Federal Railroad Administration
Office of Railroad Safety
Accident and Analysis Branch

Accident Investigation Report
HQ-2017-1228

Kansas City Southern Railway Company (KCS)
Laredo, TX
September 14, 2017

Note that 49 U.S.C. §20903 provides that no part of an accident or incident report, including this one, made by the Secretary of Transportation/Federal Railroad Administration under 49 U.S.C. §20902 may be used in a civil action for damages resulting from a matter mentioned in the report.

SYNOPSIS

On September 14, 2017, at approximately 6:30 a.m., CST, westbound Kansas City Southern Railway (KCS) mixed freight Train MBNNL12 was operating on the Laredo Subdivision (just east of Laredo, TX) – handling 78 loads, 17 empties, with 10,852 trailing tons and 6,364 feet - under clear, dark skies at approximately 75 °F. when a following westbound KCS train (QJATL-10), operating under a restricting signal, struck the rear of the stopped MBNNL-12 at a recorded speed of 14 mph, at or near Milepost 11.9, causing two locomotives and a car to derail with minor personal injuries to the MBNNL-10 crew.

Both crews sustained injuries in the accident. The crew of MBNNL-12 were transported, treated and released at the local hospital in Laredo, TX. The crew from QJATL-10 reported injuries a few days after the accident.

Approximately 50-100 gallons of lube oil was spilled and remediated with no incursion on local water sources.

The crew of the QJATL-10 was FRA Post Accident Toxicological Tested.

Damages were assessed at $540,941 (equipment- $526,260; track-$14,681).

There were no evacuations associated with this accident and this accident was not PTC preventable.

This Subdivision is not a crude oil route, nor an Amtrak route.

The probable cause of the accident was: H222 Automatic block or interlocking signal displaying other than a stop indication - failure to comply. The contributing cause has been determined to be H605 Failure to comply with restricted speed in connection with the restrictive indication of a block or interlocking signal.

It was further noted under the Fatigue Avoidance Scheduling Tool Analysis – fatigue was probable for both crew members handling the QJATL-10 – and likely contributed to the accident.

U.S. Department of Transportation
Federal Railroad Administration

FRA FACTUAL RAILROAD ACCIDENT REPORT

FRA File #HQ-2017-1228

TRAIN SUMMARY

1. Name of Railroad Operating Train #1	1a. Alphabetic Code	1b. Railroad Accident/Incident No.
Kansas City Southern Railway Company	KCS	17091404
2. Name of Railroad Operating Train #2	2a. Alphabetic Code	2b. Railroad Accident/Incident No.
Kansas City Southern Railway Company	KCS	17091404

GENERAL INFORMATION

1. Name of Railroad or Other Entity Responsible for Track Maintenance	1a. Alphabetic Code	1b. Railroad Accident/Incident No.
Kansas City Southern Railway Company	KCS	17091404
2. U.S. DOT Grade Crossing Identification Number	3. Date of Accident/Incident	4. Time of Accident/Incident
	9/14/2017	6:30 AM

5. Type of Accident/Incident
Rear End Collision

6. Cars Carrying HAZMAT	7. HAZMAT Cars Damaged/Derailed	8. Cars Releasing HAZMAT	9. People Evacuated	10. Subdivision
0	0	0	0	Laredo

11. Nearest City/Town	12. Milepost *(to nearest tenth)*	13. State Abbr.	14. County
Laredo, TX	MP11.9	TX	WEBB

15. Temperature (F)	16. Visibility	17. Weather	18. Type of Track
75 ˚F	Dark	Clear	Main

19. Track Name/Number	20. FRA Track Class	21. Annual Track Density *(gross tons in millions)*	22. Time Table Direction
Main Track	Freight Trains-40, Passenger Trains-60	26.93	West

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FRA FACTUAL RAILROAD ACCIDENT REPORT

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OPERATING TRAIN #1

1. Type of Equipment Consist:	2. Was Equipment Attended?	3. Train Number/Symbol
Freight Train	Yes	QJATL-10

4. Speed (recorded speed, if available) R - Recorded E - Estimated	Code	5. Trailing Tons (gross excluding power units)	6a. Remotely Controlled Locomotive? 0 = Not a remotely controlled operation 1 = Remote control portable transmitter 2 = Remote control tower operation 3 = Remote control portable transmitter - more than one remote control transmitter	Code
14.0 MPH	R	9839		0

