 2018, 3rd Quarter System Bulletin reissue.

1. REMAIN AT THE SWITCH UNTIL VERBALLY CONFIRMING WITH EACH CREWMEMBER THE SWITCH WAS RESTORED AND LOCKED IN NORMAL POSITION,
2. COMPLETE THE SWITCH POSITION AWARENESS FORM (SPAF) IN INK AND
3. RETAIN THE SPAF UNTIL THE NEXT TOUR OF DUTY.

505.11

Previous Rule read:

A train must not release an authority or report by a specific location until:

a. A crewmember or other employee observes the rear end marker or verifies the rear car's initials and number, or

b. The train passes a defect detector that gives an axle count that agrees with the count of a previous defect detector or an actual count made by a crewmember, or

c. The train clears the controlled track at a hand-operated switch and the switch (and derail, if equipped) has been restored and locked in normal position, or

d. A train equipped with properly functioning telemetry:

    1. Indicates the rear of the train is intact,

    2. The display indicating air pressure on the rear of the train gives the expected reading, and

    3. The distance traveled by the leading end of the train is:

        a. The train's length, as determined by the use of the odometer on the HTD, or

        b. Three miles beyond the clearing point.

Revised Rule reads:

505.11 PRIOR TO RELEASING AN AUTHORITY OR REPORTING BY A SPECIFIC LOCATION, ALL CREW MEMBERS MUST AGREE IT IS SAFE TO DO SO. ALL CREWMEMBERS MUST BE PRESENT AND HEAR THE AUTHORITY BEING RELEASED. A TRAIN MUST NOT RELEASE OR REPORT BY A SPECIFIC LOCATION UNTIL AT LEAST ONE OF THE FOLLOWING CONDITIONS CONFIRMING THE TRAIN HAS CLEARED THE SPECIFIED LIMITS IS MET:

A. A CREWMEMBER OR OTHER EMPLOYEE OBSERVES THE REAR END MARKER OR CONFIRMS THE REAR CAR BY INITIAL AND NUMBER, OR
B. THE TRAIN PASSES A DEFECT DETECTOR THAT GIVES AN AXLE

COUNT THAT AGREES WITH THE COUNT OF A PREVIOUS DEFECT DETECTOR OR AN ACTUAL COUNT MADE BY A CREWMEMBER, OR

C. THE TRAIN IS EQUIPPED WITH PROPERLY FUNCTIONING TELEMETRY THAT INDICATES:
   1. THE ENTIRE TRAIN IS INTACT,
   2. AIR PRESSURE READING ON THE REAR OF THE TRAIN IS EXPECTED READING, AND
   3. DISTANCE TRAVELED BY THE LEADING END OF THE TRAIN IS EITHER THE TRAIN'S LENGTH AS DETERMINED BY THE ODOMETER ON THE HTD OR AT LEAST THREE MILES BEYOND THE CLEARING POINT.

505.12
Previous Rule read:

When hand-operated switches are used, before releasing an authority or reporting by a specific location:

1. Complete the Switch Position Awareness Form (SPAF) in ink,

2. Report the following to the train dispatcher:

    1. Location of the switch operated,

    2. Switch(es) restored and locked in normal position,

    3. Time switch was initially reversed,

    4. Time switch was restored and locked in normal position, and

    5. Name of employee who operated the switch.

3. Retain the Switch Position Awareness Form (SPAF) until the next tour of duty.

Revised Rule reads:

505.12 WHEN HAND-OPERATED SWITCHES ARE USED, SUCH SWITCHES MUST BE RESTORED TO NORMAL POSITION BEFORE RELEASING AUTHORITY OR REPORTING BY A SPECIFIC LOCATION. IF ANY CREWMEMBER HAS DOUBT OR UNCERTAINTY ABOUT THE POSITION OF SUCH SWITCHES, THE AUTHORITY MUST NOT BE RELEASED. IF DOUBT OR UNCERTAINTY ARISES AFTER RELEASING OR REPORTING BY A SPECIFIC LOCATION, THE CREW MUST IMMEDIATELY CONTACT THE TRAIN DISPATCHER. REPORT THE FOLLOWING TO THE TRAIN DISPATCHER WHEN RELEASING AUTHORITY OR REPORTING BY A SPECIFIC LOCATION:

1. ALL CREWMEMBERS AGREE SWITCH(ES) RESTORED AND LOCKED NORMAL,
2. MILEPOST LOCATION OF SWITCH(ES) OPERATED,
3. CONFIRMATION SWITCH(ES) RESTORED AND LOCKED IN NORMAL

POSITION,
4. TIME SWITCH WAS INITIALLY REVERSED,
5. TIME SWITCH WAS RESTORED AND LOCKED IN NORMAL POSITION, AND
6. NAME OF EMPLOYEE WHO RESTORED AND LOCKED SWITCH IN NORMAL POSITION.

Post-accident, CSXT made modifications to their SPAF process, as outlined in the above operating rules 401.14, 505.11 and 505.12, however, the burden of safely operating in a signal suspension area while employees are working within that portion of territory, lays purely on those individuals operating the hand-throw switches. In order to partially comply with the recently published FRA Safety Advisory (FRA-2018-0037)[13], CSXT did invoke language to include signal maintainer locks to be applied to all switches within a signal suspension, as well as direct dialogue between the switch tender and the train crew that will be operating through the limits. CSXT's signal suspension operating plan fails to address FRA's Safety Advisory Overview in particular; Item No. 3 (c), which states "Require first train through the limits (after switches have been operated) to proceed through the limits at Restricted Speed."[14]

Amtrak also implemented new operating procedures for their trains operating in signal suspension areas per General Order 2018-04, dated March 4, 2018.[15]

Work / Rest History of Each Locomotive Engineer and Conductor:

The work rest history of the operating crews of both the Amtrak and CSXT trains indicated that fatigue was not a factor in the accident.[16]

PROBABLE CAUSE

[13] *See* Appendix 5 at the end of this report.
[14] See Appendix 6 at the end of this report.
[15] *See* Appendix 7 at the end of this report.
[16] *See* Appendix 8 for a summary of both crews work/rest history.

The probable cause of this accident and the fatalities of the two Amtrak employees was the failure of the Conductor of CSXT Train No. F777-03 to restore the switch at the north end of the Silica Storage Track to the normal position for mainline movement before releasing their train's EC-1 track authority.

The decision of the US Congress to postpone the requirement of the Rail Safety Improvement Act of 2008 for railroads to install Positive Train Control systems prior to December 31, 2015 is a direct contributing factor to the accident and fatalities of the two Amtrak employees.

The ongoing inability of FRA to act on the 1970 Safety Recommendation of the NTSB to require installation of Positive Train Control ("PTC") in a timely manner is a contributing factor in this accident.

The CSXT practice of allowing passenger trains to operate at maximum authorized speed through the entirety of a signal suspension area, (Dark Territory) for the full distance of the signal suspension, was a causal factor in the accident.

The lack of training afforded to the CSXT Train Dispatchers prior to signal suspension operations was a contributing factor to this accident. That the Train Dispatcher did not know the system could display or notice the track occupancy light was a causal factor in the accident.

That the other crew member of CSXT F777 was unconvinced of the Conductor's claim that the Main Track switch was returned to the normal position combined with the lack of time to act on their concern was a causal factor in this accident.

Additionally, had proven switch point monitoring system devices been installed and operational, this accident would not have occurred.

PROPOSED FINDINGS

HUMAN PERFORMANCE:

The failure of the crew of CSXT Train No. F777-03 to ensure the hand-operated switch at the north end of the Silica Storage Track was lined for mainline movement is the most prominent contributing factor. Additionally, the CSXT FF Train Dispatcher's actions of letting the F777-03's crew release their EC-1 authority with a track segment light still showing on the dispatcher screen as being occupied, is a contributing cause. In turn, the EC-1 authority issued to Amtrak Train No. P091-03 should have not been issued with the track occupancy light still being displayed, or at a minimum, required them to operate at Restricted Speed through the area of the signal suspension.

OPERATIONS:

After examining the operating practices in the area leading up to, and at the area of the collision, it is clear that there were operational factors contributing to this accident. First, the temporary signal suspension was in effect due to the installation of PTC in the area. Second, trains were permitted to approach switches in what was essentially Dark Territory at greater than Restricted Speed. Third, the absence of any mechanical or electronic switch position indicators. In this regard it should be noted that one of the requirements of the RSIA 2008 was for the FRA to evaluate the use of non-traditional appliances in Dark Territory. Section 406 of the act identified ten distinct appliances commonly in use at that time for FRA to prescribe standards guidance regulations or orders governing their use and implementation in Dark Territory. Specifically, item No 1 on that list was "switch position monitoring devices or indicators". Moreover, Dark Territory was defined in the legislation as "any territory in a railroad system that does not have a signal or train control system installed or operational.'' (Emphasis added) Such as the case in this accident. The railroads, Including CSXT and Amtrak argued strenuously against regulations and FRA ultimately decided not to prescribe standards, guidance, regulations, or orders for a single one of those safety technologies.

The use of switch point monitoring devices in this Dark Territory would have likely prevented this accident. [17]

[17] *See* Appendix 9, FRA research results RR07-04.

Operations in Non-Signaled Territory:

The National Transportation Safety Board ("NTSB") has been concerned since at least 1974 about the issue of train operations in areas not under a form of signal or centralized traffic control. As a result of its investigation of a fatal accident in Cotulla, Texas, involving a misaligned switch in non-signaled territory,[18] the NTSB made the following safety recommendation to the Missouri Pacific Railroad (now part of the Union Pacific Railroad):

> R-74-22
>
> Review your operation on main tracks that are not equipped with automatic block signals and take appropriate action to ensure the capability of engineers to stop trains in advance of misaligned switches. This action could include reducing the size or speed of trains, installing automatic block signals or advance-position indicators, or improving the visibility of switch stand targets.

This recommendation was classified "Closed -- No Longer Applicable" after the NTSB was provided with information indicating that the Missouri Pacific Railroad would continue to evaluate territories for the possible installation of automatic block signals or centralized traffic control.

At the time of the Cotulla accident, Interstate Commerce Commission (ICC) Order 29543 was in effect, which established a speed limit of "less than 50 mph" for freight trains operating in non-signaled territory.[19] The NTSB's investigation of the Cotulla accident revealed that Order 29543 was inadequate in that the maximum allowable speed was established without consideration of factors such as visibility and stopping distances, which at times may require lower speeds for safe operation. To address these concerns, the NTSB made the following safety recommendation to the FRA:

> R-74-26
>
> Determine and assess the current risks of train accidents involving misaligned switches, collisions, broken rail, and other route obstructions on main track where automatic block signal systems do not exist. Promulgate regulations to replace Interstate Commerce Commission Order 29543. These regulations should detail the major risks and controls

[18] National Transportation Safety Board, *Collision of Missouri Pacific Railroad Company Freight Train Extra 615 South With a Standing Locomotive, Cotulla, Texas, December l, l973*, Railroad Accident Report NTSB/RAR-74/03 (Washington, D.C.: NTSB, 1974).

[19] This speed limit does not apply along non-signaled track where train movements are governed by a manual block system permanently in effect. *See* 49 C.F.R. § 236.0(c).

> assumed, set guidelines for safe operations below the maximum operating speed, and assign responsibility to the carrier for safe operations.

When the FRA issued regulations for signal and train control systems in January 1984, the wording of ICC Order 29543 was incorporated, verbatim, into the new regulations. The NTSB had intended that the new regulations specify circumstances requiring that trains be operated below the allowable maximum speed. Because the FRA's actions did not satisfy the NTSB's intent, Safety Recommendation R-74-26 was classified "Closed -- Unacceptable Action."

