Issued: April 25, 2024 Railroad Investigation Report: RIR-24-03

Union Pacific Railroad Employee Fatality

El Paso, Texas
August 29, 2022

1 Factual Information

1.1 Accident Description

On August 29, 2022, about 9:14 p.m. local time, the conductor of Union Pacific Railroad (UP) train ISIEP 29 was killed during a shoving movement when two cars of the train derailed in UP's Alfalfa Yard in El Paso, Texas.[1] The conductor was riding on the lead end of the first railcar as the train traveled from main track 1 through Control Point (CP) Rosedale onto the yard lead when the train encountered a derail.[2] The derail was placed on the yard lead earlier in the day to protect maintenance-of-way (MOW) employees during an upcoming installation project. As the train entered the yard on the yard lead the train encountered the derail device and two railcars derailed. Railcar 1 overturned, landing on its side, then sliding into a residential property where it struck a natural gas line owned by Texas Gas Service.[3] (See figure 1.) Railcar 1's contact with the gas line did not result in a gas leak. At the time of the accident, visibility conditions were dark, and

[1] (a) All times in this report are local time unless otherwise noted. (b) Visit www.ntsb.gov to find additional information in the public docket for this National Transportation Safety Board (NTSB) accident investigation (case RRD22FR013). Use the CAROL Query to search safety recommendations and investigations. (c) A *shoving movement* is the process of pushing railcars or pushing a train from the rear with a locomotive.

[2] (a) *A yard lead* is an extended track connecting either end of a yard with the main track. (b) A *derail* is defined in Title 49 *Code of Federal Regulations* (*CFR)* 213.357 as a device which will physically stop or divert movement of railroad rolling stock or other railroad on-track equipment past the location of the device.

[3] Texas Gas Service is a division of ONE Gas, Inc. Texas Gas Service has about 11,300 miles of distribution and transmission pipelines.

the temperature was 80°F with light wind. UP estimated damages to equipment to be $78,209.

