RAILROAD SIGNAL & TRAIN CONTROL GROUP
FACTUAL REPORT OF INVESTIGATION

Side Collision between Westbound UP Train AMNML-07 and Northbound UP Train ALDAS-06 at Texarkana Interlocking in Texarkana, Texas on September 8, 2015

DCA-15-FR-014

Contents

NATIONAL TRANSPORTATION SAFETY BOARD
OFFICE OF RAILROAD, PIPELINE &
HAZARDOUS MATERIALS INVESTIGATIONS
WASHINGTON, D.C. 20594

A. ACCIDENT

LOCATION:	Texarkana, Texas
TRAIN 1:	Westbound Freight Train UP AMNML-07
OPERATOR:	Union Pacific Railroad
TRAIN 2:	Northbound Freight Train UP ALDAS-06
OPERATOR:	Union Pacific Railroad
DATE:	September 8, 2015
TIME:	12:34 a.m. CDT
NTSB #:	**DCA-15-FR-014**

B. SIGNAL & TRAIN CONTROL GROUP

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C. ACCIDENT SUMMARY

On September 8, 2015 about 12:34 am central daylight time, a Union Pacific Railroad (UP) train AMNML-07 (train #1) collided into the side of UP train ALDAS-06 (train #2) in Texarkana, Texas. The collision occurred at an interlocking near the Texarkana rail yard at Control Point (CP) CB418. At CP CB418 the Little Rock Subdivision and the Pine Bluff Subdivision intersect at grade. Engineer and conductor of UP AMNML-07 sustained minor injuries as a result of the collision. Event recorder data showed train #1 traveling at 19 mph before the train was placed into emergency brake application by the engineer. The recorder data also showed an impact speed of 6 mph.

Figure 1: Arial view of accident scene. [Photo courtesy of News Radio KEEL Shreveport La.]

Train #1; a westbound train being operated on the Pine Bluff Subdivision main track with lead locomotives UP 2542 and NS 9242 and rear locomotive (distributed power) UP 7118 with 67 loaded and no empty freight cars weighing 5167 tons and was 7094 feet long. The first two locomotive units derailed; with the UP 2542 on its side leaking diesel. The diesel leak was stopped and contained. NS 9242 had its lead wheels on the ground. The train crew (conductor/engineer) went on duty at Pine Bluff, Arkansas at 6:50 pm CDT.

Train #2; a northbound train being operated on main track 1 on the Little Rock Subdivision with lead locomotives UP 4971 and UP 4482 had 70 loaded and no empty freight cars weighing 5609 tons and was 6471 feet long. The 13th - 19th cars derailed and/or turned over. No hazardous materials were involved with the derailment of the northbound train. The train crew (conductor/engineer) went on duty at Longview, Texas, at 8:45 pm CDT.

Weather conditions were clear skies and 82°F with winds out the south at 9 mph. Damage estimate was $6 million.

D. DETAILS OF THE INVESTIGATION

1. Description of the Railroad Signal System

1.1 UP Pine Bluff Subdivision

The Pine Bluff Subdivision of the UP North Little Rock Area extended from MP 266.4 in Pine Bluff, Arkansas to MP 525.1 in Big Sandy, Texas in a timetable east-west direction. The maximum authorized timetable speed on the subdivision was 70 mph for freight trains with permanent speed restrictions between posted timetable mileposts. In the vicinity of the accident area, the UP operated trains over a single main track with passing sidings utilizing a Traffic Control System (TCS) controlled by a dispatcher located at the Harriman Dispatch Center in Omaha, Nebraska. Train movements on the Pine Bluff Subdivision were governed by operating

rules, timetable instructions, and the signal indications of the traffic control system The TCS used coded track circuits for train occupancy detection and signal communication.

1.2 UP Little Rock Subdivision

The Little Rock Subdivision of the UP North Little Rock Area extended from MP 343.6 in North Little Rock, Arkansas to MP 89.6 in Longview, Texas in a timetable north-south direction. The maximum authorized timetable speed on the subdivision was 70 mph for freight trains and 75 mph for passenger trains with permanent speed restrictions between posted timetable mileposts. In the vicinity of the accident area, the UP operated trains over two main tracks utilizing a TCS controlled by a dispatcher located at the Harriman Dispatch Center in Omaha, Nebraska. Train movements on the Little Rock Subdivision were governed by operating rules, timetable instructions, and the signal indications of a TCS. The TCS used coded track circuits for train occupancy detection and signal communication.

1.3 UP Texarkana Interlocking

The UP Pine Bluff Subdivision single main track and siding track crossed at grade with the Little Rock Subdivision two main tracks at Texarkana Interlocking located in Texarkana, Texas. Texarkana Interlocking was at MP 419.1 on the Pine Bluff Subdivision and at MP 0.5 on the Little Rock Subdivision.

