



Issued: November 13, 2024

Railroad Investigation Report: RIR-24-12

# Union Pacific Railroad Train Collision

Chico, Texas  
April 16, 2023

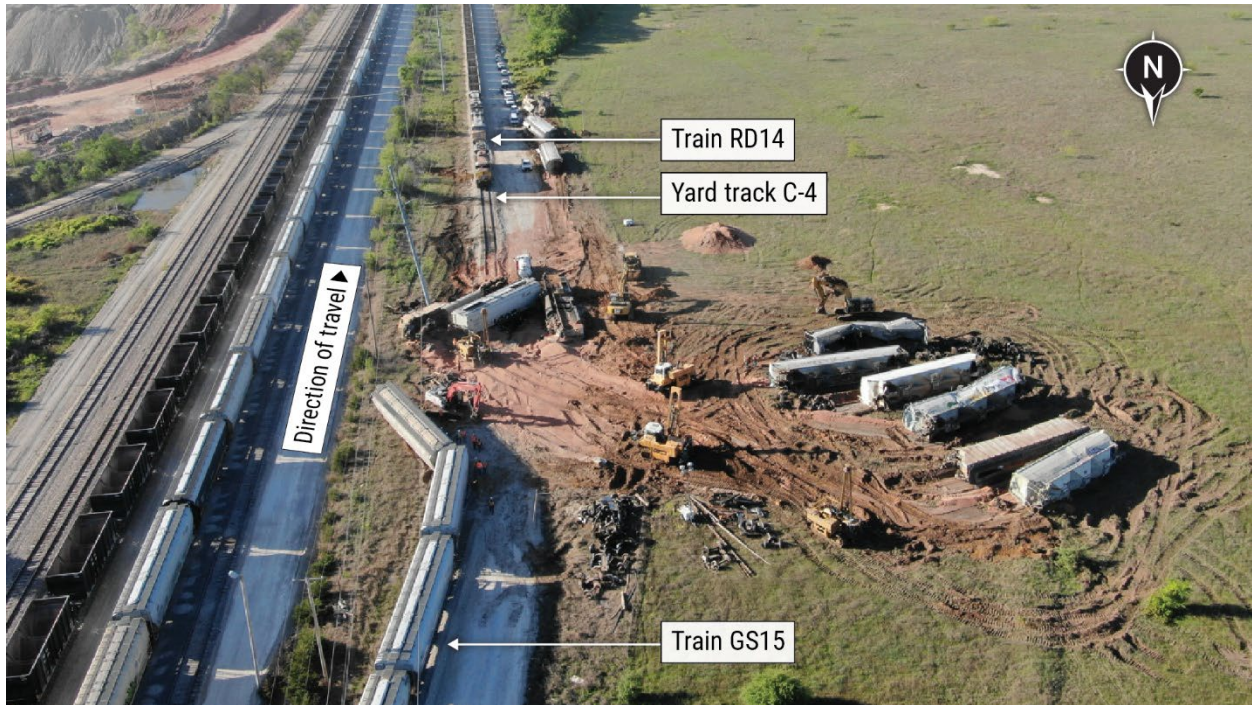
## 1 Factual Information

### 1.1 Accident Description

On April 16, 2023, about 6:44 p.m. local time, southbound Union Pacific Railroad (UP) train GSHFCC 15 (train GS15) crossed a main track switch lined toward yard track C-4 and collided with parked UP train RDACO 14 (train RD14) in Chico Yard in Chico, Texas.<sup>1</sup> (See figure 1.) As a result of the collision, 12 loaded hopper railcars and 2 locomotives from train GS15 derailed, and 1 empty gondola railcar and 2 locomotives from train RD14 derailed. Two crewmembers from train GS15 were seriously injured. UP estimated damages to equipment and track infrastructure to be about \$4.9 million. Visibility conditions at the time of the accident were daylight and clear, and the temperature was 68°F with no precipitation.