In the early morning hours of January 6, 2005, a Norfolk Southern Railway train operating in non-signaled territory in Graniteville, South Carolina was diverted from the main track by a misaligned switch. The ensuing collision, which occurred less than 60 miles from Cayce, resulted in nine deaths and over 250 injuries due to toxic chlorine exposure. The NTSB's analysis of the Graniteville accident focused on the lack of warning to the crew of the misaligned switch, and in its report reiterated its 1974 findings, and stated:

> A conspicuous visual stimulus could take one of many forms. It could be a steady or flashing strobe light (such as those used on some school buses and traffic signals) of a color that would not be confused with other railroad signals. This would be analogous to the "blue flag" procedures mandated by the FRA to draw particular attention when personnel are working on, under, or between rail cars. The crew would probably have seen a highly conspicuous light before leaving and would have relined the switch. Assuming they had tied down the train out of sight of the switch (and had not traveled past it in leaving) and had therefore left the switch improperly lined despite its conspicuity, a unique flashing strobe or other obvious light might have alerted the train 192 crew to the switch position in time to slow the train.
>
> Alternatively, a device could be installed that would use electronic technology to draw the crew's attention to an improperly lined switch. Once an employee moved a switch to a non-normal position, the device could monitor the employee's proximity to the switch. Should the employee leave the vicinity without relining the switch, a notification could be sent to the employee's pager or cell phone. If the employee failed to respond within a specified time, the system could alert the railroad dispatcher or other designated railroad employee.
>
> The foregoing examples represent two possible means, one visual and one electronic, of capturing an employee's attention, but the Safety Board recognizes that there are likely additional ways by which this objective could be achieved. The Safety Board therefore believes that the FRA should require that, along main lines in non-signaled territory, railroads install an automatically activated device, independent of the switch banner, that will, visually or electronically, compellingly capture the attention of employees involved with switch operations and clearly convey the status of the switch both in daylight and in darkness.

* * *

> As acknowledged by the FRA, the frequency and severity of accidents involving misaligned switches in non-signaled territory appear to be increasing. While at least some of the measures the FRA has directed through its emergency order may aid in reducing the number of switching mistakes, they are unlikely to eliminate such mistakes entirely. Additional measures are therefore needed to help ensure that such mistakes, when they do occur, do not result in accidents.
>
> The Safety Board therefore believes that the FRA should require railroads, in non-signaled territory and in the absence of switch position indicator lights or other automated systems that provide train crews with advance notice of switch positions, to operate those trains at speeds that will allow them to be safely stopped in advance of misaligned switches.

See NTSB/RAR-05/04 at 47–49.

The Graniteville tragedy also spurred Congress into action. Specifically, in Section 406 of the Rail Safety Improvement Act of 2008, the Secretary of Transportation was ordered to within one (1) year "after enactment … prescribe standards, guidance, regulations, or orders governing the development, use, and implementation of rail safety technology in dark territory … that ensure the safe operation of such technology, such as … switch position monitoring devices or indicators …."[20] P.L. 110–432 at § 406, 122 STAT. 4886 (Oct. 16, 2008), codified at 49 U.S.C. § 20164.

Regrettably, FRA has taken no action to require the use of switch position monitoring devices in Dark Territory. Had it done so — and had a portable switch position monitoring device been installed in Cayce (causing 2 fatalities and 92 injuries) — the accident would have been prevented.

Allowing freight trains to continue to operate unrestricted in Dark Territory at 49 MPH, and passenger trains to operate at 59 MPH, breeds an unsafe environment.[21] Post Cayce, the FRA responded with a Draft Safety Advisory related to temporary signal suspensions (Docket No. FRA-2018-0037; Notice No.1, dated April 18, 2018); although the Draft Safety Advisory addresses hand-operated main track switches in a temporary signal suspension area, it does not address the speed at which trains should traverse through the territory. The BLET's opinion is that speeds in dark territory not equipped with protective technology include appropriate restrictions capable of stopping trains short of a misaligned switch.

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[20] The term "Dark Territory" is defined in the statute as meaning "any territory in a railroad system that does not have a signal or grain control system installed or operational." 49 U.S.C. § 20164(b).

[21] *See* 49CFR Part 236

Positive Train Control:

The NTSB issued its first recommendation calling for automatic train control in 1970; 20 years later in 1990, the need for a safety redundancy system on railroads still existed, and positive train separation (which was renamed positive train control in 2001 "PTC") was first placed on the NTSB's Most Wanted List. Now, some 48 years later, PTC is still not installed and/or operational on many of the U.S. railroads.[22] The FRA's 2018 Second Quarter data shows a 25 percent drop in the number of "at-risk" railroads from 12 to 9. FRA currently considers any railroad that installed less than 90 percent of its PTC system hardware as of June 30, 2018 to be at risk, as installation of all PTC system hardware is only an initial phase of implementing a PTC system and only one of the six statutory criteria required to qualify for an alternative schedule. The BLET's opinion is that this practice of numerous lenient extensions by the FRA to the railroad carriers is unacceptable, and this accident underscores the heavy price that continues to be paid because of these interminable delays.[23]

RAIL SAFETY ADVISORY COMMITTEE ("RSAC"):

The RSAC process began in 1994,[24] and has been embraced by our Organization as we continue to participate - when it is convened. However, the RSAC regarding safety technology in Dark Territory (Task 10-02)[25] has not reconvened since 2012. We strongly urge the NTSB to recommend FRA to revisit the mandate of the RSIA.

NTSB's SAFETY RECOMMENDATION REPORT (R-18-005):[26]

The BLET applauds the NTSB for addressing train operations during signal suspensions, however, we realize these are recommendations, and the railroad Carriers can pick and choose whether to comply, or not. What is needed is for the FRA to embrace

[22] Railroads' PTC docket numbers are available at https://www.fra.dot.gov/Page/P0628.

[23] Class I railroads and any entity that provides intercity or commuter rail passenger transportation must fully implement a PTC system on all required route miles by December 31, 2018, unless a railroad qualifies for an alternative schedule under the Positive Train Control Enforcement and Implementation Act of 2015 (PTCEI Act). The PTCEI Act provides that a railroad's alternative schedule, if any, must contain a deadline that is as soon as practicable, but no later than December 31, 2020.

[24] *See* Appendix 10 at the end of this report.
[25] *See* Appendix 11 at the end of this report.
[26] See Appendix 12 at the end of this report.

these recommendations and establish policy with them.

SIGNAL SYSTEM:

A post-accident examination of the CAD screen downloads from the existing signal system in the area of the incident and confirmed during a re-enactment simulation at CSXT's dispatch center in Jacksonville, Florida, probably indicated that the track circuit was occupied, even though the way-side signals were suspended.

PROPOSED RECOMMENDATIONS

CSXT TRANSPORTATION ("CSXT"):

1. Discontinue the practice of operating trains within a signal suspension area at maximum authorized speed for freight trains of 49 MPH, and for passenger trains of 59 MPH.

2. When operating in Dark (non-signaled) Territory, implement the use of switch point monitoring system devices.

3. Require that trains operating within a signal suspension area approach all facing point switches at Restricted Speed until it is ascertained that the switch is aligned for their movement.

4. Enhance the training of the CSXT Train Dispatchers to identify all information that can be discerned on their respective CAD screens.

FEDERAL RAILROAD ADMINISTRATION ("FRA"):

1. Discontinue allowing Carriers to operate trains within a signal suspension area at maximum authorized speed for freight trains of 49 MPH, and for passenger trains 59 MPH.

2. Enforce regulations requiring Carriers to install switch point monitoring system devices when trains are operating in Dark (non-signaled) Territory.

3. Require that trains operating within a signal suspension area approach all facing point switches at Restricted Speed until it is ascertained that the switch is aligned for their movement.

CERTIFICATE OF MAILING

I certify that I have on this date electronically served upon Mr. Richard Hipskind (hipskir@ntsb.gov), Investigator in Charge RRD-MR18003, a full and complete copy of the "Proposed findings, probable cause, and safety recommendations" with regards to the head-on collision, derailment, and subsequent employee fatalities involving a CSX Transportation ("CSXT") freight road switcher Train No. F777-03 and a National Railroad Passenger Corporation ("Amtrak") passenger Train No. P091-03 in Cayce, South Carolina on February 4, 2018 , submitted by the Brotherhood of Locomotive Engineers and Trainmen 's Safety Task Force to the National Transportation Safety Board. A hard copy was also forwarded addressed to the party of interest as required by 49 CFR § 845.27 (Proposed findings).

Mr. Richard Hipskind
Investigator-in-Charge, RRD-18MR003
National Transportation Safety Board
490 L'Enfant Plaza, SW
Washington, D.C. 20594

Mr. Gregory Drakulic
FRA Railroad Safety Specialist
[redacted]

Ms. Theresa Impastato
Senior Director System Safety
[redacted]

Mr. Steve Ammons
CSX Director Transportation Train Handling
Rules and Practices
[redacted]

Mr. Matt Campbell
Sheet Metal Air Rail Transportation
Safety Team Member
[redacted]

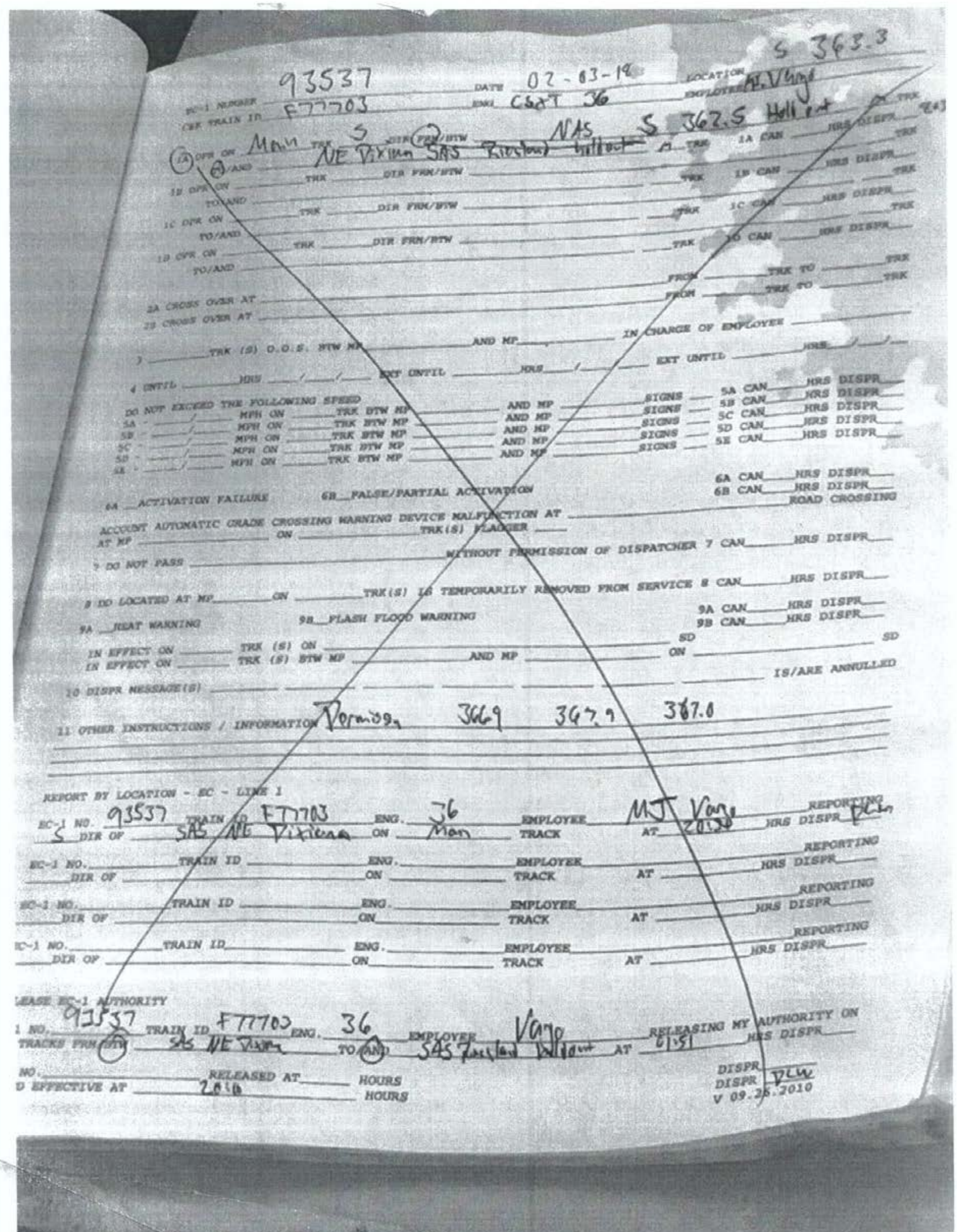
Mr. Marcus Landy
Railroad Safety Inspector, South Carolina
[redacted]

