



***Federal Railroad Administration
Office of Railroad Safety
Accident and Analysis Branch***

***Accident Investigation Report
HQ-2020-1385***

***Buffalo & Pittsburgh Railroad, Inc. (BPRR) Derailment
East Aurora, New York
May 18, 2020***

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

At approximately 10:59 p.m., EDT, on Monday, May 18, 2020, Buffalo & Pittsburgh Railroad, Inc. (BPRR) train SIBF, operating timetable northward on the BPRR Machias Subdivision main track, derailed at the north (bumper) end of the short spur (Fisher-Price siding) immediately adjacent to the single track mainline, at Milepost (MP) 17.28 in the downtown area of the Town of East Aurora, New York. At this location, compass and timetable north are almost identical. SIBF consisted of 3 locomotives in the lead and 98 cars, with 32 loaded and 66 empty mixed within the consist. The train was 5,875 ft. long and weighed 6,089 tons. SIBF was operating at an estimated speed of 34 mph on main track when train brakes were placed into emergency and SIBF entered Fisher-Price siding.

A total of 15 cars were derailed, including 5 HAZMAT empty tank cars. No material was spilled from these 15 cars. The five HAZMAT cars derailed (consist list cars 1-4, 7) all were marked hot/3257, residue last contained was elevated temperature liquid N.O.S. (paraffin wax) class 9. No HAZMAT product leaked from these five tank cars. The presence of these cars as well as cars with other commodities in the consist, resulted in 40 homes with approximately 60 people being evacuated in the area. The evacuation order was lifted once it was determined that the derailed equipment posed no threat to public safety.

Approximately 2,000 gallons of diesel fuel was spilled from the head north locomotive, the BPRR 3892. This fuel spill was contained and subsequently remediated by an environmental contractor.

Total estimated damage was \$515,195 (\$500,000 for the train, and \$15,195 for track, signal). The weather at the time of this derailment, May 18, at 10:59 p.m., was an overcast sky with a temperature between 57° F and 59° F, with some rain during the daytime and the previous night.

The Federal Railroad Administration (FRA) investigation determined that the probable cause was switch not latched or locked, Cause Code H703.

Vandalism of track or track appliances, e.g., objects placed on track, switch thrown, etc., Cause Code M503, was assigned as a contributing cause.