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<sup>1</sup> Visit [www.nts.gov](http://www.nts.gov) to find additional information in the [public docket](#) for this National Transportation Safety Board (NTSB) accident investigation (case number RRD23LR010). Use the [CAROL Query](#) to search safety recommendations and investigations.



**Figure 1.** Aerial view of the collision scene. (Courtesy of UP.)

The events before the collision involved three trains (see table 1) and two main track switches in Chico Yard, which is located on the UP Duncan Subdivision near milepost (MP) 564.2. Trains operate through Chico Yard on a single main track that runs north to south. Two tracks branch off from the main track through two separate main track switches. The track west of the main track enters a small yard, the C-yard, and is accessed by a hand-operated switch called the “C-yard” main track switch. The track east of the main track enters the Lonestar siding and is accessed by a hand-operated switch called the “Lonestar” main track switch. The C-yard and Lonestar main track switches have the same handle and target; however, the Lonestar main track switch also has a two-sided vertical sign that reads “Lonestar.” The switches are about 135 feet apart.<sup>2</sup> Figure 2 is a photograph taken after the collision that shows the C-yard and Lonestar main track switches (the switch alignments in the photograph do not show how authorities found the switches lined immediately after the collision).

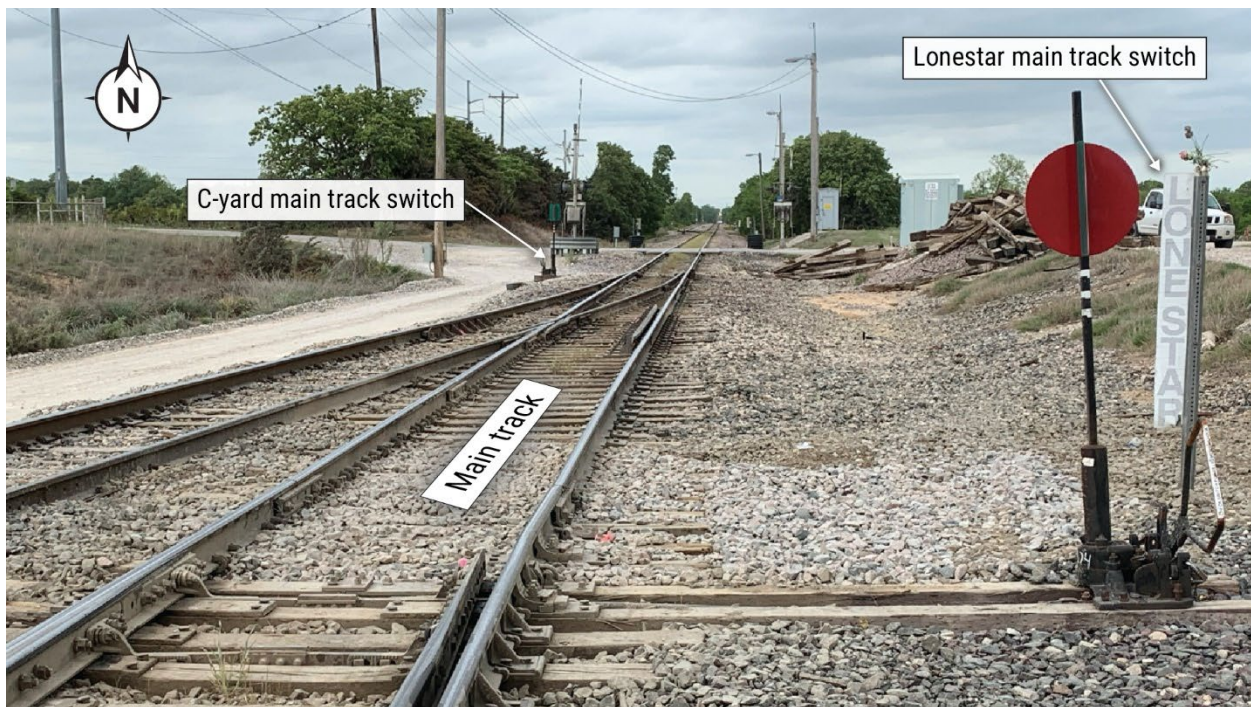
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<sup>2</sup> Both targets display a green rectangle when lined to the main track and a red circle when lined to divert trains off the main track.