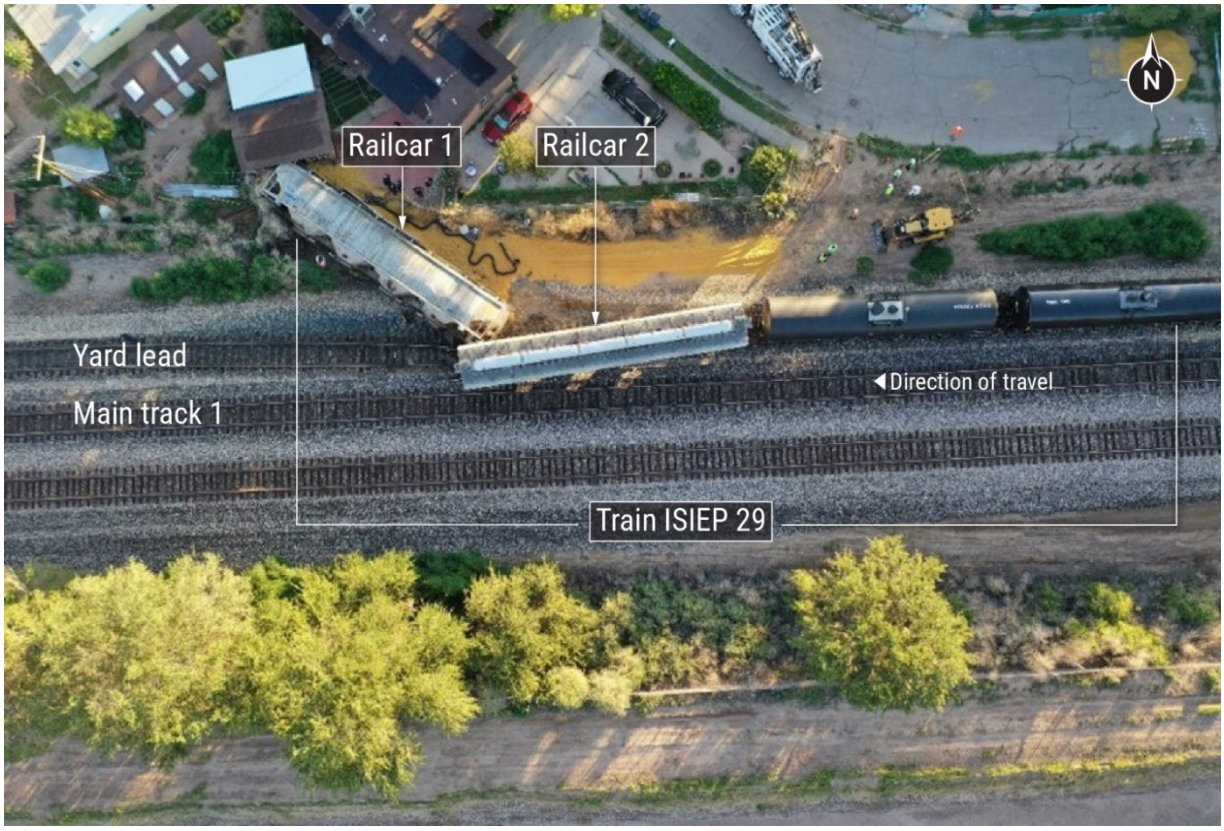

Figure 1. Image of accident scene. (Source: UP drone image.)

Train ISIEP 29 operated from Santa Teresa, New Mexico, to El Paso, Texas, a distance of about 34 miles. The train crew consisted of a conductor, a locomotive engineer, and a brakeman.

Locomotive event recorder data reviewed by the National Transportation Safety Board (NTSB) showed that the train engineer began the shoving movement about 9:09 p.m. and the train accelerated to a speed of about 8 mph.[4] The conductor was riding the north side of railcar 1 protecting the shoving movement while giving instructions to the engineer in the lead locomotive, with a hand-held portable radio, about the railcar count (or distance) to where the MOW employees were working.[5] The last communication the

[4] While *protecting a shoving movement*, the conductor stands at a designated place, such as a ladder on the leading car, to spot any obstructions or conflicting movements and to guide the engineer's movement of the train.

[5] Railroad personnel commonly use railcar counts to communicate distances during switching operations.

engineer heard from the conductor was that the maintenance crew was about 20 railcar lengths ahead. He then made a request to blow the horn. The brakeman, who was driving a maintenance vehicle and not present with the crew on the train, had positioned himself in the yard near the switch for track 3.

About 9:14 p.m., railcar 1 contacted the derail and derailed. The train's emergency braking application was activated as a result of the derailment.[6] Railcar 1 derailed and overturned on its side to the north, and into the backyard of a residence where it contacted a natural gas line. (See figure 2.)