TRAIN SUMMARY

1. Name of Railroad Operating Train #1 Buffalo & Pittsburgh Railroad, Incorporated	1a. Alphabetic Code BPRR	1b. Railroad Accident/Incident No. BPR425220D
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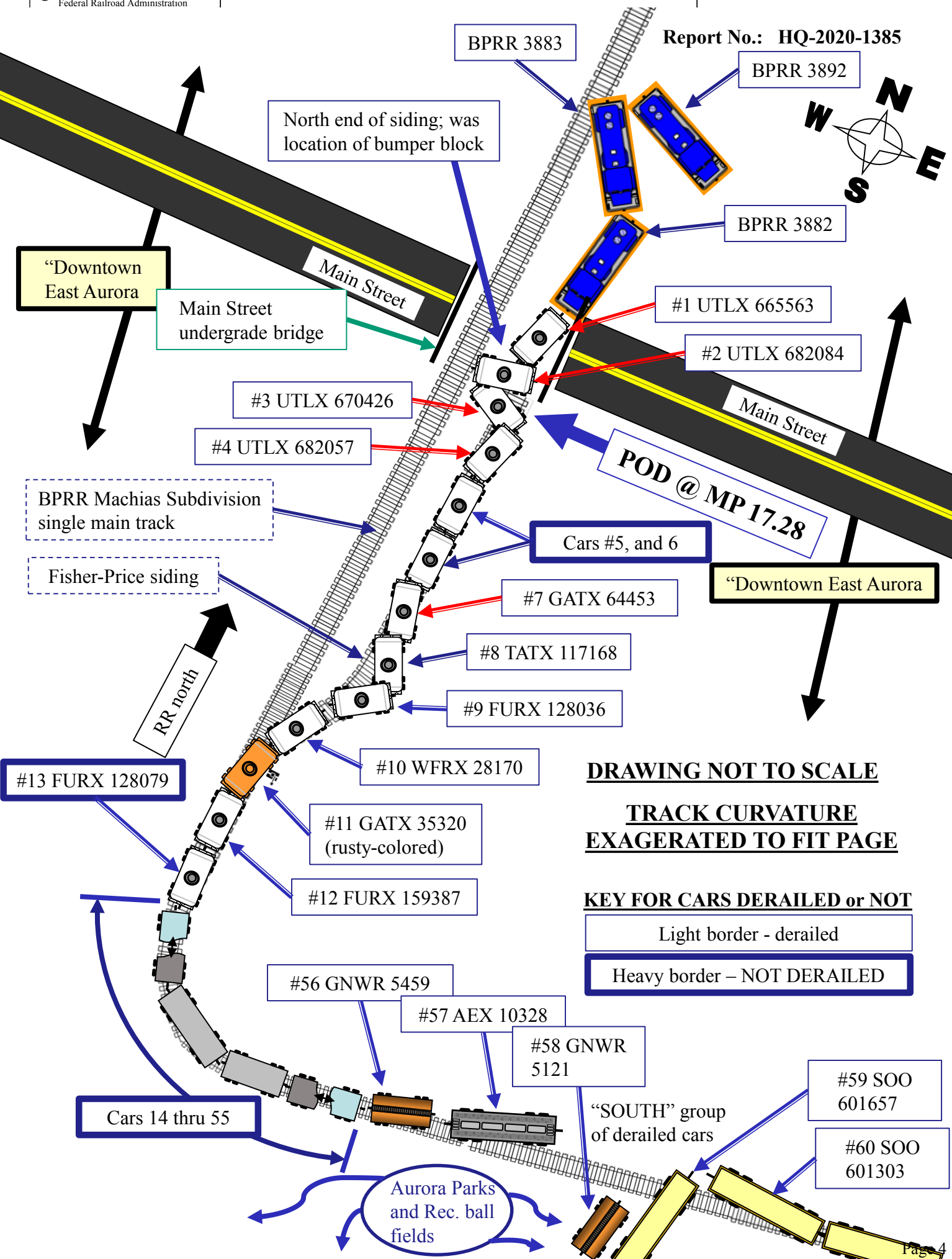
GENERAL INFORMATION

1. Name of Railroad or Other Entity Responsible for Track Maintenance Buffalo & Pittsburgh Railroad, Incorporated	1a. Alphabetic Code BPRR	1b. Railroad Accident/Incident No. BPR425220D
2. U.S. DOT Grade Crossing Identification Number	3. Date of Accident/Incident 5/18/2020	4. Time of Accident/Incident 10:59 PM
5. Type of Accident/Incident Derailment		
6. Cars Carrying HAZMAT 35	7. HAZMAT Cars Damaged/Derailed 5	8. Cars Releasing HAZMAT 0
9. People Evacuated 60		
10. Subdivision BUFFALO & PITTSBURGH RAILROAD, INCORPORATED - MACHIAS		
11. Nearest City/Town EAST AURORA	12. Milepost (to nearest tenth) 17.28	13. State Abbr. NY
14. County ERIE		
15. Temperature (F) 58 °F	16. Visibility Dark	17. Weather Cloudy
18. Type of Track Siding		
19. Track Name/Number FISHER-PRICE SIDING	20. FRA Track Class Freight Trains-10, Passenger Trains-15	21. Annual Track Density (gross tons in millions) 7
22. Time Table Direction North		
23. PTC Preventable Yes	24. Primary Cause Code [H703] Switch not latched or locked	25. Contributing Cause Code(s) M503