**Table 1.** Trains and crews involved in collision sequence.

Train	Crew	Consist	Notes
RD14	1 conductor, 1 engineer (none on board during collision)	3 locomotives, 105 empty gondola railcars	Engaged in switching operations before collision; struck while parked*
RHKPHQ 15 (train RH15)	1 conductor, 1 engineer (none in area during collision)	3 locomotives, 115 empty gondola railcars	Engaged in switching operations; not physically involved in collision
GS15	1 conductor, 1 engineer	3 locomotives, 103 loaded gondola railcars	Bound from Hutchinson, Kansas, to Corpus Christi, Texas; striking train

\* *Switching operations* involve moving railroad equipment from one track to another or to different positions on the same track and does not constitute a train movement.



**Figure 2.** Photograph of the main track, the C-yard main track switch, and the Lonestar main track switch. (Courtesy of UP.)

The track in the area of the collision is not equipped with a positive train control (PTC) system and is in non-signaled territory.<sup>3</sup> Because a PTC system (or any other automated train control system) is not in operation in the area, the Harriman Dispatch

<sup>3</sup> (a) The Federal Railroad Administration (FRA) defines a *PTC* system as one designed to prevent train-to-train collisions, over-speed derailments, incursions into established work zone limits, and the movement of a train through a switch left in the wrong position (Title 49 *Code of Federal Regulations* Part 236.1005). (b) *Non-signaled territory* is territory in a railroad system that does not have a signal or automated train control system installed or operational.

Center in Omaha, Nebraska, controls the movement of trains using track warrant control.<sup>4</sup>

On the day of the collision, the dispatcher issued a track warrant to the train RD14 crew, an engineer and a conductor, about 1:44 p.m., to work between MP 562 and MP 567.<sup>5</sup> As part of this work, the crew lined the C-yard main track switch toward yard track C-4 and parked their train on that track.<sup>6</sup> The crew then relined the C-yard main track switch back to the main track, released their track warrant about 4:12 p.m., and ended their workday. The National Transportation Safety Board (NTSB) review of the external locomotive image recorder data of the next train to arrive to the area (train RH15) showed that the C-yard main track switch was lined to the main track, as the train RD14 crew had reported to the dispatcher.