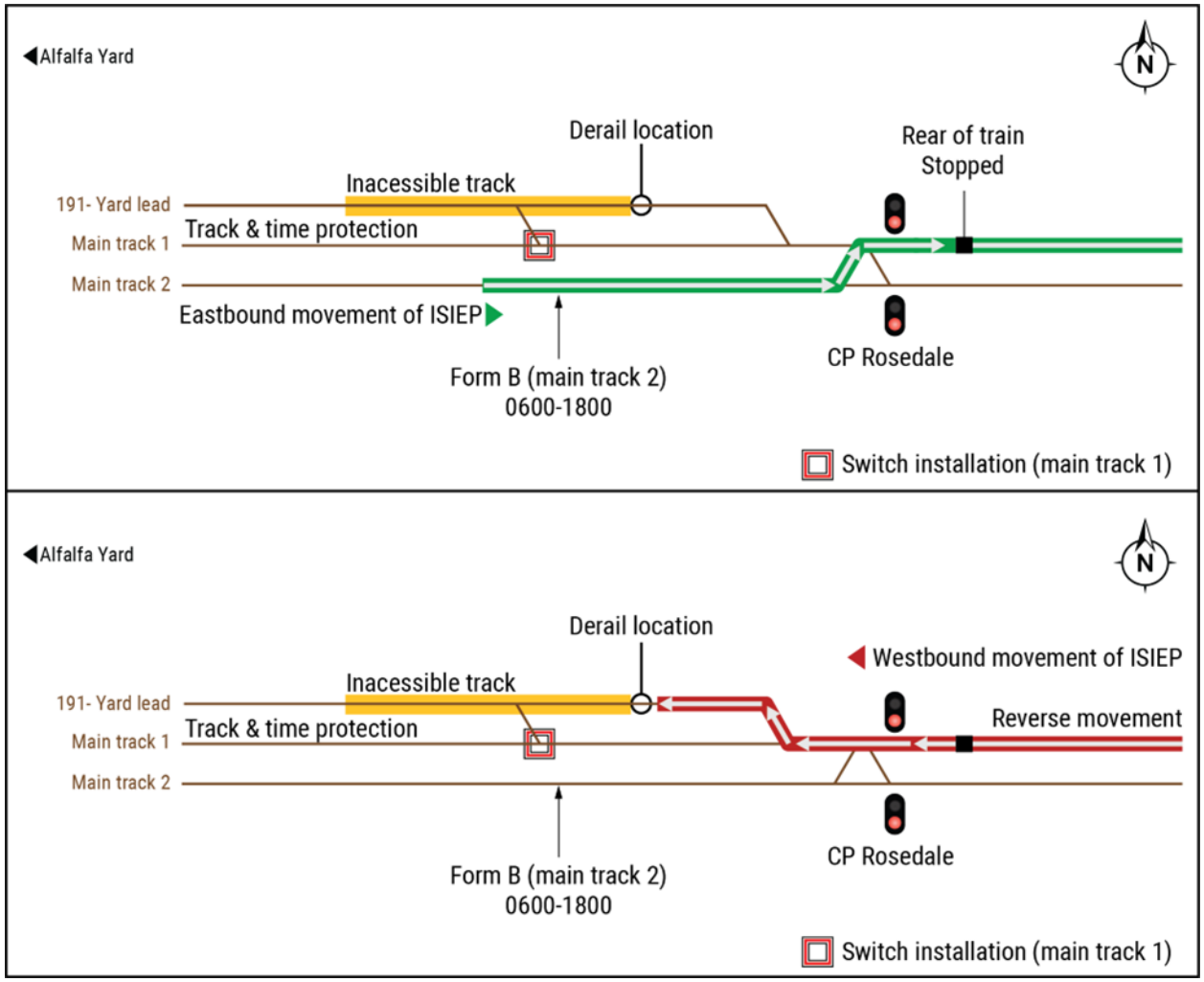

Figure 2. Main tracks 1 and 2 in Alfalfa Yard.

[6] An *emergency braking application* is the maximum brake force available and is designed to stop the train as quickly as possible and, in this case, activated once the railcars derailed.

After the train stopped, the engineer tried calling the conductor by radio but heard no response. The engineer also heard the brakeman attempting to contact the conductor by radio. The engineer radioed the evening manager of terminal operations (MTO) immediately after the emergency brake application and informed them that the train went into emergency braking, and that the conductor could not be reached.[7] The MTO told the engineer to contact the utility employee to respond to the site.[8]

A nearby resident called 911 about 9:18 p.m. to report that a train derailed in their back yard and emergency responders were dispatched to the scene. Texas Gas Service was contacted by emergency responders about 9:37 p.m. Emergency responders established command about 9:45 p.m. and a precautionary evacuation of residents was conducted, directing them to a nearby church location. The conductor was found by the emergency responders and pronounced dead. Texas Gas Service arrived on-scene about 10:26 p.m., assessed the situation, and determined there was no gas leak. The evacuation of residents lasted about 1.5 hours.

1.2 Before the Accident

1.2.1 Portable Derail Placement

The employee-in-charge (EIC), who was also the track foreman, started his shift at 4:30 a.m. on August 29, 2022. UP's engineering personnel planned to install a track switch located at the east end of the yard that connected to main track 1. The installation was scheduled to begin about 7:00 a.m. The EIC placed main track 1 out-of-service from CP Rosedale to the east end of Alfalfa Yard, established a Form B protection on both main tracks from 6:00 a.m. to 6:00 p.m. to control the movement of trains passing the work zone. The EIC also established "inaccessible track" protection on the yard lead to protect the MOW employees and equipment working on the installation.[9]

[7] A manager of terminal operations (MTO) performs similar duties as a yardmaster. MTOs are contract employees and yardmasters are non-contract employees. The duties of a yardmaster are explained in section 1.7.

[8] A *utility employee* is a temporary member of a train or yard crew who assists the crew in the assembly, disassembly, and classification of railcars as well as in the operation of trains.

[9] (a) *Form B* is a type of exclusive track occupancy which requires the use of red flags at the entrances to the area. Trains entering the Form B limits must first contact the EIC. *Exclusive track occupancy* provides on-track safety for workers by establishing working limits over controlled tracks. (b) *Inaccessible track* means a method of establishing working limits on noncontrolled track by physically preventing entry and movement of trains and equipment.

