As the insulated joint is a necessary part of the signal system as well as of the track, it naturally follows that it belongs neither to one department nor to the other, but to both. Therefore, both departments should interest themselves in keeping insulated joints in repair in an efficient and economical manner.

Most men who are directly responsible for the care of joints have found that minor defects, which require very little time to remedy, such as loose nuts, lipped rail ends, rail fins cutting into fiber, low or loose ties and defective spiking, should be corrected immediately upon being detected.

Frequent inspection should be made. Signal maintainers, when going over their territory, should check the condition of each insulated joint. Defects should be noted and reported to the person charged with the care of the joints, and necessary repairs should be made without delay. Any lipped rail ends or similar defects should be corrected by the maintainer as soon as detected. Section foremen and track walkers should make a daily inspection of insulated joints when going over their section, making such repairs as may be necessary and correcting any defects as soon as discovered.

The life of fiber renewals varies greatly and is dependent in a large measure on the care used during the initial application of the fiber parts and on the preparation of the rail joint to receive the insulation. In some joints, the fiber parts will withstand heavy traffic two to seven years. In another joint of the same kind and under identical traffic conditions, fiber of the same quality will be ruined in as many days. The fault usually lies in the lack of care in preparing the track joint to receive the insulated joint. For these reasons, no fixed rule can be formulated, or even approximated, to determine the time between fiber renewals. Inspection must decide the question.

It is generally conceded that a close check should be made of all insulated joints early each spring and again late each fall, at which time all badly worn fiber parts should be renewed and each joint placed in first-class condition. All soft ties should be replaced at this time and particular attention should be given to the drainage of the joint ties in order to keep the joints in first-class condition from both a signal and a track maintenance standpoint.

In order to secure the maximum life and most efficient service from each insulated joint, the following precautions must be observed:

(1) Use an insulated joint designed to fit the rail section to which it will be applied.

(2) See that both rail ends at the point where the insulated joint is to be installed are full, square and smooth. If they do not meet these specifications and, as is usually the case, it is impossible to move the insulated joint, the next best thing is to move the rails instead. As a rule, if the rail ends are ragged, they can be eliminated from the insulated joint by interchanging rails and often by simply turning the rails around end for end.

(3) All sharp edges, slivers, rail fins, scale, rust and dirt on rail ends and joint bars must be removed before applying. Foreign matter will cut and bruise or otherwise damage the fiber when the joint is pulled up tight with resultant decrease in the life of fiber parts.

(4) Provide the proper opening between the rail ends to take the end post or posts. If the insulated joint is designed for a ¼-in. end post, then have only ¼-in. opening between the rail ends; if the insulated joint is designed for ⅜-in. or ½-in. end post, have the rails far enough apart to obtain that opening, but no more.

(5) In forcing rail ends apart, use a rail expander if one is at hand. Do not use an ordinary full taper track chisel. If a chisel must be used, use one which is wider than the rail-head and which has a small taper, in order to avoid damaging the rail end.

(6) Do not bend bolts or drive them through bushings. If rail ends and joint parts are in proper position, the bolts can be inserted without mauling or bending.

(7) Paper insulation will not withstand the enormous force of rail expansion in hot weather. After the proper opening is secured between the rail ends for the insertion of the end post, it should be held, as much as possible, by the installation of rail anchors.

(8) When applying the insulated joint, see that all parts fit and that the joint bolts are drawn up to give an even bearing all around. In applying a joint of a type similar to the continuous angle bar or on having a base extending under the rail, the base of the bars should be driven into place before, and as, the bolts are being tightened. Too much stress cannot be placed on this point. Maul the angle bar at its lower edge. This is the only way that the full benefit can be derived from the metal and insulating base pieces which are designed for the purpose of supporting the base of the rails and thus relieve the top fiber or ball strips from excessive wear. Trackmen are prone to tighten the bolts without mauling home the base, which results in the angle bar being cocked or tipped in at the top, throwing the entire strain on a small area of fiber of the ball strip instead of distributing it over a relatively large area of the base plate.

(9) Keep all bolts tight at all times. Tighten them regularly and frequently, particularly after the joint is first applied and until all parts are firmly set. Use a good nut-lock on each nut. Whenever the bolts are tightened, the lower edge of the angle bars should first be driven home and set by using a spike maul on them.

(10) Insulated-joint manufacturers recommend that their joints be supported on smooth-face, sound, hard ties and that the joint and shoulder ties be kept especially well tamped at all times with well-drained clean ballast, otherwise pumping and churning takes place, resulting in excessive fiber wear.

(11) Use fiber material of the proper size. The fiber end-post must be of the same section as that of the rail on which it is used. If the rail is worn down or end-posts project above the top of the rail, they should be trimmed off flush before the first train runs over them.

Derails in Passing Sidings?

"Are derails necessary or desirable at ends of passing sidings in automatic signal territory? If so, should they be pipe-connected with the switch, or should they be independently operated?"