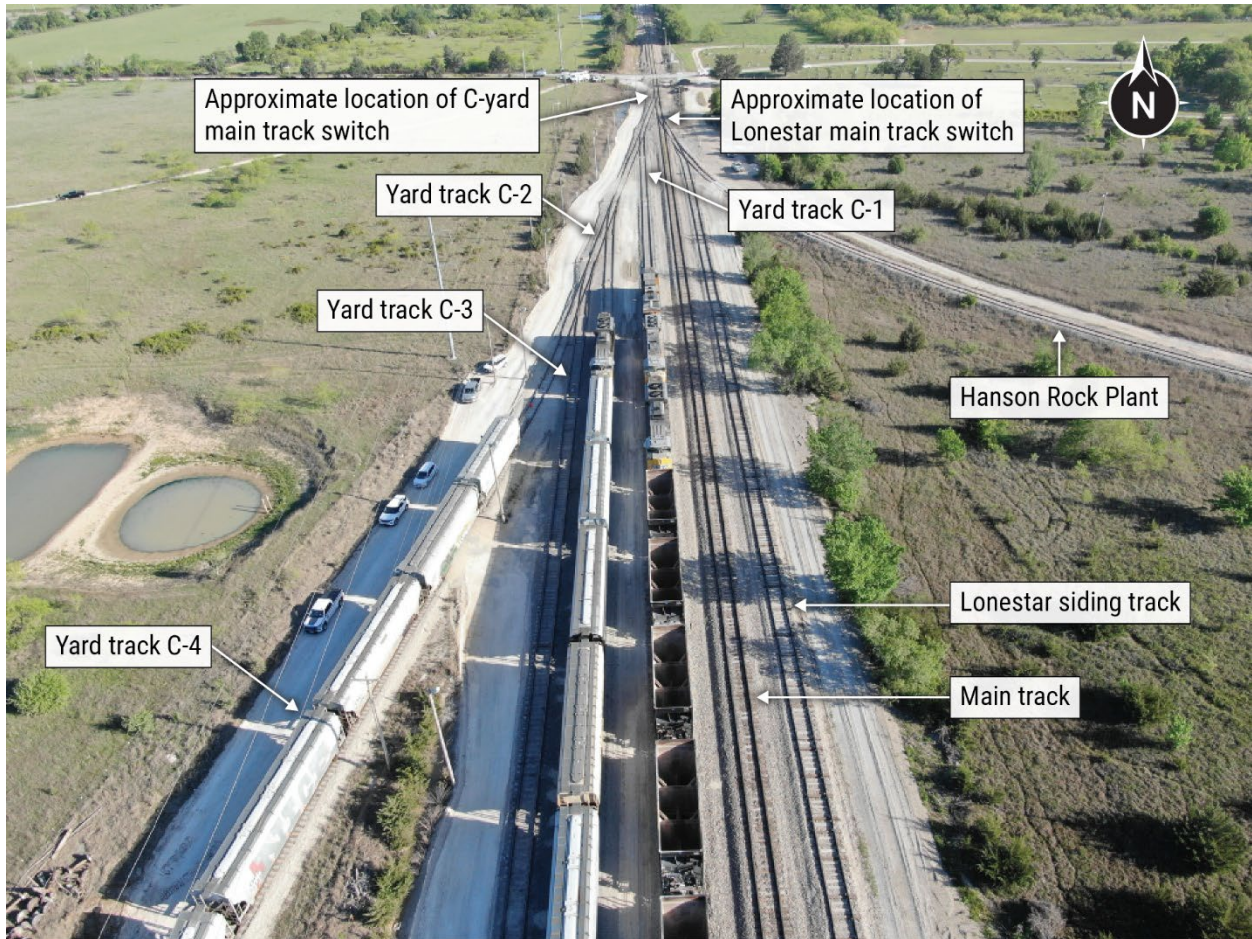
Shortly after the train RD14 crew released their warrant, about 4:37 p.m., the dispatcher issued a track warrant to the crew of train RHKPHQ 15 (train RH15), an engineer and a conductor, to proceed from Lola (a milepost location) to MP 562. The train RH15 crew lined several switches in the Chico Yard, including the Lonestar main track switch (a switch near the C-yard main track switch), to park their train in the Hanson Rock Plant. During this movement, the crew did not use the adjacent C-yard main track switch or C-yard tracks. Figure 3 shows the approximate location of the C-yard main track switch, the C-yard tracks, the main track, the approximate location of the Lonestar main track switch, the Lonestar siding track, and the Hanson Rock Plant.

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<sup>4</sup> *Track warrant control* is a dispatcher-initiated method to authorize train movements or protect people or machines on a main track.

<sup>5</sup> A *track warrant* authorizes a train to occupy a given section of track.

<sup>6</sup> Crewmembers line switches to route a train to its intended track.