In a postaccident interview with the NTSB, the EIC stated that the start of the installation project was delayed 5 hours, beginning about 12:00 p.m. He stated that he placed the portable derail and flags to protect the track about 11:23 a.m. and intended to remove it during daylight hours when it could still be seen.

The dayshift MTO started work about 5:30 a.m. on August 29, 2022, and was on duty when the EIC placed the portable derail on the rail of the yard lead. The EIC informed the dayshift MTO about the placement of the portable derail.

The evening MTO's shift started at 5:30 p.m. A handoff briefing was held between the dayshift MTO and the evening shift MTO; information on the placement of the portable derail was passed on during the handoff briefing.

1.2.2 Train ISIEP 29 and Crew

The crew for train ISIEP 29 reported for duty on August 29, 2022, at 11:00 a.m. in El Paso, Texas, and then travelled by van to Santa Teresa, New Mexico. The conductor received the paperwork and instructions for the assignment from the yardmaster and the crew held a job briefing.[10]

About 7:37 p.m., the crew departed Santa Teresa for Dallas Street. Train ISIEP 29 consisted of two locomotives, 58 loaded railcars, and 5 empty railcars. About 8:06 p.m., the crew arrived at Dallas Street and then departed Dallas Street for Alfalfa Yard about 8:31 p.m.

Upon arriving at Alfalfa Yard, the UP dispatcher routed the train from main track 2 through a set of switches at CP Rosedale, located at milepost 820, onto main track 1.[11] Before arriving at CP Rosedale, the train passed main track 1 where the MOW employees were installing a new switch to control yard access. (See figure 3.)

[10] A *job briefing* is an exchange of information within a crew to review risks and discuss safety considerations and the work to be performed.

[11] UP dispatchers operate from The Harriman Dispatch Center, UP's rail traffic control headquarters, where the movement of trains is controlled and monitored.

Figure 3. Train ISIEP 29 passing the MOW employees.

After passing the MOW employees, the engineer dimmed the locomotive's headlight due to the presence of an opposing train on main track 2. The NTSB's review of data from the outward facing image recorder confirmed that while the headlight was dimmed, the portable derail was not visible to the train crew as the train passed the yard lead. (See figure 4.)

Figure 4. Train ISIEP 29's view of the area with dimmed headlight.

As train ISIEP 29 went through a crossover movement, it slowed down to let the conductor detrain from the locomotive to be in position to observe the signal aspect and to protect the movement into the yard.[12] Event recorder data showed train ISIEP 29 stopped on main track 1, east of CP Rosedale at 8:49 p.m.

[12] A *signal aspect* refers to the appearance of a fixed signal conveying an indication, as viewed from the direction of an approaching train. Generally, red means stop, green means proceed, and yellow means proceed with caution or reduce speed.

1.3 Permission Given to Enter Alfalfa Yard

Investigators reviewed recordings of the radio communication between the conductor and the third shift dispatcher, and from the evening shift MTO and the corridor manager which highlighted that they granted train ISIEP 29 permission to enter Alfalfa Yard.[13] The conductor radioed the third shift dispatcher about 9:02 p.m. to request a signal into the yard. Table 1 outlines their recorded radio conversation.

[13] Dispatchers work 8-hour shifts, whereas MTOs work 12-hour shifts.

Table 1. Radio conversation between the conductor and the third shift dispatcher.

Speaker	Statement
Conductor	Requests for signal
Third shift dispatcher	"All right, copy that, they're ready for you there in the east end, over."
Conductor	"Yes, sir, that is correct. We're stopped on the east end ready for that signal."
Third shift dispatcher	"All right, copy that, here we go."
Conductor	The conductor then radioed the engineer and told him that they had a signal into the yard.

During postaccident interviews, the evening shift MTO stated that he observed train ISIEP 29 lined into the yard on his display screen in the yard office. The MTO called the corridor manager (CM) on the phone about 9:04 p.m. to inquire about the train's movement into the yard.[14] Table 2 outlines their recorded phone conversation.

Table 2. Recorded phone conversation between the evening shift MTO and CM.