OPERATING TRAIN #1

1. Type of Equipment Consist: Freight Train					2. Was Equipment Attended? Yes			3. Train Number/Symbol SIBF			
4. Speed (recorded speed, if available) R - Recorded 34.0 MPH E - Estimated		Code R	5. Trailing Tons (gross excluding power units) 6089		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	
6. Type of Territory Signalization: <u>Not Signaled</u> Method of Operation/Authority for Movement: <u>Direct Train Control</u> Supplemental/Adjunct Codes: <u>P</u>											
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.)		BPRR3892	1	yes				0	0		
(2) Causing (if mechanical, cause reported)		BPRR3892	1	yes	9. Was this consist transporting passengers?			No			
10. Locomotive Units (Exclude EMU, DMU, and Cab Car Locomotives.)	a. Head End	Mid Train		Rear End		11. Cars (Include EMU, DMU, and Cab Car Locomotives.)	Loaded		Empty		e. Caboose
		b. Manual	c. Remote	d. Manual	e. Remote		a. Freight	b. Pass.	c. Freight	d. Pass.	
(1) Total in Train	3	0	0	0	0	(1) Total in Equipment Consist	32	0	66	0	0
(2) Total Derailed	3	0	0	0	0	(2) Total Derailed	2	0	13	0	0
12. Equipment Damage This Consist 500000			13. Track, Signal, Way & Structure Damage 15195								
Number of Crew Members						Length of Time on Duty					
14. Engineers/Operators 1		15. Firemen 0		16. Conductors 2		17. Brakemen 0		18. Engineer/Operator Hrs: 3 Mins: 59		19. Conductor Hrs: 3 Mins: 59	
Casualties to:		20. Railroad Employees		21. Train Passengers		22. Others		23. EOT Device? Yes		24. Was EOT Device Properly Armed? Yes	
Fatal		0		0		0		25. Caboose Occupied by Crew?		N/A	
Nonfatal		0		0		0					
26. Latitude 42.767698000				27. Longitude -78.612176000							

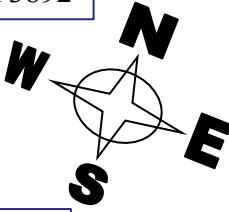
Report No.: HQ-2020-1385



BPRR 3883

BPRR 3892

North end of siding; was location of bumper block



BPRR 3882

“Downtown East Aurora”

Main Street undergrade bridge

#1 UTLX 665563

#2 UTLX 682084

#3 UTLX 670426

#4 UTLX 682057

POD @ MP 17.28

“Downtown East Aurora”

BPRR Machias Subdivision single main track

Cars #5, and 6

Fisher-Price siding

#7 GATX 64453

RR north

#8 TATX 117168

#13 FURX 128079

#10 WFRX 28170

DRAWING NOT TO SCALE

#11 GATX 35320 (rusty-colored)

TRACK CURVATURE EXAGGERATED TO FIT PAGE

#12 FURX 159387

KEY FOR CARS DERAILED or NOT

Light border - derailed

Heavy border – NOT DERAILED

#56 GNWR 5459

#57 AEX 10328

#58 GNWR 5121

#59 SOO 601657

#60 SOO 601303

Cars 14 thru 55

“SOUTH” group of derailed cars

Aurora Parks and Rec. ball fields

NARRATIVE

Circumstances Prior to the Accident**May 4, 2020**

Approximately 14 days prior to the accident, on May 4, 2020, a Maintenance-of-Way (MOW) crew with Track Foreman ("Foreman") in charge, had moved a spot tamper from Genesee & Wyoming Railroad property in Buffalo, New York, across the CSXT and NS and onto the Machias Subdivision, spot surfacing a location between Buffalo and East Aurora. Ownership on this subdivision transfers from Norfolk Southern Railway (NS) to BPRR at Milepost (MP) 8.8 on the northern end of this subdivision. This spot tamper was cleared by the Foreman in the East Aurora Fisher-Price siding (a.k.a Storage Track) and the switch locked out as out-of-service (OOS) with an MOW ("craft" vs. the transportation) tag. This track was not designated as an OOS track, but was removed from service temporarily on this day by the Foreman to store the tamper.

