

NATIONAL TRANSPORTATION SAFETY BOARD

**Office of Railroad, Pipeline and Hazardous Materials Investigations
Washington, DC**

IIC FACTUAL REPORT

RRD19FR004

Employee Switching Fatality- Bayview Yard

Norfolk Southern Corporation

Baltimore Consolidated Terminal

Harrisburg Division

Baltimore, Maryland

February 7, 2019

A. ACCIDENT IDENTIFICATION:

NTSB Accident Number: RRD19FR004
Date of Accident: February 7, 2019
Time of Accident: 7:00 a.m. - EST
Railroad Owner: Norfolk Southern
Type of Train and No: Yard Switching Train / H63
Crew Members: 1 Engineer, 1 Conductor
Location of Accident: Bayview Yard / Baltimore, Maryland

B. INVESTIGATIVE GROUP:

Troy Lloyd National Transportation Safety Board Investigator-in-Charge	Ruben Payan National Transportation Safety Board Assistant Investigator-in-Charge
Anne Garcia National Transportation Safety Board Human Performance/System Safety	David Gooden Norfolk Southern Corporation (NS) Division Superintendent
Kurt Erickson Federal Railroad Administration (FRA) Railroad Safety Inspector- Ops.	Michael Bull Federal Railroad Administration (FRA) Railroad Safety Inspector- Ops.
Randy Fannon Brotherhood of Locomotive Engineers & Trainmen (BLET) Primary Investigator	Jarred Cassity Sheet Metal, Air, Rail Transportation Union (SMART Union) Safety Task Force Investigator

C. PARTIES TO THE INVESTIGATION:

- Federal Railroad Administration
- Norfolk Southern Corporation
- Brotherhood of Locomotive Engineers & Trainmen
- Sheet Metal, Air, Rail Transportation Union



Figure 1- photo of accident train H63 sitting on the Bank track. Photo courtesy of FRA.

D. ACCIDENT SUMMARY:

On February 7, 2019, about 7:00 a.m. eastern standard time, a Norfolk Southern Corporation (NS) railroad conductor, who was working along with an engineer as part of a switching crew, died while performing switching operations in Bayview Yard, located in Baltimore, Maryland. The conductor riding at the rear of a reversing articulating high-side gondola car, and positioned on the car's rear side ladder, when he was pinned between the car, he was riding and a standing DTTX intermodal car located on an adjacent track.

E. ACCIDENT DESCRIPTION:

After going on duty at 6:00 a.m., the engineer and conductor reviewed their switching orders, completed their job safety briefing, and departed the yard office to make their first drop off of railcars in the train-van terminal tracks. After the drop off of cars was complete, the crew switched the train in position for a reverse movement onto the Bank track. The conductor, riding at the rear of the last reversing articulating high-side gondola car, and positioned on the rear side ladder, road the train as it traveled back into the Bank track. As the train continued its reverse movement; the rear of the train neared a set of standing DTTX intermodal railcars on the adjacent track. As the train continued its movement, and passing the adjacent railcars, the conductor became pinned between the railcars, due to the limited clearance, resulting in fatal injuries.



Figure 2- black rectangle indicates the location where the conductor was believed to be riding, while attempting to pass the standing DTTX intermodal cars on the adjacent track.

E. ACTIVITIES PROCEEDING THE ACCIDENT:

The H63 switching crew, consisting of an engineer and conductor, reported for duty at 6:00 a.m. at NS's Bayview Yard. The engineer, a 16-year NS employee, was assigned to the H63 switching job as the locomotive engineer for the entire week. The conductor, working a conductor vacancy from the extra board, had about 3-months of conductor service. The engineer and conductor had only worked together for about five time per the locomotive engineer.

Around 6:05 a.m., the engineer and conductor met up at the office and held a job safety briefing. After the briefing, the conductor viewed the daily switching assignments from a Remote Intelligent Terminal (RIT) device¹, but the engineer noticed that those switching assignments were already completed and instructed the conductor to meet up with the yardmaster for further instructions.

At about 6:15 a.m., the conductor met up with the yardmaster to obtain another set of switching assignments. The yardmaster informed the engineer and conductor that they were to relieve the 38A train (road train) crew at the south end of track 30 that had just arrived at the yard. The crew's instructions were to uncouple the train between railcars 8 and 9 and deliver a set of intermodal railcars from track 30 to Truck-Train terminal track 3. The conductor went ahead and aligned the switches for the train's movement from track 30 to the terminal tracks, while the engineer prepped the locomotive for their daily switching assignments. After the conductor completed aligning the switches, he returned back to his train and met up the engineer where they conducted another job safety briefing and discussed their movements. After the briefing, the engineer instructed the conductor to walk back about three car lengths, and that he would pull the train up to the conductor's location to uncouple the railcars.