6. Type of Territory

Signalization:
Signaled

Method of Operation/Authority for Movement:
Signal Indication

Supplemental/Adjunct Codes:
Q

7. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)	8. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box	Alcohol	Drugs
(1) First Involved *(derailed, struck, etc.)*	KCS 4605	1	yes		0	0
(2) Causing *(if mechanical, cause reported)*				9. Was this consist transporting passengers?		No

10. Locomotive Units (Exclude EMU, DMU, and Cab Car Locomotives.)	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End e. Remote	11. Cars (Include EMU, DMU, and Cab Car Locomotives.)	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Train	2	0	0	0	0	(1) Total in Equipment Consist	80	0	2	0	0
(2) Total Derailed	2	0	0	0	0	(2) Total Derailed	0	0	0	0	0

12. Equipment Damage This Consist	13. Track, Signal, Way & Structure Damage
515408	14681

14. Primary Cause Code
H222 - Automatic block or interlocking signal displaying other than a stop indication - failure to comply.*

15. Contributing Cause Code
H605 - Failure to comply with restricted speed in connection with the restrictive indication of a block or interlocking signal.

Number of Crew Members

16. Engineers/Operators	17. Firemen	18. Conductors	19. Brakemen
1	0	1	0

Length of Time on Duty

20. Engineer/Operator	21. Conductor
Hrs: 7 Mins: 30	Hrs: 7 Mins: 30

Casualties to:	22. Railroad Employees	23. Train Passengers	24. Others
Fatal	0	0	0
Nonfatal	2	0	0

25. EOT Device?	26. Was EOT Device Properly Armed?
Yes	Yes

27. Caboose Occupied by Crew? N/A

28. Latitude	29. Longitude
27.494316000	-99.346810000

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OPERATING TRAIN #2

1. Type of Equipment Consist:	2. Was Equipment Attended?	3. Train Number/Symbol
Freight Train	Yes	M-BNNL-12

4. Speed (recorded speed, if available) R - Recorded E - Estimated	Code	5. Trailing Tons (gross excluding power units)	6a. Remotely Controlled Locomotive? 0 = Not a remotely controlled operation 1 = Remote control portable transmitter 2 = Remote control tower operation 3 = Remote control portable transmitter - more than one remote control transmitter	Code
0.0 MPH	R	10852		0

6. Type of Territory

Signalization: Signaled

Method of Operation/Authority for Movement: Signal Indication

Supplemental/Adjunct Codes: Q

7. Principal Car/Unit	a. Initial and Number	b. Position in Train	c. Loaded (yes/no)	8. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box	Alcohol	Drugs
(1) First Involved *(derailed, struck, etc.)*	TFM 54028	95	no		0	0
(2) Causing *(if mechanical, cause reported)*				9. Was this consist transporting passengers?		N/A

10. Locomotive Units (Exclude EMU, DMU, and Cab Car Locomotives.)	a. Head End	Mid Train b. Manual	Mid Train c. Remote	Rear End d. Manual	Rear End e. Remote	11. Cars (Include EMU, DMU, and Cab Car Locomotives.)	Loaded a. Freight	Loaded b. Pass.	Empty c. Freight	Empty d. Pass.	e. Caboose
(1) Total in Train	2	0	0	0	0	(1) Total in Equipment Consist	78	0	17	0	0
(2) Total Derailed	0	0	0	0	0	(2) Total Derailed	0	0	1	0	0

12. Equipment Damage This Consist	13. Track, Signal, Way & Structure Damage
10852	

14. Primary Cause Code

H222 - Automatic block or interlocking signal displaying other than a stop indication - failure to comply.*

15. Contributing Cause Code

H605 - Failure to comply with restricted speed in connection with the restrictive indication of a block or interlocking signal.

