NATIONAL TRANSPORTATION SAFETY BOARD
Vehicle Recorder Division
Washington, D.C. 20594

January 5, 2017

Locomotive Event Recorder Data

Specialist's Factual Report
By Sean Payne

1. EVENT SUMMARY

Location:	New Orleans, Louisiana
Date:	February 20, 2016
Company:	Norfolk Southern
Train ID/Locomotive:	Train 298 - Loco 8783 - Lead
NTSB Number:	DCA16FR003

On February 20, 2016, at approximately 6:10 a.m. central standard time (CST), Norfolk Southern (NS) Train 298 struck and fatally injured a NS Terminal Trainmaster on main track 2 at milepost 186 of the NE Subdivision, Alabama Division. The visibility conditions at the time of the accident were very poor with low lying fog.

2. LOCOMOTIVE EVENT RECORDER GROUP

A locomotive event recorder group was not convened.

3. DETAILS OF RECORDER INVESTIGATION

The National Transportation Safety Board (NTSB) Vehicle Recorder Division received the following locomotive downloaded information from Norfolk Southern in .PDF form:

Locomotive ID:	**Train 298/Locomotive 8783**
Filename(s):	**NS8783_298A820_2.20.16Text1-c.pdf**
	NS8783_298A820_2.20.16Text2-c.pdf

3.1. Locomotive Event Recorder Recording Description

The file provided by Norfolk Southern did not include the entered value for the locomotive's wheel size. The NTSB was unable to independently verify if the wheelsize was entered into the recorder software properly, however, a review of the recorded data downloaded by Norfolk Southern suggests the parameters were in agreement with other external data sources that captured the accident. Therefore, it is likely the wheelsize entered by the Norfolk Southern employee who performed the recorder download was correct and the data are valid.

The data provided by Norfolk Southern for locomotive 8783 began at 0549:30 A.M. CST and ended at 0613:20 A.M. CST.

3.2. Parameters

Table A-1 lists the parameters verified and provided in this report for Locomotive 8783. Additionally, table A-2 contains the unit and discrete state abbreviations for the parameters.

3.2.1. Distance Traveled

The default output for the distance traveled is the distance decreasing with time. Therefore, the distance traveled began with a very large value in feet and continually decreased to 0 feet.

3.3. Time Correlation

The recorded time from both locomotive 8783's event recorder data and on-board forward facing video recorder[1] are independently time stamped and, consequently, the times may not reflect the actual time of day. The timestamp given in the Norfolk Southern supplied files from the event recorder on locomotive 8783 could not be independently verified as the NTSB did not conduct the event recorder's download. Typically, when an event recorder is downloaded, the timestamp is either applied by software using the download PC's internal timestamp, or a timestamp is manually set by the download operator. In the absence of other information, locomotive 8783 event recorder timestamp was assumed to be accurate.

The locomotive event recorder data from locomotive 8783 recorded PCS Open at 06:08:21 A.M. CST and later showed the train coming to a stop at approximately 06:09:27 A.M. CST. The investigator in charge provided a time of a subsequent call to emergency medical services at 06:15:51 A.M. CST. Based on the available information, it was assumed that locomotive 8783's event recorder timestamp was within a reasonable expectation of accuracy that it would be considered the authoritative timing for this accident.

3.4. Plots and Corresponding Tabular Data

Figures 1 and 2 contain locomotive event recorder data from locomotive 8783 recorded during the February 20, 2016, event. All the parameters listed in table A-1 were plotted except locomotive direction and distance traveled.

Figure 1 shows a plot of locomotive 8783's basic performance parameters from 0550 A.M. CST until 0615 A.M. CST.

Figure 2 shows a plot of locomotive 8783's basic performance parameters from 0600 A.M. CST until 0612 A.M. CST. At the time of emergency brake application (PCS open) at 0608:21 A.M. CST, speed was indicated as 57 miles per hour (mph) and throttle position was recorded as Notch 8. Traction motor current was stable around 425 amperes. Throttle command quickly changed to idle at 0608:23 CST. Speed data indicated the train came to a stop around 0609:27 A.M. CST.

All of the corresponding tabular data used to create figures 1 and 2 are provided in electronic separated value (.csv) format as attachment 1 to this factual report.

[1] Refer to the National Transportation Safety Board's On Board Image Recorder Factual Report.

