DCA16FR007
National Railroad Passenger Corporation (Amtrak)
April 3, 2016
Chester, PA

National Transportation Safety Board

Operations Group Chairman Factual Report

Accident

NTSB Accident Number:	DCA16FR007
Date of Accident:	April 3,2016
Time of Accident:	7: 50 a.m. (EDT)
Type of Train and No:	Passenger Train No. 89
Railroad Owner:	Amtrak (ATK)
Train Operator:	Amtrak Railroad
Crew Members:	1 Engineer, 1 Conductor, 2 Assistant Conductors, and 3 on- board service attendant
Location of Accident:	Chester, PA

Operations Group

Ryan Frigo
Investigator In-Charge and Operations Group Chairman
National Transportation Safety Board

Jim Gee
Operating Practices Inspector
Federal Railroad Administration

Jonathan Hines
System General Road Foreman
Amtrak

Donald Hill
BLET-STF, Party Spokesman
Brotherhood of Locomotive Engineers and Trainmen

Willie Bates
SMART Spokesperson
SMART

Accident Summary:

For a summary of the accident, refer to the *Accident Summary* report, within this docket.

Operating Crews:

On Sunday, April 3, 2016, an Amtrak (ATK) train crew, consisting of an engineer, conductor, 2 assistant conductors and 3 on-board service attendants, went on-duty in New York City, NY at 5:25 a.m. (EST) to operate Amtrak passenger train No. 89 from New York City, NY, to Washington, DC.

Leaving New York Penn Station, the train consisted of Amtrak locomotive No. 627, eight passenger cars, one café car, and one baggage car. The train crew boarded the train at New York Penn Station and performed all required air brake, mechanical and safety equipment tests. The train then boarded passengers and departed New York at 6:05 am. The engineer also properly completed the running brake test as the train departed New York. The train departed New York and made 3 stops before arriving at Philadelphia 30th St. Station, arriving there at 7:32 a.m. and departing there at 7:38 a.m.

Train 89 arrived and departed on No. 3 station track at Philadelphia's 30th Street Station.

ATK Train No. 89

Engineer: 47 years of age
Hire: 5-05-14

Current Engineer certification date: 1-19-2016

Conductor: 44 years of age
Hire: 2-22-2008
Current Conductor Certification: 6-28-2013

Assistant Conductor (#1) 30 years of age
Hire: 6-18-2015
Current Conductor Certification: Not Certified as Conductor

Assistant Conductor (#2) 44 years of age
Hire: 12-24-2014
Current Conductor Certification: Not Certified as Conductor

All train crew members who were required to, had current certifications under FRA regulations.

Train Consist:

Amtrak Train No. 89 consisted of 1 locomotive and 8 coaches, 1 café car, and 1 baggage car. On the head end of the train (South end) was locomotive No. 627. The train lined-up, as follows:

ATK 627 (Locomotive)(Head End)
ATK 82993
ATK 82524
ATK 82781
ATK 25034
ATK 25040
ATK 25013
ATK 25088
ATK 43364 Café
ATK 81543
ATK 61028 Baggage (Rear End)

Crew On-Duty Times:

89 Train Crew

Engineer - on train No. 89 on 4/3/2016, at 5:25 a.m., New York City, NY.

Conductor - on train No. 89 on 4/3/2016, at 5:25 a.m., New York City, NY.

Assistant Conductor (#1) - on train No. 89 on 4/3/2016, at 5:25 a.m., New York City, NY.

Assistant Conductor (#2) - on train No. 89 on 4/3/2016, at 5:25 a.m., New York City, NY.

Method of Operation and Location:

The Philadelphia-Washington (PW) line of the Mid Atlantic Subdivision of the Amtrak Northeast corridor extends from MP 0.0 at CP Zoo in Philadelphia, Pa. to MP 134.6 at CP Avenue, Washington Terminal in Washington DC in a timetable north-south direction. The maximum authorized timetable speed on the subdivision in the vicinity of the accident in the block between CP Baldwin and CP Hook is 110 mph for tracks two & three and 90 MPH for track one & four for passenger trains. In the vicinity of the accident area, Amtrak operates trains over four main tracks utilizing a Traffic Control System (TCS) controlled by a dispatcher located at the CNOC (Consolidated National Operations Center) in Wilmington, Delaware. Train movements on the Mid-Atlantic Subdivision between CP Phil MP 3.6 to CP Holly MP 20.3 are governed by operating rule 261[1]. Additionally, on tracks where rule 261 is in effect, ABS[2] rules & CSS[3] rules 550-561 are in effect for movements in both directions.