Maximum authorized timetable speed through the Texarkana Interlocking for trains operating on the Pine Bluff Subdivision was 20 mph. Maximum authorized timetable speed through the Texarkana Interlocking for trains operating on the Little Rock Subdivision were 30 mph.

Operation and control of the Texarkana Interlocking was performed by the UP dispatcher. The UP dispatcher sent controls to the interlocking signal equipment to line routes through the Texarkana Interlocking. Trains movements through the interlocking were authorized by signal indications. Interlocking home signals were color light signals.

2. Post-Accident Signal Data Log

2.1 UP Dispatch Center**;** Signal and Train Control Data Log

UP dispatchers monitored and coordinated train movements utilizing the signal system. Field signal and train control equipment maintained logs of signal data locally and also transmitted the data to the UP dispatch center where it was displayed on the dispatcher's terminal. The UP dispatch center computer clocks were synchronized to UTC time so the dispatcher clock time was used to synchronize all wayside field recorders to a common time reference. Table 1 summarizes signal and train control events recorded for Texarkana Interlocking (CP R001 & CP CB418) at the UP dispatch center.

Table 1. *UP dispatch center post-accident signal and train control data log*

Time	**CP**	**Event**
12:24:32	R001	Northbound interlocking home signal requested by dispatcher
12:25:54	CB 418	Westbound interlocking home signal requested by dispatcher (stacked request)

Time	CP	Event
12:26:03	R001	Northbound interlocking home signal indicated clear for main track 1
12:31:07	CB418	Track circuit 2 indicated occupied
12:31:51	R001	Track circuit 12 indicated occupied
12:34:27	R001	Northbound interlocking home signal indicated at stop Northbound OS track circuit indicated occupied
12:34:39	CB418	Westbound OS track circuit indicated occupied
12:35:16	R001	Switch 3 indicated out-of-correspondence
12:35:53	R001	Recall control requested by dispatcher to CP R001

2.2 Defect Detector and Field Signal Data Recorders

Signal and train control events recorded at CP Gertrude and the intermediate signal at MP 417.31 were downloaded for review with no exception taken. Field signal data accurately reflected the events recorded by the UP dispatch center.

In addition to wayside signal data, downloads from defect detectors encountered by the UP trains were acquired. Table 2 summarizes the data from the defect detectors.

Table 2. *Data from defect detectors for UP train*

Location	Train	Train Speed	Defects
R006	#2	31 mph	No defects
R018	#2	55 mph	No defects
CB395	#1	30 mph	No defects
CB409	#1	40 mph	No defects

Pinehurst Street crossed the UP main track at MP 417.4. The highway-rail grade crossing was equipped with a Safetran grade crossing predictor. The data log from the grade crossing system was downloaded and reviewed with no exceptions taken

2.3 Post Accident Signal System Examination and Testing

As a result of the train collision, the signal bungalow housing the signal equipment to direct train movements through the Texarkana Interlocking was heavily damaged.

The post-accident inspection found all remaining signal equipment and appurtances locked and secured with no indications of tampering or vandalism. Following the accident, UP railroad signal officials physically sealed all bungalows and signal heads as requested by FRA and NTSB investigators.

There were no defects noted during the examination of the signal system or the associated signal appurtenances. All signal appurtenances inspected were found to be in compliance with CFR 49 part 236.

2.4 Wayside Signals Inspection

Control point and intermediate signals were examined and locations equipped with data loggers were downloaded. Signal aspects were verified and ground tests were performed. Post-accident signal lamp voltage measurements were recorded

All signals and appurtenances were found to be in adequate condition and operating within parameters of CFR 49 part 236. Control Point Gertrude (MP 416.4) uses wayside searchlight signals with upper and lower signal heads capable of displaying green, yellow, and red aspects. The intermediate signal located at MP 417.31 is equipped with wayside color light signals with a single three position head capable of displaying a green, yellow, and red aspect. The Home signal for the interlocking is located at M.P. 419. This signal is equipped with wayside color light signals with a three position head capable of displaying a green, lunar, and red aspect.

2.5 UP Signal System Trouble/Remedy Tickets

Signal system trouble/remedy tickets logged by the Signal Operations Center for CP R001 and CP CB418 were reviewed for the 9-month period preceding the date of the accident. Investigators were provided with trouble ticket reports that were generated during this period for review. A total of 43 trouble/ remedy tickets were generated in a 9 month period pertaining to and associated with signal trouble at the Interlocking at CP R001 and CP CB 418. A review of the trouble/remedy tickets reflected that 18 of those tickets could be attributed to one of the following categories:

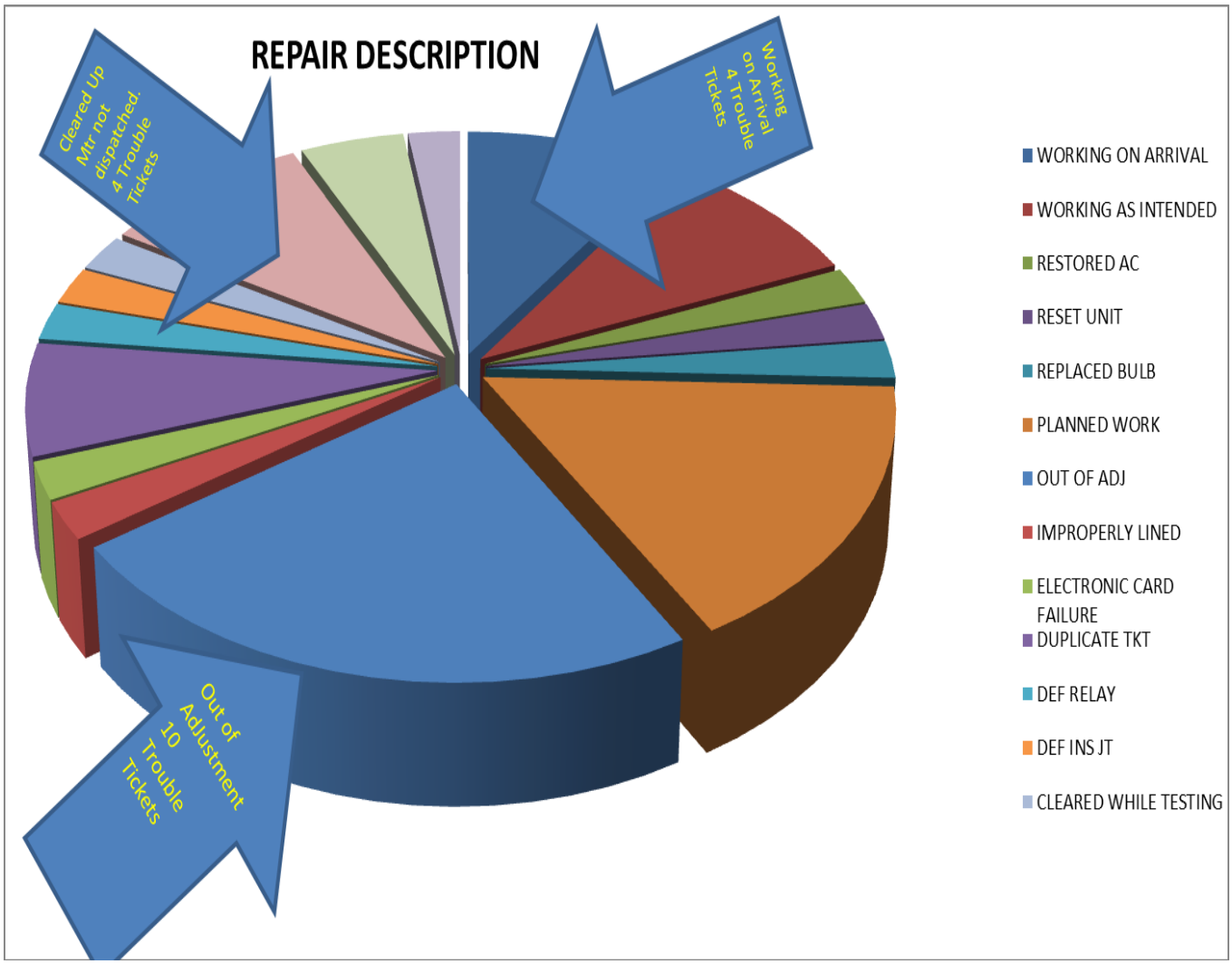
A. Signal trouble cleared up, maintainer not dispatched,

B. Working on arrival,

C. Out of adjustment,

Chart 1 summarizes the data from the Trouble/Remedy Tickets.

Chart 1 *Trouble/Remedy Tickets*



2.6 Railroad Maintenance Records

Railroad Maintenance, inspections and tests records were provided for monthly, quarterly, and annual inspections for the Texarkana Interlocking. Maintenance test records provided by Union Pacific were categorized in two sections, long term and short term tests. A total of 711 maintenance tests were performed by signal personnel between 03/01/2012 and 08/24/2015 within the limits of the Texarkana Interlocking. All maintenance tests are required by CFR 49 Part 236. Test results were placed in one of six categories:

1. C-Test complete. Equipment in satisfactory condition.
2. A-Adjustment made and test complete. Equipment in satisfactory condition.
3. R-Repairs or replacement needed.
4. S- Repairs or replacement made. Equipment in satisfactory condition.
5. O-Out of service.

6. U-Unscheduled test.

A post-accident review of signal maintenance tests records indicated that all signal inspections were recorded with the same test result marked, (C- Test complete. Equipment in satisfactory condition).

3. Damages

The UP signal system sustained damages to the signal and communication equipment and appurtenances as a result of the train collision.

END OF SIGNAL GROUP FACTUAL REPORT