

1 **NATIONAL TRANSPORTATION SAFETY BOARD**

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6 **Office of Railroad, Pipeline and Hazardous Materials Investigations**
7 **Washington, DC**

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11 **IIC FACTUAL REPORT**

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17 **DCA-13-FR-008**

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22 **Collision of Union Pacific Railroad Freight Train MSIDV 15 with Standing**
23 **Railroad Cars in Hays, Kansas**

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27 **Hays, Kansas**
28 **July 16, 2013**

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35 Factual Report Prepared by:

Date: June 24, 2014

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37 James A. Southworth,
38 Investigator-in-Charge

1 NTSB Accident Number: DCA 13 FR 008
2 Date of Accident: July 16, 2013
3 Time of Accident: 1:20 A.M. central daylight time
4 Type of Train and No: MSIDV 15
5 Railroad: Union Pacific Railroad
6 Location of Accident: Hays, Kansas
7 Fatalities: 0
8 Injuries: 3
9 Type of Accident: Collision and Derailment

10
11 **Synopsis**

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13 On July 16, 2013, at about 1:20 a.m., central daylight time¹, a westbound² Union Pacific
14 Railroad (UP) freight train MSIDV 15 encountered an open manual hand throw main track
15 switch and entered a spur track in Hays, Kansas. At the time of the accident, the train was
16 travelling westbound in non-sigaled track warrant territory with a timetable speed of 49 mph.
17 The lead locomotive collided with standing cars on track 740 at Hays, Kansas which is a spur.
18 Diesel fuel leaked from the ruptured locomotive fuel tanks and caught fire. The three crew
19 members received minor injuries. UP estimated the cost of damages as a result of the collision
20 and derailment to be \$4.3 million.
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24 **Figure 1. Photograph showing the wreckage resulting from the collision and derailment. (Photo by**
25 **Union Pacific) 508 Text: Lead locomotive of train MSIDV 15, number UP 7276 is seen in the center**
26 **of the photograph, derailed, upside down, and rotated 180 degrees amongst debris from**
27 **derailment.**

¹ All times in this brief are central daylight time.
² In this report all train movements and track references will refer to timetable direction.

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Figure 2. Photograph of the lead locomotive of Train MSIDV 15. The locomotive 7276 is upside down and has rotated 180°. (Photo by Union Pacific)

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11 About 11:28 p.m. on July 15 (approximately 45 minutes before the accident), a local
12 train, LDG89 15, had used the main track switch to enter the spur tracks in Hays. The crew of the
13 local (engineer, conductor and brakeman) went on duty at Salina, Kansas (MP 186.66) at 1:00
14 p.m. During their trip to Hays, Kansas the crew made numerous stops along the way to pick cars
15 up and set cars out.

16

17 The crew arrived at the Hays main track switch to track 141 and spur track 740 around
18 12:35 a.m. The crew had a job briefing regarding their work plan and the short time available to
19 complete the tasks. The crew decided that they would secure the train off the main track, into
20 track 141, and complete the remaining tasks the next day before their planned return trip to
21 Salina, Kansas.