May 7, 2020

On May 7, 2020, an MOW track crew had been assigned to move this tamper southward from the East Aurora Fisher-Price siding to perform additional track surfacing at MP 13.9. This crew consisted of the Foreman, with a service date of September 19, 2012, and a trackman ("Trackman"), with a service date of August 28, 2017. Both are direct hires of BPRR and their only responsibilities are this line; they are not part of a traveling gang. The Foreman and the Trackman set their hi-rail truck on the main track at Pound Road crossing. They also proceeded southward, and arrived at the tamper stored in East Aurora. The Trackman commenced to start-up the tamper. The Foreman removed his OOS MOW tag and lock (as opposed to the transportation or "main line" lock), and inserted a switch awareness tag as he operated the switch to allow the tamper to make a trailing-point move southward out of the siding. Note that MOW locks are assigned and tagged. MOW personnel generally have their lock in their possession. This MOW lock was accounted for at all times since May 4th. After removing the tamper on May 7, the Foreman and the Trackman were no longer protecting their equipment, and were supposed to secure the switch with the transportation lock, which was the only lock on this switch at the time of the derailment.

The Foreman lined the Fisher-Price switch for the siding, removing his craft specific lock, replacing it with the transportation lock (it had been sitting underneath the switch stand), and putting his switch awareness tag on it. The derail was thrown, and Trackman started moving the tamper out of the siding. During the move, the tamper lost all air pressure and the brakes locked. The Foreman and the Trackman took 10-15 minutes to resolve the issue. Afterwards, they entered the main track on a trailing point (southbound) move from Fisher-Price siding to the main. There were now two vehicles on the main, the Foreman's hi-rail truck south and leading, and the Trackman's tamper north and trailing.

The switch was restored for the main and locked with the transportation lock in preparation for the southbound move. The Foreman and the Trackman did not clearly indicate in their statements who threw and locked this switch. After concluding their work on May 7th, they gave up their track authority to the dispatcher, and reported all switches lined and locked for the main. The Foreman stated that after the tamper was moved off the siding, he (the Foreman), restored the derail, and that the Trackman restored

the switch. The Trackman stated that he and the Foreman both tugged on the switch lock and kicked the switch stand latch, ensuring themselves that it was, in fact, locked and secured. The dispatcher transcript has them reporting all switches lined and locked. The Foreman and the Trackman both stated that they completed the Switch Position Awareness Form (SPAF) requirements and accounted for switch awareness tags. The Foreman rechecked the position of the switch points twice before they headed south. Both employees agreed that the switch was thrown correctly.

Several days after this move, the Foreman inspected this same switch three different times, on May 11, 14, and 18, and made no notes as to whether the transportation lock was or was not in the appropriate keeper.

May 18, 2020

The crew of the BPRR train SIBF consisted of a BPRR locomotive engineer, a conductor, and a student conductor. They first went on duty at approximately 7 p.m., EDT, May 18, 2020, at Salamanca Yard.

The home terminal for both engineer and conductor was Bradford, Pennsylvania. The locomotive engineer has a service date of September 13, 1999 and the conductor has a service date of November 26, 2001. The train crew is based out of Bradford. (Bradford to Buffalo Pool). The engineer and conductor each received more than the statutory off-duty period prior to reporting for duty. Each was released from their previous tour of duty at 3:30 a.m. on the morning of May 18th, providing over 15 hours of rest.

SIBF originated in Riker yard in Punxsutawney, Pennsylvania. Stops en route to Salamanca yard included Dubois, Pennsylvania, where Class 1 air brake test (“air slip”) documents showed that 43 cars were added to the train (refer to documents included in Tab 4. Train Mechanical Information). Three other cars also appear to have been picked up at this location that were not reported on the air slip. According to the trainmaster, these cars erroneously received Class 2 air brake tests when a Class 1 test should have been performed. The trainmaster identified the fourth location listed on the air slip, “BR,” as Bradford.

The dispatcher transcript indicates the crew relieved a previous crew at Carrolton, Pennsylvania, 4 miles southeast of Salamanca Yard. The transcript indicates that the train had 30 loads by 50 empties at the time. The crew then entered Salamanca Yard and picked up 20 interchange cars, according to records provided from interchange railroad Western New York & Pennsylvania (WNYP). These 20 cars were placed on the head end of this train.

Relevant train orders at this time were a “Box 2 Proceed From” CP N. Clarion and Machias on the BPRR Main Track on Track Warrant # 484 (south of the area of the derailment), and a “Box 4 Work Between” Machias and MP 8.8 on the Machias Main Track on Track Warrant # 535, with East Aurora being in this segment. The crew had no slow orders as they left Salamanca.

