INTERSTATE COMMERCE COMMISSION

REPORT NO. 3408

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

SOUTHERN RAILWAY

August 8, 1951

Accident at Atlanta, Ga., on July 4, 1951, caused by failure of the screen over engine cooling fan well on a Diesel-electric locomotive unit.

REPORT OF THE COMMISSION[1]

PATTERSON, Commissioner:

On July 4, 1951, about 11:30 p.m., at Atlanta, Ga., while Southern Railway Diesel-electric locomotive unit 2108 was being serviced at enginehouse, the screen over engine cooling fan well failed when stepped on. A hostler helper was seriously injured.

[1]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

On July 4, 1951, about 11:30 p.m., at Atlanta, Ga., while Southern Railway Diesel-electric locomotive unit 2108 was at Inman Enginehouse, a hostler helper, after filling the sand box at front end of unit, stepped from walkway over the engine cooling fan well on top of engine compartment to the protective screen over the well. The welding which joined individual wires of the screen to the frame failed near this point. His foot and leg passed through the opening into the revolving fan which badly mangled the limb. The injured man was taken to a nearby hospital where the leg was amputated at a point 4 inches above the knee joint.

DESCRIPTION OF LOCOMOTIVE UNIT

Southern Railway Diesel-electric road switching unit 2108, type B-B, was built by the American Locomotive Company, at Schenectady, N. Y., in July 1949. The 12-cylinder, 4-cycle, 1500-horsepower, "V" type, Diesel engine was direct connected to the main generator. The unit was designed to be used in either single or multiple service. The driving wheels when new were 40 inches in diameter. The weight of the unit was 245,700 pounds and tractive effort 61,425 pounds. The unit was equipped with a Vapor-Clarkson steam generator.

DESCRIPTION OF PARTS INVOLVED

The engine cooling fan was located in a well near the top of engine compartment at the front of the unit. The fan was of the three-vane type, 62 inches in diameter. The speed of the fan was governed by the speed and temperature of the engine within a range of 350 to 1,000 R P M. With the engine at idling speed the speed of the fan did not exceed 350 R P M.

The circular shaped well in which the fan was located was 61-1/2 inches in diameter at its upper end and the lower end was flared outward to clear the vanes of the fan. It extended 5 inches above and 10 inches below the roof of the engine room. A protective grille was provided below the fan; a screen was provided over the top of the well, and a walk-way installed over the screen.

The screen was constructed of No. 8 B W G iron wire with 1-inch square mesh. The screen was bent downward 1/2 inch at an angle of 90 degrees at the outer edge and wires were electrically spot welded to inside of a 1/8 x 3/4 inch circular iron frame which was held in place by clamps bolted to the side walls of the well. There was 3-1/2 inch clearance between the screen and the top edges of the fan vanes. The screen was further supported by 2 parallel pieces of 1/4 x 3 inch iron, spaced on 12-inch centers and extending from the front to the rear of screen frame, 2 pieces of 1/4 x 3 inch iron spaced on 19-3/4 inch centers between the two longitudinal members, and 2 pieces of 1/4 x 3 inch iron each extending at a right angle from the center of the right and left longitudinal members, 24-1/2 inches to the screen frame. The above strips were tapered on the lower edges from the 3-inch width to the 3/4-inch width of the screen frame and were welded to the screen frame and each other at points of contact.

The walkway above the engine cooling fan screen was constructed from pressed steel running board stock and was 19-1/2 x 69-1/2 inches. It was installed after the unit was received by the Southern Railway. Sanding stations at Atlanta, Ga., and other points on this railroad were so arranged that it was necessary for an employee to go to the top of the engine compartment to fill sand boxes of this type unit. When units of this class were delivered by the builder, no walkways were provided over the engine cooling fan wells.

EXAMINATION OF PARTS INVOLVED

Examination of the failed screen disclosed that failure occurred in welds which joined the screen wires to the frame. The opening in the screen through which the leg of the injured man passed was adjacent to the frame and irregularly shaped. The transverse supporting member was bent 2 inches out of line and the screen frame was bent inwardly a distance of 3 inches. With one exception, the failed welds showed imcomplete fusion and the wires pulled out of and left holes in the weld metal which remained attached to the frame. In the case of the exception mentioned the weld metal pulled from the frame. In a large number of the remaining welds at scattered locations the weld metal had been deposited on one side of the wire only and did not cover the wire at point of contact with the frame. On the opposite side of the screen from location of accident at points 20 and 40 inches apart 3 wires had pulled from weld metal on the frame.

INSPECTION AND REPAIR REPORTS

Unit 2108 had made 76,646 miles in freight service since receiving heavy running repairs on May 5, 1950. The last annual and monthly inspections were made on April 20, 1951, and June 20, 1951, respectively.

Daily work reports covering a priod of 30 days prior to July 4, 1951, were examined and nothing had been reported that would have a bearing on this accident.

SUMMARY OF EVIDENCE

The hostler helper stated that after filling the sand box at the front of unit, he stepped from walkway over fan well to the screen over the well to give the hostler a signal to move the unit; that the screen failed under his weight allowing his foot to protrude through opening and come in contact with the revolving fan which pulled his leg into the fan to a point above the knee before it stopped revolving; that it was his practice as well as that of other employees to step on or walk over the screen covering the fan well.

DISCUSSION

The failure of the protective screen over the engine cooling fan well caused a serious accident that permanently disabled an employee. The screen failed under usage that appeared to be followed by other employees in addition to the injured man. Construction was such that casual observation might indicate the screen would be safe to step upon and the fact that it was so used would substantiate the reaction of employees whose duties required that they go on top of the engine compartment.

The rapid development of Diesel-electric locomotive units has placed in use on railroads a large number of locomotives of a type greatly different from those with which railroad employees have previously been familiar. It is therefore indicated that utmost care and judgment be exercised in design, construction and instruction in the proper use of all parts to provide a maximum freedom from failure which could result in injury, property damage and operating delay. It is also essential that the use to which parts might be subjected be consistent with the design and construction.

RECOMMENDATION

It is recommended that the carrier take appropriate action to provide suitable and proper protection of cooling fans on the subject type locomotives.

CAUSE OF ACCIDENT

It is found that this accident was caused by failure of the welds which joined netting to frame of screen over engine cooling fan well.

Dated at Washington, D. C., this 8th day of August, 1951.

By the Commission, Commissioner Patterson.

SEAL

W. P. BARTEL,

Secretary.