

Editorial Comment

Approach or Time Locking

As evidenced in centralized traffic control installations in service or planned, there is a difference of opinion with reference to the use of approach locking as compared with time locking. These forms of locking are provided for protection in the event that a semi-automatic signal has been cleared and is then taken away by lever control before the Proceed aspect is accepted and passed by a train.

Arguments can be advanced in favor of either approach locking or time locking, as applied in C.T.C. territories. The following discussion, however, deals only with the reasons for using time locking. Signal engineers, circuit designers and others, having definite opinions on this matter, are invited to send discussions to the editor for publication in these columns.

Ordinarily, with three-aspect signaling, approach locking includes circuits to detect the presence of a train in the track circuits extending from the semi-automatic signal to one track circuit beyond the next signal in approach, so that if a Clear aspect on the semi-automatic signal is "taken-away," a train approaching within sighting distance of the "distant" signal encounters an Approach aspect. In the meantime, through the track circuit control, this train places the locking in effect. A release is then effected after the operation of a time-element relay, which introduces a delay period long enough to allow the train to be stopped short of the semi-automatic signal, or if the train overruns that signal, to enter the detector track section, thus locking the switch and signals.

A characteristic feature of approach locking is that, if no train has yet entered the approach track sections, the time-element feature does not come into effect. Therefore, having "taken-away" a Proceed aspect of a semi-automatic signal, control of the switch or other signals can be effected at once, without introducing any time delay. On the other hand, time locking includes no track circuit control features, the time delay being brought into effect regardless of whether an approaching train has entered certain limits.

Operation of C.T.C. Machine

From the standpoint of the operation of a C.T.C. control machine, approach locking permits the changing of line-ups, providing the approaching train for which a semi-automatic signal has been cleared, has not yet entered the approach section. This gives the man in charge of the machine considerable leeway to change

routes which were established without proper planning, or were set up too far ahead of information concerning the actual progress being made by trains on the territory. As a general rule, the need for this leeway is most acute during the period when the men are first learning to operate a new C.T.C. control machine. After a training period of a few months, most men learn to keep their hands off the levers until they determine definitely what train movements are to be made. The need for approach locking, as compared with time locking, therefore decreases.

The Enginemen's Standpoint

Considered from the enginemen's standpoint, the practice of "taking-away" Proceed aspects of signals is improper. To an engineman, a Proceed aspect means "to keep going with safety," whereas, when he sees such an aspect taken away, he has no information of the actual circumstances, and, quite logically, may apply the emergency application of the brakes, which may result in injury to passengers or damage to lading or equipment. The least that may be expected is a few flat spots on wheels. Therefore, regardless of whether approach locking or time locking is used, certain roads have established the practice that if a semi-automatic signal has been cleared and the track-occupancy indication lamps show that a train may have approached to a point where the engineman can see the "distant" signal, the Proceed aspects are not to be taken away by lever control, except in cases of emergency. The understanding is that, even if a control operator can see how he could save train time by changing a line up, he is not to do so. In other words, Proceed aspects are not to be taken away after being seen by an engineman, except in an emergency such as might arise if some other train overran a signal and fouled the established route, and this, of course would not be by lever control.

If this practice is accepted as a necessary requisite for good railroading, the need for approach locking, as compared with time locking, seems to be minimized. From the standpoint of materials, approach locking as ordinarily installed with conventional track circuits, requires the installation of additional line wire circuits to check the track relays of track circuits in the entire approach sections, whereas time locking requires no such line wire circuits. If the line wire circuit in approach locking is falsely energized, the locking, including the time-element feature, is defeated. Therefore, from the standpoint of maximum safety, time locking may be said to be safer than approach locking with line wire circuits.