**Figure 3.** Aerial view of the area where the collision occurred. (Courtesy of UP.)

In postcollision interviews with the NTSB, the crew said after they parked their train in the Hanson Rock Plant, they agreed that the conductor would return to the Lonestar main track switch and reline it back to the main track. The RH15 conductor drove to the north end of Chico Yard alone, parked the work truck, and walked to the switch. In an interview with the UP superintendent, the conductor said he walked around a pile of railroad ties to line the switch.<sup>7</sup> In his interview with the NTSB, the conductor confirmed he walked downhill to line the switch. The conductor told the NTSB after he lined the switch, he radioed the engineer that the switch was lined for main track movement.

The train RH15 crew reunited at the Chico Yard depot, where the engineer was on the phone with the dispatch center to release the track warrant. The conductor again briefed the engineer that the “switch was lined.” While on the phone with the dispatcher,

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<sup>7</sup> Railroad ties are the primary lateral support for rails.

the engineer confirmed the switches used were restored to the main track and that he and the conductor had signed the conductor's logbook. However, in interviews with the NTSB, the engineer and the conductor said they had not made the logbook entry, a requirement under UP instructions. (See section 1.4 for more on rules and instructions.) About 6:27 p.m., the train RH15 crew released their track warrant and left Chico Yard in a company-provided van, bound for their final duty location.

Two minutes after the train RH15 crew released their warrant, about 6:29 p.m., the dispatcher issued a track warrant to the train GS15 crew, an engineer and a conductor, to proceed from MP 562 to Hicks (a milepost location) on the main track. This movement took the train through Chico Yard.

The NTSB's review of the GS15 locomotive event recorder data showed that shortly before train GS15 crossed the C-yard main track switch, at 6:43:40 p.m., while the train was traveling 49.8 mph (slightly above the maximum operating speed), the engineer initiated an emergency application of the train's brakes.<sup>8</sup> After crossing the C-yard main track switch, train GS15 entered the yard lead track, which was lined for yard track C-4, where train RD14 was parked.<sup>9</sup> The NTSB's review of the GS15 external locomotive image recorder and event recorder data showed that the conductor jumped from the front of the train at 6:44:02 p.m., while the engineer remained aboard the train as it struck the head end of train RD14 at 6:44:05 p.m. while traveling 36.7 mph. The train GS15 engineer and conductor were seriously injured.

In a written statement to the NTSB, the UP superintendent said when he arrived on scene after the collision, he saw that both the C-yard and Lonestar main track switches were lined and locked, with UP security locks, to divert trains off the main track.

## 1.2 Personnel Information

UP hired the train GS15 conductor in 2011. UP hired the train GS15 engineer in 1997, and he was certified as a locomotive engineer in 2009.

UP hired the train RD14 conductor in 2012. UP hired the train RD14 engineer in 1992, and he was certified as a locomotive engineer in 1999.

UP hired the train RH15 conductor in 2002. UP hired the train RH15 engineer in 2006, and he was certified as a locomotive engineer in 2010.

