

Federal Railroad Administration Office of Safety Headquarters Assigned Accident Investigation Report HQ-2006-83

Massachusetts Bay Commuter Railroad Company Franklin, MA October 23, 2006

Note that 49 U.S.C. §20903 provides that no part of an accident or incident report 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.

DEPARTMENT C FEDERAL RAILR	OF TRA OAD A	NSPORT DMINIST	TATI RAT	ON ION	FRA FA	ACTUA	LRA	ILR	OAD A	CCI	DENT I	REPO	RT]	FRA Fi	le #	<u>HQ-200</u>)6-8.	3
1.Name of Railroad O Massachusettes Bay	1a. Alphabetic Code 1b MBTA					1b. 1	b. Railroad Accident/Incident No. 0485												
2.Name of Railroad Op	2a. Alphabetic Code 2					2b. F	2b. Railroad Accident/Incident												
N/A	N/A						N/A												
3.Name of Railroad Re	3a. Alphabetic Code 3						Railroad A	Acciden	t/Inci	dent No.									
Massachusettes Bay		MBTA						0485											
4. U.S. DOI_AAR G	5. L	Date of Aco	6.1	. Time of Accident/Incident															
					536861K				10 23 2006					07:48: 🗸 AM 🗍 PM					
7. Type of Accident/In	ndicent	1. Derail	nent	4. Side collision				7.	7. Hwy-rail crossing 10. Explosic					n-detonation 13. Other					
(single entry in code	e box)	2. Head of	on coll	ision	sion 5. Raking collision				8. RR grade crossing 11. Fire/viol-					ent rupture (describe in narrative)					
		3. Rear e	nd col	lision	sion 6. Broken Train collision				9. Obstruction 12. Other is						narra	uve)			07
8. Cars Carrying	rs	10. Cars Releasin				g 11. People						12. Div	vision	l					
HAZMAT 0	HAZMAT 0 Damaged/Derailed				1 0 HAZMAT				0 Evacuat					0			System		
13 Nearest City/Towr	<u>י</u>				14. Milepost					15. S	. State			. County					
Torritourost enty, rowr		(to nearest te						Abbr Code				NORFOLK							
17 Temperature (F)		18 Visit	ility	(cin	(single entry) Code 10 X			741-						20					Celle
(specify if minus)		10. 11.	Dawn	3.E	3.Dusk 1				ar 3. R	ain	ntry) Code n 5.Sleet			20. Typ	Je of Track Jain 3 Siding				Code
50	F	2.	Day	4.I	Dark	2	2	. Clo	udy 4. Fe	og	6.Snow			2. Y	rand 4. Industry				1
21. Track Name/Numb	ber				22. FRA Track				Code	23. 4	3. Annual Track Density			24. Tim	ne Table Direction		ction		Code
	Branc	ch Class (1-9, X) (gross tons in millions)						0	1. North 3. East					3					
							ODED				.1		-						-
OPERATING TRAIN #1																			
25. Type of Equipmen	Spec. Mo	W Eq	uip. Code	20. V	vas Equip Attended?	ded? Code 27. Train Num					/Symbol								
Consist (single entry) 2. Passenger train 5. Single car 8. Light loco(s). Attended: 3. Commuter train 6. Out of cars 9. Maint /inspect car 3 1. Yes 2. No 1																			
28. Speed (recorded s	peed, if	available)	Cod	e 30	. Method(s) of	of Operati	on (ente	r code(s)	that a	apply)			30a. Rem	otely C	ontro	olled Loco	omot	ive?
R - Recordeda. ATCSg. Automatic blockm.Special instructions $0 = Not a4eShoutely do Wested$																			