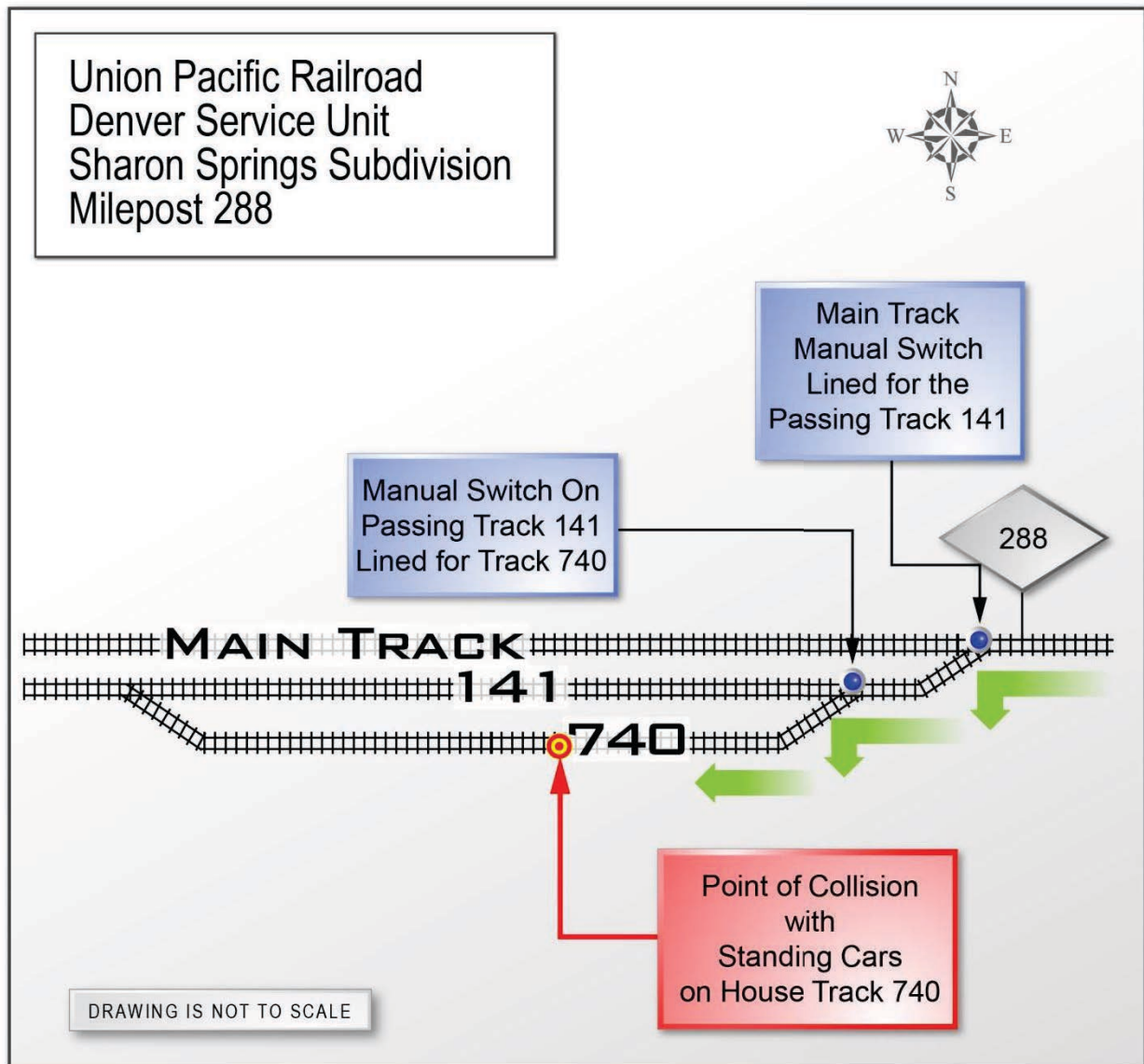
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The brakeman proceeded to line the main track switch for their train to move off the main track and enter into the track 141 at Hays, Kansas (also referred to ‘the passing track’ by Union Pacific employees). The brakeman then walked west to a derail on the passing track. The brakeman lined the hand-throw (manual) derail off of the rail and told the engineer to proceed into track 141 with the train. While the train was entering track 141, the brakeman started walking east towards the main track switch and continued to watch to the west so he could tell the engineer when the train had cleared past the derail. The train cleared the derail and the brakeman called the engineer and told him that the train was in the clear. The brakeman then restored the derail on track 141 to normal (derailing) position.

NTSB investigators went to the accident site to observe the area in darkness at the same time of night as the accident. The main track switch was not visible from track 141 switch without direct illumination from a lantern or other light source.

