Editorial Comment

Before Winter Comes

Fog, frost, ice, snow and other results of winter weather cause numerous forms of signal failures if adequate preventative measures are not taken in the months before the first snowfall. A minor item is to inspect the sealing of wire entrances, as well as ventilator openings in relay cases, instrument houses and battery boxes, to see that field mice cannot enter or get close enough to wires or cables to chew off the insulation. All forms of equipment that would be difficult to repair during cold weather should be thoroughly inspected during the next month or six weeks. For example, the bonding and insulated rail joints should be given special attention from now until snow. The same applies to switch circuit controllers, connecting rods and attachments, as well as to switch machines, rods, plates and other switch fittings.

The numerous ways of preventing frost in signal apparatus cannot be dealt with here for lack of space, other than to say that many methods applying to various types of equipment and climatic conditions have been explained in articles published during the past 25 years in *Railway Signaling*. In brief, frost is formed by the condensation and freezing of moisture from the air in the instrument housing, the contacts or other parts on which the frost forms being colder than the air which carried the moisture. One method is to arrange for sealing the case as nearly air tight as possible, and then use some material such as glycerine to absorb most of the moisture in the air confined within the housing. A decidedly different practice, which also has been successful in many locations, is to provide open ventilation through the case or housing, the theory being to carry out moist air, and also to aid in keeping the contacts and other parts in the case at nearly the same temperature as the air outside, thus minimizing the tendency for moisture to condense from warmer air on to colder parts in the housing.

At locations where neither of these methods are successful, some roads have adopted the practice of installing electrical heater units, as for example in electric switch machines. These devices are rated at 15 to 25 watts, and are designed for operation on 110 volts a.c.; therefore, they can be applied only where a.c. power is available.

The reduction in capacity of batteries when subject to extremely low temperatures has been reported by a committee of the Signal Section, A.A.R. In territories where extremely low temperatures prevail for extended periods in winter, the general practice has been to set the battery wells or boxes down in the ground, thus helping to keep the batteries warmer. A modern practice adopted by one road on centralized traffic control territory where 110-volt a.c. power is available, is to use insulated battery boxes including small electric heaters rated at 75 watts.

Adequate time is still available before cold weather not only to make a serious study of signaling failures caused by winter weather during past years, but also to do all possible at this time to prevent such failures before next winter comes.

Catch Up With Progress

During the years of the recent war, the signal forces of the railroads were hard pressed to maintain existing signaling facilities and to perform such new construction as was necessary as a part of the war program. Under these difficult conditions, the tendency in numerous instances was to follow existing standards because time was not available to investigate or test new ideas, equipment and practices. A further fact is that during the war many developments and improvements were made in materials, apparatus and signaling systems which could not be produced in quantities because of war-time restriction, but which are now available or soon will be.

The various circumstances lead to the conclusion that the railroads now have an opportunity to analyze their previous signaling construction and maintenance practices with the intention of adopting new ideas and apparatus as well as systems, wherever better signaling performance can thereby be attained. For example, one road which previously had followed the practice of using conventional d.c. track circuits, has now adopted modern types of coded track circuits for new projects wherever such circuits are adaptable.

On a long territory of double track, one road is planning to install centralized traffic control for train operation in both directions on both tracks, thus reducing train delays and increasing track capacity without adding a third track. Another railroad, which within recent years made extensive installations of single-track automatic block signaling, has now adopted a form of centralized traffic control for installation now being planned for sections of single track on which the traffic is no heavier than on territory where automatic block only was previously installed.

By use of coded carrier equipment in connection with the coded line circuits for centralized traffic control, the mileage controlled from one office can be increased, and a further advantage is that the control office need not be at the center of a long project but can be at any point either on or beyond the limits of the territory.

As applying to detailed apparatus, numerous new types of equipment are available, as, for example, plug-in relays or plug-couplers for conventional types of relays. As applying to a remotely-controlled switch with signals such as the end of a siding in C.T.C. territory, one road has adopted an instrument case including plug-in relays all made up to apply as standard to any such layout. Another road has extended this idea as applying to intermediate signals and cut section locations. These practices simplify the preparation of circuit diagrams as well as the installation of wiring in the cases at a central location.

A conclusion is that those railroad men who were too busy during the war to study new developments in signaling, should now plan a definite program of tests and investigations in order to catch up with progress in this field.