NATIONAL TRANSPORTATION SAFETY BOARD

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

RRD22LR003

Contractor Roadway Worker Fatality

National Salvage Employee

Norfolk Southern Railway Company- Buffalo Line

Reed, Pennsylvania

December 8, 2021

TRACK & ENGINEERING FACTUAL REPORT

Report by: Troy A. Lloyd

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A. Accident:

NTSB Accident Number:	RRD22LR003
Date of Accident:	December 8, 2021
Time of Accident:	11:24 a.m. (Local Time)
Type of Accident:	Contractor Roadway Worker Fatality
Contractor Employer:	National Salvage & Service Corporation
Railroad Owner:	Norfolk Southern Railway Company
Location of Accident:	Milepost BR295.11
Railroad Line:	Buffalo Line
Equipment Involved:	Norfolk Southern- Nordco Spiker No. 2

B. Track Group Party Members:

Troy Lloyd
National Transportation Safety Board
Track Group Chairman/Railroad Accident Investigator

Shane Shiffler
FRA
Track Safety Specialist

Chad Haller
FRA
Track Safety Specialist/IIC

Jon Kraholik
FRA
Track Safety Specialist

Joseph Young
Norfolk Southern Railway Company
Manager- Track

Forrest Koerner-Fox
National Salvage
Project Manager- Rail Division

C. Accident Summary:

On Wednesday, December 8, 2021 at 11:24 a.m., a National Salvage and Service Corporation (NSSC) railroad contractor employee was struck and killed by a reversing Nordco spiking machine, owned, and operated by Norfolk Southern (NS). The accident occurred on NS's Buffalo Line at milepost BR295.11, which is located about 617 feet south of Control Point North Ferry. At the time of the accident, the NSSC employee was performing work for NS's R12 Rail Gang, which was performing curve patch rail replacement work.

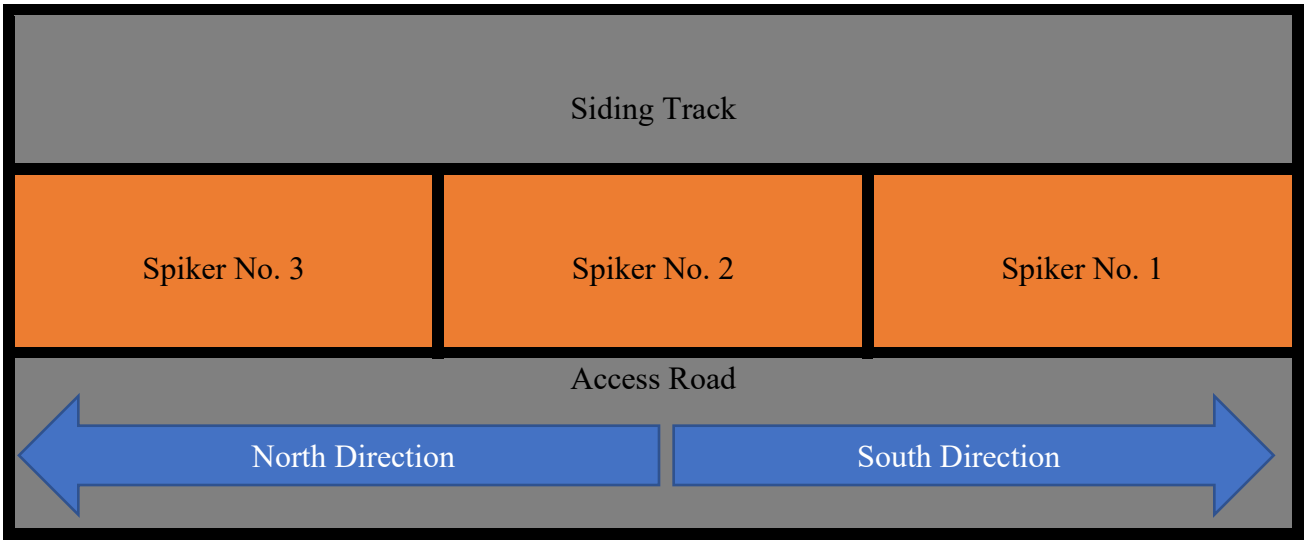
Figure 1- Photo of the accident spiking machine (Spiker No. 2)