According to railroad supervisors, when they first responded to the scene, the main track switch was lined for movement towards yard tracks 141 and 740. The yard switch controlling movement into track 141 and 740 was lined for movement into track 740 (see Figure 3).

The crew secured their train and departed the area around 1:10 a.m. The crew was transported by a Union Pacific provided contracted van to their motel after stopping briefly to get something to eat.



14.04.002.RA_Fig1b

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2 **Figure 3. A drawing showing the layout of the tracks and switches at milepost 288 on the UP Sharon**
3 **Springs Subdivision in Hays, KS.**

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5 **Rules Compliance**

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7 **Operating Documents**

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9 The crews were governed by the General Code of Operating Rules (GCOR), Sixth
10 Edition, effective April 7, 2010 with updates added July 2, 2013. At the time of the accident, the
11 current timetable was UPRR Timetable No. 4, effective October 25, 2010.

12
13 The operating rules and supplements were as follows:
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- 1 • General Code Of Operating Rules, Sixth Edition, Effective April 7, 2010,
2 Updated July 2, 2013
- 3 • Union Pacific System Special Instructions, Effective July 2, 2013
- 4 • Union Pacific Railroad, Timetable No. 4, Salina Area, Sharon Springs Sub.,
5 Effective October 25, 2010
- 6 • Union Pacific Railroad, Safety Rules, Effective July 2, 2013
- 7 • Track Warrants and Track Bulletins for UP 7276 West (MSIDV 15)
- 8 • Track Warrants and Track Bulletins for UP 2327 West (LDG89 15)

9 10 11 **Method of Operations**

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13 Trains were authorized to occupy the main track by a track warrant that was issued
14 initially at Salina, Kansas. Later during the trip the trains were given updates and new track
15 warrant authority directly from the train dispatcher by radio. The track warrant authorized the
16 train movements from one named station to another or a designated point. Once clearing a
17 section of track, the crew would release the track behind them to the train dispatcher.

18 19 **Hand Throw Switch Operations**

20
21 When placing a train on a track that is connected to the main track with a hand throw
22 switch, the crew was required to report to the train dispatcher that the switch had been restored
23 (back to normal position for main track movement) and locked before releasing their track
24 warrant authority on the main track.

25 26 **GCOR appropriate rules:**

27 28 **14.7 Reporting Clear of Limits**

29
30 In non-signaled territory comply with the requirements outlined in Rule
31 8.3 (Main Track Switches) and advise the train dispatcher:

32
33 When a hand-operated switch is used to clear the main track, except where
34 Rule 6.13 (Yard Limits) or Rule 6.14 (Restricted Limits) are in effect,
35 advise the train dispatcher of the position of the switch and that the switch
36 is locked when reporting clear of track warrant limits. Train dispatcher
37 shall repeat the reported switch position and employee releasing the limits
38 shall confirm to the train dispatcher this information is correct.

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2 **8.3 Main Track Switches**
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4 Within TWC territory when authorized by track warrant. Track warrant
5 protection must be provided for this condition. The switch must not be
6 considered restored to normal position until the train dispatcher is notified
7 by an employee at that location.
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10 According to post-accident interviews, the brakeman said he announced by radio that the
11 main track switch had been returned to the normal position. He also announced that the derail
12 had been set in the derailing position after the LDG89 15 was clear of the main track and sitting
13 on the passing track 141 (beyond and clear of the derail) at Hays. Both the conductor and
14 engineer had heard the brakeman make this announcement over the radio. The conductor in turn
15 reported to the dispatcher that the main track switch was returned to the normal position (lined
16 for the main track), and the conductor released their track warrant authority for the main track.
17