Speaker	Statement
Evening shift MTO	About lights into the yard, "They haven't given that back to me yet."
CM	The CM then asked if something was going on out there.
Evening shift MTO	"Well, from what I understand, they got that (indiscernible) away [maintenance of way] out there."
CM	The CM said there was no tag out there but then recognized that it was in the yard. The CM then asked, "I mean, is it going to hurt if they give him a light in there? Is there going to be a block or something up there?"
Evening shift MTO	"No, I mean, having the lights is not going to be a problem. Let me see who's working over there and see if I can call them and see if I have access to the lead yet or not. He's -- my understanding was that I don't have access to the lead yet. Alfalfa, stand by there, sir."
CM	"I got the dispatcher and I'm down there to stop them real quick there. So, figure that out."
Evening shift MTO	"…something, isn't it? (Indiscernible). Okay, let me, let me (indiscernible), sir, and I'm going to call this guy to see what it looks like."
CM	"Hey, that dispatcher talked to him, and they cleared him through an ISIEP. So…."
Evening shift MTO	"So, I, he can make him move?"
CM	"That's what he said. He said he talked to him."
Evening shift MTO	"To whoever is working over there?"
CM	"Yes."
Evening shift MTO	"Okay, all right. Yes, I just want to make sure because I just, I just think the (indiscernible) [MOW] they're not supposed to give it back till 9:30."

During an interview with the NTSB, the evening shift MTO stated that he radioed the train crew and gave them permission to enter the yard about 9:08 p.m.[15] The MTO also stated that he sent a message to the superintendent and the superintendent said that the yard lead would not be available for use until 9:30 p.m. The MTO further

[14] A *corridor manager* is responsible for rail corridor operations and performance, such as train availability and timing.

[15] This phone communication was on the yard channel and not recorded.

indicated that he understood that the CM communicated with the third shift dispatcher who confirmed with the foreman of the MOW crew that they were ready for the train crew. The NTSB interviewed the EIC to see if he was contacted to request permission into his work area or if he was ready for a train to use the yard lead. The EIC responded that he talked with the second shift dispatcher about 5:30 p.m. but he never released movement authority to a shift dispatcher or MTO.

1.4 Personnel Information

1.4.1 Conductor

The conductor was hired by UP on February 7, 2011, and had been working in his current position for over 11 years at the time of the accident. During calendar year 2022, the conductor was operationally tested 117 times and was found to comply with all his tests with zero failures noted.

1.4.2 Day Shift MTO

The day shift MTO was hired by UP and worked as an engineer from 1995 until 2014. In 2014, he became a manager of operating practices until 2019. In February 2022, he became an MTO, his position at the time of the accident.

1.4.3 Evening Shift MTO

The evening shift MTO was hired by UP as a conductor in 2012 and received a promotion to manager of yard operations in 2016. In 2018, he was promoted to MTO, his position at the time of the accident.

1.5 Postaccident Toxicology Testing

Postaccident toxicology testing was performed on the conductor for alcohol and other drugs in compliance with Title 49 *Code of Federal Regulations* (*CFR*) 219.201.[16] Results were negative for all tested-for substances.

[16] Postaccident toxicology testing for ethanol was conducted in accordance with 49 *CFR* 382.303(a) and postaccident toxicology testing for controlled substances, to include marijuana, cocaine, amphetamines, opiates, and phencyclidine, was conducted in accordance with 49 *CFR* 382.303(b).

The brakeman and locomotive engineer received Federal Railroad Administration (FRA) postaccident drug and alcohol tests, the results were negative for all tested-for substances, including ethanol.[17]

1.6 Mechanical Inspection

The FRA performed mechanical inspections on the two derailed railcars and the two locomotives. No defective conditions were found during the inspection.

1.7 UP Operating Rules and Procedures

1.7.1 Yardmasters

UP has adopted the General Code of Operating Rules (GCOR) to govern the operations of their railroad.[18] GCOR Rule 1.46, Duties of Yardmasters, states that the yardmaster is responsible for ensuring the prompt and regular movement of cars, especially the proper makeup of trains and their movement into and out of the yard. Yardmasters and MTOs perform similar duties.

UP's Valentine Subdivision Special Instructions states that train crews must obtain permission from a yardmaster or MTO before entering a yard facility.[19]

1.7.2 Shoving Movements

GCOR Operating Rule 6.5: Shoving Movements, states, in part, that equipment must not be shoved until it is visually determined that the portion of track to be used is clear of equipment or conflicting movements.