¹ RIT- a handheld device that uploads and downloads work instructions and switching orders to train crews.

After the railcars were uncoupled, the engineer, along with the conductor riding at the rear of the train departed from track 30 and proceeded towards Truck-Train track 3. Once the crew arrived at Truck-Train track 3, the conductor prepped the train, and uncoupled four intermodal railcars. After the railcars were uncoupled, the engineer notified the yardmaster that the switching was complete and inquired if they can reverse back north on Truck-Train track 4 to their next switching location. The yardmaster informed the engineer that the conductor wasn't allowed to ride cars on the track-train pad. So, the crew decided to depart from the south end lead of Truck-Train track 4, proceed down past the Bank track switch, and reverse north through the Bank track to get to their next switching location. The conductor then proceeded to walk south from the locomotive, and in the direction of the Bank track switch, aligning the switches as he walked.

[A review of the head-end video from locomotive No. 9207 shows the conductor walking away from the engine in the direction of the Bank switch to align the trains southward movement from the Truck-Train track.; video time stamp 06:55:35]

[Engineer testimony: "so he walked up to the bank switch, and he lined me up off of truck train 3, and the bank switch"²]

² Engineer testimony- page 11; lines 11 - 13

Once the switches were aligned for the train's movement, the conductor radioed the engineer of H63 to proceed south, clearing the Bank track switch. The engineer departed Truck-Train track 4 lead and proceeded south with 1 locomotive and 4 railcars in the direction of the Bank track switch.

[A review of the head-end video from locomotive No. 9207 shows the train proceeded south towards the Bank track switch. The conductor is seen standing on the conductor's side of the train, under the Lombard Street Bridge at the Bank track switch. The switch is lined for the turnout move; video time stamp 06:59:07]

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[Engineer testimony: "and I pulled up, slowed up and stopped. And I said, Mr. Gilmore, you – H63, Mr. Gilmore, you know you can't ride the Bank, the Perryville side, because you see those shop cars on the Perryville. You can't ride that. You got to ride on the opposite side where I can't see. He said okay. So, I pulled ahead, four cars, five cars, because the engine made five. Pulled ahead five cars, stopped. He threw the switch. He said, aligned for the bank"³]

[A review of the head-end video from locomotive 9207 shows that train H63 never stopped at the conductor's location; video time

³ Engineer testimony- page 11; line 13

stamp 06:59:07-49]

Then the last railcar cleared past the switch, the engineer stopped the train, and the conductor lined the Bank track switch for a straight move to the Bank track lead. Once the switch was properly lined, the conductor radioed to the engineer to reverse back twelve railcar lengths⁴. The engineer, with instructions from the conductor to reverse the train back twelve railcar lengths, proceeded to reverse the train north in the direction of the Bank track with the conductor riding on the on the engineer's side of the last railcar.

[Engineer testimony: "he said, when you're ready, H63 conductor to 9207, I'm on the point. Start me back 12 cars. I said roger, back 12. I started back 12 cars, up to the Bank, 10 cars, 8, 6"⁵]

[A review of the head-end video from locomotive 9207 shows the train reversing; video time stamp 07:00:38. The head-end video also shows the locomotive reversing north with the Bank switch lined normal; video time stamp 07:01:29]

As the train reversed north about 570 feet, the lead railcar traversed a section of the Bank track that curved to the right, creating limited clearance between the adjacent tracks. As the train continued back; it passed the first of three stationary DTTX intermodal cars sitting on the left adjacent track. As the train continued reversing north, the engineer spotted the conductors lantern on the ground and radioed the conductor, asking him if he had dropped his lantern.

[Engineer testimony: “and I was seeing six, I see this glare of light, and it was a lantern. And I said, 9207, H63 – I was bringing it to a stop. Said 9207, H63 conductor, you drop your lantern? No response”⁶]

[A review of the head-end video from locomotive 9207 shows as the train was backing and passing the standing DTTX cars, the conductors lantern came into view, and was laying between the Bank track and the Perryville track; video time stamp 07:02:38]

The engineer began to stop the train after not receiving a response from the conductor. As the engineer was bringing the train to a stop, the engineer noticed the conductor’s body lying on the ground between the Bank and Perryville tracks. The engineer then initiated an emergency radio message to the south end yardmaster reporting that his conductor was down, and that emergency assistance was needed.