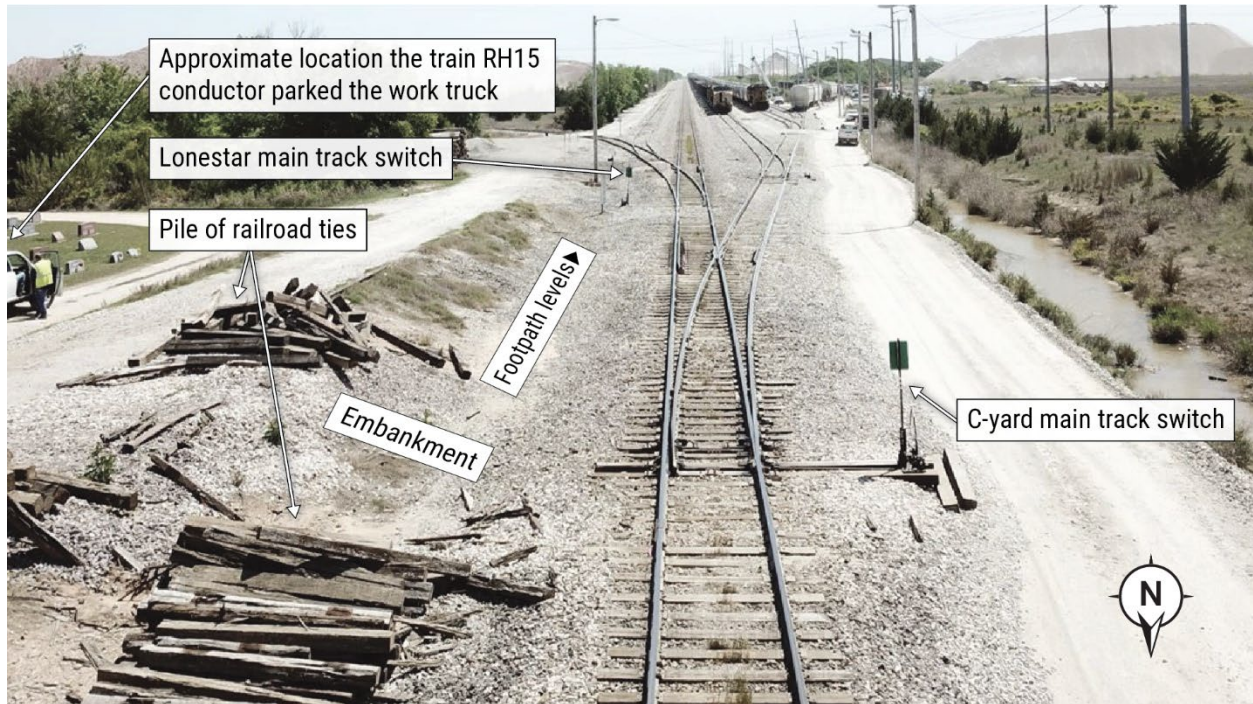
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<sup>8</sup> The maximum operating speed for trains in the area was 49 mph as set by Dallas/Ft. Worth Area Timetable No. 6, effective June 29, 2021.

<sup>9</sup> A *lead track* connects yard tracks.

### 1.3 Postcollision Site Examinations

During postcollision site examinations 2 days after the accident, the NTSB saw a pile of railroad ties and an embankment (incline) across from the C-yard main track switch. The NTSB also saw that the footpath was level near the Lonestar main track switch. In addition, the NTSB noted the approximate location the train RH15 conductor parked the work truck when he went to reline the Lonestar main track switch. (See figure 4.)



**Figure 4.** Photograph of the C-yard and Lonestar main track switches and the surrounding area. (Courtesy of UP.)

### 1.4 Operating Rules and System Special Instructions

UP has adopted the General Code of Operating Rules (GCOR) to govern its operations.<sup>10</sup> According to GCOR Rule 8.2, the employee operating a switch is responsible for the position of that switch. GCOR Rule 8.3 states the normal position of a main track switch is for main track movement, and the switch must be lined and locked in that position, except when, among other allowances, authorized by track warrant. In

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<sup>10</sup> UP General Code of Operating Rules, Seventh Edition, effective April 1, 2020, updated as of March 15, 2023.

addition, GCOR Rule 14.7 requires the conductor and engineer to confirm with the dispatcher that they agree to release the track warrant.

UP System Special Instructions Item 10-K: Main Track Switches states that before performing work that involves hand operating any main track switch, crewmembers must complete a job briefing on work to be performed and switches to be operated. Before departing the location, the crew must complete a job briefing to ensure all main track switches operated have been restored to the main track (the instruction does not require both crewmembers to visually confirm that the switch alignment is correct). The item requires train crews to record the location and time each main track switch used is lined and locked to the main track. The conductor and engineer must initial the switch entries in the conductor's logbook to acknowledge the completed job briefing for restoring switches.<sup>11</sup>

## **1.5 Postcollision Actions**

### **1.5.1 Federal Railroad Administration**

On May 9, 2023, the Federal Railroad Administration (FRA) issued a safety bulletin to railroad employees and contractors to increase awareness of safe operations of hand-operated main track switches in non-signaled territory.<sup>12</sup> The bulletin described the circumstances of the collision and provided best practices, such as (1) visually verifying that hand-operated switches are properly lined for the intended route and (2) guarding against complacency derived from repetitive task performance (such as the repetition associated with relining main track switches) by using multiple methods to confirm safety critical tasks are complete.