Yours truly,

[redacted]

Stephen J. Bruno
Brotherhood of Locomotive Engineers & Trainmen
National Secretary-Treasurer
National Chairman, Safety Task Force
7061 East Pleasant Valley Road
Independence, OH 44131

APPENDIX 1



EC-1 NUMBER 93537 DATE 02-03-19 LOCATION S 363.3
CSR TRAIN ID F77703 ENG CSXT 36 EMPLOYEE M.J.Vargo
(1A) OPR ON Main TRK S DIR FRM/BTW NAS S 362.5 Holl[illegible] TRK
(2) TO/AND NE Dixiana SAS Rivtowl holldout TRK 1A CAN HRS DISPR
1B OPR ON TRK DIR FRM/BTW TRK 1B CAN HRS DISPR
TO/AND TRK
1C OPR ON TRK DIR FRM/BTW TRK 1C CAN HRS DISPR
TO/AND TRK
1D OPR ON TRK DIR FRM/BTW TRK 1D CAN HRS DISPR
TO/AND TRK
2A CROSS OVER AT FROM TRK TO TRK
2B CROSS OVER AT FROM TRK TO TRK
3 TRK (S) O.O.S. BTW MP AND MP IN CHARGE OF EMPLOYEE
4 UNTIL HRS / / EXT UNTIL HRS / / EXT UNTIL HRS / /
DO NOT EXCEED THE FOLLOWING SPEED
5A - / MPH ON TRK BTW MP AND MP SIGNS 5A CAN HRS DISPR
5B - / MPH ON TRK BTW MP AND MP SIGNS 5B CAN HRS DISPR
5C - / MPH ON TRK BTW MP AND MP SIGNS 5C CAN HRS DISPR
5D - / MPH ON TRK BTW MP AND MP SIGNS 5D CAN HRS DISPR
5E - / MPH ON TRK BTW MP AND MP SIGNS 5E CAN HRS DISPR
6A ACTIVATION FAILURE 6B FALSE/PARTIAL ACTIVATION 6A CAN HRS DISPR 6B CAN HRS DISPR
ACCOUNT AUTOMATIC GRADE CROSSING WARNING DEVICE MALFUNCTION AT ROAD CROSSING
AT MP ON TRK(S) FLAGGER
7 DO NOT PASS WITHOUT PERMISSION OF DISPATCHER 7 CAN HRS DISPR
8 DD LOCATED AT MP ON TRK(S) IS TEMPORARILY REMOVED FROM SERVICE 8 CAN HRS DISPR
9A HEAT WARNING 9B FLASH FLOOD WARNING 9A CAN HRS DISPR 9B CAN HRS DISPR
IN EFFECT ON TRK (S) ON SD
IN EFFECT ON TRK (S) BTW MP AND MP ON SD
10 DISPR MESSAGE(S) IS/ARE ANNULLED
11 OTHER INSTRUCTIONS / INFORMATION Dormison 366.9 367.9 367.0

REPORT BY LOCATION - EC - LINE 1
EC-1 NO. 93537 TRAIN ID F77703 ENG. 36 EMPLOYEE MJ Vargo REPORTING HRS DISPR DLW
S DIR OF SAS NE Dixiana ON Main TRACK AT 20:24
EC-1 NO. TRAIN ID ENG. EMPLOYEE REPORTING HRS DISPR
DIR OF ON TRACK AT
EC-1 NO. TRAIN ID ENG. EMPLOYEE REPORTING HRS DISPR
DIR OF ON TRACK AT
EC-1 NO. TRAIN ID ENG. EMPLOYEE REPORTING HRS DISPR
DIR OF ON TRACK AT

RELEASE EC-1 AUTHORITY
EC-1 NO. 93537 TRAIN ID F77703 ENG. 36 EMPLOYEE Vargo RELEASING MY AUTHORITY ON
TRACKS FRM/BTW SAS NE Dixiana TO/AND SAS Rivtowl holldout AT 01:51 HRS DISPR
NO. RELEASED AT HOURS
EFFECTIVE AT 2010 HOURS
DISPR
DISPR DLW
V 09.28.2010

APPENDIX 2

505 - Track Warrant Control Non-Signaled (TWC-D):

When the authority for movement on a controlled track is designated in special instructions, dispatcher message, or Form EC-1 as TWC-D, trains will be governed by verbal authority from the train dispatcher.

Trains must not enter controlled track in TWC-D territory unless authorized to do so by the train dispatcher, or as a work train working as part of the engineering work group within designated working limits.

Copy the authorities from the train dispatcher on the Form EC-1 in the prescribed format. Where more than one main track is in service, the track number or name will be designated in the authority.

The limits of the authority must be designated on Form EC-1 by:
a. Station names, or
b. Mileposts, or
c. Switch, or
d. Signal, or
e. Control point.

The following table describes the limit of the authority:

When the Location Is:	***The End of the Authority Is:***
A controlled point:	The home signal or controlled point signal
A passenger station:	The point specified by the train dispatcher on Form EC-1
A hand-operated switch:	The fouling point of the switch
Multiple hand-operated switches:	The fouling point of the first switch unless otherwise specified by the train dispatcher on Form EC-1
Other stations:	The station sign

The train dispatcher may authorize a train to enter TWC-D territory at a hand-operated switch in order to clear the switch and proceed in the opposite direction.

When a train is authorized to operate in both directions:
1. It may operate in either direction,
2. Switches within the designated limits may be left as instructed by the train dispatcher during the time the authority is in effect,
3. The authority remains in effect until canceled,
4. Before the authority is released, a crewmember must ensure that all switches are locked in normal position, and
5. The train dispatcher must not authorize other movements within the limits of the authority.

To make a reverse movement, trains authorized to move in one direction:

1. Must obtain authorization of the train dispatcher,
2. Before authorizing, the train dispatcher must determine that the track to be used is clear and no opposing movements have been authorized, and
3. Once authorized, the train may make a reverse movement within the limits.

A train must report by specific locations when directed by the train dispatcher. Once a train has reported by a specific location, the train must not re-enter that section of track unless a new authority is obtained.

A track warrant authority is fulfilled when a train operating in a specified direction clears the limits. After a train clears the limits of its track warrant authority, the conductor or the locomotive operator must promptly release the authority unless otherwise directed by the train dispatcher.

A train must not release an authority or report by a specific location until:
a. A crewmember or other employee observes the rear end marker or verifies the rear car's initials and number, or
b. The train passes a defect detector that gives an axle count that agrees with the count of a previous defect detector or an actual count made by a crewmember, or
c. The train clears the controlled track at a hand-operated switch and the switch (and derail, if equipped) has been restored and locked in normal position, or
d. A train equipped with properly functioning telemetry:

1. Indicates the rear of the train is intact,
2. The display indicating air pressure on the rear of the train gives the expected reading, and
3. The distance traveled by the leading end of the train is:

a. The train's length, as determined by the use of the odometer on the HTD, or
b. Three miles beyond the clearing point.

When hand-operated switches are used, before releasing an authority or reporting by a specific location:

1. Complete the Switch Position Awareness Form (SPAF) in ink,
2. Report the following to the train dispatcher:

1. Location of the switch operated,
2. Switch(es) restored and locked in normal position,
3. Time switch was initially reversed,
4. Time switch was restored and locked in normal position, and
5. Name of employee who operated the switch.

3.Retain the Switch Position Awareness Form (SPAF) until the next tour of duty.

Obtain permission from the train dispatcher to assist a standing train. After receiving permission from the train dispatcher, a locomotive may assist a standing train provided:

1. Train dispatcher is informed that a clear understanding exists between all crewmembers of the location of the standing train,

2. A crewmember of the standing train provides warning against the assisting locomotive, and
3. The crew of the assisting locomotive perform the following:

1. Stop one-quarter mile from the standing train,
2. Approach the location at restricted speed,
3. Stop prior to coupling,
4. Conduct a job briefing with crewmember of the standing train,
5. Couple to the standing train and provide needed assistance,
6. Contact the train dispatcher and provide location of detachment,
7. Obtain permission from the dispatcher to detach from the train, and
8. Detach from the standing train then remain stopped until obtaining a new authority from the train dispatcher.

Obtain permission from the train dispatcher before leaving equipment unattended on a controlled track and provide the following information to the train dispatcher:

1.Specific locations of both ends of the equipment,
2.The identifying initials and number of the locomotive or car at each end of the equipment,
3. Total number of locomotives and cars, and
4. The information provided is confirmed to be correct by all crewmembers.

The train dispatcher may grant authority to a train to remove unattended equipment from a controlled track once the train dispatcher verifies that a clear understanding exists among crewmembers as to the location of the standing equipment. The train must:

1.Stop one-quarter mile from the standing equipment, and
2 Approach the location of the standing equipment at restricted speed.

Advise the train dispatcher of the following when unattended equipment is removed from a controlled track:

1.The identifying initials and number of the locomotive or car at each end of the equipment, and
2 The total number of locomotives and cars removed.

If a train overruns an authority:
1. Notify the train dispatcher, and
2. Provide warning against approaching trains.

APPENDIX 3

CSX T R A N S P O R T A T I O N FLORENCE DIVISION
JANUARY 30, 2018
COLUMBIA SUB DIVISION BULLETIN 105

TO: T&E CREWS AND ALL CONCERNED
SUBJECT: TEMPORARY SUSPENSION OF SIGNAL SYSTEM EFFECTIVE: 0800HRS, FEBRUARY 3, 2018

ITEM 1 - TC AND CP SIGNAL RULES ARE TEMPORARILY SUSPENDED FROM SERVICE ON ALL MAIN TRACKS AND SIDINGS AS FOLLOWS:

A. NORTHBOUND TRAINS

1. FROM BUT NOT INCLUDING THE NORTHWARD ABSOLUTE SIGNAL AT N. E . WOODFORD MP S 385.1 TO BUT NOT INCLUDING THE NORTHWARD ABSOLUTE SIGNAL AT MP 362.5 HOLDOUT MP S 362 .5.

2. THE NORTHWARD ABSOLUTE SIGNAL AT N. E. WOODFORD MP S 385 .1 GOVERNS MOVEMENT OVER THE POWER OPERATED SWITCH ONLY. NORTHBOUND TRAINS MUST HAVE BOTH A SIGNAL TO PROCEED AND EC-1 AUTHORITY FROM THE 'FF' TRAIN DISPATCHER AT JACKSONVILLE BEFORE PASSING THE NORTHWARD ABSOLUTE SIGNAL AT N. E . WOODFORD
MP S 385.1.