1.7.3 Movements on Other than Main Track

The accident movement of UP train ISIEP 29 was from a controlled track, main track 1, onto a noncontrolled track, the yard lead, track 191. GCOR Rule 6.28, Movement on Other than Main Track, states that trains or engines must move at a speed that allows

[17] Postaccident toxicology testing required by the FRA includes testing for amphetamines, barbiturates, benzodiazepines, cannabinoids, cocaine, MDMA/MDA, methadone, opiates/opioids, phencyclidine, tramadol, ethyl alcohol, brompheniramine, chlorpheniramine, diphenhydramine, doxylamine, and pheniramine.

[18] General Code of Operating Rules, 8th Edition, April 1, 2020.

[19] Sunset Area Timetable No. 5 - Valentine Subdivision Special Instructions.

them to stop within half the range of vision short of a train, engine, railroad car, men or equipment fouling the track, stop signal or derail or switch lined improperly except when moving on a main track or on a track where a block system is in effect.

1.7.4 UP Engineering Procedures

UP's engineering procedures include a Chief Engineering Instructions Bulletin that addresses the use of portable derails and their placement for creating inaccessible track for the protection of MOW employees.[20] UP's inaccessible track procedures include requirements that the EIC contact the yardmaster or control operator to determine if remote control operators (RCOs) are working in the area and, if so, how many; and conduct a job briefing with each RCO to discuss methods and locations of inaccessible track.[21]

UP's Switch and Derail Awareness Checklist is completed by the EIC before and after the completion of work performed on non-control tracks, including yard tracks. The checklist states EICs must utilize locking out, spiking and/or clamping, and tagging a switch, as the first means of making a track inaccessible to reduce the number of derails placed.

1.8 Postaccident Actions

1.8.1 Union Pacific

After the accident, UP updated the Chief Engineering Instructions Bulletin - Rule 136.4.2: Inaccessible Track, by System General Order on September 26, 2022.[22] Updates included requiring the use of a red reflectorized flag 150 feet in advance of the placement of a portable derail and requiring the placement of a red light at night when a portable derail is installed and the track made inaccessible.

The NTSB requested UP to provide an exemplar display of the placement of a portable derail using the new instructions provided in UP's engineering bulletin. Figure 5

[20] Chief Engineering Instructions Bulletin - Rule 136.4.2: Inaccessible Track. Effective May 2, 2016. Updated through May 10, 2022.

[21] El Paso Yard utilizes RCOs, and they have an RCO zone that starts from the yard lead and requires the train crew to call the MTO/Yardmaster before entering the yard to see if there is an RCO zone established.

[22] Chief Engineering Instructions Bulletin - Rule 136.4.2. Inaccessible Track. Updated September 26, 2022.

shows a comparison of the placement of the derail and illumination at the time of the accident and after changes were made to the Chief Engineering Instructions Bulletin.

Figure 5. Derail with a sign on the night of the accident (left), derail with the reflectorized flag and red light after rule changes (right). (Left image: courtesy of UP; right image: courtesy of the International Association of Sheet Metal, Air, Rail and Transportation Workers.)

UP developed and implemented a Transportation and Engineering Turnover form to better document and track MOW activities inside yard operations. The form is now used by MTOs and EICs to improve information sharing on MOW activities during shift turnover.

UP's Harriman Dispatching Center conducted safety and contact training sessions for multiple weeks with dispatchers on the importance of clear communication. The dispatching center also issued instructions by bulletin under 20.14: Statements, adding a bullet item that states, "avoid communicating maintenance work on uncontrolled tracks that could lead to a misunderstanding of the status of the track(s)."

1.8.2 FRA Safety Advisory

On October 28, 2022, the FRA issued Safety Advisory 2022-01:Use of Portable Derails, "to emphasize the importance of, first, ensuring that portable derails are clearly visible to train crews and operators of other on-track equipment, particularly at night and in other low-light conditions; and second, having processes in place to ensure that portable derails are removed when not necessary for on-track safety.[23] This safety advisory recommends that railroads and railroad contractors review and revise their on-

[23] The full text of the Safety Advisory is accessible at: https://railroads.dot.gov/regulations/federal-register-documents/2022-23486.

track safety manuals, as necessary, to ensure they include procedures and rules for the use of portable derails."

