London Midland and Scottish Railway Company

PREVENTION OF TRAIN ACCIDENTS

(ii) HINTS FOR SIGNALMEN

Chief Operating Manager's Office,
Watford H.Q.
April, 1942.
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INTRODUCTION

The first Booklet was issued in June, 1937, and signalmen were then asked to review frequently the hints, which would assist them to avoid mistakes which might have very serious consequences.

Since that date nine out of every ten of the train accidents caused or contributed to by signalmen occurred owing to one or other of these hints being overlooked, an emphatic indication of the value of the hints to all signalmen, provided they will frequently read and profit by them.

As the hints are essentially the "Voice of Experience", those in the first Booklet have been amplified and increased in this Booklet as a result of our experience since June, 1937, and it is being distributed to all signalmen so that the "voice" may pass on to each of you all that experience has taught.

Will you pay heed to the "voice" and avoid the mistakes which the same "voice" tells us may have very serious consequences?
British Railways have had a reputation for safety for so long that it is now accepted as a commonplace fact, but I do not wish to approach the important question of Train Accidents from the point of view that our record is excellent, but rather from the fact that a large proportion of the accidents were due to want of care on the part of the staff and were, therefore, avoidable.

If you peruse page 3 of the “Prevention of Accidents to Staff” booklet you will see that each hint is based upon the lessons learned from actual cases of injury, thus assisting us to profit by the unfortunate experiences of our colleagues, and I have adopted this principle as the basis of the following hints for signalmen in connection with Train Accidents, which I have described as the Operating Department’s Enemy No. 1 owing to their serious dual effect on our Safety and Punctuality.
There are twelve main causes of train accidents for which signalmen have been responsible, namely:

**Cause No. 1.**—Trains being irregularly admitted into sections occupied by other trains or portions of other trains.

**Cause No. 2.**—Signalmen overlooking stationary engines, trains or vehicles inside the home signal when accepting other trains from the signal box in the rear or when lowering signals for trains to go forward.

**Cause No. 3.**—Obstructing the line inside the home signal irregularly, either by reversing facing points towards an occupied line or authorising other movements, before an approaching train accepted under Regulation 4 has come to a stand at the home signal.

**Cause No. 4.**—Failing to pull over the correct levers for shunting movements, particularly when shunting engines or trains from a line or siding on to a running line in order to proceed into the advance section, with the result that engines or trains have gone forward on the wrong line undetected.

**Cause No. 5.**—Failing to carry out the Rules and Regulations during repairs to the permanent way, points or signals, resulting in trains passing over lines or points which were unsafe.

**Cause No. 6.**—Failing to properly warn drivers in accordance with the Permissive Regulations before allowing trains to enter a section occupied by another train.

**Cause No. 7.**—Failure to make use of the speaking instruments as required by Regulation 24 (b) (i) before switching in when opening a signal box.

**Cause No. 8.**—Failing to carry out the rules governing the operation of fixed signals.

**Cause No. 9.**—Moving points irregularly.
Cause No. 10.—Failing to carry out the appropriate rules and instructions when safety devices do not permit of the normal working of levers or appliances.

Cause No. 11.—Want of care when conversing with other signalmen or staff, either by speaking instrument or otherwise, respecting the movements of trains or vehicles.

Cause No. 12.—Allowing unauthorised persons to operate the block instruments and levers.

It is impossible to cover in this booklet every type of Train Accident caused by signalmen so, before dealing in greater detail with these twelve main causes, I wish to emphasise the important fact that in almost every accident there were two underlying causes:

(A) Failure to observe the appropriate regulation, instruction or rule.

(B) Lack of Watchfulness.

With regard to (A), I wish to stress the need for signalmen to be fully conversant with the regulations, instructions and rules affecting them and prepared to carry them out promptly; each of these regulations, instructions and rules has been carefully framed to help you to carry out your duties efficiently.