E - Estimated	t of t	raffic	n. Ot	her than m	ain trac	k	1 = Remote control portable												
29. Trailing Tons	c. Auto train stop i. Time t										ositive trair	1 contro	1	2 = Remote control tower 3 = Remote control					
excluding power	muge,	6	e Traffic k Direct ti				raffic control Code(s			ify in na (s)	rrative)	transmitter - more than one							
	. Interlocking	g 1.	Yard lin	nits	e control	<i>a</i>				remote control transmitter				0					
31 Principal Car/Unit		a Initial	and N	umber	h Positic	n in Troir		[oade	ed()	122	IN/A F	N/A [N/	A N/A		/-11-	1		_	0
(1) First involved		a. muai		uniber	0. I Oshic	/// // // // // // // // // //		Load	cu(yes/no)	32.	enter the	number	that were	e positive i	g/alcono n	or use	, Alcohol	_	Drugs
(derailed, struck, et	c)		N/A			1			yes		the appro	priate b	ox.	•			N/A		N/A
(2) Causing (if meel	hanical		0			0		N	J/A	33	3. Was this	consist	transport	ing passen	gers? (Y/N)			
cause reported)			0					r				I T -			(d - d			Empty	
34. Locomotive Units		a. Head	1. 14	Mid 7	Frain	Re d Manua	ar End	moto	35. Car	s			Lo Freight	b Pass	c Fre	Emp ight l	d Pass		Caboosa
(1) Total in Train		Elia	D. MI		c. Kelliote	1		note	(1) Total	Lin Do	unimm ant C	onoiot	0. 1 Tergin	7	0.110	igin	0	0. 0	0
(1) Totai in Train		0		0	0	I	0		(1) Tota	i in Eq	uipment C	onsist	0	/	0		0		0
(2) Total Derailed	I	0		0	0	0	0		(2) Total	l Dera	iled		0	1	0)	0		0
36. Equipment Damag	ge			37. Tra	ack, Signal, V	Vay,	-		38. Prim	ary Ca	ause	!		39. Cont	ributing	g Cau	se		
This Consist	1	500000		&	Structure Da	3	Code	303	Code N/A										
	I	Numbe	r of C	rew Me	w Members				Leng					h of Time on Duty					
0. Engineer/ 41. Firemen				42. Co	akemen		44. Engi	ineer/0	eer/Operator			45. Conductor							
N/A	N/A 0				3		0			Hrs	Hrs 2 Mi		36		Н	lrs	2	Mi	36
Casualties to: 4	46. Railr	ailroad Employees 47			in Passenger	48. Other			49. EOT D		Device?			50. Was EOT Device Proper				Arr	ned?
Fatal		0			0		0		1. Y	les	2. No 2		2	1. Yes 2. No				N/A	
					0		0		51. Cab	oose C	e Occupied by Crew?			I					
Nonfatal N/A				26 0				1. Yes 2. No									I	N/A	
	OPERATING TRAIN #2																		
UPERALINU I RAIN #2																			
Consist (single entry) 2. Passenger train 5. Single car 8. Light h								A. Spec. MOW Equip. Code					ttended?			J4. I			
	3.	Commuter	train	6. Cu	t of cars 9.	Maint./in	spect.ca	r			N/A		1. Yes	2. No N	J/A		N/A	A	
55. Speed (recorded s	peed, if	available)	Cod	e 57	. Method(s)	of Operati	on (ente	ter code(s) that apply)					57a. Remotely Controlled Locomotive?					
R - Recorded	g	g. Automatic block m.Special instructions						ŀ	0 = Not a remotely controlled										
E - Estimated	U	MPH	IN/A	t	. Auto train c	control h	. Curren	t of t	raffic	n. Ot	ner than m	ani trac	N	1 = Rem	ote con	trol p	ortable		