B. SOUTHBOUND TRAINS

1. FROM BUT NOT INCLUDING THE SOUTHWARD ABSOLUTE SIGNAL AT MP 362.5 HOLDOUT MP S 362.5 TO BUT NOT INCLUDING THE SOUTHWARD ABSOLUTE SIGNAL AT N. E. WOODFORD MP S 385.1.

2. THE SOUTHWARD ABSOLUTE SIGNAL AT MP 362.5 HOLDOUT MP S 362.5 GOVERNS MOVEMENT INTO THE SIGNAL SUSPENSION ONLY. SOUTHBOUND TRAINS MUST HAVE BOTH A SIGNAL TO PROCEED AND EC-1 AUTHORITY FROM THE 'FF' TRAIN DISPATCHER AT JACKSONVILLE BEFORE PASSING THE SOUTHWARD ABSOLUTE SIGNAL AT MP 362.5 HOLDOUT
MP S 362.5.

C. ALL TRAINS

1. ANY TRAIN ENTERING THIS SIGNAL SUSPENSION FROM ANY POINT MUST OBTAIN EC-1 AUTHORITY FROM THE TRAIN DISPATCHER.

ITEM 2 - METHOD OF OPERATION

A. BE GOVERNED BY OPERATING RULES 504.36 AND 504.37

1. PROVIDED EC-1 AUTHORITY IS GRANTED, IT WILL NOT BE NECESSARY FOR TRAINS TO STOP AT ABSOLUTE SIGNAL LOCATIONS AT: S. E. NASSAU, N. E. NASSAU, RICHLAND HOLDOUT, S. E. DIXIANA, N. E. DIXIANA AND S. E. CAYCE YARD

B. AUTHORITY FOR MOVEMENT

---------- ---------- ----- 1 ---------- ---------
BETWEEN LOCATION/MILEPOST I RULE IN EFFECT
---------- ---------- 1 ---------- ---------
N. E. WOODFORD MP S 385.1 AND I 505
MP 362.5 HOLDOUT MP s 362.5 I (TWC-D)
---------- ---------- ------- 1 ---------- ------- --
ITEM 3 - SWITCHES

A. THE POWER OPERATED SWITCHES AT S. E. NASSAU MP S 377.8, N. E. NASSAU MP S 376.5, S. E. DIXIANA MP S 366.5, N E. DIXIANA MP S 365.8 AND S. E . CAYCE YARD MP S 363.2 ARE SECURED IN HAND POSITION AND LINED FOR MOVEMENT ON THE MAIN TRACK.
TRAINS ARE NOT REQUIRED TO STOP AND EXAMINE THESE SWITCHES BEFORE PASSING THESE LOCATIONS.

B. ALL SWITCHES WITHIN THE LIMITS OF THE SIGNAL SUSPENSION WILL BE OPBRATBD IN ACCORDANCE WITH OPERATING RULES 401 AND 505.12 UNDER THE DIRECTION OF THE 'FF' TRAIN DISPATCHER AT JACKSONVILLE. TBM 4 - SPEEDS
TBM 4 - SPEEDS

A. UNLESS OTHERWISE RESTRICTED, THE MAXIMUM AUTHORIZED SPEED IS 59 MPH POR PASSBNGBR TRAINS AND 49 MPH POR FREIGHT TRAINS BBTWBBN N.E. WOODFORD MP S 385.1 AND MP 362.5 HOLDOUT

B. UNLESS FURTHER RESTRICTED, THE MAXIMUM AUTHORIZED SPEED FOR ALL TRAINS MAKING DIVERGING MOVES THROUGH CROSSOVERS OR TURNOUTS WITHIN THE LIMITS OF THE SIGNAL SUSPENSION IS 15 MPH.

APPENDIX 4

C S X T R A N S P O R T A T I O N
JUNE 22, 2018

HEADQUARTERS SUB SYSTEM BULLETIN 001

TO: T&E CREWS AND ALL CONCERNED
SUBJECT: 2018 3RD QUARTER SYSTEM BULLETIN REISSUE
EFFECTIVE: 0001HRS, JULY 1, 2018

OPERATING RULE CHANGES: 401.14, 505.11, & 505.12
EFFECTIVE: 2359HRS, MARCH 7, 2018 DOCUMENT NUMBER: 019

ITEM 1 - OPERATING RULE CHANGES

OPERATING RULES 401.14, 505.11, & 505.12 ARE CHANGED AS FOLLOWS:

401.14 THE EMPLOYEE WHO RESTORES A HAND-OPERATED MAIN TRACK SWITCH TO THE NORMAL POSITION FOR THE PURPOSE OF RELEASING AN AUTHORITY OR REPORTING BY A SPECIFIC LOCATION WHERE TWC-D RULES ARE IN EFFECT MUST:

1. REMAIN AT THE SWITCH UNTIL VERBALLY CONFIRMING WITH EACH CREWMEMBER THE SWITCH WAS RESTORED AND LOCKED IN NORMAL POSITION,
2. COMPLETE THE SWITCH POSITION AWARENESS FORM (SPAF) IN INK, AND
3. RETAIN THE SPAF UNTIL THE NEXT TOUR OF DUTY.

505.11 PRIOR TO RELEASING AN AUTHORITY OR REPORTING BY A SPECIFIC LOCATION, ALL CREW MEMBERS MUST AGREE IT IS SAFE TO DO SO. ALL CREWMEMBERS MUST BE PRESENT AND HEAR THE AUTHORITY BEING RELEASED. A TRAIN MUST NOT RELEASE OR REPORT BY A SPECIFIC LOCATION UNTIL AT LEAST ONE OF THE FOLLOWING CONDITIONS CONFIRMING THE TRAIN HAS CLEARED THE SPECIFIED LIMITS IS MET:

A. A CREWMEMBER OR OTHER EMPLOYEE OBSERVES THE REAR END MARKER OR CONFIRMS THE REAR CAR BY INITIAL AND NUMBER, OR
B. THE TRAIN PASSES A DEFECT DETECTOR THAT GIVES AN AXLE COUNT THAT AGREES WITH THE COUNT OF A PREVIOUS DEFECT DETECTOR OR AN ACTUAL COUNT MADE BY A CREWMEMBER, OR
C. THE TRAIN IS EQUIPPED WITH PROPERLY FUNCTIONING TELEMETRY THAT INDICATES:
   1. THE ENTIRE TRAIN IS INTACT,
   2. AIR PRESSURE READING ON THE REAR OF THE TRAIN IS EXPECTED READING, AND
   3. DISTANCE TRAVELED BY THE LEADING END OF THE TRAIN IS EITHER THE TRAIN'S LENGTH AS DETERMINED BY THE

ODOMETER ON THE HTD OR AT LEAST THREE MILES BEYOND THE CLEARING POINT.

505.12 WHEN HAND-OPERATED SWITCHES ARE USED, SUCH SWITCHES MUST BE RESTORED TO NORMAL POSITION BEFORE RELEASING AUTHORITY OR REPORTING BY A SPECIFIC LOCATION. IF ANY CREWMEMBER HAS DOUBT OR UNCERTAINTY ABOUT THE POSITION OF SUCH SWITCHES, THE AUTHORITY MUST NOT BE RELEASED. IF DOUBT OR UNCERTAINTY ARISES AFTER RELEASING OR REPORTING BY A SPECIFIC LOCATION, THE CREW MUST IMMEDIATELY CONTACT THE TRAIN DISPATCHER. REPORT THE FOLLOWING TO THE TRAIN DISPATCHER WHEN RELEASING AUTHORITY OR REPORTING BY A SPECIFIC LOCATION:

1. ALL CREWMEMBERS AGREE SWITCH(ES) RESTORED AND LOCKED NORMAL,
2. MILEPOST LOCATION OF SWITCH(ES) OPERATED,
3. CONFIRMATION SWITCH(ES) RESTORED AND LOCKED IN NORMAL POSITION,
4. TIME SWITCH WAS INITIALLY REVERSED,
5. TIME SWITCH WAS RESTORED AND LOCKED IN NORMAL POSITION, AND
6. NAME OF EMPLOYEE WHO RESTORED AND LOCKED SWITCH IN NORMAL POSITION.

APPENDIX 5

Whether the proposed collection is necessary for the FHWA's performance; (2) the accuracy of the estimated burdens; (3) ways for the FHWA to enhance the quality, usefulness, and clarity of the collected information; and (4) ways that the burden could be minimized, including the use of electronic technology, without reducing the quality of the collected information. The agency will summarize and/or include your comments in the request for OMB's clearance of this information collection.

Authority: The Paperwork Reduction Act of 1995; 44 U.S.C. Chapter 35, as amended; and 49 CFR 1.48.

Issued On: April 17, 2018.

Michael Howell,

Information Collection Officer .

[FR Doc. 2018–08394 Filed 4–20–18; 8:45 am]

BILLING CODE 4910–22–P

DEPARTMENT OF TRANSPORTATION

Federal Railroad Administration

[Docket No. FRA–2018–0037; Notice No. 1]
[Draft Safety Advisory 2018–01]

Draft Safety Advisory Related to Temporary Signal Suspensions

AGENCY: Federal Railroad Administration (FRA), Department of Transportation (DOT)

ACTION: Notice of draft Safety Advisory; request for comment.

SUMMARY: This document provides notice of FRA's intent to issue a Safety Advisory addressing railroad operations under temporary signal suspensions. The Safety Advisory would identify existing industry best practices railroads utilize when implementing temporary signal suspensions and would recommend that railroads conducting rail operations under temporary signal suspensions develop and implement procedures and practices consistent with the identified best practices. The Safety Advisory would also recommend that railroads take certain other actions to ensure the safety of railroad operations during temporary signal suspensions. FRA believes that actions consistent with the draft Safety Advisory will reduce the risk of serious injury or death both to railroad employees and members of the public. FRA invites public comment on all aspects of the draft Safety Advisory.

DATES: Interested persons are invited to submit comments on the draft Safety Advisory provided below on or before June 22, 2018.

ADDRESSES: Comments in response to this notice may be submitted by any of the following methods:

- *Website:* The Federal eRulemaking Portal, *www.Regulations.gov*. Follow the website's online instructions for submitting comments.
- *Fax:* 202–493–2251.
- *Mail:* Docket Management Facility, U.S. Department of Transportation, Room W12–140, 1200 New Jersey Avenue SE, Washington, DC 20590.
- *Hand Delivery:* Docket Management Facility, U.S. Department of Transportation, 1200 New Jersey Avenue SE, Room W12–140 on the Ground level of the West Building, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

Instructions: All submissions must include the agency name, docket name, and docket number for this notice, Docket No. FRA–2018–0037; Notice No. 1. Note that all comments received will be posted without change to *http://www.Regulations.gov*, including any personal information provided. Please see the Privacy Act Statement in this document.

FOR FURTHER INFORMATION CONTACT: Douglas Taylor, Staff Director, Operating Practices, Office of Railroad Safety, FRA, 1200 New Jersey Avenue SE, Washington, DC 20590, telephone (202) 493–6255; or Carolyn Hayward-Williams, Staff Director, Signal & Train Control Division, Office of Railroad Safety, FRA, 1200 New Jersey Avenue SE, Washington, DC 20590, telephone (202) 493–6399.