[1] Amtrak defines operating rule 261; Track signaled in both directions. Signal indication will be the authority for a train to operate in either direction on the same track. At a hand operated switch that is not equipped with an electric lock, a train may clear the main track only where the maximum authorized speed on the main track over the switch is 20 MPH or less.

[2] Amtrak defines ABS as a block signal system in which the use of each block is governed by an automatic block signal, cab signal, or both.

[3] Amtrak defines CSS as a cab signal system that is interconnected with the fixed signal system to provide the Engineer with continuous information on the occupancy and/or condition of the track ahead.

On Sunday, April 3, 2016, at 7:50 a.m. eastern daylight time (EDT), Amtrak passenger train No. 89 struck a maintenance-of-way Case 590N Super backhoe (equipped with a specialized cribbing bucket at the rear and a loader bucket at the front) at MP 15.7, and then derailed and came to rest at MP 16.1 on Amtrak's Northeast Corridor PW Line.

Operating Rules:

Operating Rules governing employees were the Northeast Operating Rules Advisory Committee (NORAC) Operating Rules 10 Edition, effective 11/06/2011. Also governing train movements was Amtrak Timetable No.6 effective 02 /22/2016. Latest General Order in effect was General Order No. 601, effective 02 /22/2016. Bulletin Orders in effect were NYW6-03(sum), effective 03/07/2016, NYW6-06, effective 03/28/2016 and NYW6-01SCH-a, effective 02/22/2016. Also in effect was Wilmington Dispatching Office Temporary Speed Restriction Bulletin, effective 04/03/2016 (5:00 am).

Federal Oversight

Federal oversight of Amtrak Operations is provided by the Federal Railroad Administration (FRA), which is part of the Federal Department of Transportation (DOT). The FRA has multiple field inspectors which conduct field inspections on Amtrak property on a scheduled and random basis. FRA operational field inspectors monitor the railroad's compliance with Federal Department of Transpiration regulations per 49 CFR Parts 200 to 299. FRA also conducts periodic

records reviews on Amtrak for various federal record keeping requirements.

Emergency Response

Federal regulations, 49 CFR Part 239 require that Amtrak have an Emergency Response Plan, and that the plan be reviewed on a regular basis by the FRA. In addition, employees must be trained in the designated Emergency Response protocols outlined in the plan. A review of Amtrak's part 239 plan showed that it was current, and had been reviewed by the FRA. Based on employee interviews conducted after the accident, Amtrak train crew employees stated that that emergency response training that they had received prior to the accident was very useful immediately following the accident.

Efficiency Testing

Federal regulations, 49 CFR Part 217 require that Amtrak have a program to periodically conduct operational tests and inspections to determine the extent of compliance with its code of operating rules, timetables, and timetable special instructions.

Amtrak's operational testing program, is called "TESTS". The following is an overview of Amtrak's "TESTS" program.

Amtrak's TESTS Program :

- **"TESTS"** is Amtrak's program for conducting and recording federally mandated

(49CFR217.9) operational tests and inspections documenting employee compliance with railroad operating rules and instructions. Amtrak's TESTS records are electronically stored in a database, making them readily available for inspection and analysis.

- Amtrak's TESTS program is detailed in the "Supervisor's Guide to Efficiency TESTS", which describes how to conduct each listed test, and outlines supervisor requirements and program oversight responsibility.
- The program's operational tests are based on railroad functions rather than railroad specific rules or instructions. This permits the same operational tests to be used throughout the Amtrak system, regardless of host railroad.
- The selection of available operational tests is keyed to employee craft.
- When recording an operational test non-compliance, supervisors are required to view any previous employee specific non-compliances.
- Four different types of observations are currently documented in TESTS:
    - 1872 Efficiency Tests – Operating rule / instruction compliance (all operating crafts).
    - 1875 Engineer Evaluations – On-the-job Locomotive Engineer train operating proficiency.
    - 1876 Student Engineer Evaluations – On-the-job Student Engineer train operating proficiency.
    - 1877 Conductor Evaluations – On-the-job Conductor proficiency in train operations & customer interactions.