DEPARTME FEDERAL RA	NT OF TI AILROAD	RAN ADI	SPORT MINIST	ATI RAT	ON TION	FRA F.	ACTUA	L RAILI	ROAD AC	CII	DENT I	REPO	ORT	F	RA File #	<u>HQ-200</u>	<u>5-83</u>		
56. Trailing Tons (gross tonnage, excluding power units)						. Auto trai . Cab Traffic	n stop i. j. k	train orders of nt control 1 ïc control	ain orders o. Positive train control control p. Other (Specify in narrative) Code(s)					2 = Remote control tower 3 = Remote control transmitter - more than one remote control transmitter					
					f.	Interlockin	g 1. · · m ·	Yard limits	1.1	N/A	N/A	N/A	10/21						
58. Principal Car/Unit a. Initial and Nu					Number	b. Posit	ion in Trai	n c. Loa	ded(yes/no)	59.	If railroad enter the	i emplo	oyee(s) teste er that were	ed for drug	/alcohol us	se,	Druge		
(1) First involved (derailed, struck, etc) 0							0		N/A	the appropriate box.						N/A	N/A		
(2) Causing (if mechanical									NT/A	60 Was this consist transporting passengers? (V/N)							1011		
cause reported) 0							0		N/A							/	N/A		
61. Locomotive	Units a. Head End b. Ma			Mid Ianual _I	Train c. Remote	Re d. Manua	ear End l c. Remote	62. Cars	62. Cars Lo a. Freight					En c. Freight	npty d. Pass.	e. Caboose			
(1) Total in Train			0	0 0) 0		0	(1) Total in	fotal in Equipment Consist			0	0	0	0	0		
(2) Total De	(2) Total Derailed 0			0	0	0	0	(2) Total E	(2) Total Derailed			0	0	0	0	0			
63. Equipment D This Consis	63. Equipment Damage 6 This Consist 0					ack, Signal, Structure D	Way, amage	0	65. Primar Code	65. Primary Cause 66. Contributing Cause Code N/A Code						luse	N/A		
			Numbe	r of C	Crew Me	embers	0 1				1		Length of	Time on D	uty				
67. Engineer/	68.	Firem	nen		69. Co	nductors	70. Bi	rakemen	71. Engin	eer/O	perator			72. Con	ductor				
Operators	0	0				0		0	Hrs 0				0		Hrs	0	Mi 0		
Casualties to:	73. R	ailroa	ad Emplo	yees	74. Tra	in Passenge	rs 75. Ot	her	76. EOT Device?					77. Was	Armed?				
Fatal			0			0		0	- 1. Y	es	2. No		N/A	1.	N/A				
Nonfatal			0			0	_			78. Caboose Occupied by Crew?									
	ser Inv	olved		0		Rail Equipment Involv													
79. Type			111511 W	.y 0.		orved		Code	83. Equip	83. Equipment									
C. Tru A Auto D Pic	Motor Vel	icle	3.Train (standing) 6.Light Loco(s) (moving) 7.Light(s) (standing) 7.Light(s) (standing)								noving)	Code							
B. Truck E. Va	er (spec. in	narrative)	2.Train(units pushing) 5.Car(s)(standing) 8.Other (specify in narrativ									2							
80. Vehicle Spe	irection	geograph	ical)	Code	84. Position of Car Unit in Train														
(est. MPH	1.No	orth 2.S	outh 3.East	4.West		85 Circum	otona				I			<u> </u>					
82. Position	Crossing	2 Stor	nned on (Tross	ing 3 N	loving Ove	r Crossing	Code	1. Rail Ed	juipm	ent Struc	k High	way User				Code		
4. Trapped	ing on	loting off	crossing	4	2. Rail Ec	luipm	nent Struc	k by H	ighway Use	er			1						
86a. Was the hi	nent inv	olved		Code	86b. Was t	here a	a hazardo	us mat	erials releas	e by			Code						
in the impa	act transpor	rting l ail Ea	hazardou	s mat	terials?	4 Naithar		1 4	1. High	1. Highway User 2. Rail Equipment 3. Both 4. Neither									
1. Fighway Oser 2. Kail Equipment 3. Both 4. Neither 86c. State here the name and quantity of the hazardous materials released, if any.															I				
		-	-					N/A											
87. Type of 1. Gates 4. Wig Wags 7. Crossbucks 10. Flagged by crew 88. Signaled Crossing Warning Code 89. Whistle Ban															Code				
Warning	ais 8.Stop 9.Wate	hman 1	2.None	c. in narr.)	(2	See instru	ctions	tor codes)	2. No										
Code(s)	01	C	03	00	6	N/A	N/A	N/A	N/A					N/A	3. Un	known	2		
90. Location of V 1. Both Side	Location of Warning						91. Cross with	ing Warning Highway Si	Interconnect	Interconnected Code 92. Crossing gnals Lights					Iluminated by Street Special Lights				
2. Side of Vehicle Approach								1. Yes			1. Yes			. 0					
3. Opposite Side of Vehicle Approach						1	2		2 2. No 3. Unknown						own				
93. Driver's	s Gen	der C	ode	95. Dr	iver Drove	Behind or	rain Code	ain Code 96. Driver											
Age	1. Mal	e			an 1	d Struck or	was Struch	Train	rain 1. Drove around or thru the Gate 4. Stopped on Crossi 2. Stopped and then Proceeded 5. Other (specify in							g			
40 2. Female 1						Tes 2	2	2 3. Did not Stop						rrative)	5				
97. Driver Passed Standing Highway Vehicle 98. View of Track Obscured by (primary obstruction)														Code					
1. Yes 2. No 3	3. Unknowi	n	1		2. Star	nanent Stru iding Railro	ad Equipn	o. Pass nent 4. Top	ography 6.	Highv	way Vehi	cle 8	Not obstru	cted	a11dUVC)		8		
101. Casulties to Highway-Rail						Injured	99. Drive	r Was		Code			100. Was E	Priver in th	1	Code			
Crossing Users Killed					u	injuicu	1. Killed	1 2.Injured 3	Uninjured		3		1. Yes 2. No						
$\begin{array}{ c c c c } 0 & 0 & 102. \text{ Highy} \\ \hline 0 & (\text{est. } d) \end{array}$									(include driver) 250000 ge) 250000 103. Total Number of Highway-Rai						Kail Cross	ng Users			
104. Locomotive	104. Locomotive Auxiliary Lights? Code 105. Locomotive Auxiliary Lights Operational?													Code					
1. Yes 2. No 1 1. Yes 2. No													1						
106. Locomotive Headlight Illuminated?								Code	107. Locor	107. Locomotive Audible Warning Sounded?							Code		
1. Yes	1. Yes 2. No 1										1. Yes 2. No								