SUPPLEMENTARY INFORMATION:

Draft Safety Advisory

A review of FRA's accident/incident data shows that overall, rail transportation, both passenger and freight, is safe. However, recent rail accidents occurring in areas where a railroad has temporarily suspended the signal system, typically for purposes of maintenance, repair, or installation of additional components for a new or existing system, demonstrate that rail operations during the signal suspension present increased safety risks. Further, these accidents show that if the increased risks associated with rail operations under a temporary signal suspension are not addressed, serious unsafe conditions and practices are introduced into rail transportation.

Most recently, on February 4, 2018, both the engineer and conductor of National Railroad Passenger Corporation (Amtrak) Train P09103 were killed and 115 passengers injured,[1] when their train collided head-on with a CSX Transportation, Inc. freight train (Train F77703). The collision occurred at approximately 2:27 a.m. in Cayce, South Carolina when the Amtrak train, traveling south from New York City, New York, to Miami, Florida, and operating on a track warrant, was diverted from the main track through a misaligned switch. The misaligned switch sent the Amtrak train into the siding where the CSX train was parked, resulting in a head-on collision with an impact speed of 50 miles per hour (mph). The lead locomotive and six of the seven cars in the Amtrak train derailed. At the time of the accident, eight Amtrak crew members and 139 passengers were on board the train.

While the cause of the February 4, 2018, accident has not yet been determined, FRA's preliminary investigation indicates that despite the CSX train crew reporting to the train dispatcher that the switch was lined correctly, the crew did not restore the main track switch to its normal position as required by Federal regulation (49 CFR 218.105) and CSX's own operating rules. Instead, it appears the crew left the switch misaligned in the reverse position (*i.e.*, lined for the siding, not the main line). Amtrak Train P09103 was the next train to traverse this location. The misaligned switch diverted the Amtrak train into the siding and into the standing CSX train parked on the siding. Notably, CSX signal personnel had suspended the signal system for the area where the accident occurred to upgrade the system with positive train control (PTC) technology.[2] Signal personnel had stopped working for the day at the time of the accident, yet the temporary signal suspension remained in place.

The National Transportation Safety Board (NTSB) is investigating this accident under its legal authority. 49 U.S.C. 1101 *et seq.*; 49 CFR 831.2(b). As is customary, FRA is participating in the NTSB's investigation and is also investigating the accident under its own authority. 49 U.S.C. 20902; 49 CFR 1.89(a). While NTSB has not yet issued any formal findings, on February 13, 2018, NTSB issued a Safety Recommendation Report[3] regarding

[1] Including 92 individuals who were transported to medical facilities for treatment and 23 people who received first aid at a triage area established near the accident site.

[2] PTC is a system designed to prevent train-to-train collisions, overspeed derailments, incursions into established work zone limits, and the movement of a train through a switch left in the wrong position, as described in subpart I of 49 CFR part 236 and 49 U.S.C. 20157(i)(5).

[3] NTSB, Safety Recommendation Report: Train Operation During Signal Suspension, Report No. RSR–18/01, Recommendation No. R–18–005 (Feb.

Continued

train operations during signal suspensions to FRA. In its report, NTSB recommended that FRA issue an emergency order directing railroads to require train crews to approach switches at restricted speed when signal suspensions are in effect and a switch has been reported relined for a main track. NTSB further recommended that after the switch position is verified, train crews should be required to report to the dispatcher that the switch is correctly lined for the main track before subsequent trains are permitted to operate at maximum-authorized speed. FRA is issuing this draft Safety Advisory consistent with the NTSB's recommendation. Issuance of a Safety Advisory allows FRA to make all railroads aware of both the safety concerns identified and information and practices that specifically address the issues raised. Moreover, issuance of a Safety Advisory provides all railroads the flexibility to review and revise their existing operating rules and practices as necessary to ensure the safety of their rail operations, without imposing rigid, and inherently limited, new requirements on the industry.

As noted in the NTSB Report, a similar accident occurred on March 14, 2016, near Granger, Wyoming, when at 9:41 p.m., a westbound Union Pacific Railroad (UP) freight train (Train KG1LAC–13) traveled from the main track through a switch into a controlled siding and collided head-on with a standing eastbound UP freight train (Train LCK41–14). The collision occurred at a recorded speed of 30 mph and the engineer of the striking train sustained minor injuries. Similar to the recent accident in Cayce, South Carolina, at the time of this 2016 accident, UP was installing and testing PTC technology on the main track. While this work was in progress, UP suspended the signals in the area and established absolute blocks intended to provide for the safe movement of trains through the area without signals. NTSB determined the probable cause of the accident was the employee-in-charge incorrectly using information from a conversation with the train dispatcher as authorization to send a train into the area where the signal system suspension was in effect. The NTSB also found that a contributing factor was the involved conductor pilot's failure to check the switch position before authorizing the train to enter the area.

The trains involved in both the Cayce, South Carolina, and Granger, Wyoming, accidents were operating under temporary signal suspensions where the signal systems that would normally govern operations through the areas were suspended as the railroads installed additional components to comply with the statutory mandate to implement a PTC system.

FRA realizes that railroads suspend signal systems for a variety of reasons, including for example, maintenance or repair purposes, to install a new system, or to add additional components to an existing system. Although temporary signal suspensions are necessarily common occurrences, rail operations under signal suspensions should be rare and appropriately limited. FRA believes that, as exemplified by the accidents described above, rail operations under the temporary loss of protections provided by an existing signal system have a high potential of introducing new safety risks and amplify the safety risks encountered because railroad employees accustomed to the safety an existing signal system provides must operate in an environment they may not encounter on a regular basis. Indeed, a temporary signal suspension requires operating employees to immediately apply operating rules and practices different than those to which they are accustomed. Because a person's routine may include learned habits that are difficult to set aside when a temporary condition is imposed, operating employees may also need specialized instruction on the applicable rules and practices. Such risks must be addressed to provide for the safety of train operations during the loss of protection afforded by the signal system. Moreover, if a railroad elects to operate trains in signal suspension territory, the scope of the signal suspension should be limited in both geographic area and duration and rail operations through or within the territory should be limited.

Federal regulations do not prohibit railroads from temporarily suspending existing signal systems for purposes of performing maintenance, upgrades, repairs, or implementing PTC technology. However, FRA regulations in 49 CFR part 235 require railroads to apply for FRA approval for certain discontinuances and modifications of signal systems. Specifically, FRA's regulations provide for both a formal approval process in 49 CFR 235.5 for a variety of signal system changes and also an expedited approval process in 49 CFR 235.6 for modifications directly associated with the implementation of a PTC system. Although the safety of railroad operations during temporary signal suspensions may be addressed under these approval processes, part 235 also excludes various signal system changes from FRA approval (49 CFR 235.7).

FRA's regulations also require individual railroads to adopt and comply with operating rules addressing the operation of hand-operated main track switches. *See* 49 CFR 218.105. Specifically, § 218.105 requires railroads to designate in writing the normal position of hand-operated main track switches and, with limited exceptions, requires those switches to be lined and locked in the designated position when not in use. That same section requires employees to conduct a job briefing before leaving a location where any hand-operated main track switch was operated and all crewmembers to communicate to confirm the position of the switch. Further, § 218.105 generally requires an employee releasing the limits of a main track authority in non-signaled territory (including an area under temporary signal suspension) where a hand-operated switch is used to clear the main track to report to the train dispatcher that the hand-operated main track switch has been restored to its normal position and locked, prior to departing the switch's location and after conducting the required job briefing. Upon the employee's report, § 218.105 requires the train dispatcher to repeat the reported switch position information to the employee releasing the limits and requires the employee releasing the limits to confirm to the train dispatcher that the information is correct.

In addition to these regulatory requirements, virtually all railroads have adopted additional operational protections to ensure the safety of rail operations when an existing signal system is temporarily suspended. FRA reviewed the current operating practices of several railroads and engaged in discussions with these railroads to identify the industry's best safety practices related to temporary suspension of an existing signal system. As a result of this outreach, FRA believes that certain operational safeguards railroads already undertake constitute the best practices within the industry when temporarily suspending a signal system. These best practices, include:

- Take all practical measures to ensure sufficient personnel are present to continue signal work until the system is restored to proper operation. If sufficient personnel are not present, the signal suspension should be terminated until such time as sufficient personnel are on hand.
- If a railroad elects to allow train traffic through suspension limits:

13, 2018), *https://www.ntsb.gov/investigations/AccidentReports/Reports/RSR1801.pdf* (NTSB Report).

○ Establish the smallest limits possible for the signal suspension (if possible, no more than three (3) control points or use phased limits to allow restoration of the signal system as work is completed);

○ Minimize the duration of the signal suspension to the shortest time period possible (if possible, no more than twelve (12) hours); and

○ Take all practical measures to ensure only through traffic is allowed to operate within the limits (avoiding any train meets or any moves requiring the manipulation of switches within the suspension limits).

• If any switches within the suspension limits are manipulated, consistent with 49 CFR 218.105(d), establish an effective means of verifying that all switches have been returned to the proper position prior to any train traffic operating through the limits. (For example, require spiking or clamping of switches followed by locking for through movement after use; utilize a signal employee to tend the switch and to establish agreement between assigned crewmembers and the switch tender that the switch is properly lined; and/or require the first train through the limits after the manipulation of any switch to operate at restricted speed).

Recommendations: Considering the accidents discussed above, and to ensure the safety of the Nation's railroads, their employees, and the public, FRA recommends that railroads take actions consistent with the following:

1. Develop and implement procedures and practices consistent with the industry best practices discussed above for rail operations conducted under temporary signal suspensions.

2. Inform employees of the circumstances surrounding the February 4, 2018, accident in Cayce, South Carolina, and the March 14, 2016, accident near Granger, Wyoming, discussed above, emphasizing the potential consequences of misaligned switches and the relevant Federal regulations and railroad operating rules intended to prevent such accidents.

3. Review, and as appropriate, revise all operating rules related to operating hand-operated main track switches (including operating rules required by 49 CFR 218.105(d)), to enhance them to ensure (a) train crews and others restore switches to their normal position after use, and (b) the position of switches are clearly communicated to train control employees and/or dispatcher(s) responsible for the movement of trains through the area where the signal system is temporarily suspended. In doing so, railroads should pay particular attention to those main track switches where employees report clear of the main track to the train dispatcher.

4. Increase supervisory operational oversight and conduct operational testing on the applicable operating rules pertaining to the operation of hand-operated main track switches. This should include face-to-face initial job briefings with all train and engine (T&E) crews that will operate in any area where the signal system will be temporarily suspended.

5. Enhance instruction on the relevant operating rules concerning the operation of hand-operated main track switches in non-signaled areas, including the operating rules required by 49 CFR 218.105(d) during both initial and periodic instruction required by 49 CFR 217.11. In doing so, railroads should emphasize the applicability of the rules to area(s) where the signal system is temporarily suspended and the need to ensure and verify that all hand-operated main track switches manipulated within any suspension limits have been returned to the proper position prior to operating any trains through the limits.

6. Stress to T&E employees the importance of thorough and accurate job briefings when operating hand-operated main track switches, particularly in areas where the signal system is temporarily suspended, and specifically when releasing main track authority. Ensure adequate processes and procedures are in place enabling clear and timely communication of switch positions between and among all dispatching, T&E, and train control employees responsible for operating, performing work, or authorizing trains to operate through areas where the signal system is temporarily suspended, including processes and procedures for communicating switch position information during shift handovers. Encourage employees, in case of any doubt or uncertainty regarding the position of such switches, to immediately contact the train dispatcher or take other appropriate action to confirm the position of the switch prior to authorizing a train to operate through the limits of the area.

FRA requests public comment on all aspects of this draft Safety Advisory.