D. Circumstances Prior to the Accident

On December 8, 2021, NS's R-12 rail gang was tasked to remove and install 1,342 feet of continuous welded rail between milepost BR295.00 and milepost BR 295.25. At around 7:30 a.m., the R-12 work group, included two contract employees from NSSC (one being the deceased NSSC employee) attended their job safety briefings at the South Ferry Siding parking lot. The briefings

were conducted by the R-12 supervisor, the R-12 foreman, and the local qualified roadway worker in-charge (RWIC). After the briefing were complete, the operators proceeded to start their equipment and performed their daily walk-around inspections per FRA Part 214.527. The operator stated that while conducting his equipment inspections he discovered no issues with his spiking machine. He also stated that if he does discover problems with his machine, he immediately reports the issue to the mechanics for repairs. After the working limits were established by the RWIC between Control Points North and South Ferry, the operators were instructed to move their equipment south out of the siding track, and once clear, to reverse their equipment back north on the mainline track to the start of the job location at North Ferry. Once the work equipment was in place, the work crews were instructed to begin the work processes of removing and installing new replacement rail along the high-side of the curve.

After the old rail was removed, and the new rail was installed, the accident spiking machine (known as spiker No. 2) was installing cut spikes to secure the newly installed continuous welded rail (CWR) to the crossties. At the time, Spiker No. 2 was working in a southward direction, and was situated between two other working spiking machines to the front and rear.



While spiking ties behind spiker No. 1, the spike feeder from spiker No. 2 stated that he saw the NSSC employee walking north past their equipment between the mainline track and the siding track, and also stated that the employee was not wearing a reflective vest, but rather a black hoodie with green tiger strips. As spiker No. 2 continued to spike southward, and eventually working up to the rear of spiker No. 1, the operator decided to reverse his machine to assist spiker No. 3 with spiking. The operator stated that he looked in his left-side view mirror and did not see anyone standing behind his equipment; blew his equipment horn three times, and started to back up north in the direction of spiker No. 3. As the machine was backing, the operator stated that it felt like he had just backed over a rail weld. That is when the operator looked down at the track and noticed the NSSC employee was under his machine. The operator immediately stopped his equipment and notified an emergency radio call stating that an employee was under his machine, and to shut down everything, and that emergency services were needed to respond.

When investigators interviewed spiker No. 3 operator who was working and facing in the direction of the accident, he stated that when he looked up, he saw the NSSC employee standing in the gauge of the track behind spiker No. 2 and was facing the east siding track. He stated that the NSSC employee appeared to be looking down at something before being run over by the equipment. The operator continued to state that when he looked up again, that is when he saw the NSSC employee getting run over by the backing spiking machine. The operator immediately got on the radio and told the spiker No. 2 operator to stop his equipment. After the equipment was stopped, he ran up to the NSSC employee who was positioned under the machine and yelled to see if he was responsive. The operator stated that he only heard a few moans from the employee, and then the employee was not responsive.

Employees tried to use the turntable on spiker No. 2 so that the equipment could be lifted

off the employee, but the attempts were unsuccessful due to the accident location being in a superelevated curve. Employees then used the Badger (multi-crane) to lift the equipment enough to pull the employee out from under the machine. Emergency services provided on-site emergency care to the NSSC employee, but he died at the scene from the traumatic injuries that he received.

E. Job Safety Briefings

FRA Part 214.315 states that when an employer assigns duties to a roadway worker(s) that calls for that employee(s) to foul a track, the employer shall provide the employee(s) with an on-track safety briefing that specifies the type of on-track protection to be provided, the limits of the required on-track protection, and any required adjacent on-track protection. The R-12 supervisor and the NS local qualified roadway worker in-charge both stated that they provided job safety briefings to the R-12 gang employees. Both stated that the briefings covered the specific on-track safety requirements and authority for the work location, working limits and adjacent on-track protection, specific details of the rail removal job, rail-cut locations of where the rail was to be removed, and even discussed an employee injury that occurred on a previous rail job. When asked by investigators regarding the NSSC employee performing work between working roadway maintenance machines, the supervisor answered no, not normally. He stated that the NSSC employee marking out the rail usually stays at the front of the gang, out in front of the spike pullers. He continued to state that employees know not to go into the kill-zone, or between working equipment, unless they get the attention of the equipment operator to stop all movement and work. The supervisor continued to state that he does not know why the employee was standing in the track between working equipment. When asked by investigators if NS formally documents their FRA required job safety briefings, or utilizes a type of check-off list to conduct their briefings, the R-12 supervisor answered that they do not document or write out job safety briefings.