So far as (B) is concerned, watchfulness on the part of a signalman is of the greatest importance, both before a movement is authorised and until it is completed or has passed beyond his control, whether the movement be with a train or a shunt.

One of every four of the train accidents caused by signalmen during the last five years was due to an obstruction within the signalman’s view being overlooked.

Watchfulness will help you to carry out your duties properly with particular reference to the prompt application of the emergency regulations when the necessity arises, and will also assist in preventing you from being misled by, or misunderstanding, other members of the staff.
Let me end my remarks on Watchfulness by warning you against three great dangers, each concerning yourself:—

(a) Be on your guard against that type of familiarity with your task which the old proverb says breeds contempt. Need I say more on this point than that a high proportion of these accidents were caused by signalmen of long experience, and inquiries suggested they were “taking too much for granted”.

(b) Do not think you may commit a minor irregularity without risk; you cannot, and many men who have committed minor irregularities have misled themselves or their colleagues into major mistakes.

(c) When in doubt do not take any risks; it is much better to err on the side of caution.

**CAUSE No. 1.**

These cases are generally described by signalmen as “two in a section”, and my first general hint is in connection with the train register book.

If you will use this book correctly by making the necessary entries carefully and promptly you will find it a valuable record of the state of the line, a great aid to your memory, and of considerable assistance in guarding against some of the irregularities described below which have led to this type of train accident. If you have a signal box lad make him understand that he must enter only those signals which he sees or hears given or received, or is told by you to enter, and that he must not, in any circumstances, assume he has missed or overlooked any signals, but must consult you immediately if he is in doubt respecting any signals being given or received, or if any signals are not in proper sequence with the signals he has entered in the train register book.

If this is done you can at once review the position and probably detect any differences or irregularities in time to prevent them leading to accidents.
The second general hint is in connection with the fog regulations. When your fog object is obscured you must at once take steps to provide drivers and yourself with the authorised additional assistance and, unless you have special instructions to the contrary, carry out clause (e) of Regulation 4, and Rule 94, using emergency detonator placers where provided whether fogsignalmen are on duty or not; also enter in the train register book the time each fogsignalman commences and leaves duty so that you will not have to rely on your memory but will know when Regulation 4 (e) applies.

The causes of these Train Accidents may be divided under two heads:—

(i) Signalmen irregularly authorising trains to approach from the box in rear.

(ii) Signalmen irregularly authorising trains to go forward to the signal box in advance.

The irregularities (i) have caused the most serious accidents for which signalmen have been responsible, and I cannot urge you too strongly to guard against these mistakes and note specially the following points:—

(a) Pay the utmost attention to your vitally important duty of seeing the tail lamp or receiving other information as required by regulation that a train is complete; never "think" you have seen the tail lamp or that a train has passed you unobserved, otherwise another train may be admitted into the rear section whilst it is occupied by a train or portion of a train.

(b) Never assume, in any circumstances, that your block indicator for the rear section is at the "Train on Line" position because you have forgotten to give the "Train out of Section" signal for a train which has passed you, even if the train register book confirms the assumption; it is very probable that the block indicator is correctly telling you that there is a train in the rear section.
and that you have momentarily overlooked it and even forgotten to enter the signals in connection with it in your train register book. Make sure of the facts before you give the “Train out of Section” signal and accept another train.

(c) When dealing with trains, particularly where there is more than one up and one down line, take care that you are using the correct block instrument before transmitting or accepting any block bell signals.

(d) When assisted by a fogsignalman during fog or falling snow, have a clear understanding with him respecting the observation of the tail lamp and see that it is strictly carried out before giving the “Train out of Section” signal for any train.

(e) Where an additional home signal is provided at least ¼ mile in rear of the home signal the Is line Clear signal must not be acknowledged in accordance with Regulation 4 during fog or falling snow when the line is clear only to the inner home signal, unless fogsignalmen are on duty at the distant signal and outermost home signal.