During the 12 month period prior to the accident A total of 87,894 *tests were recorded as conducted on* 2112 *different train and engine employees on the northeast corridor. This number includes other railroads that Amtrak hosts on the northeast corridor.*

Operational Factors

The Amtrak engineer began operating as an engineer with the New Jersey Transit in 1999 and worked in that capacity for several years. He hired on with Amtrak and began training for locomotive engineer in May 2014. He became a promoted engineer with Amtrak in June 2015 and has worked over the accident territory ever since. At the time of the accident he had been assigned to the extra board.

The Amtrak engineer's certification status for the last two years is as follows:

- Train Service Engineer Efficiency Test (FRA 303) 03/14/2016 Pass
- Train Service Engineer Medical Examination 06/10/2015 Pass
- Train Service Engineer Last Skills Performance/Monitoring Ride 01/07/2016 Pass
- Train Service Engineer Knowledge Test 01/19/2016 Pass
- Train Service Engineer Prior Employment Review 05/21/2015 Pass
- Train Service Engineer Hearing Examination 06/10/2015 Pass
- Train Service Engineer Vision Examination 06/10/2015 Pass
- Train Service Engineer Operating Rules (FRA 125) 01/20/2016 Pass

- Train Service Engineer State Review 04/28/2015 Pass
- Train Service Engineer NDR Review 04/30/2015 Pass
- Train Service Engineer EAP Review 04/30/2015 Pass

Use of Personal Electronic Devices:

The locomotive engineer stated during his interview that he did not have an electronic device with him at the time of the accident. After review of inward facing video, NTSB has confirmed that electronic devices were not in use by the locomotive engineer, at the time of the accident. Detailed documentation is contained in associated NTSB reports.

Interviews:

The Operations and Human Performance Groups conducted 6 interviews during the on-scene phase of the investigation. A summary of the interviews conducted are described below:

Summary of the interview with the Engineer of Amtrak Train 89

His railroad career began as a Locomotive Engineer with New Jersey Transit (NJT) in March 1999. This training lasted approximately 15 months. He was promoted in June 2000. He transferred to Road Foreman with NJT from 2007 to 2010 when he returned to train service. Hired with Amtrak, May 2014, and promoted on NEC June 2015. His current certification is January 2016. The Last time he operated over the territory was Saturday April 2, 2016 (9:20 a.m. to 7:10 p.m.). His scheduled days-off are Tuesdays. He received a call from crew dispatcher 2:50 a.m. for a 5:25 a.m. sign-up at Penn Station NY. He arrived

to work and attended job briefing conducted by the conductor. Had a face to face briefing with yard crew in regards to brake test and equipment. He stated that Train 89 departed Penn Station at 6:05 a.m. (on-time). He stated that the weather north of Philadelphia was windy and raining and that the train was a few minutes late due to wheel slips. The Engineer noted that the weather began to clear as the train approached Philadelphia, and that he experienced no wheel slips south of Philadelphia (weather was clear and sun was out). He stated that everything seemed ordinary. The Engineer stated that Train 89 had all clear signals as it departed Philadelphia approaching the site of the derailment and that he did not notice any flag men or whistle boards as the train approached the accident site. As the train approached the accident site he first noticed a large piece of equipment (LORAM) on track 2. As the train got a little closer determined that there was a backhoe on track 3. He began to blow horn and applied emergency braking, then laid down on the floor and braced for impact. After impact he could feel the engine lift off the track and knew that the engine had derailed. Once the train stopped he attempted to use the radio and it was inoperable. He then checked to see if the rest of the train was still on the rail (once he saw the rest of the train on the rail he believed that the rest of the passengers and crew were ok). He went to the rear cab of the locomotive in an attempt to exit the locomotive and noticed oil/liquid everywhere and didn't believe he would be able to safely exit the engine. The conductor walked up to the engine to check on him. The conductor was talking to the dispatcher via radio (the engineer told the conductor tell the train dispatcher to send help). He was shaken up after impact, hyper-ventilating, had chest, shoulder and back pain and bump bruises on knee, elbow and hip. He stated that EMS took him to hospital (EMS was

concerned about chest pain and checked for any heart related problems). The Engineer also discussed train movement bulletins including that the only time crews would know about work being performed on the right of way would be through a Form D or bulletin order. He further discussed that when a track is being fouled, engineers would have an indication if the train encounters a stop signal.