18 The operating rules and procedures required the crew to have a job briefing before they
19 used the main track switch to clear the main track. According to interviews, the crew did
20 conduct a job briefing. The rules also required the brakeman to notify the conductor or engineer
21 when the main track switch had been restored. The brakeman, stating he had done this in post-
22 accident NTSB interview, felt that he had complied with the requirement and called the engineer
23 to report the main track switch had been restored. The rules also required the employee releasing
24 the track warrant to inform the train dispatcher that the main track switch had been restored. The
25 conductor stated that he informed the dispatcher after hearing the trainman on the radio. All of
26 these actions are standard operating procedure and in compliance with the operating rules.
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1 **Post-Accident Toxicological Testing**

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3 According to Title 49 Code of Federal Regulations (CFR) Part 219 (Subpart C- Post-
4 Accident Toxicological Testing) the crew members of train MSIDV 15 were required to submit
5 specimens for post-accident toxicological testing. They all provided urine and blood for testing.
6 They also performed a breath test. All of the tests had negative results.

7
8 The LDG89 15 crew was released from duty at Hays, Kansas when they tied up, left the
9 area to get something to eat and then went to a hotel. Once released, these employees cannot be
10 recalled for testing per 49 CFR Part 219.203(b) (4) unless:

- 11 a) The employees went off duty normally prior to being contacted by a
12 supervisor and instructed to remain; and
13
14 b) The railroad's investigation indicated a clear probability that the
15 employees played a role in the cause or severity of the accident/incident;
16 and
17
18 c) The accident/incident occurred within the employee's duty tour.

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21 The crew of LDG89 15 did not qualify under item C and were not tested. The crew's duty
22 tour ended at 1:00 a.m. and the accident occurred at about 1:20 a.m.

23 **Train MSIDV 15**

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25 The conductor and engineer of the MSIDV 15 were qualified on the territory. A conductor
26 trainee was also assigned to MSIDV 15. The conductor trainee is assigned to a territory with
27 qualified conductor to learn and/or qualify on territories they will eventually be working. None
28 of them were using their cellular telephones at or near the time of the accident. All of their
29 toxicological results were negative.
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Mobile Cellular Telephone Records

Records were obtained for the crews of both trains. There was use of the phones during their on duty time, however, limited use is allowed by the railroad operating rules.³ Other than the engineer assigned to LDG89 15, none of the records obtained showed use of a cellular telephone near anytime the crews were performing duties at Hays, Kansas. The engineer on train LDG89 15 stated during his interview that he did use his cellular telephone to call the hotel for a ride after he had cleared rail cars from fouling the Vine Avenue crossing. The time stamp for this call was part of his cell phone records.

Pre-Departure Brake Tests

Records and train crew interviews revealed that both trains had received the appropriate pre-departure and en route air brake tests.

Postaccident Equipment Mechanical Inspections

The train MSIDV 15 rail cars that did not derail were inspected after they were removed from the accident site. The air brakes applied and released as required by UP air brake rules and Federal Railroad Administration (FRA) regulations. There was no visible binding or chafing observed between any underframe braking components or between the trucks and their respective car body. There was no indication on the track structure that anything had been

³ Union Pacific Railroad, System Special Instructions, July 2, 2013, Rule Revisions General Code of Operating Rules, 2.21 Electronic Devices, B. Personal Electronic Devices ...A railroad operating employee may use a personal cell phone only for voice communication when: Rolling and on track equipment is stopped. A safety briefing is conducted with all crew members to confirm that it will not interfere with any safety related or required duty. No member of crew will foul any track.

1 dragging prior to the accident. The braking components were within all tolerance and wear
2 limits. All braking surfaces displayed work polished surfaces without indication of excessive
3 thermal stress.