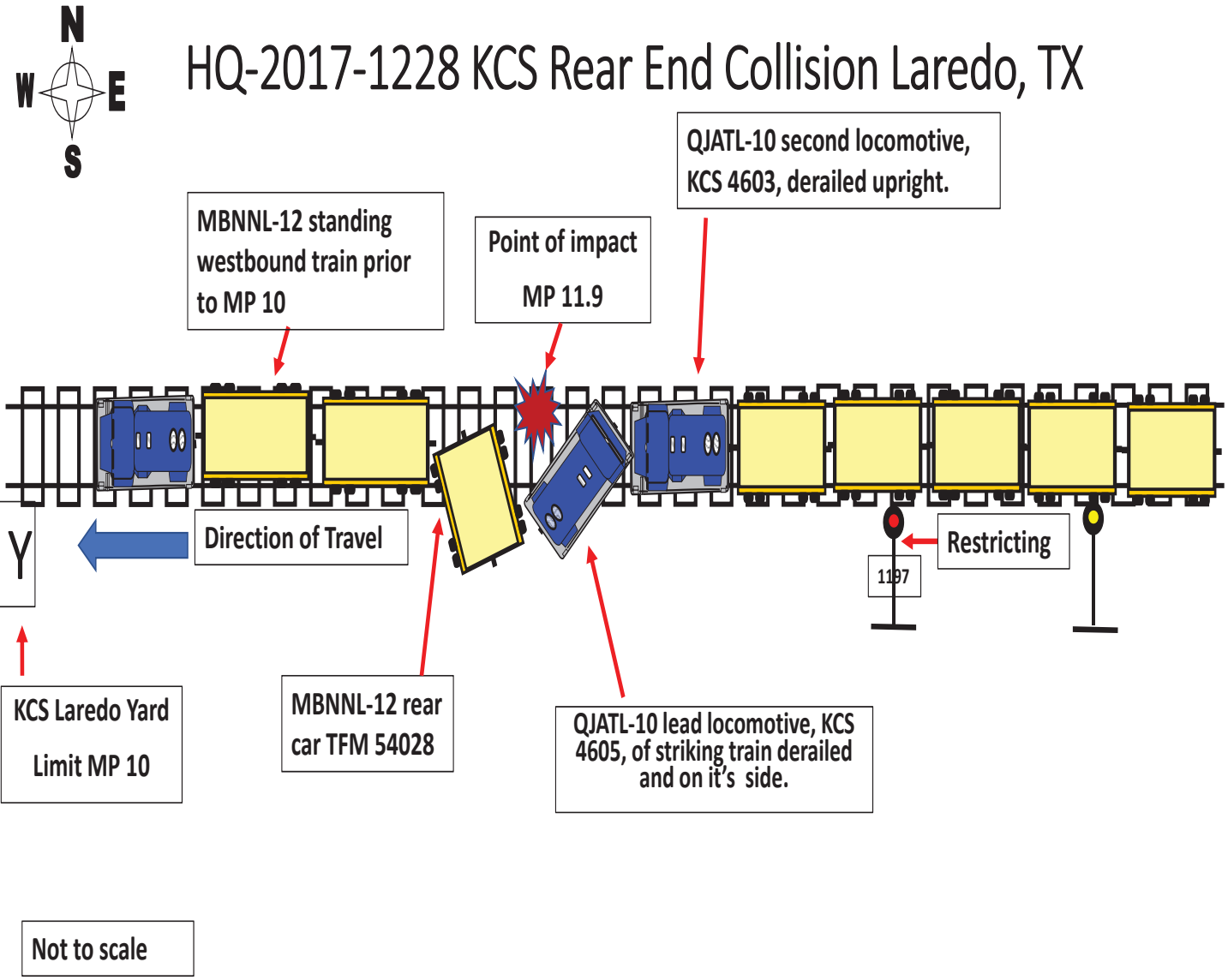
Number of Crew Members				Length of Time on Duty	
16. Engineers/Operators	17. Firemen	18. Conductors	19. Brakemen	20. Engineer/Operator	21. Conductor
1	0	1	0	Hrs: 8 Mins: 33	Hrs: 8 Mins: 33

Casualties to:	22. Railroad Employees	23. Train Passengers	24. Others	25. EOT Device?	26. Was EOT Device Properly Armed?
				Yes	Yes
Fatal	0	0	0	27. Caboose Occupied by Crew?	N/A
Nonfatal	2	0	0		

