

National Transportation Safety Board  
Office of Railroad, Pipeline and Hazardous Materials Investigations  
Washington, D.C. 20594

U.P. Derailment on Bridge with HAZMAT

Tempe, AZ

July 29, 2020

Mechanical Group Factual Report

## Accident

NTSB Accident Number: RRD20LR005  
Date of Accident: July 29, 2020  
Time of Accident: 6:06 a.m. (MST)  
Type of Train: Freight  
Railroad Owner: Union Pacific  
Train Operator: Union Pacific  
Fatalities: 0  
Location of Accident: Tempe, AZ

## Mechanical Group Members

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## Synopsis

On July 29, 2020, at approximately 6:06 a.m. (MST), a westbound Union Pacific (UP) freight train, MTUPX 29, with 3 locomotives and 97 cars, derailed 12 cars in Tempe, Arizona. The train was operating on a single main track at 23 mph while crossing a bridge over Tempe Town Lake when the derailment occurred. Of the derailed cars, three were tank cars loaded with Cyclohexanone. Two of the tank cars fell off the bridge of which one tank car was reportedly leaking. A third tank car partially derailed and was reportedly leaning near the south end of the bridge.

Air traffic from Phoenix Sky Harbor International Airport was diverted away from the derailment area due to heavy black smoke accumulation. An evacuation of a small area near the accident was initiated as a precaution. One person was reportedly treated for smoke inhalation at a hospital and released.

The Federal Bureau of Investigation initiated an investigation into possible criminal activity. The investigation was completed without finding evidence or discovery of any criminal activity.



Figure 1 Photo of the accident scene at the south end of the bridge looking north. (Photo by FRA)

## **Train Consist**

### MTUPX 29

The westbound (compass north) loaded mixed manifest train MTUPX 29 consisted of 3 locomotives located at the front of the train. The loaded 97 car train consisted of 89 loads and 8 empties, was 6,895 feet in length and weighed 11,828 tons including the locomotives.

- |            |          |              |            |
|------------|----------|--------------|------------|
| 1. UP 7390 | Forward  | GE C45ACCTE  | Built 2009 |
| 2. UP 3056 | Backward | EMD SD70AHT4 | Built 2018 |
| 3. UP 7892 | Backward | GE C45ACCTE  | Built 2008 |

## **Accident Sequence**

A preliminary review of event recorder data indicates that the westbound MTUPX 29 was approaching Tempe Town Lake bridge at 22 mph. The throttle was in position T4 and there was no brake application. At 6:06 a.m. (MST) it recorded a trainline emergency brake application and quickly came to a stop. After the emergency brake application, the train traveled about 500 feet in 27 seconds before coming to a stop.

## **Pre-Departure Inspections**

On July 28, 2020 a Class I Air Brake test and Pre-departure inspection was conducted on the MTUPX 29 by U.P. Qualified Mechanical Inspectors at Tucson, Arizona. Besides a full air brake test and inspection, inspectors look for defects on the wheels, axles, bearings, and other running gear components for defective conditions as outlined in 49 CFR part 215. The air brake test was conducted in accordance with 49 CFR part 232.

## **Equipment Post Accident Inspections**

Between the dates of July 30 and August 1, 2020 investigators examined the rear portion of the train at the Mesa yard and took no exceptions. Investigators also inspected the locomotives and the front half of the train in the Phoenix yard for defective conditions. The air brakes applied and released without exception and

the brake components and running gear showed normal wear patterns. From the front of the train cars 49-60 derailed including cars 55-59 which were on the ground below where the bridge was (See Figure 4). Total mechanical damage was approximately \$485,000. Two cars were discovered with witness marks on the wheels indicating that they had traversed a broken or damaged rail head (See Figure 2).



Figure 2 Photo of the witness mark on the right 3 wheel of car NATX 160112 (Photo by FRA)

The 2 cars that had wheels with witness marks were loaded hopper car TILX 518747 and loaded tank car NATX 160112 which were cars 48 and 49 respectively from the front of the train. TILX 518747 had a

witness mark on the trailing axle and NATX 160112 had witness marks on the leading 2 axles. This indicates that without witness marks, the number 2 axle was the first derailed axle. (See Figure 3)