2 Analysis

2.1 Introduction

On August 29, 2022, about 9:14 p.m. local time, the conductor of UP train ISIEP 29, was killed while protecting a shoving movement from Railcar 1 when his train encountered a portable derail in UP's Alfalfa Yard in El Paso, Texas. Two railcars derailed, including railcar 1, as the train entered the yard on the yard lead. Railcar 1 overturned, landing on its side, and sliding into a residential property where it struck a natural gas line owned by Texas Gas Service.

A switch installation project to control yard access had been scheduled to begin at 7:00 a.m. The EIC had placed a portable derail and flags on the yard lead track to render the yard lead inaccessible as a method of work zone protection to protect the MOW employees. The start of the installation project was delayed by about 5 hours, beginning about noon.

2.2 Permission to Enter Alfalfa Yard

The MTO, who was controlling train movements within the yard, granted train ISIEP 29 permission to enter the yard on the yard lead about 9:08 p.m. Recorded communications between UP personnel granting the train permission to enter the yard before the accident showed that the MTO and third shift dispatcher (who was solely coordinating train movements on main tracks in the area) did not inform the train crew that a portable derail had been placed on the yard lead. Further, the NTSB's examination of communications between UP personnel determined that the MTO and third shift dispatcher did not contact the EIC before the MTO authorized the movement. This denied the EIC an opportunity to remind the MTO and third shift dispatcher of the portable derail rendering the yard lead inaccessible. If the MTO or third shift dispatcher had contacted the EIC about train ISIEP 29's planned movement into the yard lead, the accident likely would have been prevented, either by withholding permission to proceed or by removal of the portable derail. As a result of this accident, UP's Harriman Dispatch Center issued a new instruction under 20.14: Statements for dispatchers to avoid communication on uncontrolled tracks that could lead to confusion. This prevents the dispatcher from speaking to others who do not control that section of track. Dispatchers were also trained on the new instruction and the importance of clear communication.

2.3 Portable Derail

The EIC's placement of the portable derail on the yard lead track to protect the MOW employees was performed in compliance with UP's Switch and Derail Awareness Checklist and engineering procedures. When the EIC placed the portable derail, he expected that he would remove the derail before low light or nighttime conditions. In normal light conditions, the derail and flags would have been visible to the train crews. However, the crew of train ISIEP 29 started the shoving movement onto the yard lead at restricted speed when it was dark, at about 9:09 p.m.[24] The conductor was not informed that a portable derail was placed on the yard lead track and in dark conditions, could not see the derail or the flags.

The NTSB's review of data from train ISIEP 29's outward facing image recorder showed that the portable derail and the flags were not visible to the crew of train ISIEP 29 because of the dark, nighttime conditions; therefore, the train crew could not visually determine the placement of the derail or flags and be able to stop the train in half the distance of vision to this object as required by restricted speed. Had the portable derail been illuminated, the conductor would have had a visual indication that the derail was present and could have radioed the engineer to stop short of the derail's location, preventing the derailment. After the accident, UP developed and implemented a Transportation and Engineering Turnover form to better document and track MOW activities inside yard operations. UP also modified its rules on derail placement, now requiring derails to be illuminated upon initial placement and the positioning of a reflectorized warning sign 150 feet ahead of the derail's location. Further, the FRA issued a safety advisory on the use of portable derails, emphasizing the importance of having clearly visible portable derails and having processes to remove portable derails when not necessary for on-track safety.

3 Probable Cause

The National Transportation Safety Board determines that the probable cause of the August 29, 2022, Union Pacific Railroad employee fatality was the failure of personnel to contact the employee-in-charge before granting train ISIEP 29 permission to enter the yard lead track.

[24] *Restricted speed* is defined by FRA regulations in 49 *CFR* 236.812 as a speed that will permit a train or other equipment to stop within one half the range of vision of the operator and not exceed 20 mph or a lower limit set by the operating rules of the railroad.

The NTSB is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in the other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, "accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties … and are not conducted for the purpose of determining the rights or liabilities of any person" (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB's statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)).

For more detailed background information on this report, visit the NTSB Case Analysis and Reporting Online (CAROL) website and search for NTSB accident ID RRD22FR013. Recent publications are available in their entirety on the NTSB website. Other information about available publications also may be obtained from the website or by contacting –

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