108. DRAW A SKETCH OF ACCIDENT AREA INCLUDING ALL TRACKS, SIGNALS, SWITCHES, STRUCTURES, OBJECTS, ETC., INVOLVED. HQ-2006-83 Sketch.jpg



109. SYNOPSIS OF THE ACCIDENT

A eastbound MBTA passenger train collided with a tractor trailer truck at the Fisher Street crossing on October 23, 2006, at 7:48 a.m. The trailer was a low bed type which was carrying a portable rock- crushing machine that weighed approximately 53 tons. The trailer was hung up on the crossing and the truck driver was attempting to raise the trailer at the time of the collision. The collision occurred in Franklin, Massachusetts, at MBTA Milepost 28.4, on the MBTA Franklin Branch.

The truck driver was not injured, but two railroad employees and 26 passengers sustained various types of injuries. The low boy trailer was slightly damaged. The rock crusher machine was knocked off of the trailer with the conveyor belt of the machine slicing through the roof of the control car and coming to rest against the car. The control car sustained approximately \$500,000 worth of damage. The lead truck of the control car did derail and the entire passenger car was severely leaning towards the fireman's side. Because of this, the two wheels on the engineers side of the rear truck were raised up off of the rail.

The FRA's investigation concluded the probable cause was the low boy trailer loaded with the rock crushing machine was fouling the track. According to the MBTA police report, the area of the collision was thickly settled residential and commercial in nature. The roadway was poor in condition due to recent construction and had been patched with asphalt. Several potholes were present in the roadway on the day of the collision. Both of these conditions played a significant role on the clearance of the trailer. Because of these findings, it was determined that the truck driver was not responsible for the collision. The FRA's investigation also concurs with the findings of the MBTA police.

110. NARRATIVE

Circumstances Prior to the Accident

The crew of passenger train MBTA 710 included a locomotive engineer, a conductor, and two assistant conductors. One of the assistant conductors first went on duty at 7:25 a.m., EST, October 23, 2006 at the MBTA Forge Park station. The remainder of the crew first went on duty at 5:12 a.m., EST, October 23, 2006 at the MBTA equipment layover facility in Franklin, Massachusetts. This is the regular assignment for all crew members and all received more than the statutory off duty period, prior to reporting for duty.

Their assigned passenger train consisted of one locomotive and seven passenger cars. MBTA Train 710 departed the MBTA Forge Park station at the scheduled time of 7:45 a.m. and was due to arrive at Boston's South Station at 8:52 a.m.

As the eastbound train approached the accident area, the locomotive engineer was located in the engineers compartment of the control car. The conductor was located in the first car behind the control car, one assistant conductor in the second car behind the control car and the additional assistant conductor in the last passenger car of the train.

In this area of the railroad, the track is a single main line with a 3-degree curve to the left. In this area of Fisher Street, the road crosses the track perpendicular. When traveling in the northbound direction, the road does descend from the track and turns to the right.

The railroad timetable direction of the train was east.

The Accident

Train MBTA 710

The train was being operated at 40 mph approaching the accident area. The engineer observed a man to the right of the track waving in a stop motion. The engineer placed the trains brakes in an emergency application while sounding the horn. At that time the train proceeded through the curvature of the track and the Fisher Street crossing came into view. The engineer could see the huge machine perpendicular on the track. Realizing that impacting the machine imminient, the engineer turned to warn the passengers. At the same time, he felt and saw the train strike with the machine. The speed was recorded on the event recorders of the control car and the locomotive. The maximum authorized speed for the train was 40 mph, as designated in the current MBCR Timetable No. 5.