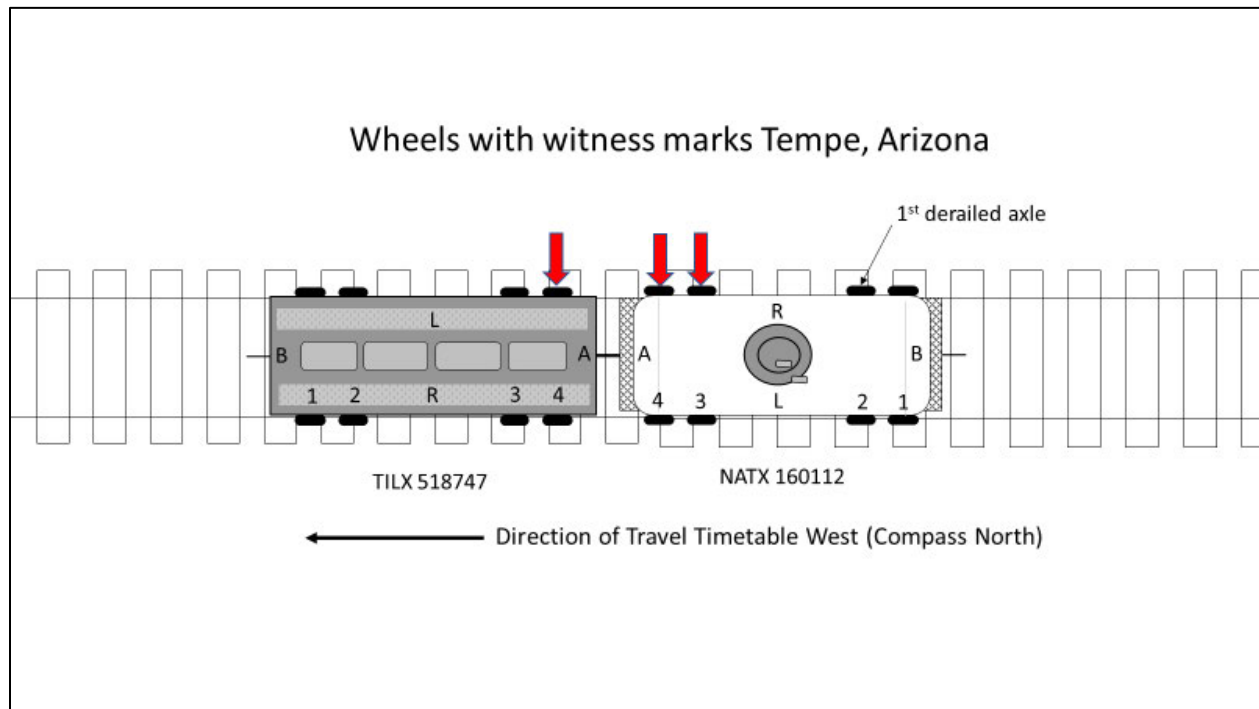


Figure 3 Diagram indicating the wheels where witness marks were located and the first derailed axle.

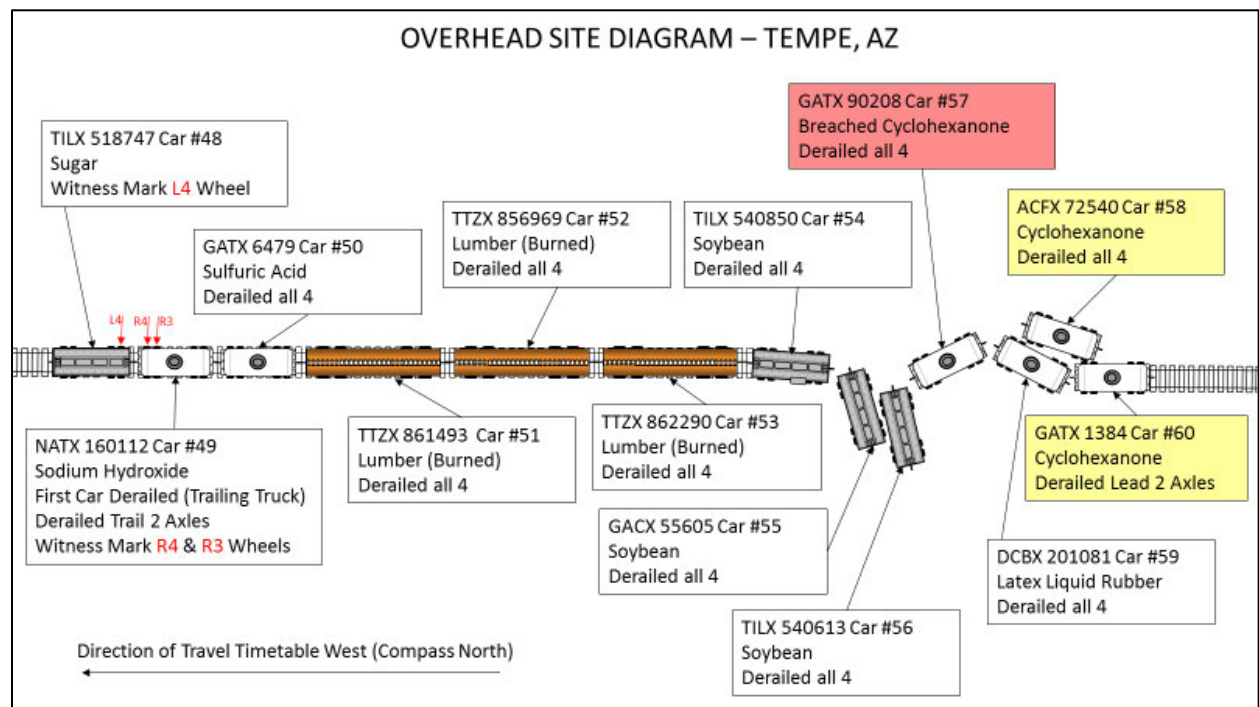


Figure 4 An overhead depiction of the derailed cars including the cars that had axles with witness marks.

## Evidence Collected

### MPUTX 29

- UP 7390 Event recorder file and forward facing video file
- UP 3056 Event recorder file
- UP 7892 Event recorder file

## Documentation Received

- Train list
- Weight list
- Any diagrams & photos of accident scene
- Aerial photos of accident scene (if available)
- Event Recorder data download
- Forward facing camera download
- Locomotive/Railcar maintenance records and/or repair records (All derailed cars and 10 cars ahead)
- FRA form F6180-49A Locomotives
- Daily inspections Locomotives
- Air brake test inspection certificate
- Hot box data
- WILD data
- TPD data
- UMLER data
- Dragging equipment data
- Waybills
- Rear End Device inspection/calibration record
- Post-accident inspections/repairs
- Equipment damage estimates

## Group Member to the Investigation – Acknowledgement Signatures

The undersigned designated *Group Member to the Investigation* representatives attest that the information contained in this report is a factually accurate representation of the information collected during the on scene phase of this investigation, to the extent of their best knowledge and contribution in this investigation.

\_\_\_\_\_ Date \_\_\_\_\_

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\_\_\_\_\_ Date \_\_\_\_\_

Roland Figueroa, FRA

\_\_\_\_\_ Date \_\_\_\_\_

Jeff Vance, U.P.

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