EDITORIAL COMMENT

A Signal Shopping Policy

WITHIN the next few years, it is to be expected that the railroads will make extensive detailed inspections of all signaling apparatus in service, and much of the older equipment, regardless of whether its operation is up to standard, may be sent through the shops for complete cleaning, overhauling, replacement of parts and adjustment. The time is now opportune, therefore, to make a detailed analysis of the expenses that will be incurred in such shopping programs, and to compare these costs for each class of equipment with the cost of new modern apparatus.

When determining whether devices, as for example relays, of a certain age and type are to be scrapped or repaired, a signal engineer must know all the facts, in order that he may not be influenced unduly by stores officers desiring to justify their overhead, or by accountants who have certain reasons for peculiar amounts of the charges. Perhaps an extreme example of such practices is that of crediting a relay, received at the shop, at scrap value, or very close thereto, and, when overhauled, charging it out to the signal department at the price of a new relay. The opposite extreme, perhaps, is to charge the shopping program of a relay with only the time of the repairman at the bench, plus the purchase price of the new parts installed, and allowing all overhead and supervision to be charged to the general signal account. In order to minimize book work and accounting, some roads charge the entire labor and repair parts used, in the shop to operations, to maintenance account 249. In none of the three procedures, outlined above, is the true cost of shopping certain types of equipment readily ascertainable.

The true cost of overhauling a signal device includes many items. When received at the shop station, it is carted to the shop and unpacked. The instrument must then be taken apart, and the various parts must be cleaned and perhaps repaired. The instrument must be carefully assembled, tested, and adjusted to be sure that the operating characteristics are within specified limits. The device is then packed and reshipped. These shop operations must be supervised by a man who is not only an efficient foreman, but also an expert in the repair and adjustment of signaling devices. Thus the total expense of overhauling a relay or other device should include not only the repairman's time and the cost of new parts, but also a proportionate share of the entire shop expense, including packing, cleaning, supervision, machinery, tools, power, heat, light, building maintenance, stores charges, etc.

Having assembled all the costs involved in shopping a signal device, the further important matter of obsolescence must be given thorough consideration. Within recent years, relays, controllers, signals, switch mechanisms, control machines and other equipment, used in signaling systems, have not only been vastly improved but, in many instances, complete new designs are available. For example, a modern track relay is more sensitive to shunting than earlier designs, and the operating characteristics are such that the relay will operate satisfactorily with more limiting resistance, thereby increasing the life of the battery sufficiently to save $3 annually, and thereby pay the difference between the cost of a new relay and the cost of shopping an old relay within five or six years. One road, which shopped some obsolete relays, found that the total cost was $21 per relay. Even with this expense, the operating characteristics could not be brought up to standard, nor was the operation as efficient as that of modern types of relays. Similar examples can be cited concerning signals, controllers, switch mechanisms, and control machines; in which safer operation, fewer signal outages, reduced operating costs, etc., will readily justify the changeover to modern equipment.

C. T. C. on Multiple Track

SO MANY investigations have been made and so many descriptions have been published of installations of centralized traffic control on single-track lines, that there perhaps may be some tendency to overlook the advantages of this type of control as applied to one or more tracks of a multiple-track line. As a matter of fact, the application of centralized traffic control to multiple-track lines was an important feature of many of the earlier installations; the New York Central, in 1927, not only included 37 miles of single track, but also 3 miles of double track on which train movements were directed by signal indication in each direction on both tracks; installations made in later years, such as those on the Boston & Maine in 1929, and on the Burlington in 1930, included either-direction operation on tracks of multiple-track lines.

Where a particular track of a multiple-track line is provided for the operation of trains in one direction only, and where no trains are run in that direction during certain periods, the track may just as well be used by trains running in the other direction. The reduction in train delays and the increase in track capacity which naturally results from this practice are especially beneficial in sections where train movements predominate in one direction during certain portions of the 24 hours. An excellent example of either-direction train operation with centralized traffic control on a two-track line is afforded on the Texas & Pacific between Dallas, Tex., and Ft. Worth, 31.5 miles, where reverse movements are made several times daily to advantage.

Perhaps one reason why more such installations have not been made is that the train delays that occur under existing operating conditions are being accepted as inevitable by operating officers. As a matter of fact, it is sometimes difficult to visualize the possible benefits that accrue to train operation unless a detailed study is made. When making such a study, one must not only investigate delays to trains at points on the road, but attention must also be given to the possibility of expediting the movement of freight trains out of yards. With centralized traffic control, including either-direction operation, freight trains, in the majority of instances, can be moved out of terminal yards as soon as they are ready. As a general rule no records are available for such delays, and considerable study, with the co-operation of dispatchers, trainmasters, road foremen of engines, yardmasters and roundhouse foremen, is necessary to develop the facts.