Summary of interview with the Conductor of Amtrak Train 89

The conductor went on duty at 5:25 a.m. at Penn Station in New York. He held a job briefing to discuss the first run. The employees in attendance were the engineer and two assistant conductors. There were no Form D's in effect. The first three cars of the train were designated for "regional passengers", [NY to Washington D,C,]. The rest of the train, 6 coaches and one baggage car on the rear, were scheduled to make the entire trip to Savanah, Georgia. He stated that the run to Philadelphia was uneventful. Over 80 passengers boarded the train in Philadelphia. At the time of the accident, the conductor was stationed in the fourth car from the locomotive. He reported hearing no radio traffic from the dispatcher, or from roadway workers. After passing Chester Station, he felt heavy braking and heard the engineer sound the horn in a long continuous blast. Due to the heavy braking, he and the passengers that were standing were thrown off balance. He saw that some people were thrown to the floor or against bulkheads and seats during the emergency braking after the impact with the track equipment. Some passengers panicked, thinking that the accident was a possible terrorist attack. After calming the passengers and containing them in the train as best they could, he delegated the responsibility to make verbal

announcements to the passengers in the train because the public address (PA) system did not work after the accident. (It was working properly prior to the accident). He overheard the first assistant conductor made the initial "Emergency" call over the radio, and then instructed the assistant conductor to move the people that were ambulatory to the rear of the train and instructed them to stay on the equipment and to stay off the live tracks.

He stated that three passengers appeared seriously injured in the first car. They received medical attention from a physician, who was a passenger on the on the train. At least one first aid kit was used. Firefighters from Chester PA and EMTs from Crozer Chester Medical Center were the first to respond to the scene. They set up a triage location at the Trainer United Methodist Church, a quarter mile from the accident scene. The conductor was in place to guide first responders to the most severely injured. The engineer and 1st assistant conductor went for treatment of minor injuries and were released.

Summary of the interview with the Assistant Conductor of Amtrak Train 89

The assistant conductor was hired by Amtrak in July 2015, and marked up for service October 2015. He is based in New York, and is an extra-board employee.

He went on duty April 3, 2016 at 5:25 a.m. He performed a job briefing with his conductor and engineer. The crew did a class 2 brake test. After departure the engineer made a running brake test.

He worked the first three cars and made required PA announcements. He walked the train while it was in the station to check for any hand brakes that may be applied. He took no

exceptions with the equipment. The train was already on the Amtrak platform to load passengers. The assistant conductor stated that the conductor assigned him to make announcements and to take care of the first three coaches.

They made a passenger stop at Philadelphia station. As the train traveled to Chester, Pa, he heard the horn sound and then felt the train go into emergency braking. He said about 5 seconds later he was thrown to the floor, and observed objects flying into the window and knocking it out.

When the train stopped he used his radio to make an emergency call to the dispatcher.

He observed that at least 3 passengers appeared seriously injured. In addition, some of the passengers from the first train car self-evacuated and ran across the tracks. The conductor, who had walked from the 4th car to the 1st car, told him to get all passengers back on the train. After getting all the passengers back on the train he instructed them to walk to the back of train.

The assistant conductor heard the conductor using his radio in an attempt to communicate with the engineer. He also heard the conductor talking to the dispatcher and telling him that they needed medical personnel to get to their location immediately.

The assistant conductor stayed with the medical personnel and passengers until all were evacuated from the train. After all the passengers evacuated from the train he was taken to the hospital and received medical attention.

Amtrak Train Dispatcher Interviews

The Operations and Human Performance Groups interviewed two Amtrak train dispatchers (the third shift of April 2nd, and the first shift of April 3rd) who had dispatched trains through Chester on the day of the accident. The interviews were conducted on April 6, 2016, on the first floor conference room of Amtrak's Consolidated National Operations Center, located adjacent to the Train Movement office (CETC), at 15 S. Poplar St. Wilmington, DE 19801. A safety briefing was conducted prior to the first interview.