Irregularities (ii) also have caused serious train accidents but they can be generally prevented if you look carefully at your correct block instrument before lowering the last stop signal. You must, however, make proper use of the block indicator which is provided to give you a visual indication of the position of the section of line to which it applies.

If you fail to give the “Train Entering Section” signal as required by Regulation 3 a train will be in the advance section but the block indicator will be telling not only you, but the signalman at the box in advance, that the section is clear. This false indication may mislead you into irregularly allowing a second train to go forward because you think the “Line Clear” indication is correct.

Again, if you give the “Train Entering Section” signal prematurely, the block indicator will tell you, and the
signalman at the box in advance, that a train is in a section which, in fact, is clear.

Perhaps you may wonder how danger can arise if a clear section is shown to be occupied, so let me explain. If you give the “Train Entering Section” signal prematurely for a train which is approaching or at your box you have to remember that there is not a train in the advance section although the indicator shows “Train on line”. You have to remember, and, so long as you remember correctly, all may be well, but is your memory infallible? Suppose the indicator for the advance section is correctly at the “Train on line” position for a train actually in the section when you have a second train approaching or at your box to proceed on the same line, may you not temporarily overlook the train which is in the section and, thinking that the indicator is at “Train on line” because you have, as on previous occasions, given prematurely the “Train Entering Section” signal for the train which is approaching or at your box, irregularly lower your signals for that train to go forward. Other signalmen have made this serious mistake so why not you, if you needlessly, and irregularly, set yourself such a trap.

The only safe way is to carry out the regulations and see that your block indicators give you a true, not a false, indication. Also, how can the signalman at the box in advance carry out Regulation 11 if you either fail to give the “Train Entering Section” signal or give it prematurely.

Another point; unless you have instructions to the contrary, be careful to give the “Call Attention” signal and receive the acknowledgment before giving the “Train Entering Section” signal so that you will know your colleague, who controls the block indicator, is in attendance and prepared to place the block indicator at the correct position.

One further hint to prevent these cases—place your fixed signals to danger promptly, as required by rule, when a train has entered the advance section, otherwise they may be taken by a following train before you detect that your signals have been left off too long.
CAUSE No. 2.

These cases emphasise in the strongest possible manner the need for watchfulness, so that the area of the lines visible from the box is carefully scrutinised during all movements on or across them, and always before an "Is line clear?" signal is accepted or the fixed signals lowered for another train.

As already pointed out, one in every four of the train accidents caused by signalmen during the last five years was due to an obstruction within the signalman's view being overlooked.

The greatest care must also be taken to ensure that all engines, trains or vehicles are properly protected as required by the Train Signalling Regulations, rules or instructions, with special reference to Regulations 10, 12, 13 and 13a, Rule 114, and the instructions respecting the use of lever clips and the special appliances for placing on the commutators or handles of the Block Instruments.

Before leaving this question of protection let me remind you of the need for reporting all cases where Rule 65 is not carried out immediately or not carried out at all. This rule is for your protection and designed to prevent you from overlooking obstructing trains and vehicles.

CAUSE No. 3.

Signalmen will readily appreciate how these cases can be prevented, and the accidents which these irregularities have caused demonstrate the need for keeping the line clear and not authorising any conflicting movement within the required distance from the home signal, whilst the train accepted under Regulation 4 is approaching.

Also, do not overlook that you are required by Regulation 4 (a) to have all the points necessary for the safety of the approaching train in their proper position, and facing points bolted where bolts are provided, before you accept a train under that regulation, and you must keep the points in those positions until you are authorised to move them.
CAUSE No. 4.

Here again "watchfulness" is the important preventative.

Take care to set the points correctly and use your fixed signals where provided to obtain the benefit of the interlocking; also see that the movements travel in the required direction, particularly when shunting engines or trains from a side line on to a running line, otherwise trains may proceed undetected in the wrong direction.

CAUSE No. 5.

