

# EDITORIAL COMMENT

## British Report on Automatic Train Control

THE automatic train control committee of the Ministry of Transport, Great Britain, which was appointed in 1927, has issued its report (dated November 3, 1930) and the stationery office, London, has issued it in pamphlet form at six pence a copy. This committee of nine members was appointed to consider the whole broad subject and in particular to review the conclusions of an earlier committee (1922). The chairman was Colonel Sir John W. Pringle, chief inspecting officer of railways (now retired) and embraced in its membership C. B. Collett, chief mechanical engineer of the Great Western, and E. A. Wilson, chief engineer of the Metropolitan (Underground) of London. The Great Western has in operation the only extensive automatic train control system in Britain (or anywhere outside the United States) and the Metropolitan uses an automatic stop of the same general type as that in use in the subways of New York City.

The present report begins with an elaborate statement of the high degree of safety already attained on the railroads of Great Britain under the universal use of the block system (including electric train staff) on both double-track and single-track lines. Emphasis is placed on the need of uniformity, and the time of the committee has been largely taken up in studies of line clearances, etc., this having been done with the coöperation of the railway companies. Large numbers of inventions have been examined.

All American systems of automatic train control are virtually rejected, and the only system which the committee regards as fully developed to meet railway requirements in Great Britain is the ramp system now in use on the Great Western and which is described in an article elsewhere in this issue.

References to automatic train control systems in use in America consist only of brief sentences telling what inquiries were made and giving reasons for not favoring any of them. Data furnished by the Interstate Commerce Commission are said to have been of great service to the committee. The delicacy of the apparatus on the locomotive, the possibility of failure of electric current supply, and defects developed in operation, are held to be likely to cause serious delays to trains on British lines of dense traffic. The committee consulted W. K. Howe, chief engineer of the General Railway Signal Company, and the English representative of the General Railway Signal Company presented a proposed ramp scheme for introduction on British Railways, to give three indications; but the system has not been tried and no opinion is expressed as to its value. The Westinghouse Brake and Saxby Signal Company proposed the continuous control system of the Union Switch & Signal Company, and offered to install a system for experimental purposes on a section of railway in Great Britain. The Hudd system, intermittent inductive control, is mentioned, and the committee is informed that its principle had been tried on the Wabash and on the Missouri Pacific. The Hudd system as now presented to the committee is ap-

proved for trial and may be tried on the Southern Railway of England.

The committee investigated the Crocodile system, used on the Northern of France, but rejects it as giving no proceed indication and as not disclosing its failures. The Rodolausse system, which has been tried on the Paris & Orleans, was tried on the Great Western of England, but is not approved. The Regan system, in use on the Rock Island, was considered but is held to be too costly. Mr. Raven's system on the London & Northeastern has been in use on that road for 30 years, on 154 miles of track, but it is purely mechanical and gives no indication when the signal is clear; and so it is not further considered.

The electric and electro-pneumatic trip apparatus in use on the London Underground lines, is held unsuitable for speeds above 50 miles an hour, and also because no indication is given when the line is clear. It is also doubtful whether English roads could afford to provide suitable clearances for such a trip stop.

Finally, it is held that continuous control (that of the Union Switch & Signal Company) would give better results than any other system, but the expense is "very great." The additional safety as compared with present conditions on British railways would not justify the heavy expenditures. Practically the same decision is given against intermittent American systems; and invitations to visit America have been declined.

The system in use on the Great Western of England, a ramp with a plunger shoe, is recommended as the only one thus far proved suitable for use in Britain. This system is sufficiently reliable even under snow and ice conditions for general adoption. Automatic train control is called a "direct" method of increasing safety. A "direct" method is preferable; but the report then goes on to examine at considerable length "indirect" methods, which are to be recommended where "direct" methods for any reason cannot be introduced. Locomotives, cabs and windows could be arranged so that steam and smoke would be less troublesome; roadside signals could be put in better positions, and especially could be reduced in height; the illuminative and penetrative power of signal lights can be improved; correct focusing of the light is essential. Electric signal lights have been in use for three winters in England with such satisfaction that fogging services have been dispensed with at such signals. However, the general extension of electric lights depends on further cheapening of electric current. Oil lamps, long burning, seem to have found little favor, but it is held that they can be improved.

Summarizing its conclusions the committee begins with a prefatory remark that the standard of security on British railways has been fully maintained during the past eight years (the percentage of serious train accidents having been reduced somewhat). The committee nevertheless believes that "progressive action" is desirable and then says, as noted above, that increased security can most reasonably be attained by "direct" action and that "in our opinion, direct means are generally to be preferred." Considerable space is given to the safeguarding of stop signals where the usual automatic train control is not applicable and the committee would favor

(as, for example, where an engineman starting from a station or junction may disregard a signal before he has moved more than a short distance) a control trap; or torpedo placers; or catch points, or derailleurs. This is followed by the recommendation of indirect methods. It will be for each railway to determine what it must do. "On railways where considerable expenditure has already been incurred, it is obviously desirable that the system in use should be extended" (this applies to the Great Western alone). The exploration of the general question of automatic train control should be actively continued.