From the time train SIBF left Salamanca Yard through the time of derailment, the train consisted of 3 locomotives in the lead and 98 cars, with 32 loaded and 66 empty mixed within the consist. The train was 5,875 ft. long and weighed 6,089 tons. SIBF departed Salamanca, travelling northward towards Buffalo. The trip was reportedly uneventful prior to the incident.

Review of maintenance records for the three locomotives in the consist showed no deficiencies in inspection, identification, or repair of noted defects. Brake tests were noted for the cars removed on May 20 and 21 from the derailment site. No defects were noted during this testing.

As the SIBF was passing through East Aurora in a northward direction (both compass and timetable northward), the consist entered a slight, right-hand 1° - 10' curve located approximately at MP 17.75. The grade here is downhill in the direction the train was travelling (northward). According to the 1995 ex-Conrail track chart, the downhill grade was about 0.04 percent.

Train speed was an estimated 34 mph, as shown on the locomotive event recorder data provided by BPRR. Main Track here has a maximum authorized speed (MAS) of 30 mph. A sight distance evaluation was made on May 21. The switch target was first visible to the approaching SIBF from 1,266 feet away. At 34 mph, 1,260 feet (or 2,992 feet/minute) would have been covered in about 30 seconds. Fisher-Price siding is 525 feet long from the switch with a bumper block at the north end of the track. Fisher-Price siding has a MAS of 10 mph.

Tests of the head of train device (HTD) and end of train device (EOT) were carried out (by BPRR and Federal Railroad Administration (FRA)) on the Westinghouse 30CDW brake emergency application feature of the train's head locomotive, the BPRR 3892, on May 28. Upon an emergency brake application, the HTD normally would signal the EOT to dump the air from the rear of the train, reducing momentum that causes the train to "bunch up" towards the head of the train. However, the test on the 3892 concluded that the emergency application of the locomotive automatic brake did not engage an emergency activation of the EOT. Either the HTD was not receiving the signal from the locomotive, or it was not correctly sending the signal to the EOT for this function. The result on May 18th would have been that the emergency application originated throughout the train from the head end only, with the result that the train cars likely pushed into the locomotives, causing multiple freight cars to jackknife and derail. This conclusion was supported by the inspection of the train on May 20. Evidence that the coupler draft keys compressed into the rearmost position in the key slots of the 12th to 54th cars indicated that high buff forces were applied to the head end of the consist. If the HTD / EOT communication had been successful, fewer cars may have derailed.

Note that this report uses the train-consist-car-order-numbering without including the locomotives to describe the consist list and enumerate the freight cars (derailed or not). For example, the first car in the consist was #1 (not the 4th, is in the method including all 3 locomotives), the second car was #2 (not the 5th), and so on.

The Accident

As the SIBF was passing through East Aurora in a northward direction at an estimated 34 mph, the consist traversing the curve, the crew noticed that the target of the mainline-facing point Fisher-Price switch (just north of this curve) was displaying a red target. This indicated that the switch was in the reversed position, lined for the siding. The engineer placed the train into emergency braking upon seeing the misaligned switch, and the crew called out the emergency via radio. The consist traveled through the reversed switch, staying upright and on the rails. It continued a short distance, sheering off the side track derail, before crashing through the siding bumper block.

The point of derailment (POD) is located just on the south side of the Main Street under-grade bridge. The train continued an estimated 360 feet beyond the POD. The lead unit, the BPRR 3892, eventually dug in, uncoupled, and turned 90 degrees, and finally came to rest down an embankment perpendicular to the two trailing units.

Note that BPRR 3892 is an EMD SD60M unit, built (as BN 9201) in December of 1989. This lead

locomotive suffered damage to its fuel tank and released an estimated 2,000 gallons of diesel fuel. This spilled fuel was contained and remediated by an environmental contractor.