Privacy Act Statement: Anyone can search the electronic form of all comments received into any of DOT's dockets by the name of the individual submitting the comment (or signing the comment, if submitted on behalf of an association, business, labor union, etc.). You may review DOT's complete Privacy Act Statement in the **Federal Register** published on April 11, 2000 (65 FR 19477), or you may visit *http://www.regulations.gov/#!privacyNotice.*

Issued in Washington, DC, on April 18, 2018.

Ronald Louis Batory,

Administrator.

[FR Doc. 2018–08406 Filed 4–20–18; 8:45 am]

BILLING CODE 4910–06–P

DEPARTMENT OF TRANSPORTATION

Pipeline and Hazardous Materials Safety Administration

[Docket No. PHMSA–2018–0008]

Pipeline Safety: Information Collection Activities

AGENCY: Pipeline and Hazardous Materials Safety Administration, DOT.

ACTION: Notice and request for comments.

SUMMARY: On February 12, 2018, in accordance with the Paperwork Reduction Act of 1995, the Pipeline and Hazardous Materials Safety Administration (PHMSA) published a notice in the **Federal Register** (83 FR 6088) inviting comments on the information collection identified by OMB control number 2137–0049 that expires on April 30, 2018. PHMSA is requesting an extension with no change for this information collection.

During the public comment period, PHMSA received no comments in response to the information collection. PHMSA received six comments that did not pertain to the information collection request. PHMSA is publishing this notice to provide the public with an additional 30 days to comment on the renewal of the information collection referenced above and to announce that the Information Collection Request will be submitted to OMB for approval.

DATES: Interested persons are invited to submit comments on or before May 23, 2018 to be assured of consideration.

FOR FURTHER INFORMATION CONTACT: Angela Dow by telephone at 202–366–1246, by email at *angela.dow@dot.gov,* by fax at 202–366–4566, or by mail at U.S. Department of Transportation, PHMSA, 1200 New Jersey Avenue SE, PHP–30, Washington, DC 20590–0001.

ADDRESSES: You may submit comments identified by the docket number PHMSA–2018–0008 by any of the following methods:

• *Fax:* 1–202–395–5806.

• *Mail:* Office of Information and Regulatory Affairs, Records Management Center, Room 10102 NEOB, 725 17th Street NW, Washington, DC 20503, ATTN: Desk

APPENDIX 6

CSX TRANSPORTATION SIGNAL SUSPENSION
Operating Plan

Overview

Following recent incidents, the FRA has issued a proposed Safety Advisory to enhance safety when a railroad institutes a temporary signal suspension. The proposed Safety Advisory contains the following recommended best practices:

1. Ensure sufficient personnel are utilized to continue work until the system is restored.
2. If train traffic is allowed within the limits during the suspension
    a. Establish smallest possible limits
        i. No more than three control points if possible
    b. Minimize the duration of the signal suspension
        i. No more than 12 hours if possible
    c. Take measures to ensure only through traffic is allowed to operate
        i. Avoid any movements that require the manipulation of switches
3. If switches are manipulated by hand, establish effective means of verifying that all switches have been returned to the proper position prior to any train traffic. Examples include:
    a. Spiking or clamping with lock
    b. Signal employee serving as switch tender
        i. Establish process to ensure agreement between switch tender and train crew; and/or
    c. Require first train through the limits (after switches have been operated) to proceed through the limits at Restricted Speed.

CSXT Signal Suspension Operating Plan

- Job briefings and oversight
    - Transportation crews receive job briefings before operating through limits
        - Face to face with supervisor where possible, or
        - Dedicated job briefing phone line manned by supervisors
            - Number for employees to contact supervisor provided on dispatcher messages.
        - Foreign line employees
            - Job briefing by direct supervisors, or
            - Job briefing by CSX supervisors by one of the methods listed above
    - Transportation supervisors will monitor train activity within limits to include operational testing
    - Train dispatchers receive job briefing from operations center supervisors
    - Operations center supervisors will monitor activity to include operational testing

- CSXT Signal Department will ensure:
    - Adequate staffing at work locations to complete planned work in timely manner
    - Only necessary control points affected
    - Once the train dispatcher authorize the signal suspension start, the signal department will place all switches on hand and secure every switch within the limits with a craft specific lock and red tag. The signal department will report the position of switches and the applied craft

specific locks to the train dispatcher. Signal Department craft specific lock.

- Operations center
    - When train dispatcher authorizes a switch to be placed in a position other than normal, the dispatcher will apply a switch tag (electronic CAD's function) to the switch being used. Once the switch is restored to normal position (as verified by steps below), the dispatcher will remove the switch tag.
    - Dispatcher turnover will consist of a thorough job briefing regarding the status of any switches that are in other than normal position.

- Train operations
    - Industrial and other switching will be discontinued during signal suspension
    - Planned train meets will occur outside of suspension limits
    - Position of switches will be coordinated between train dispatchers and on-sight signal department employees

        - If switches are required to be operated for train route:
            - The train dispatcher will authorize the train crew or switch tender to operate the switch.
            - The train crew or switch tender will communicate with the signal department to unlock the switch. The crewmember or switch tender will line the switch for the train route.
            - The signal department verify switch is properly lined and secure the switch with a craft specific lock and red tag before the train movement
            - After the train movement is made, the switch will be restored by the train crew or switch tender and secured by the signal department using a craft specific lock and red tag.
            - The train crew or switch tender will report to the train dispatcher the switch has been restored, secured by the signal department, and communicate the SPAF requirements. Train Crew instructed to not pass location where switches were operated until confirming switch position with Switch Tender

    - Once the train dispatcher authorizes the cancellation of the signal suspension, the signal department will place all switches on power and remove their craft specific locks, red tags and secure every switch within the limits with a transportation switch lock.

Conclusion

The operating plan as outlined above creates additional safety measures for signal suspensions. In addition to existing rules governing the use of hand operated switches. This plan incorporates the best practices outlined in the FRA Safety Advisory and provides redundant verification of switch position.

1. **Other System Special Instructions**

a. **Host Railroad Operating Rules involving Signal Suspensions**

The following operating rules apply on host railroads during signal suspensions:

- **GCOR** – Track Warrant Control (TWC), Rule 9.23 – Signal Suspensions
- **CSX** – Track Warrant Control Non Signaled (TWC-D), Rule 504.36 & 504.37(Signal Suspensions)
- **NS** – Rule 171: Non Signaled Track – Mandatory Directive Authorizes Movement, Rule 298: Operating Instructions during Suspension of the Signal System.
- **CN** (USOR) – Rule 1003 – Track Authority Outside CTC Territory, Rule 863 & 864
- **CN** (CROR) – Occupancy Control System (OCS) Rules
- **BBRR** – Track Warrant Control (TWC) Rule 505, Rule 504.36 & 504.37
- **NORAC** – Form D Control System (DCS) Rules 400-406; ABS Failure: Non-signaled DCS Substitution

b. **Amtrak Trains Operating During Planned Signal Suspensions**

The following new system instruction applies to Amtrak trains operating on host railroads.

To ensure passenger train safety, in addition to complying with all host railroad operating rules and special instructions during planned signal suspensions, train crews of Amtrak trains operating in territory with a planned signal suspension where Positive Train Control (PTC), Cab Signals and wayside block signal systems are not in service must perform the following tasks:

- Crews must conduct a pre-trip job briefing to identify and discuss <u>any facing point switches</u> within the limits of the signal suspension.
- Conductor must remind the locomotive Engineer of the approach to the signal suspension area and <u>all facing point switches</u> within the limits. This reminder must be made no less than 2 miles prior and no more than 5 miles before entering the signal suspension area.
- Train must not pass over facing point switches until the engineer or conductor visually determines that the switches are properly lined for the intended movement.
- If facing point switches are improperly lined, crews must stop the train and inform the controlling Train Dispatcher immediately.

c. **Planned Signal Suspensions CSX Territory – South End Subdivision**

As information, CSX Signal Suspensions are planned between the following locations:

- **CSX Florence Division, South End Subdivision**

  <u>Expected Start Time and Date</u>: 8:00 A.M. Monday, March 05, 2018

  - Between South Sellers (MP A 275.5) and Maple (MP A 262.8)

- **CSX Jacksonville Division, Tampa Terminal Subdivision**

  <u>Expected Start Time and Date</u>: 8:00 A.M. Saturday, March 10, 2018

  - Between End of Main Track (MP A 881.7) and S.E. Uceta (MP A 878.8)

    <u>Note</u>: Due to presence of Railroad Crossings at Grade within the signal suspension limits at TN and 14th Street, crew pre-trip job briefings must include a discussion of the requirements of CSX Rule 311.1.

Shawn K. Gordon, AVP – Transportation, Southeast Division

APPENDIX 8

Amtrak Locomotive Engineer (P-91):

Previous Time Off	On Duty Date/Time	Off Duty Date/Time	Total Time On Duty
Day Off	01/26/2017		
Day Off	01/27/2018		
52 hours, 5 minutes	01/28/2018-7:35 a.m.	01/28/2018-11:49 a.m.	4 hours, 14 minutes
5 hours, 10 minutes	01/28/2018-4:59 p.m.	01/28/2018-11:09 p.m.	6 hours, 10 minutes
Day Off	01/29/2018		
Day Off	01/30/2018		
Day Off	01/31/2018		
Day Off	02/01/2018		
Day Off	02/02/2018		
5 Days	02/03/2018-10:43 p.m.	02/04/2018-2:27 a.m.	time of accident

Amtrak Conductor (P-91):

Previous Time Off	On Duty Date/Time	Off Duty Date/Time	Total Time On Duty
Day Off	01/25/2018		
26 hours, 44 minutes	01/26/2018-2:35 a.m.	01/26/2018-9:37 a.m.	7 hours, 2 minutes
12 hours, 26 minutes	01/26/2018-10:03 p.m.	01/27/2018-7:04 a.m.	9 hours, 1 minute
Day Off	01/28/2018		
Day Off	01/29/2018		
Day Off	01/30/2018		
81 hours, 14 minutes	01/31/2018-4:17 p.m.	02/01/2018-12:04 a.m.	7 hours, 47 minutes
26 hours, 31 minutes	02/02/2018-2:35 a.m.	02/03/2018-9:24 a.m.	6 hours, 49 minutes
13 hours, 19 minutes	02/03/2018-10:43 p.m.	02/04/2018-2 :27 a.m.	time of accident

CSXT Locomotive Engineer (F777-03):

Previous Time Off	On Duty Date/Time	Off Duty Date/Time	Total Time On Duty
Off Day	01/25/2018		
Off Day	01/26/2018		
Off Day	01/27/2018		
Off Day	01/28/2018		
4 Days	01/29/2018-3:30 p.m.	01/30/2018-12:11 a.m.	8 hours, 41 minutes
15 hours, 19 minutes	01/30/2018-3:30 p.m.	01/30/2018-11:23 p.m.	7 hours, 52 minutes
64 hours, 8 minutes	02/02/2018-3:00 p.m.	02/02/2018-11:22 p.m.	7 hours, 52 minutes
16 hours, 8 minutes	02/03/2018-3:00 p.m.	02/03/2018-2:27 a.m.	Time of accident

CSXT Conductor (F777-03):

Previous Time Off	On Duty Date/Time	Off Duty Date/Time	Total Time On Duty
Off	01/25/2018		
Off	01/26/2018		
84 hours, 40 minutes	01/27/2018-3:30 p.m.	01/27/2018-11:25 p.m.	7 hours, 55 minutes
16 hours, 5 minutes	01/28/2018-3;30 p.m.	01/28/2018-11:21 p.m.	7 hours, 51 minutes
16 hours, 9 minutes	01/29/2018-3:30 p.m.	01/30/2018-12:10 a.m.	8 hours, 40 minutes
15 hours, 20 minutes	01/30/2018-3:30 p.m.	01/30/2018-11:21 p.m.	7 hours, 51 minutes
Off	01/31/2018		
Off	02/01/2018		
64 hours, 9 minutes	02/02/208-3:00 p.m.	02/02/2018-11:21 p.m.	7 hours, 51 minutes
16 hours, 7 minutes	02/03/2018-3:00 p.m.	02/04/2018-2:27 a.m.	Time of accident

APPENDIX 9

U.S. Department
Of Transportation

**Federal Railroad
Administration**

Research Results

**RR07-04
April 2007**

Development of a Switch Point Monitoring System in Non-Signaled Territory

SUMMARY

The key objective of the Switch Point Monitoring System (SPMS) is to monitor, detect, and report improperly aligned switches on main tracks, which could compromise the safe movement of trains in non-signaled territory. When an improper switch point alignment is detected, the system will convey the information through a wireless network to the train dispatch system, allowing the train dispatcher to provide safe mitigation of the reported switch anomaly. SPMS provides an innovative, low-cost, closed-loop technology for improvement of freight and passenger train railway safety, affording a safer transportation environment at the community and industry levels by preventing train collisions and derailments.