⁶ Engineer testimony- page 12; lines 3 - 6



Figure 3- photo shows the rear of the railcar. The conductor was believed to be riding on the right side of the railcar. Notice the conductors brake stick hanging from the rear of the railcar on the engineer's side of the train.



Figure 4- photo showing the high-side gondola passing the standing intermodal railcars. The intermodal railcars to the left of the picture are sitting on the Perryville track. Notice the limited clearance between the railcars.

F. BAYVIEW YARD SITE DESCRIPTION:

Bayview Yard is located in southeast Baltimore, Maryland, and is part of the NS Baltimore Consolidated Terminal, on the Harrisburg Division. The yard is configured in a north-south direction. Amtrak Northeast Corridor mainline tracks are situated to the west of Bayview Yard. The yard has 22 tracks and is broken into three sections; President Street Branch, Bayview Class Yard and the Intermodal tracks. Five tracks are situated in the intermodal section of the yard for loading and unloading purposes. Bayview Yard operates an average of five daily northbound

freight trains for mainline service. Train movements within the yard are controlled by the south end yardmaster and movements to and from Amtrak mainline are controlled Amtrak's CTEC-2 dispatcher.

G. ACCIDENT SITE DESCRIPTION:

The accident occurred on the Bank track (track 258) in the President's Street Branch section of Bayview Yard. At the accident site, there is a series of six ladder tracks that are utilized for the storage of railcars. The six ladder tracks are configured in a right-hand curve traveling in a south to north direction. The ladder tracks are divided by nine hand-throw switches to the north and six switches to the south. Track centers measured between the Bank and Perryville tracks varied between 11-feet 9-inches to 12-feet 1-inches. The Bank track is designated as track 258 and the Perryville track is designated as track 259 on the Bayview Yard track diagram.

The tracks in the area of the accident were constructed of wood crossties measuring 9 inches by 7 inches, and measuring 8 foot 6 inches long, spaced on 24-inch centers. The running rail section consisted of 136-pound RE rail continuous welded rail (CWR). The running rails were fastened to the crossties through double shoulder tie plates with standard cut spikes to secure the track gauge. The cut spiking pattern consisted of one rail hold spike and one anchor holding spike on the field side of the rail and two rail holding spikes in the gauge of the rail. Every other crosstie was box anchored with rail anti-creeper that assist in restraining longitudinal movement of the continuous welded rail due to train dynamics and thermal forces. The track structure was supported with crushed granite rock ballast.



Figure 5- photo taken looking north towards the accident track location (Back track). Blue arrow indicates the trains reverse travel route. Notice the standing DDTX intermodal railcars to the left of the accident track (Perryville Track).

G. CONDUCTOR HISTORY:

The conductor completed his employment application with NS on May 6, 2018 and started his employment processing on May 24, 2018 on the Harrisburg Division, after completing his pre-employment forms and medical evaluations. On August 6, 2018, the conductor was hired by NS, where he began his phase one conductor trainee classes at NS's training facility located in McDonough, Georgia. On August 27, 2018, the conductor began his phase two on-job training (OJT) as a conductor trainee on the Harrisburg Division.

After sixty-seven days of OJT, and three recorded field observations conducted by NS supervision, the conductor was signed off by an NS Division Superintendent and promoted to a full-service conductor on November 2, 2018.

H. ENGINEER HISTORY:

The engineer had about fifteen years and five months of service with NS. The engineer was hired by NS on September 25, 2003 and worked as a conductor until promoted to a full-service locomotive engineer on March 20, 2008 in Baltimore, Maryland.

I. NS CONDUCTOR TRAINING:

NS provides an FRA-approved training program for new hire conductor trainees where they are taught the requirements in performing conductor duties and responsibilities. The training requirements are listed in a new hire's conductor training packet at the start of the training. The training program has instruction on switching techniques, safety of train movements, operating rules, safety rules and physical characteristics.

The training program is completed in two phases, with each of the phases being instructed over different lengths in-time, depending on the district or division. The training phases for the Harrisburg Division range between 70-days to the longest being 150-days. The conductor was being trained under the 70-day training program.

Each new hire is sent to the NS training facility in McDonough, Georgia for their first three week of training. In the training, students learn instruction by following a forty-step training process, gaining competency in each of the steps as the training progresses. Each step is then verified and signed off by an NS training supervisor after the student proves competency. The conductor trainee, after passing the initial three weeks of training in McDonough, Georgia, is then transferred back to their division, where they undergo up to five weeks or more of on-the-job training.