Due to the presence of HAZMAT paraffin cars (list # 1-4,7), as well as other commodities in the consist, 40 homes near the incident were evacuated. The evacuation order was lifted once it was determined that the derailed equipment posed no threat to public safety. These 5 HAZMAT cars, were all marked hot/3257, residue last contained, elevated temperature liquid N.O.S. (paraffin wax) class 9. No HAZMAT product leaked from these seven tank cars, and the packages were not compromised. There was minimal derailment damage on the running gear and safety appliances of these HAZMAT tank cars. The first 20 cars behind the locomotives were empty tank cars. Of these, the first 10 cars remained upright and mostly in-line. Cars # 1, 2, 3, 4, 7, 8, 9, 10, 11, and 12 in the consist list derailed. The lead cars were tank cars, which are generally heavier than other empty cars. The high buff forces and energy built up through the heavy brake effort at the head of the consist forced very few cars to buckle off the rail due in part to this heavier weight. Due to the locomotives running off the rail, the braking effort was additionally supplemented with kinetic energy being absorbed by the plow of the lead engine, BPRR 3892, which ran off the rail and removed a depth of approximately 14 inches of cinders and ballast from the 74-foot bridge deck.

Cars # 56-60 in the consist list (2 empty rock salt and 3 loaded center beam flats) derailed, with significant damage, in the area adjacent to the East Aurora Parks and Recreation fields south of "downtown" East Aurora. The "Photographs and Maps" section show the post-derailment, at-rest positions of these cars. The 56th car (GNWR 5459) was leaning east off the center plates, but its relative position remained in line with the track. The trailing truck of the 57th car (AEX 10328) derailed to the east, away from the recreational fields. The R-3 and R-4 wheels remained on the rail, with the left-side wheels above the rail due to the car leaning east. The 58th car (GNWR 5121) and 59th car (SOO 601657) derailed and travelled off the roadbed and down the west side embankment of the right-of-way. The 58th car was rotated during the derailment with damage to the B-R corner, which shoved the 57th car to the east. The derailment of the 58th and 59th car is due in part to the combination of the short shank coupler on the empty 58th car and long shank coupler of the loaded 59th car. The 60th car had the lead truck, A-end pulled off to the west by the 59th car.

Analysis and Conclusion

Analysis – Train Crew and Toxicological Testing

Analysis-Locomotive Engineer Operating Performance: The lead locomotive was equipped with a speed indicator and event recorder, as required. The train was operating at 4 mph over the MAS for the track. BPRR and FRA downloaded and analyzed the relevant event recorder data.

Injuries and FRA Post-Accident Toxicological Test: No injuries occurred in this derailment. The three crew members were not tested, and there was no basis for reasonable suspicion or reasonable cause testing. Therefore, there are no Federal Railroad Administration Post-Accident Forensic Toxicology Result Reports.

Conclusion: General crew activities and intoxication were not a factor.

Analysis – MOW Crew previous activities

According to the witness statements of the two MOW employees, Foreman and Trackman, on May 7th, the switch had been lined for the main and the latch had been locked. Reported vagueness in the

witnesses' recollections leave open the possibility that the switch was locked incorrectly. It is possible that Foreman relied on Trackman to secure the switch, instead of ensuring that the switch was lined and locked correctly as the lead employee of the MOW crew.

East Aurora police and other onsite railroad and FRA staff uncovered no evidence of vandalism. There were no strike force marks nor other indications that someone may have struck the lock or keepers to compromise the switch and move the padlock. The lock does not appear to have been moved from the main-line-movement keeper to the reverse-movement keeper (where it was found immediately after the derailment) by third parties after May 7th.

It is possible that the lock was applied to the reverse-movement latch by the MOW employees. This latch was locked, but the stand arm was not in the keeper, but was unsecured in the main-line-movement keeper. This left the potential for the switch to be lined reversed by anyone. The incorrect securement of this switch was not noted for several track inspections. Conditions were ripe for trespassers, if they had noticed the incorrect securement, to throw it for the siding. However, even if a trespasser with a switch key was to compromise the switch, it is unlikely they would have left the padlock locked underneath the reversed switch stand arm.