28. Latitude	29. Longitude
27.494316000	-99.346810000

SKETCHES

Sketch



NARRATIVE

Circumstances Prior to the Accident

The crew of westbound mixed freight Train QJATL-10 (striking train), consisted of a locomotive engineer and a conductor. The train crew went on-duty at 11:00 p.m., CST, on September 13, 2017, at Corpus Christi, Texas, in Nueces County. Both crew members had their statutory time off-duty rest prior to reporting for their assignment. The Engineer was at the controls in the engineer's seat on the lead locomotive and the Conductor was seated in the conductor's seat on the lead locomotive. Timetable direction will be used throughout this report.

The striking train consisted of 2 locomotives on the head-end, with KCS 4605 in the lead and KCS 4603 in the trail position, and 82 cars. The mixed freight train consist had 80 loads, 2 empties, 9,839 trailing tons, and 5,250 feet. It had a Class I air brake test done at Vicksburg, Mississippi, on September 9, 2017, at 9:00 a.m., CST, by mechanical personnel.

The crew of the westbound standing mixed freight train, MBNNL-12 (struck train), consisted of a locomotive engineer and a conductor. The train crew went on duty at Robstown, Texas, at 10:00 p.m. and had their statutory time off prior to reporting to their assignment. The Engineer was at the controls in the engineer's seat on the lead locomotive and the Conductor was seated in the conductor's seat on the lead locomotive.

The struck train consisted of 2 locomotives, with BNSF 7102 in the lead and BNSF 4393 in the trail, and 95 cars. The struck trains consist had 78 loads, 17 empties, 10,852 trailing tons, and is 6,364 feet long. The struck train had a Class I air brake test done at Galveston, Texas, on September 12, 2017, at 9:51 a.m., by mechanical personnel. The struck train was stopped prior to KCS' Laredo Yard limits which is located at MP 10 awaiting yarding instructions from the manager-on-duty when they were struck by the striking train. This resulted in the rear car of the struck train to derail, along with the locomotive consist of the striking train. The lead locomotive, KCS 4605, turned over onto the conductor's side, and the rear locomotive, KCS 4603, derailed but remained upright.

The track alignment and grade approaching the accident site is undulating and varying. In succession, there are: a 3-degree, left-hand curve approximately 1,000 feet in length; tangent track for 1,500 feet, then a 2-degree, right-hand curve 1,000 feet in length; tangent track for 1,500 feet then another 2-degree, right-hand curve 1,500 feet in length; tangent track for 2,100 feet in length then a 3-degree, left-hand curve for 1,000 feet; tangent for 1,500 feet followed by another 3-degree left-hand curve 500 feet in length; and then tangent track for 1,000 feet to the point of the accident. The grade undulates from .88 percent descending to .70 percent ascending with the grade descending to .78 percent at the accident location. The striking train had a vertical crest of 1.7 miles before the accident site, a valley (negative crest) .8 miles before the accident site, and a small vertical crest .5 miles before the accident site.

The Accident

The struck train had stopped at or near Milepost 11.9 (East of Laredo Yard @ Milepost 10) awaiting yarding instructions from the manager on duty when they were struck on the rear by the striking train at a recorded speed of 14 mph. This resulted in the rear car of the struck train (TFM 54028 – empty gondola) to derail, along with the locomotive consist of the striking train. The lead locomotive, KCS 4605 turned

over onto the conductor side, and the rear locomotive, KCS 4603 derailed but remained upright.
The method of operation is Centralized Traffic Control (CTC) with a maximum authorized speed of 50 MPH.
The KCS 4605 leaked approximately 50-100 gallons of lube oil in the drainage ditch where it turned over. The lube oil was contained without incursion to any water sources.
Signal data logs showed the struck train moving past Control Point (CP) 18 at 05:48 a.m. without stopping. The striking train passed the CP at 06:18 a.m. – moving under a restricting signal due to the struck train ahead. As stated, event recorder logs show the striking train moving at a speed of 14 mph at the time of impact to the rear of the struck train.
The collision resulted in minor injuries to the crew attending the striking train. The crew was transported, treated, and released from a local Laredo Hospital. The crew of the struck train reported injuries several days after the accident.
Damages were assessed at $540,941 (equipment- $526,260; track-$14,681).