Third Shift (of April 2nd) Train Dispatcher

The night shift dispatcher was hired by Amtrak in 2007 as a Block Operator on the Mid Atlantic Division and was promoted to the position of Train Dispatcher in 2009. He has worked as a Train Dispatcher since that time and explained that he is qualified on the territory of CETC (Centralized Electrification & Train Control) Section 4, which extends from Penn Interlocking (exclusive) to Ragan Interlocking (exclusive). Prior to becoming a Block Operator in 2007 he attended and passed a Block Operator Training Course and then in 2009, attended and passed a Train Dispatcher Promotion Course. He received 5 days "on the ground", in order to assist in his qualification of the territory for CETC 4 and then received 3 Road Days per year, every year since that time. He also attends annual Block Training classes (as all Train Dispatcher's must) in order to retain his qualifications. (5 days "On the ground" represents the period of time a newly promoted Train Dispatcher is afforded, in order to become familiar with field characteristics of the territory he is in training to control. "Road Days" are days which Train Dispatchers are afforded in order to

re-familiarize themselves with territory they are already qualified to perform duty.)

The third shift dispatcher explained his duties as a train dispatcher and provided a "walk-through" of the events that occurred during the evening he worked, leading to the transfer of section control to the incoming dispatcher at the end of his shift. He was working the 11:30 p.m. - 7:30 a.m. shift on CETC Section 4, which began the evening of April 2nd, 2016. By his recollection, the (incoming) relief dispatcher arrived shortly before 7 a.m. Sunday, April 3rd. They discussed a track outage, by Form D A1403 of 4/2/2016, in the name of the overnight EIC (Employee in Charge), which was in effect on track No.2 between Baldwin and Hook interlockings. This work was part of a 55-hour track outage, which began the evening of Friday April 1st. During the job briefing, which the third shift dispatcher held with his relieving dispatcher, it was discussed that Foul Time had been requested and granted intermittently throughout the evening and into the morning of April 3rd. The third shift dispatcher explained that appropriate blocking was applied to tracks 1, 3 and 4 for the Foul Time authority that was granted to the overnight EIC and in effect during their transfer of shift, and was subsequently confirmed by and turned over to the incoming (relieving) dispatcher.

During the interview, the third shift dispatcher explained that he was unaware of any SSD's (Supplemental Shunting Devices) being placed on any of the tracks that were being fouled, as the only way he would know that an SSD was placed on any track, would be if the EIC advised him that such action had taken place [Amtrak Special Instruction 140-S2 of GO

601]. He went on to explain that when a positive shunt is placed on a track in the field, it is shown on his track model display (on his computer console) by way of a red block (referred to as a TOL or Track Occupancy Light) that would extend the length of the track segment for which it was applied (if blocking is applied, a TOL segment appears blue with a red outline above and below the affected track segment). He did recall these types of indications as he worked through the evening and into the morning, but explained that when track work is taking place, there are numerous reasons a track could appear shunted (red block) or otherwise "occupied", but was never advised by the EIC that shift, that any TOL's were related the placement of an SSD. He also confirmed that the EIC did not ask if any TOL's or positive shunts appeared on his computer console for the segments of track in the vicinity of where the 55-hour track outage was taking place. He confirmed that he has been asked by EIC's in the past, to verify if a positive shunt, TOL, or "a light", appeared on his console while work was being performed.

The third shift dispatcher mentioned that the radio communications were sporadic near the location where the 55-hour track outage was taking place. Sometimes the radio reception seemed adequate and at other times, it did not. He also implied that there appeared to be certain locations and/or times, when radio communications are less then favorable or unclear, as compared to other times and/or locations.

There was also some conversation related to overlapping authorities; where the night dispatcher stated that if two foremen were requesting to foul the same track, between the

same interlockings (holding points), he would advise the 2nd requestor to work with the Foreman for which he already issued the initial Foul Time authority. If an outgoing Foreman (going off duty) wants to turn his/her Foul(s) over to the incoming Foreman, he/she must relinquish the Foul(s) and report all clear of the associated track(s). The incoming foreman would then re-request Foul Time with the Train Dispatcher, in order to resume any foul time authority. The third shift dispatcher stated that there was no identifiable difference between the work that took place the night of April 2nd into the morning of April 3rd, as compared to any other night, with any other EIC.

First Shift (of April 3rd) Train Dispatcher

He began working for Amtrak as a Block Operator in February 1988. Eventually qualified entire office. Qualified as an Assistant Chief Dispatcher. He was qualified on Sections 1,2,3,4,5,and 6. He served as an Acting MTO (Manager of Train Operations) several times.

