

INTERSTATE COMMERCE COMMISSION

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REPORT NO. 3391

IN THE MATTER OF MAKING ACCIDENT INVESTIGATION  
REPORTS UNDER THE LOCOMOTIVE INSPECTION ACT  
OF FEBRUARY 17, 1911, AS AMENDED

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DELAWARE AND HUDSON RAILROAD

May 9, 1951

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Accident at Colonie, N. Y., on March 26, 1951, caused by  
a defective crown stay blowing out of firebox sheet  
while being calked.

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REPORT OF THE COMMISSION<sup>1</sup>

PATTERSON, Commissioner:

On March 26, 1951, about 2:55 a.m., at Colonie, N. Y.,  
Enginehouse, a crown stay in Delaware and Hudson Railroad  
locomotive 1517 broke and blew out of firebox sheet while  
being calked. The boilermaker who was doing the work was  
seriously injured.

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<sup>1</sup>Under authority of section 17 (2) of the Interstate Commerce  
Act the above-entitled proceeding was referred by the Commission  
to Commissioner Patterson for consideration and disposition.

## DESCRIPTION OF ACCIDENT

Delaware and Hudson Railroad locomotive 1517 arrived at Colonie, N. Y., at 1:00 a.m. on March 26, 1951, after completing a freight run from Binghamton, N. Y. While the locomotive was on the pit it was noticed that much of the brick arch had fallen and the fire was ordered withdrawn. The locomotive was then moved to the enginehouse where a boilermaker was assigned to make the necessary repairs. Upon entering the firebox the boilermaker found one crown stay leaking extensively and several others with minor leaks. He then started to calk the first mentioned stay with a hand hammer. After several blows had been struck the crown stay failed and was blown into the firebox. The boilermaker was severely burned by escaping steam and hot water before he escaped from the firebox through the fire door.

The injured man was given first aid treatment by a physician and then moved to a hospital at Troy, N. Y.

## DESCRIPTION OF LOCOMOTIVE

Locomotive 1517 was a simple-articulated 4-6-6-4 type, company's class designation "J", built by American Locomotive Company in 1940. The cylinders were 20½ by 32 inches; weight on driving wheels 406,500 pounds; driving wheel diameters 69 inches with full tires; and tractive effort 95,800 pounds. The weight of the locomotive and tender in working order was 907,200 pounds.

The locomotive was equipped with a type E superheater; Standard HT type stoker; Alco, type G, power reverse gear; Hancock non-lifting, type 3-W, injector on right side and Elesco No. 3 exhaust steam injector on left side; an Alco water column with four gage cocks and a Talmage 12-inch water glass on right side of back boiler head, and a Nathan, type C-9, 12-inch water glass on left side. The working steam pressure was 285 pounds per square inch.

The rectangular tender had a capacity of 22,500 gallons of water and 26 tons of coal.

## DESCRIPTION OF FIREBOX

The seven-piece fusion welded firebox consisted of crown sheet, side sheets, door sheet, rear tube sheet, combustion chamber, and inside throat sheet. The firebox was 213-1/32

inches long and 108-3/16 inches wide and the combustion chamber was 94 inches in length. There were five arch tubes, 4 inches outside diameter, which supported seven rows of brick arch. A Gaines wall was located at the front end of the firebox, 69 inches to the rear of the inside throat sheet. The grates were Waugh firebar type.

The crown sheet was supported by 65 transverse rows and 24 longitudinal rows of stays, all of which were Alco flexible stays except the 14 center longitudinal rows which were hammered head taper end rigid stays with reduced body diameter.

#### EXAMINATION OF STAY THAT FAILED

The rigid crown stay that failed was located in the 7th longitudinal row right of center and 19th transverse row from the door sheet. It was 26 inches long and had broken 3 inches from the outside surface of the wrapper sheet and the 25-inch portion had blown into the firebox. The stay showed an old fracture which extended through approximately 25 percent of the cross-sectional area, starting at the center and progressing to the outer circumference at an angle of about 90 degrees to the axis of the stay. The remainder of the fracture was slightly rusted but apparently complete breakage occurred as the stay was being caked.

The firebox end of the stay showed evidence of having been worked excessively. The head had been driven almost flush with the crown sheet and the edges had been drawn to a jagged knife edge.

The threads on both the tapered end of the stay and in the crown sheet were almost obliterated. The diameter of the stay at the threaded end was 1-1/4 inches while the stay hole was 1-11/32 inches in diameter.

#### EXAMINATION OF OTHER CROWN STAYS

Most of the rigid stays in the 14 longitudinal center rows from the 17th to the 25th transverse rows ahead of the door sheet had been excessively caked in the firebox, and were flattened against the sheet with a head crown height of approximately 1/32 inch and edges very thin and jagged.

It was noted that many of the rigid stays above the arch were in poor condition and should have been removed. This was

done and the stays were cut away from the wrapper sheet and tapped with a hammer to note if the threads would hold in the firebox crown sheet. Of the 181 stays removed in this critical zone, 29 stays had the threads completely wasted away and these stays readily fell to the grates.

Although many of the crown stays were in poor condition the crown sheet was not distorted and was in its proper position.

#### INSPECTION AND REPAIR REPORTS

The last monthly or annual inspection was made at Oneonta, N. Y., on March 5, 1951. This was an annual inspection.

The locomotive had made 108,000 miles since last classified repairs to the date of the accident and had tires turned after 59,000 miles had been made.

Daily inspection and repair reports, from all terminals out of which the locomotive was operated for 30 days prior to the accident, were examined and the following defects were found reported that may have a bearing on the accident:

March 7, at Oneonta, N. Y., reported by engineer:  
"Crown bolts leaking." Repairs signed for.  
Report approved by foreman.

March 10, at Mechanicville, N. Y., reported by engineer: "Crown bolts leaking." No notation.  
Report approved by foreman.

March 18, at Mechanicville, N. Y., reported by engineer: "Crown bolts leaking." No notation.  
Report approved.

March 19, at Oneonta, N. Y., reported by engineer:  
"Crown bolts leaking." No notation. Report approved by foreman.

March 26, 1:00 a.m., at Colonie, N. Y. (Inbound, date of accident.) "Leak under jacket right side" was reported by engineer.

Record of boiler work reviewed showed that on March 5, 1951, at Oneonta, N. Y., 6 crown stays were renewed and on December 23, 1950, at the same point, 23 broken crown stays were renewed.

## DISCUSSION

The stay that failed was in the area above the top row of arch bricks where the firebox flames and gases reverse the direction of flow and impinge on the crown sheet. Frequently leakage is found at stays in this area when the fire is low. Often the leakage stops when the fire is built up but calking must be resorted to in some instances to stop the leakage.

It is commonly recognized that attempts to repair leaks while boilers are under pressure is liable to result in serious injury or death to the persons so engaged. Safety rules of practically all railroads, including the Delaware and Hudson Railroad, either directly or indirectly, prohibit such practice.

## CAUSE OF ACCIDENT

It is found that this accident was caused by a defective crown stay which blew out of a firebox sheet when calked under pressure.

Dated at Washington, D. C., this 9th day  
of May, 1951.

By the Commission, Commissioner Patterson.

SEAL

W. P. BARTEL,

Secretary.