At this point in the training, the conductor is assigned to a division conductor mentor that works with, schedules, and instructs additional division specific training to the new hire.

Division specific training includes; switching operations, division specific safety rules, division

special instructions, and physical characteristics. The mentor also schedules conductor trainees to work with various train crews to gain additional “boots on the ground” training and mentoring.

In order for a conductor trainee to train with another switching crew, the mentoring conductor has to have at least one-years’ experience as a conductor. At times, the trainee is scheduled to train with conductors that have less than one-year experience, due to vacancies and scheduling conflicts. During this training time, the trainee has to remain in the locomotive, and is not allowed to assist or train in switching operations. NS officials stated that this locomotive time can be spent refreshing rules, special instructions and yard maps. Before a student is promoted to a full-service conductor, training observations are carried out and signed-off by NS management officials through field evaluations, train rides and verbal testing.

J. BAYVIEW YARD SPECIAL INSTRUCTIONS:

A review of NS’s Harrisburg Division; Timetable Number 1, effective September 19, 2015; states the follow regarding close clearance terminal instructions for the Baltimore Consolidated Terminal; Bayview Yard:

(A) CLOSE CLEARANCE

Account close clearance situations, employees are prohibited from riding the side or end of equipment in the following locations:

1. Baltimore, Maryland (Bayview)- close clearance exists on #1, #2, and #3 Relay when cars are on adjacent tracks.

2. Baltimore, Maryland (Presidents Street I.T.)- close clearance exists on the Incline track, Bank track or Perryville above when cars are on adjacent tracks.

Note: On Perryville above, cars other than empty flatcars could strike equipment passing on Bank track due to track profile.

3. Baltimore, Maryland (Presidents Street I.T.)- close clearance exists on all

tracks except the North track on Eastern Avenue under-grade bridge due to girders adjacent to the tracks.

K. ACCIDENT REENACTMENT:

On February 8, 2019, investigators had the articulating high-side gondola positioned on the Bank track directly beside the first standing DTTX intermodal car so that investigators could take between car measurements. Investigators took eight between car measurements at the front, middle and rear of the DTTX car. At the rear of the DTTX intermodal car, and where the track profile curved to the right; investigators measured the smallest clearance between the cars at nine inches.



Figure 7- photo shows the limited clearance between the high-side gondola and the adjacent DTTX intermodal railcar.



Figure 8- photo shows an investigator attempting to climb the accident railcar in the no clearance area between the two cars.

Investigators then had the train reverse into the accident track at 10 mph to see if any vehicle/track interaction contributed to the accident. Investigators observed no train rock or lateral track movement.

L. NORFOLK SOUTHERN SAFETY ALERT:

On February 12, 2019, NS released a systemwide “safety alert” to elevate awareness on how to work safely in the railroad environment. The safety alert describes the incident, highlights safety considerations, and provides topics on specific job briefing topics and applicable safety and operating rules for crew and employee discussion.

M. HUMAN PERFORMANCE/SYSTEM SAFETY:

The Human Performance/ System Safety investigation focused on the Conductor and includes Behavioral Factors, Operational Factors, Environmental Factors and applicable NS Rules.

1. Behavioral Factors:

a. Toxicology report:

Following the accident, specimens obtained from the Conductor by the Office of the Chief Medical Examiner (ME) of the State of Maryland were provided for testing by the Civil Aerospace Medical Institute (CAMI) of the Office of Aerospace Medicine, of the Federal Aviation Administration. The specimens were tested and found to be negative for the presence of illicit drugs and alcohol.

b. Work-rest history:

Investigators were unable to obtain a work-rest history for the 35-year-old conductor from the family member that he lived with. NS stated the Conductor had not worked the days preceding the accident and his work schedule was 6 a.m. to 6 p.m., Monday through Friday. 5

c. Workload:

The workload on the day of the accident was normal, with no unusual work requests or requirements.

