

CHICAGO AND NORTH WESTERN  
TRANSPORTATION COMPANY

LEVIS, WISCONSIN

AUGUST 15, 1977

## Synopsis

A derailed caboose plunged off a bridge into the bank of Levis Creek near Levis, Wisconsin, on August 15, 1977, at about 1:45 a.m. The conductor, who was riding in the caboose of the westbound Chicago and North Western Transportation Company (CNW) freight train, was killed, and the flagman, who was the other caboose occupant, was seriously injured.

## Cause

Improperly loaded lading from a truck trailer on a piggyback flat car fell to the track structure, knocking it out of alignment and causing the caboose to derail. The shipper's failure to properly secure the lading in accordance with loading rules and the carrier's failure to inspect the load to assure it was adequately secured were primary contributing factors.

## Location and Method of Operation

The accident occurred on the CNW's Twin Cities Division, Elroy Subdivision, which extends westward from Elroy to Altoona, Wisconsin, a distance of 103.4 miles. Levis is 52.3 miles west of Elroy. Trains operate over the single track main line in the accident area by timetable, train orders and the signal indications of an automatic block signal system. Maximum authorized speed in the accident area is 60 m.p.h.

The west switch of a long siding that parallels the main track on the south is 707 feet west of Levis station. The east end of Bridge No. 112 is 111 feet further west. This 211.2-foot-long trestle-type bridge spans Levis Creek. An Industrial Park Lead track diverges to the north from the main track, 4,079 feet east of the station. This is a facing point switch for westward movements. The switch stand is on the north side of the main line. State Highway 54 intersects the main track and siding 2,884 feet west of the Industrial Park Lead switch. Throughout the accident area the track is tangent and practically level. The initial derailment occurred 73 feet west of the Industrial Park Lead switch.

## Bridge No. 112

Stone and steel piers support Bridge No. 112 across Levis Creek. The creek bed is about 10 feet wide and, at

its lowest point, about 70 feet below track level. On the north side of the bridge the ends of the ties extend 2 feet 4 inches beyond the north rail. The south half of the bridge, where one track has been removed, is used for a walkway and driveway.

### Circumstances Prior to the Accident

Westbound freight train No. 477 consisted of two diesel-electric locomotive units coupled in multiple unit control, 12 loaded TOFC cars and a caboose. The lead unit of No. 477 was an EMD SD 40-2 locomotive. Both locomotive units were equipped with Barco Speedometers, which had not been supplied with speed recorder tapes. Both the locomotive and caboose were equipped with radios. The westernmost TOFC car in the train, TTX 255946, carried two trailers. The trailer on the west end of the car, BRIZ 412, was a flat-bed truck trailer loaded with bundles of sheet steel. The front of the trailer faced west.

Train No. 477 left Adams Yard, Wisconsin, at 12:29 a.m., on the day of the accident. According to members of the outbound crew of No. 477, they conducted a roll-by inspection, noting no defective conditions of train or lading. In post-accident statements, the crew members stated the train brakes functioned properly when applied prior to the accident. Although at Adams Yard the engine crew had trouble receiving transmissions from the caboose radio, while en route and approaching Levis it transmitted properly.

As No. 477 approached Levis at an estimated speed of 57 m.p.h., the engineer was at his position at the north side of the control compartment at the front of unit 6860, the lead unit; the front brakeman was seated at the south side of the compartment; the conductor was seated at the bay window on the south side of the caboose, and the rear brakeman was seated on the north side of the caboose.

### The Accident

When train No. 477 neared the switch to the Industrial Park Lead at Levis, one of the bundles of sheet steel from BRIZ 412 fell from the back of the truck trailer. Most of the sheet steel dropped to the north side of the main track, striking the switch stand and the head block ties of the switch. The force of the blow moved the track structure out of alignment 18 inches to the north. All trucks of the following 11 cars and caboose, except the easternmost truck of the caboose, negotiated the track irregularity. All wheels of this truck derailed to the north.

The caboose remained coupled to the train and continued along the track structure with the south wheels of the derailed truck between the rails and the north wheels on the north edge of the ballast section on the field side of the north rail. As the derailed truck of the caboose crossed the smooth, level surface of Highway 54, it slewed into line with the rails and continued westward in this position, with the south wheels between the rails and the north wheels on the field side of the north rail. At the curved closure rail of the turnout at the west end of Levis siding, the south wheels were forced northward. At the heel filler block of the switch, the south wheels of the truck jumped the north rail of the main track placing all wheels of the derailed truck north of the main track.

Still coupled to the train, the caboose was pulled along onto Bridge No. 112 over Levis Creek. Just beyond the east pier, the derailed truck separated from the caboose and dropped off the bridge to the north. Because of the violent rocking action of the caboose, the conductor and rear brakeman could not reach the air brake valve about three feet behind the conductor's seat. However, the conductor was able to reach the radio transmitter; he called the engineer, telling him, "shoot it, shoot it," meaning make an emergency brake application. But at this same moment, the engineer was sounding the locomotive horn for Highway 54 and did not recognize the voice. He tried to contact the conductor after sounding the horn, but before he received any response, the train brakes applied in emergency. Near the center of the bridge the caboose, the east end of which was hanging over the north edge of the bridge, separated from the train and plunged to the creek bed, landing on the west bank.

A General View  
of  
The Derailement Site  
Looking West



## Casualties and Damages

The conductor died instantly from massive internal injuries. The rear brakeman suffered severe back injuries. Both men had been tossed about the caboose as it rocked about violently. After the accident both men were found against the rear door of the caboose.

The detached east truck of the caboose came to rest west of the creek bed. The caboose, with the west truck intact, was propelled northward by momentum about 75 feet off the bridge to the west bank of Levis Creek. It came to rest upright and practically in line with the bridge structure. Intact except for the caboose, the train stopped with the locomotive units on Black River Bridge which is 5,018 feet west of Bridge No. 112.