4 **Crew Qualifications and Rest**

5 **Train LDG89 15**

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7 Title 49 CFR 217.9 Hours of Service of Railroad Employees, requires that railroad
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9 operating employees not work over 12 hours in a given shift and must have a minimum of 10
10 hours off duty between shifts. The crew of train LDG89 15 had nearly worked the full 12 hour
11 duty. According to interviews, none of the crew members expressed feeling fatigued at the end of
12 the shift. Investigators reviewed the crew's work history and determined the LDG89 15 crew
13 had sufficient off-duty time before reporting for work, and their duty hours were within the
14 requirements of the regulation.
15

16
17 All of the crew members were familiar with the territory. Much of their work included
18 physical activity of switching cars and making set outs and pick-ups on the trip from Salina,
19 Kansas to Hays, Kansas. The conductor stated that the work went very smoothly and that the
20 extra crew member (brakeman) was good to work with and he appeared to know where to locate
21 himself at the right time for the switching operations (an indication of a seasoned employee).

22 **Previous NTSB Investigations**

23 **Graniteville, South Carolina**

1 On January 6, 2005, a Norfolk Southern freight train collided with a standing local train
2 near Graniteville, South Carolina.⁴ The collision resulted in the release of hazardous material
3 which resulted in nine fatalities. The NTSB determined the following:

4 The National Transportation Safety Board determines that the probable cause of the
5 January 6, 2005, collision and derailment of Norfolk Southern train 192 in Graniteville, South
6 Carolina, was the failure of the crew of Norfolk Southern train P22 to return a main line switch to
7 the normal position after the crew completed work at an industry track. Contributing to the failure
8 was the absence of any feature or mechanism that would have reminded crewmembers of the
9 switch position and thus would have prompted them to complete this final critical task before
10 departing the work site. Contributing to the severity of the accident was the puncture of the ninth
11 car in the train, a tank car containing chlorine, which resulted in the release of poisonous chlorine
12 gas.
13

14 **Shepherd, Texas**

15 On September 15, 2005 a Union Pacific freight train collided with a parked train in a
16 siding in non-signaled territory.⁵ The train had entered the siding at a hand throw switch and
17 struck a standing train in a siding; fatally injuring the engineer on the standing train. The NTSB
18 determined the following:

19 The National Transportation Safety Board determines that the probable cause of the
20 September 15, 2005, collision of Union Pacific Railroad trains MPBSR 13 and LEF52 14 in
21 Shepherd, Texas, was the failure of the previous crew for train LEF52 14 to return a main track
22 switch to the normal position after they had secured the train on the siding and departed the area.
23
24

25 **Bettendorf, Iowa**

26 On July 14, 2009, southbound Dakota, Minnesota & Eastern Railroad freight train B61-
27 13 went into Bettendorf Yard in Bettendorf, Iowa, due to a misaligned switch and struck 19
28

⁴ *Collision of Norfolk Southern Freight Train 192 With Standing Norfolk Southern Local Train P22 With Subsequent Hazardous Materials Release at Graniteville, South Carolina, January 6, 2005*, Railroad Accident Report NTSB/RAR-05/04 (Washington, D.C.: National Transportation Safety Board, 2005). <<http://www.nts.gov>>

⁵ *Collision of Two Union Pacific Railroad Trains at Shepherd, Texas, September 15, 2005*, Railroad Accident Brief NTSB/RAB-06/01 (Washington, D.C.: National Transportation Safety Board, 2006). <<http://www.nts.gov>>

1 stationary railcars.⁶ The impact fatally injured the locomotive engineer and the conductor. The
2 NTSB determined the following:

3
4 The National Transportation Safety Board determines that the probable cause of the
5 accident was the BNSF Railway local train RCHI4274-131 crew releasing track warrant
6 authority before returning the north yard hand-operated switch to the correct position.
7 Contributing to the accident was the dispatcher for the Dakota, Minnesota & Eastern (DME)
8 Railroad granting track warrant authority to DME train B61-13 without holding a job briefing
9 which would confirm the accurate positions of all applicable main track switches. Also
10 contributing to the accident was a hand-operated switch position reflector target that could not be
11 observed by the crew of train B61-13 at a sufficient distance to stop the train and avoid the
12 accident.

13 In each case a crewmember failed to return a main track switch to the normal position.
14 More significantly, these accidents occurred in non-signaled territory where the switches are not
15 protected by any sort of warning system.