Find Pipe-Connected Derails Desirable

By W. H. Stilwell
Signal Engineer, Louisville & Nashville, Louisville, Ky.

The practice on the Louisville & Nashville is to install a pipe-connected derail on all main-line turnouts, including passing track turnouts, in conjunction with the installation of automatic signals. While under normal operating conditions it might seem that derails on passing track turnouts are unnecessary, we find that it is not

infrequent that a portion of a train is derailed on these turnouts. This leads to the belief that if the derails were not there, the main track might have been fouled while a train was passing. When unusual moves such as sawbys or set-offs occur, train movements can be more fully protected if derails are used. Further, we know that crews do head into passing tracks and fail to stop clear of the fouling circuits where derails are not in use.

We find that it is more satisfactory to pipe-connect these derails to the main-line switches than to operate them independently because when the derails are pipe-connected, trains can head in or out with less delay.

Derail Sometimes Needed; Recommends Use of Separate Switch Stand

By C. A. Christofferson
Signal Engineer, Northern Pacific, St. Paul, Minn.

At the ends of some passing tracks it might be necessary to install a derail, whether it is desirable or not. If it is necessary and desirable to pipe-connect it, an independent stand, bolt-locked with the switch should be used, and I believe that a switch stand placed next to the derail is preferable, but in either case there should be a switch circuit controller placed on the derail.

The experience we have had on the Northern Pacific with the derail which is pipe-connected to the switch stand leads me to believe that in each case an independent stand should be used, as described above. Our operating officers are very much opposed to any pipe-connected derails and prefer an old switch stand placed right in front of the derail, and I believe that this is all that is needed.

Derails an Unnecessary Expense

By W. J. Eck
Assistant to Vice-President, Southern, Washington, D. C.

In our opinion, these derails are neither necessary nor desirable. We have not used derails in passing sidings for many years and have found that our practice is safe. Derails at such points are an unnecessary installation and maintenance expense, and do not add to the safety of operation. The only places where we consider derails necessary are in house tracks or storage tracks where cars are left unattended. At such places cars may foul the main track either by being blown out or by being moved by outsiders. At such places derails are desirable, but in passing sidings such conditions do not prevail and derails are unnecessary.

W. M. Post, assistant chief signal engineer of the Pennsylvania, replies, "It is my opinion that derails are not necessary at the ends of passing sidings in automatic signal territory, excepting where such sidings are used for the storage of cars. Most signal engineers believe that derails are not necessary on main track at interlocked grade crossings, or junction points, because the engineman can be depended upon to stop his train at the signal. It would seem logical to assume that the engineman can stop at the end of a passing siding, especially as he is running at slow speed on the siding."

Proceed Aspects for Isolated Home Signals

"Should a different Proceed aspect be provided for a home signal at an isolated (not tied in with any other signals) interlocking plant, such as an automatic crossing, than for signals in automatic signal territory, or in larger interlocking plants, where there is a signal in advance of (i. e., in the territory governed by) the signal in question?"

Believes Use of Different Aspects Advisable

By C. H. Tillett
Signal Engineer, Canadian National, Toronto, Ont.

In my estimation, the home signal at an automatically protected crossing should be different from the home signal at an interlocking plant. Under our rules, an engineman receiving a Stop indication at a home signal of an interlocking plant remains there until he receives a caution card, Form D, or other communication, sometimes in the form of a telephone conversation from the signalman that he is to proceed.

The action of the train crew at an automatically protected crossing is to proceed to the crossing and, after making sure that no train is on the opposing route, to flag their train across. This action is very similar to the means of getting by an absolute signal in A.P.B. territory. When such a signal is at Stop and communication cannot be had with the dispatcher, they flag themselves through, and for that reason the same indication in our rule book has been given to the absolute signal in A.P.B. territory that is given to the home signal at an automatically protected crossing. This is differentiating between an automatically protected crossing and one protected by a manually controlled signal.

Operating Rules Should Govern

By F. B. Wiegand
Signal Engineer, New York Central, Lines West, Cleveland, Ohio

A different Proceed aspect should not be provided for a home signal at an isolated interlocking plant than for home signals at other points. In making this statement, I have in mind aspects as between interlocking plants, keeping in mind that the giving of indications by such signals is also involved.

Code Rule 281 makes no distinction in the giving of indications. In this rule the Proceed indication is given by the signal arm in the vertical position in the daytime, and by a green light at night. The day and night aspects for color-light signals are the same as the night aspect of semaphore signals, i. e., green, and those for position-light signals are the same as the day aspect of semaphore signals, i. e., vertical.

The isolated interlocking in this day and age would undoubtedly be in manual block territory, and the question is brought about by a condition affecting a train movement through a block under permissive indication.

A train entering a block permissively must proceed through the block prepared to stop short of a train ahead. The train entered the block under a yellow light, or the equivalent thereof, and when it arrived at the isolated interlocking it received a green indication. The first indication gave the train permission to proceed permissively and the second indication gave the train permission