

C. T. C. SAVES TRAIN TIME ON FRISCO



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Above—The C.T.C. between East Tulsa and Afton is controlled by a machine in the dispatcher's office at Tulsa. Below—Eastbound freight train passing over the No. 20 equilateral turnout at East Tulsa



TRAIN TIME ON FRISCO

Project on 75-mi. main line eliminates nine of 21 sidings; expedites freight trains one hour or more; and cuts delays in former yard limit territories

By installing centralized traffic control on 75 mi. of single track between Afton, Okla., and Tulsa, the St. Louis-San Francisco has been able to eliminate 9 of 21 sidings, increase tonnage ratings, reduce freight train time 1 hr. or more and lift yard limit territories. At Afton, the east end of the new C.T.C., two important lines diverge; one eastwardly through Monett, Mo., and Springfield to St. Louis; and the second northward through Fort Scott, Kan., to Kansas City, Mo. There are two main tracks between East Tulsa and Sapulpa, Okla., 13.7 mi., and then from Sapulpa two lines diverge, one westward to Oklahoma City, and the other southward to Dallas and Fort Worth. Thus, the traffic to and from two lines at both ends must be handled over the one single track between Afton and East Tulsa.

From 30 to 35 Trains a Day

Four passenger trains and four scheduled freight trains, in each direction, are operated daily between Afton and Tulsa. About eight extra freight trains are operated daily, and two local freight trains run daily except Sunday. In addition, one through passenger train each way, operated jointly with the Missouri-Kansas-Texas, uses the 11.6 mi. of the Frisco between Afton and Vinita, Okla., as well as the line between Afton and St. Louis. Thus, the total number of trains on the Afton-Tulsa section is about 30 to 35 daily. The difficulties of operating trains with minimum delays are increased because they are bunched in certain periods. For example, nine trains, three passenger and six freight, must be handled during the early morning hours.

The C.T.C. control machine is in the dispatcher's office at Tulsa. The track diagram has lamps which are lighted in the conventional manner to indicate the locations of trains.

Characteristics of Line

Between Afton and Tulsa, the railroad traverses prairie, with rolling grades ranging up to a maximum of about 1 per cent. The curves are few and most of them are 2-deg. or less, although there are one 3-deg. and two 5-deg. curves at Garnett. For the most part, therefore, the grades and curves do not hinder train operations. Speeds are limited to 70 m.p.h. for passenger trains; 50 m.p.h. for steam freights; and 55 m.p.h.

for Diesel freights. Trains pulled by steam locomotives handle up to about 3,500 tons, and by Diesel locomotives up to about 5,000 tons. Semaphore automatic block signaling was previously in service on this territory, and the passing track switches were operated by hand-throw stands with spring switches at 11 sidings.

Experience with previous installations on the Frisco indicated that the number of sidings could be decreased when installing centralized traffic control. Formerly, there were 21 sidings between Afton and East Tulsa. Five sidings were removed, namely, at Cort, Nemo, Sunsweet, Howard and Salsman, as shown on the map. Short sidings at Foyil, Claremore, Garnett, Dawson and Bomber, no longer needed for regular service to meet or pass trains, were left in place, with hand-throw switches. This left only 11 of the original 21 sidings to be equipped with power switches and C.T.C.-controlled signals. Several of these sidings were lengthened so that the capacities of nine sidings now range from 106 to 155 cars, and the other two are 91-car and 98-car.

New No. 15 turnouts with 22-ft. points were installed at both ends of these 11 sidings so that trains can enter and depart at speeds up to 25 m.p.h. At the end of double track at East Tulsa, a new No. 20 equilateral turnout was installed, permitting train movements in either direction at 50 m.p.h. The new power switch machine and signals at this location are part of the C.T.C. At Afton the C.T.C. includes power switch machines at the junction switch and two switches leading from other tracks, as well as the east switch of a new 127-car siding extending from Vinita to Kahoga on the line toward St. Louis. Thus, in all, the C.T.C. includes 26 power switches with C.T.C. controlled signals.

Train Time Saved

The centralized traffic control is the means of saving considerable train time, and also of increasing the tonnage handled by some freight trains. Previously train movements were authorized by timetable and train orders. Now the siding switches are equipped with power machines, and the dispatcher operates these machines, as well as the signals at these switches, to control train movements on a minute-to-minute basis, so that meets can be made on close time.

Under the former operating procedure, a freight



New No. 15 turnouts, permitting train speeds up to 25 m.p.h., were installed at the power-operated sidings

train was required to be in the clear on a siding at least 5 min. prior to the time of a passenger or other superior train. This time is now reduced by making close meets, the timing being so close in many instances that neither train stops. For example, on February 7, east bound freight train No. 30, with 95 cars, went through three sidings non-stop, at Degroat, Chelsea and Whiteoak, to meet one passenger and two freight trains which likewise did not stop.

The power switch machines, under the control of the dispatcher, eliminate the stops formerly required when trainmen operated the hand-throw stands for trains to enter and leave siding. The dispatcher finds that a long freight saves 8 to 10 min. when leaving a siding, and perhaps 4 to 5 min. when entering, depending on the local grades. Formerly trains had difficulty in using some of the sidings, and the elimination of stops when entering and leaving has permitted an increase from 2,900 tons to 3,500 tons in the tonnage handled by some locomotives. All through freight trains are now making the run in either direction between Afton and Tulsa

in an average of about 2 hr. 45 min., as compared with 3 hr. 45 min. previously for fast freights, and 4 hr. 30 min. for slower ones. Time is saved in two ways: (1) by closer meets, and (2) by the facility with which trains enter and depart from sidings.

The dispatcher also has found that the time spent by trains waiting in the yards, after they are ready to leave, is reduced because with C.T.C. a freight can be run on close time ahead of a passenger train. For example, on February 3, an eastbound freight train departed from Tulsa at 1:25 p.m., only 35 min. ahead of the "Firefly" passenger train. With the previous timetable and train-order operation, the freight would have been held at Tulsa, thus losing at least 35 min. On the day mentioned it was possible for the freight to run all the way to Afton ahead of the passenger train.

No Yard Limit Delays

Previously, under the requirements of Rule 93, all trains, other than first class, were required to run at reduced speeds, prepared to stop short of train or obstruction, in yard limits which extended throughout a switching and industrial area from East Tulsa eastward to Rice, about 4.5 mi. Compliance with this rule not only handicapped the work of the switching crew which served these industries, but also slowed down the through freights. After the C.T.C. was installed the yard limit boards were removed and, therefore, Rule 93 does not apply. Under C.T.C. operation, the dispatcher can authorize the switching crew to make moves on the main track as required, but when the switcher is in the clear and locked on some spur, the through trains are authorized by signal indication to operate at maximum permissible speed, with safety, because the switching crew cannot open a switch or foul the main track.

This C.T.C. project was planned and installed by signal forces of the St. Louis-San Francisco, under the direction of R. W. Troth, superintendent of communications and signals, the major items of signaling equipment being furnished by the Union Switch & Signal Co.



Sidings were removed at five points in the C.T.C. territory between Afton and East Tulsa