Sunday Morning

He had been off duty the previous two days (Friday and Saturday). Turnover/transfer between the third shift dispatcher and the first shift dispatcher occurred between 6:45 a.m. and 7:00 a.m. The third shift dispatcher cleared up foul time for Train 160 to operate through the work area, then gave the fouls back about 7:11 a.m. The third shift dispatcher departed the dispatch desk at 7:15 a.m. The first shift dispatcher then sat down and took over dispatching operations. The day shift foreman called the first shift dispatcher and requested to take the track out of service. The first shift dispatcher said to give him about 2

minutes and call back because he just sat down. The day shift foreman called back (7:23 a.m.) and was issued Form D A1401 at 7:26 a.m. and said that the night shift foreman will be calling in to cancel his Form D. Shortly thereafter the night shift foreman called (7:27 a.m.) and cancelled Form D A1403 at 7:28 a.m. The first shift dispatcher cleared fouls on tracks 1, 3 and 4 - Hook to Baldwin - with confirmation, and that was the last time the first shift dispatcher heard from the night shift foreman. The last time the first shift dispatcher spoke to the day shift foreman was after the accident when the day shift foreman called in and asked if the night shift foreman gave up his foul time. (The first shift dispatcher confirmed that he did). The day shift foreman told him that the accident was serious and ambulances were needed. At the same time an Emergency Plate displayed on Main Train 4. The first shift dispatcher then told the Assistant Chief about the incident that Train 89 ran into the back of some equipment. Signals at Phil Interlocking were not displayed for Train 89 until Train 89 was out of Philadelphia. The signals at Baldwin were not display for Train 89 until Train 89 was by Phil Interlocking. The first shift dispatcher had decided that if foul time was requested on Track 3 then Train 89 could be routed to Track 4 at Philadelphia. (*Note*: Foul time under the night shift foreman was released at 7:28 a.m. and the signal at Baldwin was pulled up at 7:38 a.m.) The first shift dispatcher stated that his rational for this possible maneuver was to allow the day shift foreman additional time (10 minutes) to call back for foul time. He recalled that the first time the day shift foreman called was around 7:15-7:18 a.m. The day shift dispatcher told him to call him back shortly. The second time the day shift foreman called was about 7:23 a.m. for Form D A1401. (Track 2 out of service 7:26 a.m.) The first shift dispatcher asked if he was going to be fouling the

track like the night shift foreman. The day shift foreman responded that he was not sure and he was waiting for the backhoe operator to show up. The third time the day shift foreman called was after Amtrak train 89 struck the backhoe. Prior to the accident and while the first shift dispatcher was anticipating the day shift foreman to call back for foul time, he was keeping his options open to run trains and give foul time, i.e., a train departing Wilmington/Northbound and Train 89 departing Philadelphia/Southbound. The first shift dispatcher anticipated the day shift foreman to call back and request foul time. The reason for this was because earlier the first shift dispatcher spoke to the day shift foreman before he issued his Form D, and asked if he was going to request fouls on all three tracks like the night shift foreman. The day shift foreman stated that he probably will, but was waiting for the backhoe operator to get here. After the accident. the first shift dispatcher was relieved from Section 4 Desk at 8:45 a.m.

Timeline of Audio Communications between Dispatcher and Roadway Workers

Refer to the Dispatcher Audio Recording Group Factual Report within this docket.

Sight Distance Observations

Refer to the Track and Engineering Factual Report within this docket.

Parties to the Investigation - Acknowledgment Signatures

The undersigned designated *Party to the Investigation* representatives attest that the information contained in this preliminary factual report of the collision and derailment of Amtrak Train 89 with MOW equipment and employees on April 3, 2016, in Chester, Pennsylvania, is a factually accurate representation of the information collected during the

on-scene investigation, to the extent of their best knowledge and contribution in this investigation.

_____

//s//_____ Date 9/30/16

Ryan J. Frigo, NTSB

//s//_____ Date 9/29/16

Jim Gee, FRA

//s//_____ Date 9/28/16

Jonathan Hines, Amtrak

//s//_____ Date 9/30/16

Donald Hill, BLET

//s//_____ Date 9/24/16

Willie Bates, SMART/UTU