Appendices to the report show British train mileage, accident increases, and decreases, etc., condensed from the records of years since 1911; information concerning A. T. C. in America, and record of signal facilities in England today. This last shows:

Length of track, 25,363 miles; number of signal boxes, 9,413; number of distant signals, 24,674, of which 2,225 have fixed arms; number of stop signals, 55,120; number of steam locomotives, 22,903; number of motor vehicles, 1,156; these totals are made up from the reports of the four principal railways, the Great Western, the Southern, the London, Midland & Scottish, and the London & Northeastern.

The approximate cost of apparatus of the type of control recommended (the Great Western) is given as follows: a dead ramp \$72.60, ramp with insulated wiring to signal box \$338.80; ramp with uninsulated wiring \$266.20; locomotive with warning effect only \$121; dual warning and clear effects \$252.68.—B. B. A.

## The Stop Signs for Highway Crossing Signals

FOR years various associations and divisions of the American Railway Association have studied the subject of highway crossing protection. In order to coordinate these efforts and to standardize the protection to be used, the president of the American Railway Association, early in 1930, appointed a joint committee on Highway Crossing Protection, including five representatives each from the Operating division, the Engineering division, the Safety section, and the Signal section. This committee, at its first meeting in May, 1930, studied a report which the Committee on Protection of Railway Grade Crossings and Highway Intersections was to present at the National Conference on Street and Highway Safety. As a result, the A. R. A. Joint Committee suggested certain changes in the report which were accepted before it was presented to the Conference. In view of the fact that these changes were of material benefit to the railroads, the first efforts of the A. R. A. Joint Committee may be said to have borne fruit.

At a meeting of the American Railway Association in Chicago on May 14, the Joint Committee on Highway Crossing Protection presented a report including recommendations, an abstract of which follows:

"The committee recommends the continued use of the American Railway Association's present standard automatic flashing-light and wig-wag highway crossing signals, with the following changes and additions:

"Lights on every signal shall shine in both directions along the highway.

"Circuits shall be arranged so that crossing signals will operate until rear end of train reaches crossing, and then cease.

### REFLECTOR TYPE

"Each crossing signal shall be equipped with a square sign with black background and white reflecting buttons, displaying the words 'stop on red signal' toward highway traffic approaching the near side of the crossing.

"Or when conditions warrant:

### LIGHT TYPE

"Each crossing signal shall be equipped with an illuminated sign displaying the word 'Stop' in red letters toward highway traffic approaching the near side of the crossing, only while the signal lights are flashing or wig-wag swinging.

"Bell should be used on crossing signals only when required by public authority or local conditions. Bell should be arranged so as to ring while signal lights are flashing or wig-wag swinging."

It is now nearly eight months since these recommendations were presented; yet to the best of our knowledge the railroads have made little effort to follow the recommendations, except that the New Haven has provided reflector signs on signals installed in 1930. Of course, the Wabash and other roads which had standardized previously on the illuminated Stop sign have continued its use and in Wisconsin and Minnesota, where the motor-operated revolving disk Stop sign is required in conjunction with the flashing light signals, the practice has been continued.

The hesitancy of some roads to adopt the new signs may be due to a lack of understanding as to the function or status of this Joint Committee on Highway Crossing Protection. Of course, each of the divisions and sections of the A. R. A. mentioned has representatives on the Joint Committee, yet there seems to be some doubt in the minds of railroad officers as to whether the recommendations can be considered the standard practice of the A. R. A. without giving the members of the several associations an opportunity to express their opinions and objections.

*Railway Signaling* believes that the Stop sign is highly desirable in order to give definite instruction for action to be taken by an automobile driver when the signal is in operation. The automatically controlled illuminated Stop sign or the rotating disk Stop sign are most effective, but where power is not available the reflector type of sign is much better than none at all. In presenting its recommendations, the joint committee explained that:

"In dealing with the large number of regulatory bodies, all the way from state commissions down through the local authorities in each individual town, it is obviously desirable that the railroads should have uniform recommendations and should be united in what is proposed. It is, of course, recognized that the same class of protection would not be required at all crossings.

"In connection with the adoption of a standard, it is obviously necessary that the public be educated as to the meanings of the signals and signs adopted. Experience indicates that there is considerable misunderstanding by highway users of the meanings, especially of signals, and many apparently do not know what is expected of them when a signal is displaying a red light."

Naturally there are other opinions on this important matter which should be freely discussed on the floors of conventions so as to arrive at an agreement that will permit standardization. In a matter in which so many different organizations have a part, consideration must be given to the fact that many minor concessions may have to be made to reach an agreement on standards.

Those interested might well give these subjects consideration and be prepared to advance constructive discussion at the convention of the American Railway Engineering Association in Chicago on March 10-11, as well as at the convention of the Signal Section in New York on May 12-13.