Figure 1: Recorded information between 0550 A.M. CST and 0615 A.M. CST

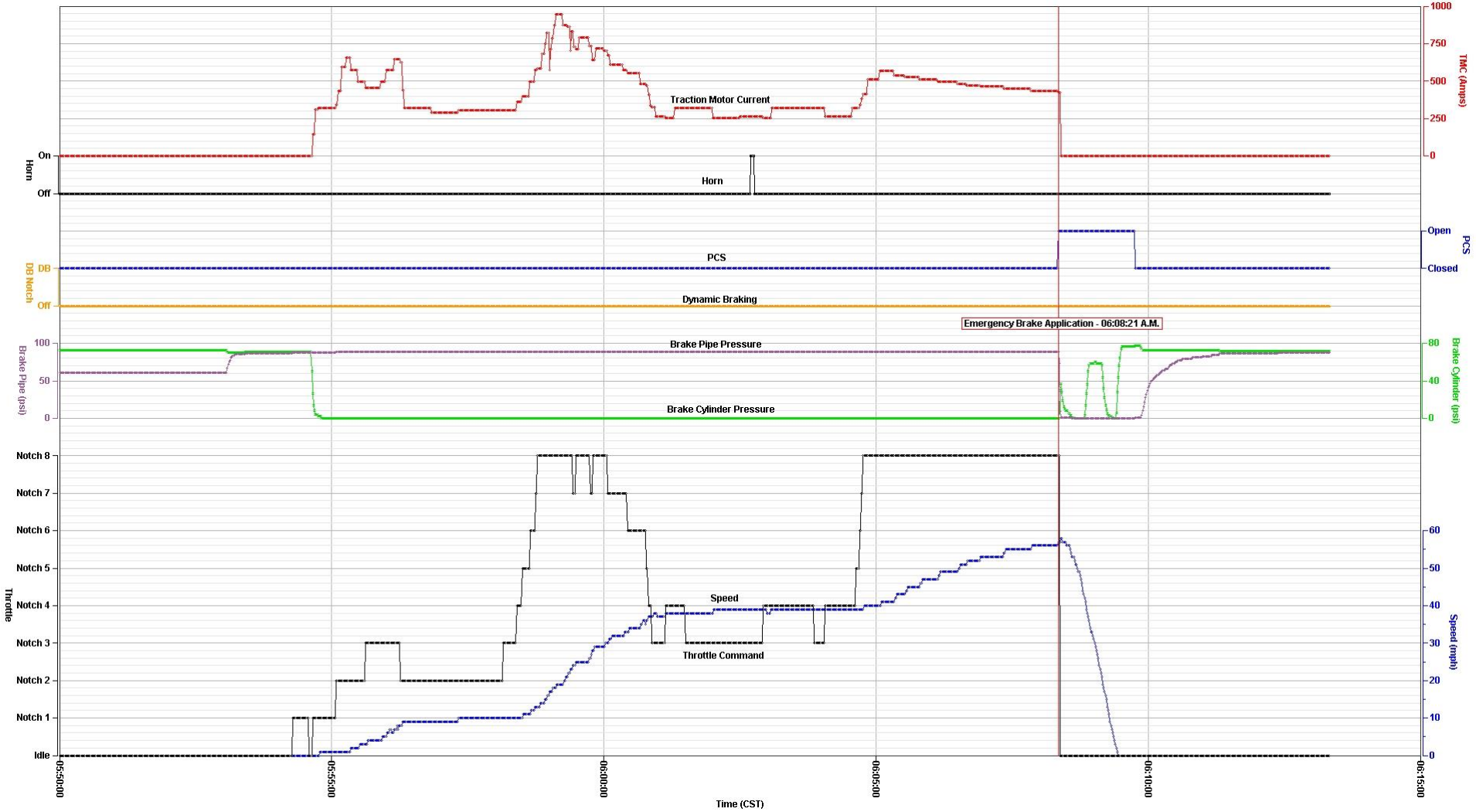
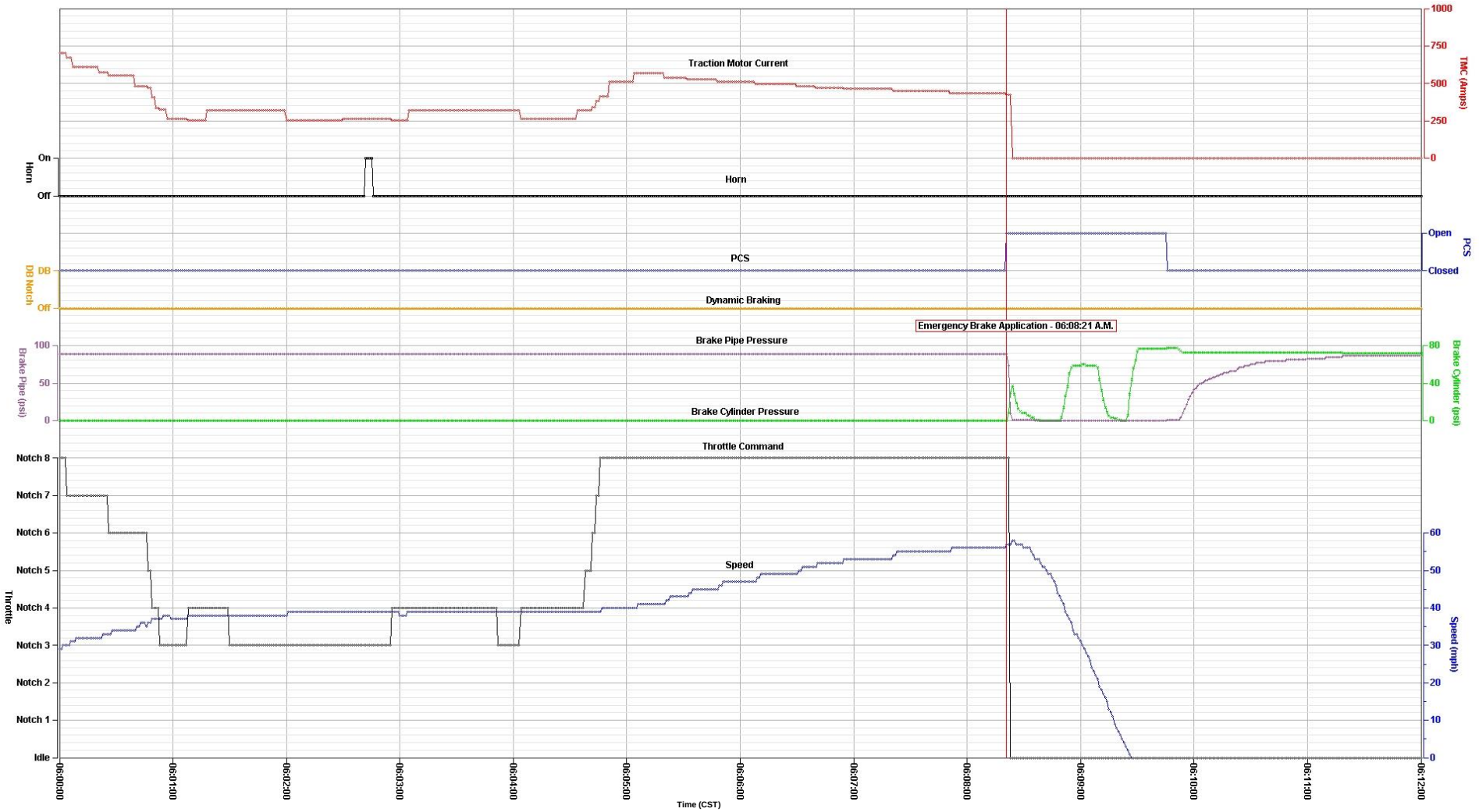