The carrier estimated that the cost of damages to caboose, bridge and track structure was \$8,900.

## Post-Accident Examinations

### TTX 255946

Post-accident examination of TOFC car TTX 255946 disclosed no condition contributing to the accident. According to the waybill, the cargo on the TOFC car was two trailers grossing 60,000 pounds. Both trailers were well spaced and properly secured on the car.

### BRIZ 412 and Lading

BRIZ 412 was the westernmost truck trailer on TTX 255946. It was loaded with 14 gage sheet steel packaged in bundles ranging from 19 to 75 sheets each. Each sheet measured 10'10" x 3'9". The bundles were arranged on the truck trailer in two lengthwise stacks; one at the east end, one at the west. Several steel shafts and two boxes of miscellaneous material lay alongside and on top of the easternmost stack of steel sheets.

Section 7, Figure 240 of the Association of American Railroads's (AAR) open top loading rules prescribes loading instructions for steel sheets like those on TTX 255946. Accident investigators noted the following exceptions to these rules:

- (1) The required hardwood end-securing pieces were missing.
- (2) The high tension bands encircling the stacks widthwise were too narrow; instead of the required 2", they were 3/4" wide.
- (3) The high tension bands encircling the stacks lengthwise were too narrow; instead of the required 2", each was 1 1/4" wide.

At some point before the derailment, the high tension bands failed; a bundle of steel sheets on BRIZ 412 shifted over the east end of the truck trailer to the deck of the TOFC car and, subsequently, to the track structure. Accident investigators found a broken segment of high tension steel band on the track structure about 1,000 feet east of the initial derailment site.

#### Industrial Park Lead Switch

The Industrial Park Lead was built in 1976, but had not yet been used, and the switch to the Lead had been spiked. The spike remained in place during the derailment and held the switch points in place. Accident examination showed that a bundle of steel sheets had struck the switch stand and the head block ties, heavily damaging both and, at the same time, shifting the track structure as much as 18 inches to the north.

#### Track

Post-accident track structure inspection showed the track moved laterally to the north beginning about 21 feet east of the Industrial Park Lead switch. The misalignment, which, at a maximum, was 18 inches, continued through the accident area for about 40 feet. The first mark of derailment was found on the ties about 73 feet west of the switch points of the Industrial Park Lead switch. At this point, the south wheels of the rear truck of the caboose struck the ties between the rails. The wheel marks of the derailed truck continued 4,824.3 feet westward to Bridge No. 112.

Wheel marks also were visible on the bridge on the field side of the north rail along the ties and stringers to the point where the caboose separated from the train and fell from the bridge.

#### Caboose 11128

Inspectors found no defects on caboose 11128 that could have contributed to the accident.

#### Carrier Inspection Procedures

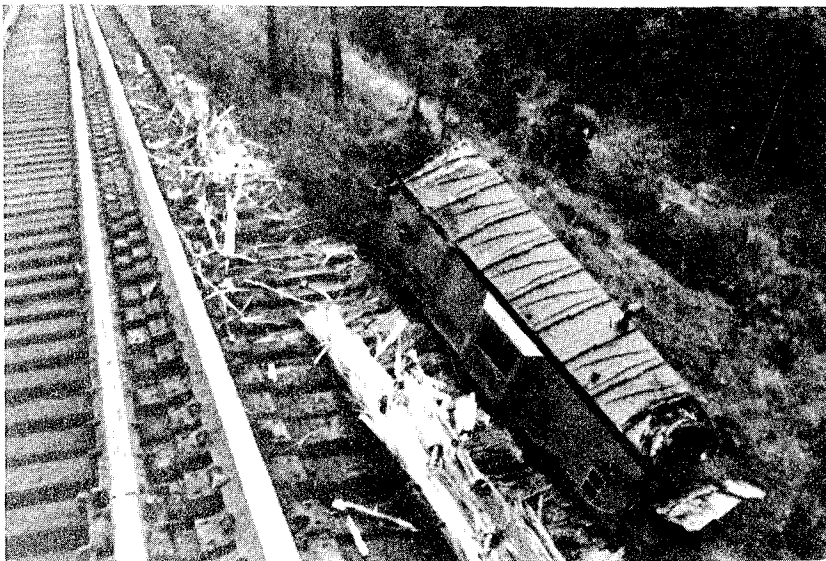
At the time of the accident, the Chicago and North Western Transportation Company was performing only cursory inspections when accepting the type of truck trailer involved in this accident. Loads were covered with tarpaulin, and CNW inspectors apparently did not check for proper securement beneath these covers. The most common deficiency found was the use of a 3/4-inch-wide high tension band, instead of the required 1 1/2 or 2-inch-wide band. In some cases, the chains on coil steel were improperly placed, and the blocking was not that required by the AAR open top loading rules.

The sheet steel shipper was moving this product via CNW until this accident occurred. When CNW insisted on stricter compliance with the AAR open top loading rules, the shipper discontinued service via CNW, shipping via another railroad.

The more recent railroad transporting the shipper's product is rejecting all loads that do not meet the AAR open top regulations.

### Findings

1. Train No. 477 was being operated in accordance with all applicable carrier rules.
2. The condition of the track in the accident area complied with FRA standards for the train speed involved.
3. Accident investigators found no contributory defects on either the piggyback flat car or caboose.
4. The high tension steel banding holding the load of steel on the truck trailer failed, permitting part of the cargo to fall to the ground.
5. The carrier now transporting the truck trailers of sheet steel is inspecting loads to assure compliance with loading rules.



The point where the left wheels of the caboose broke through the guard rail.