IN RE INVESTIGATION OF AN ACCIDENT WHICH OCCURRED ON THE NASHVILLE, CHATTANOOGA & ST. LOUIS RAILWAY NEAR STONE RIVER, TENN., AUGUST 17, 1918.

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September 30, 1918.

On August 17, 1918, a temporary wooden bridge collapsed near Stone River, Tenn., on the Old Hickory branch of the Nashville, Chattanooga & St. Louis Railway, throwing the engine and one car of a freight train into the bed of a stream fifty feet below and resulting in the death of three employees and serious injury of one employee. After investigation, the Chief of the Bureau of Safety reports as follows:

The Old Hickory branch is a double track line extending between Old Hickory and Stone River, Tenn., a distance of 7.04 miles. At Stone River connection is made with the Lebanon branch of the Nashville, Chattanooga & St. Louis Railway, a single track line extending between Lebanon and Nashville, Tenn., a distance of 30.93 miles. Through service between Nashville and Old Hickory is over the Lebanon and Old Hickory branches via Stone River. Train movement between Nashville and Old Hickory is by time table authority, train orders and a manual block system, except that yard rules apply between Old Hickory and Bondurant, a distance of 1.24 miles. Trains move with the current of traffic on double track.

The Old Hickory branch was constructed within the past year by the United States Government in order to furnish traffic facilities for a munition plant located at Old Hickory and was turned over to the N. C. & St. L. Railway for operation in the early part of July.

The train involved in this accident was Extra 615 north, in charge of Conductor Shriver and Engineman Terry, and consisted of N.C.& St.L. engine 615, 45 empty freight cars and a caboose. This train left Old Hickory about 8 p. m., passed Dodson, the last open telegraph office, 1.5 miles south of Stone River, at 8.30 p. m., and while crossing the bridge across Stoner Creek, about one mile north of Dodson, the structure gave way, throwing the engine and one empty coal car into the bed of the creek underneath. The engine was backing at the time, and the train was moving about 7 miles per hour. The engine came to rest on its side almost parallel with and directly underneath the track. The engine tender crossed the bridge before its collapse, and came to rest with its rear truck on the rails and its forward truck and front end hanging down on the concrete pier of the bridge. The empty coal car, which was a 40-foot high side gondola, came to rest in an almost perpendicular position, one end on the engine and the other against the top of the concrete pier.

The bridge in question spans Stoner Creek, a tributary of Stone River. It has a total length of 242 feet, each approach being 96 feet in length, and the span across the channel 50 feet. The approaches are pile bents of standard construction and on either side of the span are concrete piers. The bridge was double-tracked all the way and the plans provided for the laying of plate girders on the concrete piers for each track. When operation commenced the plate

girders while set in place for the southbound track were not available for the northbound track, and in lieu thereof a temporary or false work was substituted between the piers which consisted of three bents composed of four piles each, driven through the earth which covered the solid rock to a depth of about 20 feet in the bottom of the creek. Three sets of sway bracing were spiked to each bent and three lines of longitudinal girts rested upon sash braces, all securely fastened to the piles. The method of construction of this temporary or false work was similar to that used for a permanent structure, except that four piles per bent were used instead of 6, and the bracing was spiked instead of bolted. The construction of this false work was in accordance with the N.C.& St.L. standards for temporary work of this nature.

The track is tangent 1500 feet north and 1000 feet south of the point of accident; the grade is 0.31% descending northward.

The channel of Stoner Creek is narrow and deep, with steep banks. The contour of the surrounding country is such that water drains very rapidly into the stream, which develops a swift current, owing to the constricted channel.

Traffic on the Old Hickory branch is quite dense. Eleven passenger trains in each direction are operated daily. Seven freight crews are regularly assigned to handle freight between Old Hickory and Nashville and this number is frequently increased.

The engine which was derailed is of 2-6-2 type, weight on drivers 213000 pounds; total weight 272000 pounds.