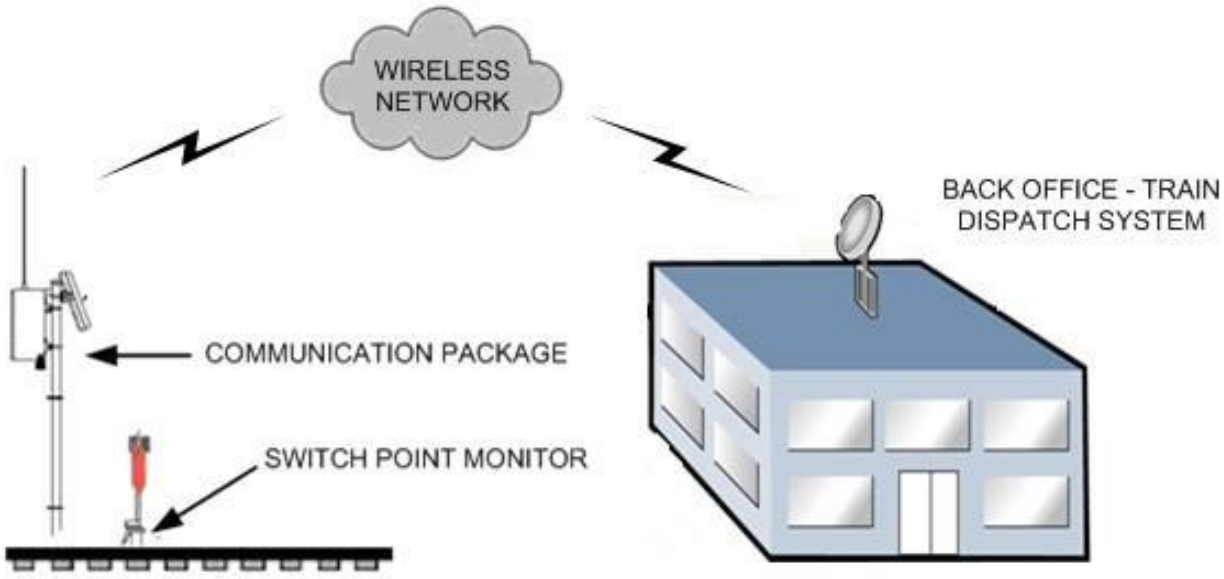


Figure 1. High-Speed Wireless Data Network for Railroad Operation

INTRODUCTION

The rail industry continues to experience incidents caused by switches improperly lined in main track non-signaled territory. In 2004, eight accidents resulted in injuries to eight railroad employees; in January 2005, three major accidents were caused by improperly lined switches in main track non- signaled territory.

As a result of this ongoing issue troubling the rail industry, the BNSF Railway and the Federal Railroad Administration (FRA) are piloting a project demonstrating a method of monitoring switches in non-signaled territory to safely find and correct situations where switches are left in an improperly lined position.

TECHNICAL OBJECTIVE

As its name suggests, SPMS aims to monitor, detect, and report switch point gapping for switches on main tracks in non-signaled territory in order to prevent unsafe train movements. Improper switch point alignments are discovered and conveyed through a wireless data radio to the train dispatch system, allowing the train dispatcher to provide safe mitigation of the reported switch anomaly. SPMS also adds the benefit of a low- cost, easy-to-implement technology toward the improvement of freight and passenger train railway safety.

The current environment in non-signaled main track territory has the train dispatcher relying on verbal communication with train or ground crews to determine if switches are left lined for the main track. The implementation of SPMS to detect and show improperly aligned switches in non-signaled main track territory would essentially eliminate the need for verbal communication and lower the potential for human errors occurring in that medium of communication.

The demonstration system involves the installation of switch position monitoring devices on areas of track where switches are outside of signal systems and restricted limits operations. These monitoring devices communicate through a data radio to a data network, then onto a train dispatching system. The dispatching system software checks the position of the switches before allowing the issuance of track warrants, thus eliminating the potential of issuing a track warrant over a switch that was not properly lined for train movement.

Figure 2. Apparatus at the Switch

SYSTEM OVERVIEW

The SPMS monitoring project is comprised of a wireless communication system that interfaces with switch point monitoring devices known as switch circuit controllers (SWCC). The com- munication link provides the means to transmit switch position information in a closed-loop methodology to the back office computer-aided dispatch system.

Closed-loop methodology safeguards against loss of communication from the wayside to the back office and assures that the switch position reported from the wayside is timely and not latent information. In the event that the communication

Figure 3. Solar-Powered Wayside Interface with Radio

link with the wayside is lost, the safest mode of operations is assumed from an operating rules perspective to protect train movements over a non-communicating switch monitoring device.

The switch position information received from the monitoring device is interlocked into the current train dispatch system to provide the train dispatcher with near real-time alerts of switches in non- signaled territory that are in a position other than what is expected by the train dispatcher.

These exceptions are brought to the train dispatcher's attention through a graphical user interface (GUI) from the train dispatch system, which allows him or her to intercede regarding any unsafe train movements.

This switch monitoring approach allows for the migration into a current technology being tested on the Beardstown Subdivision for a positive train control- (PTC) type overlay system known as the Electronic Train Management System (ETMS). This ETMS technology allows switch positions to be conveyed directly to the locomotive for predictive enforcement of train movements over switches with exceptions.

SPMS will be developed as a safety closed-loop overlay that works in conjunction with existing operating rules and processes.

Installation of the field equipment and office software would allow the dispatcher to determine the actual position of switches under track warrant control. This ability would cross-check the communication with personnel who have thrown or reported switch position. Determination of the actual switch position through indications to the dispatch system allows checks to be performed automatically, eliminating the need for dispatch personnel to record these separately.

The ability to automatically determine the switch position allows the dispatcher, using the dispatch system, to issue movement authorities over those properly lined switches without the need for the train crew to stop their train at the switch. Conversely and more importantly, switches that are improperly lined for the movement would be automatically indicated to the dispatch system. Therefore, the dispatcher will not issue a track warrant, which could potentially send the train to the incorrect track and cause a collision or derailment.

IMPLEMENTATION AND TESTING

The field portion of the demonstration project will be on BNSF's Avard Subdivision, which runs between Avard (northwest), OK, and Tulsa (northeast), OK. There are currently 49 SPMS locations installed and being monitored in the State of Oklahoma on the Avard Subdivision. SPMS automatically relays information about switch point integrity to the train dispatch system located in Fort Worth, TX, at the Network Operations Center.

The technology being used is a mix of mature and proven products, as well as technology applied in rail and other industries. The SPMS will build upon this proven foundation to provide an additional layer of protection in train operations. The technology and infrastructure is transferable to existing networks of other railroads, allowing this innovative, closed-loop technology to improve freight and passenger train safety industry-wide.

Figure 4. A Typical Installation

The infrastructure required to support SPMS is comprised of wayside switch monitoring equipment, office dispatch system software, and data communication equipment. Propagation studies have identified the distribution of the radios required for system operation.

The switch monitoring devices (SWCCs) are standard signal devices used in wayside signal systems. The US&S U-5 vital switch controllers are used in detecting the switch position. The data radios are Meteorcomm's 545C packet data radio operating at 44.58 MHz. This data radio is currently in use with BNSF's ETMS and Hy-Rail Limits Compliance System (HLCS). The interface between the SWCC and packet data radio is an I/O interface module that is currently being used for ETMS.

The wayside equipment, office software changes, and operational procedures have been augmented during the evaluation of this project. The office segment was developed and deployed during the test and evaluation phases. Several changes were made as the evaluation continued. It should be pointed out that SPMS was developed as a safety critical closed- looped overlay. There is no single point of failure in the

system design that does not report the failure to the dispatch system. The failure reporting would initiate human intervention to prevent and/or mitigate an unsafe switch position in track warrant control territory.

The SPMS has been in service on the Avard Subdivision since November 2005. Since that time, minimal issues have arisen that can be addressed easily. There were occasional commercial telecommunication outages, and sporadic maintenance was needed to adjust the switch points. These are normal day-to-day anomalies that the railroads experience in their typical daily operation. Very infrequently, a wayside radio may lock itself out from communicating with the network, until it is reset. When this happens, the crew is instructed to inspect the switch points visually before traversing the switch. This issue is with the radio firmware, which will be addressed after this evaluation period.

MIGRATION PATH

This switch point monitoring technology allows for its migration into other technologies being developed. The components that are used at the switch location can be used to provide power-assist remote control of a switch in non-signal territory from remote train dispatch central offices. This migration step would provide additional protection and security, along with the ability to improve safety, increase operational efficiency, and enhance train velocity.

The SPMS can also migrate to be used with PTC systems. It has been specifically designed to integrate with ETMS, a PTC system currently being tested on the Beardstown Subdivision. This integration allows the wayside device to use ETMS technology and transmit switch position information directly to the locomotive for predictive brake enforcement of trains when switches are improperly aligned.

NEXT STEPS

The SPMS has been successful on the initial implementation pilot area. Since then BNSF Railway has further implemented this system partially on another subdivision and is reviewing other areas where this system can provide benefits.

ACKNOWLEDGEMENTS

The SPMS was sponsored by the BNSF Railway and FRA's Office of Research and Development.

Meteor Communications, Inc. provided special support in the testing and implementation.

Gary Gaumer and William Richard, BNSF signal managers, provided office/field installation and testing support.

Michael Bratcher, Senior Director of Train Control Systems, and Richard Bowden, Assistant Director Signal Engineering, provided technical design and integration support.

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CONTACT

Terry Tse
Federal Railroad Administration Office of Research and Development 1120 Vermont Ave. NW–Mail Stop 20
Washington, DC 20590 Email:
terry.tse@dot.gov

KEYWORDS

Switch point monitoring, wireless communication, Meteorcomm, non-signaled territory, dispatch system

APPENDIX 10

Federal Railroad Administration
Railroad Safety Advisory Committee
Fact Sheet

About the Railroad Safety Advisory Committee (RSAC)

History

- The Federal Railroad Administration (FRA) originally convened RSAC in 1994 as an ad hoc regulatory advisory committee to address roadway worker safety. That process produced a new rule resulting in the reduction deaths and injuries of track side workers, and demonstrated the need for a permanent formal, collaborative advisory committee.

- In March 1996, FRA established the Railroad Safety Advisory Committee (RSAC) to provide advice and consensus-based recommendations to the FRA on railroad safety matters. Today, 60 voting representatives drawn from 39 member organizations representing large and small railroads, rail labor organizations, state associations, rail passenger representatives, manufacturers and suppliers.