Figure 2: Recorded information between 0600 A.M. CST and 0612 A.M. CST



APPENDIX A

This appendix describes the locomotive event recorder parameters provided and verified in this report for locomotive 8783. Table A-1 lists the parameters and table A-2 contains the unit and discrete state abbreviations for the parameters.

Table A-1. Verified and provided locomotive event recorder parameters for locomotive 8783.

Parameter Name	Parameter Description
1. Speed	Speed
2. Distance	Distance Traveled
3. TMC	Traction Motor Current
4. Brake Pipe	Brake Pipe Pressure
5. Brake Cylinder	Brake Cylinder Pressure
6. Throttle	Throttle Position
7. DB Notch	Dynamic Braking Position
8. Direction	Locomotive Command Direction
9. PCS	Pneumatic Control Switch
10. Horn	Horn

Table A-2. Unit and discrete state abbreviations.

Units Abbreviation	Description
mph	miles per hour
ft	feet
Amps	amperes
psi	pounds per square inch
notch #	notch position of throttle command lever
on	on
off	off
forward	forward
neutral	neutral
reverse	reverse
open	open
closed	closed

NOTE: For parameters with a unit description of discrete, a discrete is typically a 1-bit parameter that is either a 0 state or a 1 state where each state is uniquely defined for each parameter.