Hunter McDonald, chief engineer, stated that the bridge over Stoner Creek was built in accordance with plans prepared by the contractors after standards of the railway and approved by him. The false work was built in the usual manner and was sufficient for the purpose, built in accordance with standard plans of the company, and capable of carrying the traffic imposed upon it. A temporary structure for the north track of the bridge was necessary by reason of delay in obtaining steel girders for the main span. He was of the opinion that a large pile had floated down stream, wedged between the piles of the middle bent and broke the up-stream pile, causing this bent to be swept out by the high water and driftwood accompanying it.

J.R.McElhiney, superintendent in charge of a gang which built the trestle over Stoner Creek, stated that he visited the scene of the accident the day thereafter and found the center bent of the temporary trestle washed clear away. One pile was broken about 12 feet from the bottom, indicating that some great force had struck it. He considered the bridge safe for the loads being carried and stated that the only reason temporary bents were not constructed in the same manner as those for permanent service was that no deterioration was anticipated.

Bridge foreman Dolan stated that the trestle was in good condition previous to the storm. He left Stone River at noon on the day of the accident, placing his assistant in charge.

Nathan Edwards, bridgeman, who was left in charge by bridge foreman Dolan, stated that an unusually hard rain fell and that he had decided to visit the bridge as soon as the storm abated. In the meantime the operator informed him that an engine "was in the ditch." He immediately proceeded to the point of accident and found the water in the creek 12 or 15 feet deep, or almost up to the top of the boiler, which had dammed up the stream. The center bent with broken pile was washed clear of the wreckage, due, he thought, to driftwood, the force of which might have caused the pile to break.

V.L.Wright, operator at Stone River, stated that a heavy storm commenced at about 7 p. m. on the day of the accident and was in progress when the trestle collapsed at about 8.30. The storm appears to have been of unprecedented violence.

S.F.Beard, switch-tender at the Stone River telegraph office, stated that an unusually hard rain began about 7 p.m. and was still in progress when the accident occurred. On hearing the crash of the collapsing trestle he sought help and immediately went to rescue the injured. He found the locomotive which filled the space between the concrete piers filled with water and damming the stream.

O.M.Wallace, flagman of extra 615, said his train left Old Hickory at 7.15 p. m. and stopped at Bondurant, Hopewell and Dodson. The train left the last station at 8.20 p. m. and proceeded directly to Stoner Creek. It was moving at

about 7 miles per hour, and rain fell heavily from 5 p. m. until the accident occurred. He remained all the time in the rear to protect his train and did not visit the scene of accident until relieved.

Conductor Shriver, Engineman Terry and Fireman Smith were killed in the accident. Front brakeman Hose was seriously injured and could not be interviewed.

This accident was caused by the collapse of the temporary trestle, due to one or more bents being worked out by the swollen stream and many driftwood accompanying it.

Rule 541 of the operating rules of the N.C.& St.L. Railway, relating to the duties of section and bridge foremen, reads in part as follows:

> In case of heavy rain or violent windstorm, have the entire section patrolled, especially watching points where obstructions are likely to occur.

The evidence is that at the time of the accident a rain storm of exceptional severity was in progress, which had prevailed for several hours prior thereto. In view of the nature of Stoner Creek and its susceptibility to rapid and extreme rise, special care should have been taken to see that the requirements of Rule 541 were observed, but no attention was given to the bridge or its approaches during the heavy rain existing at, and prior to, the time of this accident. Bridgeman Edwards stated that he was preparing to inspect the bridge as soon as the rain ceased; but such inspection is not what the rule requires. Patrolling should

have been done while the storm was in progress, and not after it had ceased.

This accident is but another case which emphasizes the necessity of strict compliance with all rules and regulations promulgated to insure safety. Had the rule referred to been strictly complied with the accident would probably have been averted.

The train and engine service employees involved had been on duty seven hours and fifty minutes at time of accident, and had been off duty more than ten hours prior to commencing trip.

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