Highway Vehicle

The tractor trailer was traveling south to north on Fisher Street. As the loaded trailer was pulled over the single main line, it bottomed out on the track and became hung up. The truck driver attempted to free the trailer by utilizing the "blocking system" to lift it off the track. When he realized that his attempts to free the trailer were unsuccessful, he exited the cab of the tractor and attempted to manually place blocks under the trailer. As he was attempting this maneuver, the crossing's active warning devices activated and the crossing gates began to lower. He then observed the train approaching and ran for safety. As a result of the collision, the tractor was separated from the trailer.

The train struck the trailer, knocking the portable rock crushing machine off the trailer and onto the railroad right of way. The conveyor belt of the machine struck the front of the control car and also lacerated the roof of the control car behind the engineers compartment. The trailer came to rest against the control car with the wheels remaining on the road surface. The train came to a stop approximately 79 feet east of the roadway.

FRA FACTUAL RAILROAD ACCIDENT REPORT

After the train stopped, the conductor notified the train dispatcher of the emergency and requested medical assistance. The conductor and two assistant conductors then assisted in the evacuation of the train passengers.

At 7:51 a.m., EMT's, MBTA Transit police and Franklin police were notified. MBCR Senior Trainmaster William Rae was dispatched to the scene and arrived at approximately 9 a.m. The MBTA Transit police arrived at approximately 9:15 a.m. The MBTA Transit police took control of the collision site and conducted the investigation into the collision.

The locomotive engineer and 20 train passengers were transported to the Milford Regional Medical Center with non-life threatening injuries. Days after the accident, one employee and six passengers reported injuries sustained in the collision.

The remainder of the train passengers were transported to the Franklin Train Station where they could board a train to continue on their trip.

Analysis and Conclusions

The driver was a 40 year old male. He had been operating tractor-trailers for total of 22 years.

The highway-rail grade crossing at grade is equipped with cross bucks, warning lights, gates, and a bell. There is no advance warning sign or pavement markings. There is also no sign for north bound travel on Fisher Street warning that low boy trailers are prohibited. Also, Fisher Street is not the only street that provide accessability to the location where the rock crushing machine was picked up at. Trucks can gain access by operating over the Hayward Street highway-rail grade crossing, which is not humped, through the Franklin public works yard.

At the time of the collision, the Fisher Street crossing was listed in the FRA Inventory as a private crossing. Since that time, the crossing has been changed in the inventory to a public crossing. The roadway is under the care of the Town of Franklin Public Works.

The railroad has a whistle post located approximately 1,000 feet west of the Fisher Street crossing. MBCR Timetable No. 5 requires the sounding of the locomotive horn when the train is proceeding in either direction. The engineer stated that he did sound the horn when he saw the man waving for the train to stop. One of the assistant conductors confirmed that he did hear the horn sounding. The event recorder does confirm that the horn was sounded.

The active warning devices were tested by an MBCR signal maintainer in the presence of a FRA signal and train control inspector. The warning devices functioned as intended.

The leading control car was equipped with a headlight, auxiliary lights, and the audible warning device as required by Federal regulations. Due to the amount of damage sustained by the control car, none of these devices could be tested.

The control car was equipped with an speed indicator and event recorder as required. The relevant event recorder data was downloaded by the MBCR cab signal supervisor that was present at the collision site. The data was analyzed immediately by the supervisor and the MBCR Senior Road Foreman of Engines. The analysis disclosed that the engineer was in compliance with all applicable railroad operating rules. FRA reviewed the results of this analysis, and concurred with the conclusion.

The engineer was operating the train in full compliance with railroad operating rules and Federal regulations.

Conclusion

Based on the investigation by the MBTA Transit police, possible contributing causes are; poor condition of the roadway due to recent construction which had been patched with asphalt as well as several potholes in the roadway on the day of the collision. Both of these conditions played a significant role in the clearance of the trailer. As a result of these conditions, the police did not cite the driver nor feel that he was responsible for the collision. Also, there was no warning sign posted for the north bound Fisher Street traffic warning about poor clearance for a low bed trailer, however; it should be noted that Fisher Street is a one-way street with South bound traffic only, the low bed trailor was traveling in the wrong direction. There is a warning sign posted prohibiting low bed trailors from transversing the tracks which is viewable if traveling in the correct direction on this one-way street.

The FRA's investigation concluded that the probable cause was the low bed trailer fouling the track because of the highway user's misjudgement under normal weather and traffic conditions; the highway user operated his low bed trailor over a prohibited crossing.