### **1.5.2 Union Pacific Railroad**

After the collision, UP issued an incident alert reminding employees of applicable rules, including GCOR Rule 8.2, GCOR Rule 8.3, and Special System Instructions Item

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<sup>11</sup> The "conductor's logbook" is another name for UP form 20849.

<sup>12</sup> FRA. 2023. Safety Bulletin 2023-03: Train Collision Involving a Mis-Aligned Switch-Dark Territory. May 9, 2023. Washington, DC: FRA.

10-K.<sup>13</sup> UP also updated Duncan Subdivision General Order No. 5 to include a head-end speed restriction of 20 mph throughout Chico Yard.<sup>14</sup>

## 2 Analysis

In this accident, train GS15 crossed the C-yard main track switch, which was incorrectly lined and diverted train GS15 to a yard track, where it collided with parked train RD14. The conductor and engineer of train GS15 sustained serious injuries. Before the collision, the crew of a third train, train RH15, performed work in the area that required them to line the Lonestar main track switch, which was near the C-yard main track switch and had the same style of handle and target.

Train RH15's external locomotive image recorder data showed that the C-yard main track switch was lined for the main track when train RH15 arrived at Chico Yard. When the UP superintendent arrived on scene, he found both the C-yard and Lonestar main track switches lined away from the main track. The crew of train RH15 was operating under a track warrant from their arrival in Chico Yard until shortly before the collision and was the only crew present to manipulate switches. Therefore, at some point during their work, the RH15 train crew lined both switches away from the main track and did not restore them.

The crew lined the Lonestar main track switch away from the main track to park their train in the Hanson Rock Plant. When the conductor went by himself to restore the Lonestar main track switch, he walked downhill and lined a switch across from a pile of railroad ties and a downward-sloping embankment, a location consistent with the C-yard main track switch, not the Lonestar main track switch. (The Lonestar main track switch was in a flat area with no railroad ties nearby, about 135 feet south of the C-yard main track switch.) The conductor likely lined the C-yard main track switch away from the main track and toward yard track C-4 when he intended to restore the Lonestar main track switch.

After mistakenly lining the C-yard main track switch to yard track C-4, the train RH15 conductor briefed the engineer, by radio and in person, that the Lonestar main track switch was restored to the main track. During a phone call with the dispatcher to release the track warrant, the RH15 engineer told the dispatcher he and the conductor had signed the conductor's logbook. However, in postcollision interviews, the crew told the NTSB they had not recorded the realignment of the Lonestar main track switch in the conductor's logbook. UP System Special Instructions Item 10-K requires train crews to

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<sup>13</sup> UP Incident Alert, April 20, 2023.

<sup>14</sup> Duncan Subdivision General Order No. 5, effective June 5, 2023.

reline main track switches to the main track after use and record the action in the conductor's logbook (the logbook entry is intended to aid crews in confirming the safety critical task is completed). The crew's failure to make the logbook entry may have resulted in a missed opportunity for the conductor to think through his actions, note the location of the Lonestar main track switch, and recognize that he had lined the C-yard main track switch instead.

Not realizing their error, the crew of train RH15 released their track warrant and left the yard. About 2 minutes later, the dispatcher issued a track warrant to the train GS15 crew to proceed southbound on the main track, unaware that both main track switches were lined to divert trains off the main track. Subsequently, train GS15 crossed the incorrectly lined C-yard main track switch, diverted onto yard track C-4, and collided with parked train RD14 before the engineer's emergency braking application could bring the train to a stop.