2. Operational Factors:

a. Training:

The Conductor completed the NS training program for conductors. This training began with a 3-week course in McDonough, GA followed by 5- weeks of On-the-Job Training (OJT) at his reporting station (Bayview Yard, Baltimore, MD). During OJT, the conductor trainee is assigned a Mentor to assist with training. During his interview, the Mentor stated that he had voiced concerns regarding the conductor trainee being ready to be certified.

b. Experience and Disciplinary Actions:

The train crew consisted of a locomotive engineer and conductor (deceased). Prior to the accident, the locomotive engineer was employed by NS for about 15 years and the conductor for about 6 months.

c. Equipment and Cell Phone Information:

The conductor was wearing his NS assigned personal protection gear, to include a reflective vest, and was carrying his NS-provided radio, brake stick and lantern, as required. The conductor was using his radio preceding the accident, to communicate with the locomotive engineer to direct their reversing movement on the yard tracks. The conductor's personal cell

phone was located stowed in his grip; he was not using his personal cell phone during the time preceding the accident. His cell phone usage report will be included in the docket.

3. Environmental Factors:

a. Weather:

The NTSB's Senior Meteorologist provided a weather report for Baltimore, MD on February 7, 2019, from the weather reporting location at Baltimore/Washington International Thurgood Marshall Airport, located approximately 9 miles southwest of the accident site at approximately the same elevation. This report stated the weather observed at the time of the accident was a variable wind at 3 knots, visibility of 6 miles in mist, temperature of 43 degrees Fahrenheit (F) and no precipitation reported during the past 24 hours.

b. Time of day:

The train crew went on duty about 6:00 a.m. and the accident occurred about 7:00 a.m. EDT. The NTSB's Senior Meteorologist reported that The United States Naval Observatory website indicated Sunrise at 0708 EST.

4. Pertinent NS Rules and Regulations:

Four days after the accident (February 11, 2019) NS issued a Safety Alert which referenced and discussed two NS Rules for employees to review “to minimize risks when operating on tracks restricted account close track centers and riding equipment.”

NS Operating Rule 20(a)(4), Prohibited Acts – Riding equipment on tracks restricted account close track centers, prohibits employees from riding equipment on tracks designated by Special Instructions to be restricted account close track centers.

NS Operating Rule 27 Close Clearance states that some equipment on adjacent track will not clear a person on the top of side of a car or engine.

5. Interviews:

The Human Performance/System Safety group and Operations Group conducted interviews at NS Bayview Yard, Baltimore, MD. Transcripts from the interviews are provided in the Docket.



On Thursday, February 7, 2019 at approximately 7:00 AM EST, Keith Gilmore, a 35-year-old Norfolk Southern Conductor died after sustaining injuries during a shove movement in Baltimore, MD. Mr. Gilmore was riding equipment positioned on the side of a railcar on the leading end of a shove movement at the time of the accident. His body came into contact with standing equipment on an adjacent track, and he was subsequently struck by his movement. Norfolk Southern extends its deepest condolences to Mr. Gilmore’s family, friends, and co-workers.

Incident Description

While the investigation of this tragic incident is still ongoing, the following information is known:

- Mr. Gilmore had been employed with Norfolk Southern for six (6) months.
- Mr. Gilmore was working as a conductor on assignment H63 in Bayview Yard.
- Mr. Gilmore was using the radio to communicate with his engineer to direct their shove movement.
- The yard tracks that H63 operated on at the time of the accident have close track centers.

Safety Considerations

Although the cause of this accident is not yet known, safety considerations in this publication should be used to elevate awareness on how to work safely in the railroad environment. Always pause to identify risks, process the information to choose a safe course of action, and proceed with the task in a safe manner.

Applicable Rules For Discussion

Although the incident remains under investigation, a few rule excerpts are provided for review to minimize risks when operating on tracks restricted account close track centers and riding equipment

- Participation and involvement in Job Safety Briefings are required and must be done:
 - At the beginning of each job
 - When the work changes
 - When the work becomes confusing or new tasks are started
 - When a rule violation is observed

The person conducting the Job Safety Briefing must confirm that everyone involved understands all the instructions. ***Reference Operating Rule 1 Job Safety Briefings***

- Employees are prohibited from riding equipment on tracks designated by Special Instructions to be restricted account close track centers. NOTE: This rule does not prohibit an employee from riding on the platform of a locomotive in these tracks. ***Reference Operating Rule 20(a)(4) Prohibited Acts – Riding equipment on tracks restricted account close track centers***
- Some platforms, bridges, and other structures, switch stands, tunnels, and equipment on adjacent track will not clear a person on the top or side of a car or engine. Employees must become familiar with these and other close clearance locations and protect themselves from injury. ***Reference Operating Rule 27 Close Clearance***

What other material is available for review on shove moves?

- Operating Rule 216 Shoving, Backing, or Pushing Movements

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2 *Figure 9- copy of the NS Safety Alert published on February 11, 2019.*