Many of these cases have been dealt with in the booklet "Notes on Rules 77 and 78", which should be carefully studied, but I must here emphasise four main points:—

1. See that you have a complete understanding with the ganger, lineman, man in charge, or other authorised person before the work is commenced and that the necessary entries have been made in the train register book and signed.

2. When the locking is disarranged or points or signals are disconnected or under repair, remember the handsignalman must act under your instructions and that you are required by rule to see that he understands what he has to do.

3. Before you authorise any movement over the points affected give the handsignalman clear instructions and get an assurance from him that all the points over which the train requires to pass are in their proper positions and clipped.

4. Maintain these precautions, or continue to regard the line concerned as obstructed, until the man in charge or other authorised person informs you the work is completed or the obstruction has been removed, and any locking affected has been tested and found to be correct, and the necessary entry made in the train register book and
signed. Do not attempt to save a few minutes' delay by using some unauthorised arrangement for ascertaining the line is clear, otherwise misunderstandings and accidents will undoubtedly occur.

CAUSE No. 6.

The Rules and Regulations provide specific ways for the warning of drivers before they are allowed to enter occupied sections, and there are two points for you to watch when you have authority for trains to proceed under any of the Permissive Regulations:

(i) Do not let a driver proceed into an obstructed section until he has been warned, and see that he understands that he has been warned.

(ii) Remember the driver knows how he should be warned in such circumstances and will, therefore, understand an authorised warning, so do not use a method of your own to warn the driver and expect him to understand you.

If you require to stop a train by a hand signal from a signal box use the authorised hand danger signal so that the driver will know he must not move again, although the hand danger signal may be withdrawn, until you have exhibited a green hand signal.

CAUSE No. 7.

The failure to comply with this important part of Regulation 24, i.e., clause (b) (i), has led to serious accidents.

Unless special instructions are issued to the contrary, you should regard the observance of this clause as the first duty when opening a signal box, so that you will have full information of all matters necessary to enable you to discharge your duties properly BEFORE you switch in.
There are seven main features respecting the working of fixed signals:—

I. They should not be lowered to authorise a movement until the necessary Regulations, Rules or instructions have been complied with.

II. They should be restored to danger or caution promptly so that they will at once protect the train which has passed against anything following, but take care not to restore them prematurely otherwise a driver may stop a train at a point where you consider the line is clear.

III. The movement of a signal lever does not guarantee that the signal will respond, and it is the indication of the signal, not the position of the lever, which controls the movement of trains.

Do not, therefore, overlook the importance of seeing, as required by rule, that your signals respond to your levers, and keep a careful eye on your signal light repeaters.

IV. After a signal has been lowered for a train to start and you find it necessary to replace the signal to danger before the train starts, you must not obstruct the line to which the signal applies or reverse points ahead of the train until you have satisfied yourself that the driver knows the signal has been reversed.

V. In the event of it being necessary for a passenger train or other train composed of coaching stock, or a freight train signalled with the “Is Line Clear?” signal, 5 consecutive beats, to be run from one line to another through a junction over which it is necessary that speed should be reduced, and such route is not the booked route of the train, the distant signal applicable to the line upon which the train is approaching must be kept at Caution and the home signal
must not be taken off until the train has passed the distant signal.

Do not overlook that the "booked route of the train" is that booked in the Working Time Table or Special Train Notice, and does not mean any temporary alteration required by Permanent Way repairs, etc., even if shown in the Fortnightly Notices or Supplementary Notices.

VI. When a signal is defective but the interlocking is in order, the man in charge of the work must disconnect the signal and you must use the lever applicable to such signal to obtain the benefit of the interlocking.

VII. When it is necessary for a train to pass at danger a defective stop signal, before a handsignalmann takes up his duties, and there are facing points or switch diamonds in advance of the signal, you must fulfil one of the two following conditions before you authorise a driver to pass the signal at danger:

(a) If the defective stop signal is in rear of the box you must satisfy yourself that the facing points or switch diamonds are set in position for the line over which the train has to run,

or

(b) If the defective signal is in advance of the box you must stop the driver at the box, explain the circumstances to him, intimate over which line he is required to proceed, and request him to see that the facing points or switch diamonds are set in position for that line before taking the train over them.