This collision resulted from the crew of train RH15 lining the wrong switch and not recognizing their mistake, combined with the inability of the dispatcher to determine that the C-yard main track switch was incorrectly lined. The dispatcher had no way of verifying the switch position because Chico Yard was (1) in an area without PTC, (2) in non-signaled territory (territory that does not have a signal or train control system), and (3) in an area that did not have switch-position technology installed. In the absence of these technologies, all of which would have provided the dispatcher with real-time information on the position of the main track switches, operational safety depended on administrative controls.<sup>15</sup> These controls failed when the train RH15 crew did not follow UP instructions, both by inadvertently leaving switches lined away from the main track and by not completing the associated logbook entry. After the collision, the FRA issued a related safety bulletin. UP issued an alert to its employees about rules governing manipulation of switches and reduced the timetable speed in the area of the collision to 20 mph to give crews time to react if they see an incorrectly lined switch.

The NTSB has investigated several similar accidents where the use of administrative controls failed to prevent collisions resulting from switches being left in the wrong position.<sup>16</sup> Following one such collision in Bettendorf, Iowa, the NTSB issued the following safety recommendation to the FRA:

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<sup>15</sup> *Administrative controls* change the way work is done or give workers more information by providing them with relevant procedures, training, or warnings.

<sup>16</sup> See the following NTSB reports for more information:

Require railroads to install, along main lines in non-signaled territory not equipped with positive train control, appropriate technology that warns approaching trains of incorrectly lined main track switches sufficiently in advance to permit stopping. (R-12-27)

In February 2019, the FRA communicated to the NTSB that it does not plan to act on this recommendation because, while effective technologies exist, the “FRA could not determine a cost-justified regulatory solution.”<sup>17</sup> Further, in a December 2023 report to Congress, 8 months after the Chico collision, the FRA indicated that it has no plans to address Safety Recommendation R-12-27.<sup>18</sup> As of the date of this report, Safety Recommendation R-12-27 has been classified Open–Unacceptable Response since April 18, 2013.

### 3 Probable Cause

The National Transportation Safety Board determines that the probable cause of the April 16, 2023, collision between Union Pacific Railroad train GSHFCC 15 and Union Pacific Railroad train RDACO 14 was the lining of the C-yard main track switch to yard track, a human error made by the Union Pacific Railroad train RHKPHQ 15 conductor. Contributing to the collision was the inability of the dispatcher and the crew of train GSHFCC 15 to determine the position of the main track switch in non-signaled territory in time to prevent the collision.

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- *Southwestern Railroad Collision, Roswell, New Mexico, April 28, 2015.* [NTSB/RAB-18/04.](#)
  - *Collision of Dakota, Minnesota & Eastern Railroad Freight Train and 19 Stationary Railcars, Bettendorf, Iowa, July 14, 2009.* [NTSB/RAR-12/03.](#)
  - *Collision of Two Union Pacific Railroad Trains, Shepherd, Texas, September 15, 2005.* [NTSB/RAB-06/01.](#)
  - *Collision of Norfolk Southern Freight Train 192 With Standing Norfolk Southern Local Train P22 With Subsequent Hazardous Materials Release at Graniteville, South Carolina, January 6, 2005.* [NTSB/RAR-05/04.](#)

<sup>17</sup> For the complete correspondence between the FRA and the NTSB regarding Safety Recommendation R-12-27, see the corresponding [CAROL record](#).

<sup>18</sup> FRA. 2023. Report to Congress: 2022 Actions to Implement Unmet Statutory Mandates and Address Open Recommendations Regarding Railroad Safety. December 21, 2023. Washington, DC: FRA.

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 [RRD23LR010]. 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 –

National Transportation Safety Board  
Records Management Division, CIO-40  
490 L’Enfant Plaza, SW  
Washington, DC 20594  
(800) 877-6799 or (202) 314-6551