F. Buffalo Line Description:

NS's Buffalo Line operates between beginning milepost BX0.21 (Myers Road) to ending milepost BR306.2 (Wye). The line is geographically configured in an operational north-south direction, with mileposts increasing traveling in a southward direction. The line consists of 306 miles of single main track, and 17 passing siding tracks totaling about 47 miles. Mainline maximum authorized speeds (MAS) vary between 10 mph and 50 mph, depending on the location and track configuration. Siding track MAS varies between 10 mph and 30 mph, depending on the location and track configuration. The method of operations for both the mainline and siding tracks is dispatcher control and signal indication, operating under rule No. 261[1].

G. Accident Site Description:

The accident occurred in a right-hand 1.90 average degree curve, with 2 inches of super-elevation. The main track was constructed with wood crossties measuring 9 inches by 7 inches, and measuring 8 foot 6 inches long, spaced on 19.5-inch centers (nominal). Both running rail sections consisted of 136-pound RE—continuous welded rail. The high-rail was fastened to the crossties with new 18" double shoulder tie plates and standard cut spikes to maintain and secure the track gauge. The cut spike pattern consisted of one rail hold spike and one plate holding (back-up) spike on the field side of the rail, and one rail holding spike and one plate holding spike on the gauge side of the rail. Every other crosstie was box anchored with locking style anchors to assist in restraining longitudinal movement of the continuous welded rail due to train dynamics and thermal forces. The track structure was supported with 2.5" fractured ballast. The main track at the accident site is classified at FRA Class 4 track with a maximum authorized speed (MAS) of 50 mph

[1] Rule No. 261 means that train can operate in both directions under dispatcher control and signal indication.

for freight train, and is inspected per FRA Part 213.233 as twice weekly with at least 1 calendar day interval between inspections. No passenger trains operate on the Buffalo Main Line track.

H. R12 Gang and Equipment Description:

The R12 gang consists of about 25 employees, which usually includes 2 contractor employees from NSSC to assist in marking old rail for scrap or resale purposes. The R12 gang is equipped with about 15 pieces of rail-bound roadway maintenance machines, which includes a grapple truck owned and operated by NSSC. The gang performs "curve patch work", where it removes and installs new continuous welded rail on the high side of rail curves[2]. On the day of the accident, the R12 gang was removing and installing 1,342 feet of continuous welded rail between milepost BR295.00 to milepost BR295.25. The spiking machines are located near the end of the equipment line-up, and perform the track gauging, and the final spiking of crossties.

I. NS Operating Rule No. 818

NS operating rule No. 818- Proper Spacing between Rail Equipment paragraph C states that when working, on-track must maintain 25 feet of separation from other on-track equipment, or employees or equipment working in the foul of the track. When necessary, on-track equipment may operate closer than 25 feet provided a job safety briefing is held with the other operator or employee in the foul of the track, and all involved have a clear understanding of the movement to be made.

[2] High-rail curve patch work is when track crews replace old worn continuous welded rail along the high-side of a curve with new continuous welded rail.

Figure 2- Photo of the rear of spiker No. 2

J. NS Safety Rule No. 1044

NS safety rule No. 1044- High-Visibility Safety Garments states that engineering employees must wear an NS approved high-visibility safety vest when required to be on any railroad tracks or right-of-way. Other high-visibility garments such as jackets, shirts, sweatshirts, or rain suits may be worn in lieu of the company issued vest provided the garment is labeled

certified as meeting the American National Standards Institute (ANSI) Class II or Class III standards for garment size, reflectivity material and performance, and are of a fluorescent yellow-green color. Safety garments, when required, must be worn as the top layer of clothing, and must not be removed except in an emergency.

K. Postaccident Track Geometry Measurements:

Investigators documented track geometry measurements and notes at the accident site location. Geometry stations were laid out from milepost BR 295.1 to milepost BR 295.09. Track gauge and cross-level measurements were recorded at every 15'6" stations.

Track gauge measurements averaged between 56 1/2 inches to 56 9/16 inches at the measured stations. Investigators noted no lateral track movement and took no exception to the crosstie conditions and the spiking and anchor patterns. Cross-level measurements averaged between 2.0 inches to 2 ¼ inches at the measured stations. No underload vertical deflection of the track was noted, and no fouled ballast was observed. The shoulder and crib ballast appeared to be adequate and clean with no obstructions. No longitudinal rail movement was noted at the base of the rail, under spike head locations, or at the existing rail anchor locations. Investigators noted that all track geometry measurements were within the engineering design range of NS's curve data and track profile charts.