Analysis and Conclusions

Analysis - Toxicological Testing: This accident did meet the criteria for 49 CFR 219 Subpart C Post Accident Testing. Federal Railroad Administration Post-Accident Forensic Toxicology Result Reports indicate the two employees tested of the striking train had negative test results.
Conclusion: Drug or Alcohol use was not a factor.
Analysis - Striking Train Operating Crew Certification: Engineer and Conductor certification records for the striking train were as follows: Engineer certification was issued 08/05/15. Conductor certification was issued 05/4/16. No exceptions noted for either employee.
Conclusion: The Engineer and Conductor were qualified with proper certification.
Analysis - KCS Mechanical Inspection: The striking train received a Class 1 air brake test on September 9, 2017, at 9:00 a.m., by qualified mechanical inspectors at Vicksburg, Mississippi.
Conclusion: Mechanical was not a factor.
Analysis - Track Structure: The track alignment and grade approaching the accident site is undulating and varying. In succession, there are: a 3-degree left hand curve approximately 1,000 feet in length; tangent track for 1,500 feet then a 2-degree right hand curve 1,000 feet in length; tangent track for 1,500 feet then another 2-degree right hand curve 1,500 feet in length; tangent track for 2,100 feet in length then a 3-degree left hand curve for 1,000 feet; tangent for 1,500 feet followed by another 3-degree left-hand curve 500 feet in length; and then tangent track for 1,000 feet to the point of the accident. The grade undulates from .88% descending to .70% ascending with the grade descending to .78% at the accident location. Westbound train QJATL-10 had a vertical crest 1.7 miles before the accident site and a valley (negative crest) .8 miles before the accident site, and a small vertical crest .5 miles before the accident site.
KCS track inspection records for the 30 days preceding the accident were reviewed by FRA. No defects were noted in the area of the accident.
Conclusion: Track structure was not a factor.
Analysis - KCS Signal and Train Control System: The signal system involved is a traffic control system (TCS) on a single, main track. The signal system consists of searchlight signals and power-operated switch machines. The method of operation is by signal indications of a TCS. After the accident, the

signal system was tested by KCS Signal Personnel and was found to be functioning as intended.
Conclusion: Signal and Train Control was not a factor.
Analysis - Train Crew Operating Performance: Video evidence, which was reviewed by FRA and KCS officials, revealed the striking train had passed an approach signal at MP 14.53, as the train passed the approach the conductor turned his chair around and was facing the rear of the cab. The train then passed a flashing red signal, (requiring the crew to operate at restricted speed), restricting proceed, at MP 11.97 traveling 31 MPH, and the conductor turned his seat back around just prior to the impact at a speed of 14 MPH. The track alignment around the curves helped to slow the train down prior to impact. The locomotive engineer was looking forward the entire time. Just prior to the collision the engineer placed the train into emergency.
Conclusion: Train Crew operating performance was the probable cause of this accident.
Analysis - Fatigue: FRA uses an overall effectiveness rate of 77.5 percent as the baseline for fatigue analysis, which is equivalent to blood alcohol content of 0.05. At or above this baseline, we do not consider fatigue as probable for any employee. Software sleep settings vary according to information obtained from each employee. If an employee does not provide sleep information, FRA uses the default software settings. FRA obtained fatigue-related information, including a 10-day work history, for the crew of the striking train. Analysis of the Fatigue Avoidance Scheduling Tool data indicated that fatigue was probable for both employees.
Conclusion: FRA concluded that fatigue was probable for the crew of the striking train.

Overall Conclusion

The crew of the striking train failed to comply with the requirements of the intermediate restricting signal at MP 11.97 on KCS' Laredo Subdivision. The crew should have been traveling at restricted speed from that signal.

Probable Cause and Contributing Factors

FRA determined the probable cause of this accident was cause code H222 - Automatic block or interlocking signal displaying other than a stop indication - failure to comply. Secondary to H222, FRA determined cause code H605 - Failure to comply with restricted speed in connection with the restrictive indication of a block or interlocking signal was also contributory to the accident.
FRA also determined fatigue was likely a contributing factor in this accident.