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17 **Safety Issues**

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19 The NTSB concluded that the lessons learned from the Graniteville, South Carolina;
20 Shepherd, Texas; Bettendorf, Iowa accidents highlight the need for measures to ensure safety
21 redundancy that is greater than those provided by current rules or regulations. Train dispatchers
22 must have assurance that the track ahead of train movements in non-signaled territory is clear of
23 other trains or equipment and that switches are in their correct positions before track warrant
24 authorities are issued to trains. A verbal confirmation is not adequate when a crewmember lines
25 the wrong switch. As a result of the Bettendorf accident, the NTSB concluded the following:

26
27 Therefore, the NTSB recommends that the FRA require railroads to
28 install, along main lines in non-signaled territory not equipped with
29 positive train control, appropriate technology that warns approaching

⁶ *Collision of Dakota, Minnesota & Eastern Railroad Freight Train and 19 Stationary Railcars Bettendorf, Iowa July 14, 2009*, Accident Summary Report NTSB/RAR-12/03/SUM (Washington, D.C.: National Transportation Safety Board, 2012). <<http://www.nts.gov>>

1 trains of incorrectly lined main track switches sufficiently in advance to
2 permit stopping. Because this recommendation expands upon and
3 reinforces the intent of Safety Recommendation R-05-14, that
4 recommendation is reclassified “Closed—Superseded.”

5 6 **Previous Board Actions**

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8 Following the January 6, 2005, Graniteville, South Carolina, accident the NTSB made the
9 following safety recommendation:

10 11 **To the Federal Railroad Administration:**

12 Require that, along main lines in non-signaled territory, railroads install
13 an automatically activated device, independent of the switch banner that
14 will, visually or electronically, compellingly capture the attention of
15 employees involved with switch operations and clearly convey the status
16 of the switch both in daylight and in darkness. (R-05-14)

17
18 However, following the Bettendorf, Iowa accident investigation, Safety Recommendation
19 R-05-14, previously classified “Open—Acceptable Alternate Response,” was reclassified
20 “Closed—Superseded by Safety Recommendation R-12-27.” The Safety Board then issued the
21 following recommendations:

22 23 **To the Federal Railroad Administration:**

24 Require railroads to install, along main lines in non-signaled territory not
25 equipped with positive train control, appropriate technology that warns
26 approaching trains of incorrectly lined main track switches sufficiently in
27 advance to permit stopping. (R-12-27)

28
29 Revise Title 49 *Code of Federal Regulations* Section 218.105(d) (1) to
30 require that, until the appropriate switch position technology is installed
31 on main track switches in non-signaled territories that are not equipped
32 with positive train control, train crews releasing track authority to the
33 dispatcher must hold job briefings with the dispatcher and clearly convey
34 the position of all main track switches that were used prior to releasing
35 track warrant authority. (R-12-28)

36
37 Require that until appropriate switch position warning technology is
38 installed on main track switches (in non-signaled territory not equipped
39 with positive train control), when a main track switch has been reported
40 relined for a main track, the next train to pass the location approach the
41 switch location at restricted speed. That train crew should then report to

1 the dispatcher that the switch is correctly lined for the main track before
2 trains are allowed to operate at maximum authorized speed. (R-12-29)

3
4 Since these recommendations were issued the FRA has responded by letter from Joseph
5 C. Szabo, Administrator, on April 18, 2013 which concluded, “The preliminary cost-benefit
6 analysis conducted related to this recommendation shows that rulemakings cannot be justified as
7 having benefits outweighing cost”. The NTSB replied to Mr. Szabo’s response, “...we urge the
8 FRA to consider an appropriate alternate means of warning approaching trains of incorrectly
9 lined main track switches. Pending completion of a plan for doing this, Safety Recommendation
10 R 12 27 is classified OPEN—UNACCEPTABLE RESPONSE.”