L. Postaccident Site Measurements:

Prior to NTSB's arrival, NS representatives had staged the accident track equipment back to their approximate "*time of accident*" track locations for NTSB and FRA investigative purposes. At the accident site location, investigators discovered several "witness" marks on the tie places and crossties, busted paint cans, a broken measuring wheel, and other personal belongings. The

track group took accident measures, and all concurred on the following measurements:

- Rear of spiker No. 2 to group determined point-of-contact with roadway worker = 29'11"
- Body drug to final resting location = 34'10"
- Body at final resting location under spiker No. 2 = 65'9"
- Rear of spiker No. 2 to front of spiker No. 3 = 126"6"
- Spiker No. 3 operator seat to point-of-contact = 114'10"
- Front of spiker No. 2 to lead spiker No 1 = 34'11"
- Clearance under spiker No. 2 = 17"

Investigators also measured from milepost BR295.00 to the following locations:

- Milepost to rear of spiker No. 2 = 661'6" feet
- Milepost to point-of-contact = 617'6" feet
- Milepost to final resting location of body = 581'11"

M. Interviews

On Thursday, December 9, 2022, the track group conducted four interviews with the following NS employees:

- **Operator of accident spiker No. 2**
    - Hired with NS on October 2, 2021
    - 9 years with company
    - Held various positions such as trackman, anchor operator, spiker operator
    - Stated that he thought that he ran over a rail weld
    - Was backing up when the accident occurred to assist the spiking machine behind him
    - Drives 30-40 minutes to job site
    - Arrives at job site at 6:30 a.m.
    - Attended job safety briefing at 7:30 a.m. conducted by supervisor
    - Clear weather---visibility was good
    - Has no idea that the worker had placed himself behind his machine
    - Trained on all spikers / trained and certified
    - Performed morning inspection of his machine
    - Calls mechanic if there are problems with the machine
    - Minor repairs on equipment within the last 2 months- broken bracket and reverse light
    - Describes horn on his machine as a "Prius" horn (not very loud)
- **Operator of rear spiker No. 3**
    - Hired with NS in 2018

- Became an operator on May 20, 2019
- Stated that NSSC employees work from front to back of the gang
- Witnessed accident when it occurred
  - Worker was standing in the gauge of the track
  - Worker was facing east towards the siding track
  - Worker was looking down at something
- Has never witnessed worker performing work between equipment

- **Spike feeder for accident spiker No. 2**

  - Hired with NS on August 23, 2021
  - Hired as a trackman/laborer
  - Currently assigned to the R12 gang s a trackman
  - Was working as the spike feeder on accident spiker No. 2
  - Morning job safety briefing discussed the 25 feet rule from equipment
  - Witnessed worker walking north past spiker No. 2
  - Then witnessed worker walking past spiker No. 2 on the east side between the main track and the siding track
  - Five minutes later the accident occurred
  - Recalls worker was not wearing no reflective safety vest
  - Recalls worker wearing a tool belt

- **R12 Gang Supervisor**

  - R12 gang supervisor for 2 ½ years
  - Described his duties as a gang supervisor
  - Performs job safety briefings and work details
  - Described how NSSC employees perform work
  - Witnessed worker walking north in the adjacent siding track
  - Had no recommendations to prevent reoccurrence

- **NSSC boom truck driver**

  - Has been employed with NSSC for about 4 years
  - Has performed rail marking duties before
  - Attended R-12 gang morning briefing with other NSSC employee
  - Majority of briefing conducted by R-12 supervisor and foreman
  - Stated that 25 foot rule has been mentioned in previous meetings
  - Does not believe that anything was discussed regarding NSSC marking out rails
  - Did receive an on-track briefing from the RWIC
  - Estimated that about 25 employees were in-attendance
  - Additional briefing was held with NSSC regarding boom truck work
  - Stated that his equipment track traveled with the NS equipment from the siding
  - Did recall NSSC employee stating that he was slower than normal due to rail conditions (bolt holes/rail welds)
  - Stated that it was not normal for the NSSC employee to be working between

equipment
- Stated that a possible relief cut may have been the reason to put him in that position (rail length would have to be recalculated)

[END OF REPORT]