RSAC Background

- As a Federal Advisory Committee, RSAC provides invaluable input to the FRA regarding the development new regulations, the review and revision of existing regulations, statutory requirements, and identification of non-regulatory alternatives for the improvement of railroad safety in the United States. RSAC also provides advice and recommendations on specific tasks assigned to it by FRA, which the agency utilizes as the basis for some proposed and final regulatory actions.

RSAC Process

- FRA identifies a problem that may be solved through regulatory action. FRA sends a written problem statement to RSAC in the form of a "formal task."
- RSAC may accept or reject the task, or ask that it be restructured.
- Once accepted RSAC establishes a working group with the necessary expertise to define the safety problem presented, gather relevant facts, develop a range of options, and decide upon a recommended option.
- When a task is assigned, FRA sets a target date for the presentation of the RSAC's recommendations to the FRA Administrator. FRA may withdraw a task from the RSAC at any time and promulgate a rule through traditional rulemaking.
- RSAC receives the working group report and considers whether to adopt the recommendations.
- Once adopted, RSAC makes recommendations to the FRA Administrator for action. Following the FRA Administrator's approval, FRA publishes proposed and final rulemaking actions.

RSAC Members

- The RSAC is made up of 60 voting representatives drawn from 39 member organizations representing large and small railroads, rail labor organizations, state associations, rail passenger representatives, manufacturers and suppliers. In addition, it has non-voting advisors from agencies with rail safety responsibilities in Canada and Mexico, and advisory representatives of the National Transportation Safety Board, Transportation Security Administration, and the Federal Transit Administration. Click here for the membership list.

Significant Accomplishments

Since 1996, the RSAC has accepted 39 tasks resulting in rulemakings covering critical safety areas such as:

2. Track Safety Standards
3. Locomotive Crashworthiness
4. Passenger Equipment Safety Standards
5. Roadway Worker Protection

APPENDIX 11

Department of Transportation
Federal Railroad Administration

Railroad Safety Advisory Committee Task Statement: **Safety Technology in Dark Territory**
Task No.: 10-02
Date initially presented to the RSAC: September 23, 2010

Purpose: To prescribe standards, guidance, regulations, or orders governing the development, use, and implementation of rail safety technology in dark territory, as required by SEC. 406 of the Rail Safety Improvement Act of 2008 (Act).

Description:
Review the applicable content and scope of the existing signal and train control regulations as authorized by the Signal Inspection Act and the Federal Railroad Safety Act in order to determine their application to the use of safety technologies in dark (non-signaled) territory.
Review the applicable content and scope of other existing federal regulations which are associated with the use of advanced technology and may provide additional insight/direction.
Assist FRA in developing/identifying additional appropriate/applicable standards, guidance, regulations, or orders responsive to the legislative mandate.
Help to ensure the appropriate and safe development and use of safety technologies in dark territories.
Help to determine a reasonable method for safety technology inventory and system awareness by FRA.

Issues requiring specific report:
What criteria should be used to determine existing rule applicability?
What criteria can be developed for the regulated community to determine cost effectiveness?
How can the use of safety technology in dark territory address risk mitigation and what impact can such technology have on a railroad's Railroad Safety Technology Plan required by 49 USC 20156(e)?
Will underlying functions of safety technologies (e.g., switch position monitoring, track circuit integrity, other similar rail safety technologies), as determined by the Secretary, be implemented well before eventual PTC systems?
How should modifications or discontinuances of safety technologies be addressed following initial implementation?

Source: 49 U.S.C. § 20162, as enacted by section 406 of Division A, Public Law No. 110-432.

Refer to/establish following working group: Safety Technology in Dark Territory Working Group

Target Dates: Report recommendations for proposed or interim final rule (as determined by FRA in consultation with the Office of the Secretary of Transportation and the Office of Management and Budget) by September 30, 2011.

Disposition: Accepted Date: 23 September, 2010

APPENDIX 12

National Transportation Safety Board

Washington, DC 20594

Safety Recommendation Report Train Operation During Signal Suspension

Accident/Incident Number:	RRD18MR003
Operator:	CSX Transportation
Accident:	Amtrak/CSX Train Collision
Location:	Cayce, South Carolina
Date:	February 4, 2018
Recommendation Number:	R-18-005
Adopted:	February 13, 2018

The National Transportation Safety Board (NTSB) is investigating a head-on collision that occurred on February 4, 2018, about 2:27 a.m. eastern standard time on the CSX Transportation (CSX) Columbia Subdivision in Cayce, South Carolina. Southbound Amtrak train 91, operating on a track warrant, diverted from the main track through a reversed hand-thrown switch into a siding and collided head-on with stationary CSX local freight train F777 03.[1]

The engineer and conductor of the Amtrak train died as a result of the collision. At least 92 passengers and crewmembers on the Amtrak train were transported to medical facilities. The engineer of the stopped CSX train had exited the lead locomotive before the Amtrak train entered the siding, ran to safety, and was not injured. The conductor of the CSX lead locomotive saw the Amtrak train approaching in the siding and ran to the back of locomotive. The conductor was thrown off the locomotive and sustained minor injuries.

The normal method of train operation on the subdivision was a traffic control system with wayside signals. Signal indications authorize movement in either direction. On the day before the accident, February 3, 2018, CSX signal personnel suspended the traffic control signal system to install updated traffic control system components for implementing positive train control (PTC) on the subdivision. During this time, scheduled to last through February 4, 2018, the signals would not operate and dispatchers would use track warrants to move trains through absolute blocks in the

[1] *Track warrant* is a method of authorizing movements or protecting employees or on-track equipment in signaled or non-signaled territory on controlled track within specified signals. These movements are under the jurisdiction of the train dispatcher.

work territory.[2] Although the installation was only partially complete, the signal personnel stopped work at the accident location at 7:00 p.m., and the signal suspension remained in place.

Previous Investigation

On March 14, 2016, NTSB investigated a similar collision, which involved two Union Pacific Railroad (UP) freight trains in Granger, Wyoming. Westbound UP freight train KG1LAC-13 (5718 West) traveled from the main track through a switch into a controlled siding and collided head on with stopped eastbound UP local freight train LCK41-14 (5155 East). At the time, UP was installing and testing PTC on the main track. While this work was in progress, UP employees suspended signals and established absolute blocks to ensure that trains could move safely through the areas without signals (the suspension).

When 5718 West entered the limits of the suspension on main track 1, it was traveling about 46 mph. The crew saw that the switch at CP G844 was lined so that their train would enter a siding instead of continuing on main track 1. Typically, switches were not lined until the dispatcher had decided the next movement through the switch; therefore, the switch was still lined for the previous train movement. The engineer immediately applied the emergency brakes, and the train slowed to about 30 mph and collided with the stopped 5155 East.

The NTSB determined that the probable cause of the accident was that the employee-in-charge incorrectly used information from a conversation with the train dispatcher as authorization to send a train into the signal suspension territory. Contributing to the accident was the failure of the conductor pilot at CP G844 to check the switch position before authorizing the train to enter the signal suspension territory.[3]

Previous Recommendation to Federal Railroad Administration

On July 14, 2009, a Dakota, Minnesota & Eastern Railroad (DME) freight train was operating under track warrant authority in nonsignaled territory on the main track when it went into Bettendorf Yard in Bettendorf, Iowa, via a misaligned hand-operated switch and struck 19 loaded railcars on a yard track. The hand-operated switch had been left incorrectly lined from the main track onto the yard track by the crew of a BNSF Railway local train. The engineer and the conductor on the DME train sustained fatal injuries. The NTSB determined that the probable cause of the accident was, in part, the BNSF Railway local train crew releasing track warrant authority before returning the hand-operated switch to the correct position.[4]

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[2] (a) CSX used a mandatory directive, known as an EC-1 form, permitting passenger trains to proceed at speeds not to exceed 59 mph and for freight trains to proceed at speeds not to exceed 49 mph. (b) *Absolute block* means a block in which no train is permitted to enter while it is occupied by another train.

[3] National Transportation Safety Board, *Collision of Two Union Pacific Railroad Freight Trains, Granger, Wyoming, March 14, 2016,* RAB-17/10 (Washington, DC: National Transportation Safety Board, 2017).

[4] National Transportation Safety Board, *Collision of Dakota, Minnesota & Eastern Railroad Freight Train and 19 Stationary Railcars, Bettendorf, Iowa, July 14, 2009*, RAR-12/03 (Washington, DC: National Transportation Safety Board, 2012).

As a result of the Bettendorf, Iowa, accident, the NTSB issued the following recommendation to the Federal Railroad Administration (FRA):

R-12-29

Require that until appropriate switch position warning technology is installed on main track switches (in non-signaled territory not equipped with positive train control), when a main track switch has been reported relined for a main track, the next train to pass the location approach the switch location at restricted speed. That train crew should then report to the dispatcher that the switch is correctly lined for the main track before trains are allowed to operate at maximum authorized speed.

On April 18, 2013, NTSB classified Safety Recommendation R-12-29 *Closed□Reconsidered* because the FRA argued that implementing this recommendation, which would apply to 52% of US railroad route miles, would be too disruptive to transportation.[5]

Ongoing Investigation

In the current accident in Cayce, South Carolina, as well as in the Granger accident, the evidence indicates that human decision making and actions likely played key roles in the accident scenarios. In both accidents, safe movement of the trains through the signal suspension depended on proper switch alignment, which, in turn, relied on error-free manual work. The risk of error in the manual work was not safeguarded, either by technology or supervision. Thus, the reliance on error-free human performance for safe train movement created a single point-of-failure in the operating practices currently used and in compliance with extant regulations.[6] The NTSB concludes that additional measures are needed, such as restricted speed, to ensure safe operations during signal suspensions, especially during the movement of passenger trains, due to the likelihood of harm to the traveling public.[7]

Therefore, the NTSB recommends that the Federal Railroad Administration (FRA) issue an Emergency Order directing railroads to require that when signal suspensions are in effect and a switch has been reported relined for a main track, the next train or locomotive to pass the location must approach the switch location at restricted speed. After the switch position is verified, require the train crew to report to the dispatcher that the switch is correctly lined for the main track before trains are permitted to operate at maximum-authorized speed.

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[5] *Dark Territory Working Group Update*, presentation to the 44th Railroad Safety Advisory Committee Meeting, May 20, 2011.

[6] Technical studies on human performance have established that people are prone to committing errors of omission and commission and, therefore, safety-critical tasks must be designed with safeguards and fail-safe mechanisms to avoid system failures and catastrophic consequences (J. Reason, *Human Error* (Cambridge, U.K.: Cambridge University Press, 1990)).

[7] According to Title 49 *Code of Federal Regulations* (*CFR*) 236.812, *restricted speed* is a speed that will permit stopping within one-half the range of vision, but not exceeding 20 miles per hour.

This recommendation would apply only to areas subject to a signal suspension—a minute portion of the United States' rail network, whereas Safety Recommendation R-12-29 applied to all railroad dark territory.

Recommendation

As a result of this report, the National Transportation Safety Board makes the following urgent safety recommendation:

To the Federal Railroad Administration:

Issue an Emergency Order directing railroads to require that when signal suspensions are in effect and a switch has been reported relined for a main track, the next train or locomotive to pass the location must approach the switch location at restricted speed. After the switch position is verified, the train crew must report to the dispatcher that the switch is correctly lined for the main track before trains are permitted to operate at maximum-authorized speed. (R-18-005) **(Urgent)**

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

ROBERT L. SUMWALT, III
Chairman

EARL F. WEENER
Member

T. BELLA DINH-ZARR
Member

Adopted: February 13, 2018