Train accidents have been caused by signalmen failing to observe one or more of these seven elementary precautions.
CAUSE No. 9.

The greatest care must be exercised when operating points, otherwise you may reverse them under a movement and cause a derailment which will obstruct another line on which a train is approaching, or turn a train or shunt without any warning to the men in charge of it from a clear line on to an obstructed one.

Also, if you are at a junction or other diverting point, and not in a position to set up the route required for a train until the train is closely approaching the stop signals at such diverting point, you must not commence to move the points and set the required route unless you have satisfied yourself, as far as practicable, that, having regard to the position and speed of the train, it is safe to do so.

CAUSE No. 10.

The various safety devices, including repeaters, track circuits, rotary block, interlocking block, fouling bars, detectors, etc., have been provided specially to help you to carry out your duties efficiently, based on safety and punctuality in that order. If these devices do not permit of the normal working of levers or appliances you must assume at once that they are carrying out their functions, or, in other words, are doing exactly what they have been designed to do, and take the necessary steps for traffic movements to be made only in accordance with the appropriate emergency rules and instructions. Even if, as occasionally happens, you later find the devices are out of order, you must realise you have lost their aid and take the precautions required by the rules until the devices are put right and again rendering you service.

Let me illustrate what may happen if you disregard this warning by giving you two of many examples, using the Junction Diagram on page 10 of the Absolute Block Regulations book and calling the line A to C the up main line, B to D the up branch line and the lines from C and D towards A as the corresponding down lines.
Case 1. The signalman at B decided there was just time, before an up express passenger train was due, to shunt a light engine standing on the up branch line on to the down main line via the up main line and the crossover road, but as the junction facing points were set and locked for C they were run through and badly damaged when the light engine was shunted. This fact escaped the notice of the signalman who quickly restored the crossover road points to the normal position, accepted the express passenger train from A, got it accepted by C and then tried to lower the up main line signals, but the detector at the damaged facing points held the up main line home signal at danger. The signalman, however, thought the signal was faulty instead of assuming at once that the detector was functioning, and when the express was approaching he centred his attention on avoiding delay instead of thinking first of safety and the rules, hurried out of the box and exhibited a green hand signal to the driver. The driver, unlike the signalman, thought first of the rules, stopped the train, looked at the facing points, found the damage, and an accident was avoided.

Case 2. In this case interlocking block was in operation between boxes B and A on the down line and consequently the down starting signal at B could be lowered only when the down line block indicator for A was at the Line Clear position; also the signal could be lowered once only for each time the block indicator was placed by A at the Line Clear position.

The signalman at B obtained a path for a passenger train from D to proceed to A over the down line and lowered the signals, but when the train passed B towards A the signalman omitted to give the "Train Entering Section" signal. He correctly restored the signals and points when the train had passed and then accepted another
passenger train from C which required to proceed to A. When this train was approaching B on the down line the signals were at danger and the driver sounded the whistle. By this time the signalman at B had forgotten the first train from D, looked at his down line indicator for A, saw it was at the Line Clear position, concluded that A had accepted the train from C and tried to lower the down line signals for it to proceed. The down starting signal, of course, was held at danger as the only Line Clear release which had been given by A was for the train from D, and when B placed the starting signal to danger after this train had passed the Line Clear release was cancelled.

The signalman at B, however, thought the signal had temporarily failed instead of at once assuming that the interlocking block device was functioning correctly, so he asked the signalman at A by telephone for another Line Clear release. This request was complied with irregularly by the signalman at A, with the result that the down starting signal at B was lowered for the train from C and it proceeded towards A while the first train was still in the section and a serious collision occurred. There would not have been a collision if the signalman at B had carried out the appropriate instruction when he could not lower the down starting signal, and authorised the driver to pass the signal at danger and proceed cautiously through the section prepared to stop short of any obstruction.