The combination of the locked keeper and incorrectly secured switch stand arm is highly irregular. It could indicate lax compliance by the MOW crew, as they pulled the tamper out onto the main line and continued their business south of that location. Failure to identify the insecurity over several track and switch inspection cycles also indicates low job awareness, whether the MOW crew or a third party had put the lock and stand arm in this position.

Conclusion: The MOW crew activities likely resulted in an unsecured switch. The Foreman appears to have failed to observe the condition upon subsequent inspection.

Analysis – Non-Causal Related Factors

First, FRA has considered the travelling speed of the train relative to the MAS for that track segment. Event recorder data indicated that the train travelled at 34 mph, compared with the MAS of 30 mph. Second, FRA has considered whether a lack of Positive Train Control (PTC) was a relevant factor. Class 2 and 3 railroads that operate passenger service are required to have PTC installed. However, the incident occurred on "dark" territory. The territory includes no Amtrak passenger service, and has a MAS of 30 mph. Therefore, this line does not meet the threshold requirements for PTC implementation. If this had been PTC required territory, PTC would have prevented this derailment. A PTC territory switch would have had a wayside interface unit that would have notified the locomotive that the switch was reversed, averting the derailment.

Third, FRA has considered the switch mechanism. When the switch throw was tested after May 18th, the throw tension on the lever from normal position to reverse was loaded (the switch points were under tension). However, this tension could be as result of the derailment causing a mis-adjustment. The latches and fasteners (track spikes) were tested and after the derailment and noted as secure. This indicates that the main-movement latch was probably strong enough to hold the stand arm until someone stepped on and released the latch.

Fourth, FRA has considered the failure of the emergency braking action to engage the EOT. The evaluation of the locomotive's brake system and HTD/EOT concluded that the application of the emergency brake did not engage an emergency activation of the EOT. If the emergency braking action

had instead successfully engaged from both ends of the train, the train might not have travelled as far into the siding once the brakes had been applied.

Finally, FRA has considered the potential for involvement of drug or alcohol abuse. There does not appear to be any drug and alcohol concern. The crew was not tested, and the circumstances of the incident did not trigger reasonable suspicion or reasonable cause testing.

East Aurora Police informed FRA that they arrested two male individuals in their mid-20s for trespassing on the day of the derailment, and that GWRR has filed a complaint against them. The police have conducted a full investigation, but no additional information has been forthcoming.

Genesee & Wyoming (GWRR), parent to the BPRR, has indicated that they could not find the SPAF for May 7th. Employees are only required to keep these forms for seven days. The derailment occurred on May 18th, 11 days after the MOW crew last handled the switch. The track employees were taken out of service immediately after the derailment, pending a hearing.

Overall Conclusions

On May 7, 2020, the Fisher-Price switch was apparently left lined for the mainline, but un-secured, when two BPRR employees Foreman and Trackman pulled the tamper out of the siding and departed the area southward. The switch was lined for the main, and the mainline padlock was applied to the keeper. So, the switch was “lined for the main and locked.” However, the switch apparently was not locked for the mainline movement (Cause Code H703). While the switch was lined for the main, the padlock was applied to the reverse-movement keeper.

Immediately after the derailment on May 18th, the secured padlock was still locked on the reverse-movement keeper. The switch stand arm was laying in the reverse keeper but on top of the applied (closed and locked) mainline padlock. This is shown in the “Photographs & Maps” section.

Over the next several days from May 7th to May 18th, this condition (switch thrown for the mainline move but the padlock locked on the reverse keeper) was not observed during several track inspections of the area. By the time the northbound BPRR train SIBF traversed this area (May 18, 2020 at 10:59 p.m.), some individual(s) had stepped on the mainline-movement-keeper latch, releasing the unsecured arm, throwing the switch reverse, i.e., for the siding (Cause Code M503). Train SIBF was not able to respond to the unexpected switch position in time, and it took the reverse movement into the siding, derailing past the bumper block at the siding’s north end.

Probable Cause and Contributing Factors

The Federal Railroad Administration (FRA) investigation determined that the probable cause was switch not latched or locked, Cause Code H703.

Vandalism of track or track appliances, e.g., objects placed on track, switch thrown, etc., Cause Code M503, was assigned as a contributing cause.