The point of importance is that the railroads can utilize centralized traffic control on many territories to effect either-direction train operation on sections of multiple-track lines, and thus secure the desired increase in track capacity without adding tracks.

OPEN FORUM

This column is published to encourage interchange of ideas on railway signaling subjects. Letters published will be signed with the author's name, unless the author objects. However, in order to encourage open discussion of controversial matters, letters may be signed with pen names at the request of the author. In such instances, the correspondent must supply the editor with his name and address as evidence of good faith. This information will not be disclosed, even on inquiry unless the correspondent consents.

Accurate Grinding of Drills

To the Editor: Chicago

I have compiled some data on economies effected by use of a special power-operated grinder for sharpening bonding drill bits. This grinder includes a holding device so arranged that the drills can be ground to the pitch desired. For drilling in hard steel, the pitch should be flatter. The device includes a micrometer adjustment which can be used effectively for grinding the drills accurately, and yet at the same time not grind off too much of the drill. The grinder is located in our signal shop at Moline, Ill. Drills are shipped to this shop to be ground and then sent out the same day to the maintainers and construction forces. The grinder was purchased early in 1937, and cost a little less than $300.

The holes drilled per bit are computed on the basis of 275 joints for 1936, when only new 39-ft., 112-lb. rails were involved, and 300 joints per mile in 1937 and 1938 when both 39-ft. and 33-ft. rails were involved. Part of the reduction in consumption of new drills in 1937 is due to an accumulation over the line of used ones during 1936. Prior to that time there had been a tendency to hold them back because of difficulty in obtaining a good regrinding job with hand grinders in the field.

Considering the above variable conditions, obviously it is not possible to determine closely the saving made by using the special grinder. However, doubling the average number of drills used per mile in 1938 and comparing with the average number used per mile in 1936 before it was purchased, and figuring drills at 30 cents each, we show a saving of $3,125 in outlay for drills in 1938.

Data Based on Drilling Four 9/32-in. Holes for Each Joint

Year	Track miles bonded rail relay	Track miles bonded new signals	Total track miles bonded	New drills issued 9/32 in.	Drills per mile bonded	Holes drilled per bit
1936	93	0	93	2,908	31	36
1937	81	307	388	2,214	5.7	210
1938	153	296	449	1,792	3.9	307

An additional important saving which cannot be readily computed is the increased number of joints drilled per man per day when reground drills were as good as new ones. Suffice it to say, we averaged better than 200 joints on 112-lb., and 250 joints per day on 90-, 100- and 110-lb. rail, these latter three not being so hard as the 112-lb.

To complete the picture, three additional points should be mentioned: (a) The issues of new drills referred to in each year included those sent to signal maintainers; (b) a sizable number of accumulated drills were collected from maintainers and placed in the rotating stock for maintenance and construction; (c) when we completed the large 1938 program, our total supply of drills (new and used) was very small, indicating the proficiency of the system to obtain maximum service from a minimum supply of drills on the system as a whole.

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At Chard, Wash., on a secondary branch line of the Union Pacific, a pile trestle over Pataha creek was weakened by flood conditions on February 15, and collapsed under the locomotive of a freight train, causing a derailment which resulted in injury to the engineman and fireman. In the opinion of the Bridge and Building Supervisor and the Division Engineer, the pressure of the flood water against debris, which had piled up against the trestle, had snapped off the piling which had gone out from under the bridge before the train arrived. The information above is from a report of the Bureau of Safety, I. C. C., investigation 2331, dated March 22, 1939.

On the Southern, near Paint Rock, N.C., at 10:25 p.m. on February 3, the locomotive of a freight train struck a rock on the track and was derailed, and simultaneously the locomotive and tender were struck by a landslide. About 25 min. prior to the accident, a passenger train had passed this point. An automatic block signal, located 407 ft. in approach to the point of accident, was indicating proceed when the freight train passed. The train speed was about 25 m.p.h. when the engineman saw the rock, and by making an emergency application of the brakes the speed was reduced to about 15 m.p.h. A watchman patrols the track in this vicinity when weather conditions seem to warrant, and had done so until 4 p.m. on the day of the accident. On January 28, the section foreman had climbed the slope and inspected the hillside above the tracks, but saw no indications of any break in the slope. The information above is taken from a report of the Bureau of Safety, I. C. C., Inv. 2327, dated February 28.