**CAUSE No. 11.**

Serious accidents have resulted from misunderstandings between signalmen in the same signal box, or other signal boxes, and between signalmen and other staff owing to want of care when conversing respecting train and shunting movements.
Communications between signalmen in regard to train signalling should be made by means of the block bells in accordance with the Regulations, and, as far as possible, signalmen should refrain from making use of the telephone for this purpose. Whenever it is necessary for the telephone to be used respecting the actual Block working of trains, signalmen must first give the name of their signal box, be quite clear to whom they are speaking, and then in all cases give the full description of the train about which inquiries are being made so that there may be no risk of any misunderstanding as to the particular train referred to.

Great care must also be exercised in all conversations between signalmen in the same box, or with other staff respecting train or shunting movements, the full description of any trains or lines concerned being given; do not use any local terms or slovenly expression as, although your regular colleagues may understand you, such terms and expressions may seriously mislead a reliefman, guard or driver.

**CAUSE No. 12.**

This cause is quite distinct from any other because a signalman who allows an unauthorised person to work the block instruments or levers does it deliberately, although fully aware he is breaking very definite rules and instructions.

I feel sure we shall never have another case of this kind if signalmen will realise that this irregular working seriously jeopardises the safety of their colleagues and our passengers.

Also do not overlook that it is always a temptation for a signal box lad or a porter or clerk visiting the box for some purpose, to “take a hand”. This should be definitely forbidden by signalmen in charge.
CONTRIBUTORY CAUSES.

So far I have dealt with main causes only, but there are three contributory causes which are of the greatest importance:

1. You will be aware Rule 39 (a) requires that when a stop signal is at Danger the next stop signal in rear of it worked from the same signal box must not be lowered for an approaching train until the train is close to such signal and has been brought quite, or nearly, to a stand.

The rule, therefore, requires two conditions to be fulfilled before the rear signal is lowered:

   (a) The train must be close to such signal, and

   (b) The train must be quite, or nearly, at a stand.

The list of train accidents and irregularities, which have been contributed to by signalmen lowering the rear signal before these two conditions have been fulfilled, is a lengthy one.

The object of the rule is to intimate to drivers that the stop signal ahead is at danger, and for you to satisfy yourself he has noted this fact. Do not, therefore, mislead drivers by lowering the rear signal prematurely, otherwise you may find you have contributed to a train irregularly entering an obstructed section before you can take effective action to prevent it.

2. Signalmen have contributed to accidents by failing to warn drivers as required by the Regulation when the trains have been accepted by the box in advance under Regulation 5 (Warning arrangement).

Signalmen should realise that it is just as important for them to warn a driver, as required by this Regulation, as it is for them not to obstruct the line inside the home signal after they have accepted a train under Regulation 4.
Let me add one further word on this important question of warning drivers, whether as required by Rule 39 (a), Regulation 5, Station Yard Working, the Permissive Regulations, or any other Regulation or Rule.

These particular Rules and Regulations have been issued because experience has proved they are necessary for safe working, and it is not the information which you possess, but the information which you give the driver, which contributes to safe operating, for the driver, not you, is working the train.

3. Be prepared to carry out Regulation 11, and remember that its value depends on you applying it as soon as an unusual time has elapsed between the receipt of the "Train Entering Section" signal and the time you should be able to determine the train is approaching.

These hints would not be complete without a warning to those signalmen on single lines worked under the Electric Token Block Regulations.

Take great care of your tokens; do not leave them lying about or you may deliver a wrong token to a driver; hand them only to the authorised staff, and however sure you may feel that you have got the correct token, make a practice of seeing that it is the correct one immediately before you deliver it.

Never allow a token to remain out of the instrument when you have received it after use even though it may be again required for shunting later on.