MINISTRY OF TRANSPORT

RAILWAY ACCIDENTS

REPORT ON THE COLLISION

which occurred on 18th August 1952 between DALMARNOCK and BRIDGETON CROSS in the SCOTTISH REGION BRITISH RAILWAYS

LONDON : HER MAJESTY'S STATIONERY OFFICE

1953

SIXPENCE NET

MINISTRY OF TRANSPORT,
Berkeley Square House,
London, W.1.
30th October, 1952.

SIR,

I have the honour to report for the information of the Minister of Transport, in accordance with the Order of 21st August, 1952, the result of my Inquiry into the collision between two passenger trains which occurred at about 12.40 p.m. on 18th August, 1952, in the tunnel between Dalmarnock and Bridgeton Cross Stations on the Glasgow Central Low Level line in the Scottish Region, British Railways.

Although the circumstances of the collision revealed serious irregularities, the consequences were fortunately small. One passenger and three railwaymen were slightly injured, and damage to engine and rolling stock was negligible.

The trains concerned were the 12.30 p.m. Rutherglen to Possil, and the 12.35 p.m. Rutherglen to Balloch. The Possil train consisted of a Class 3 passenger tank engine and three coaches, weighing altogether 155 tons, and the Balloch train comprised a Class 4 M.T. tank engine and four coaches, weighing 193 tons. The brakes of both trains were off at the time.

DESCRIPTION

The Line.

The Glasgow Central Low Level double line commences at Strathclyde Junction and runs through Dalmarnock, Bridgeton Cross, Glasgow Green, and thence north and west through Glasgow. At Bridgeton Cross, it is joined by the line from Carmyle and Parkhead. Between Dalmarnock and Bridgeton Cross, which is the Down direction, it rises at gradients of 1 in 130 for 198 yards, 1 in 750 for 308 yards and 1 in 642 for 396 yards. From Dalmarnock Station to Bridgeton Cross Down Home signal, a distance of 766 yards, it is in tunnel, curving to the left at a radius of 16 chains for 80 yards after leaving Dalmarnock, and thereafter running straight. The collision occurred on the Down line in the tunnel about 150 yards before it emerged into Bridgeton Cross Station.

The Signalling.

Block working is controlled by the Tyer's Electric Lock and Block System. Details of the interlocking and electrical controls which are particularly relevant to this accident are :—

(*a*) When the signalman at Bridgeton Cross has accepted one train from Dalmarnock, it is impossible for him to accept another until the first train has passed through the section and depressed a treadle which is situated in advance of the Starting signal into the next section ahead (Bridgeton Cross – Glasgow Green).

(*b*) The Starting signal at Bridgeton Cross requires a Line Clear release from Glasgow Green for each occasion that it is pulled. The signal lever is check locked to the normal position, and requires the acknowledgment of "Train entering Section" from Glasgow Green before it can be fully restored to normal. "Train out of Section", moreover, cannot be given to Dalmarnock until the Starting signal is restored to Danger.

(*c*) For emergency purposes, in order to free the block in the event of cancellation or treadle failure, a "Relieving Instrument" is provided. This instrument normally requires the co-operation of the signalmen in the signal boxes on either side, using similar instruments, before it can be operated.

Bridgeton Cross, however, is the first signal box in the line of boxes having these instruments, and only requires the co-operation of Glasgow Green. The next signal box, at Dalmarnock, is equipped with an independent release of a different type.

The effect of these arrangements is, therefore, to ensure that the line is clear for the train to proceed into the next section, and that it has actually done so, before the block in rear can be restored to normal for the acceptance of another train. Moreover, any variation of this sequence requires the simultaneous co-operation of the signalmen on either side.

A description of the relieving instrument and its method of operation is given in Appendix "A" at the end of this Report.

The Accident.

The 12.30 p.m. Rutherglen to Possil train was accepted by Bridgeton Cross from Dalmarnock at 12.31 p.m., and was at once offered to Glasgow Green, who also accepted it. The signalman at Bridgeton Cross then pulled off his Down Home No. 1, Home No. 2, Starting and Distant signals for it. (The Distant signal is slotted on the Dalmarnock Down Starting signal).

The train made a booked stop at Dalmarnock at 12.34 p.m., departing into the tunnel to Bridgeton Cross at 12.35 p.m. "Train entering Section" was given to Bridgeton Cross at the same time.

Owing to lack of steam, the train encountered difficulty on the rising gradient and came almost to a stand in the tunnel at a point about 150 yards from Bridgeton Cross. It had, however, passed over the treadle in advance of the Dalmarnock Starting signal, and thus released the block in rear for the acceptance of another train up to that signal.

At 12.37 p.m. the signalman at Dalmarnock, who knew nothing of the engine failure, accepted the following train, the 12.35 p.m. Rutherglen to Balloch, but he could not offer it forward as he had not received "Train out of Section" for the previous train. After the usual time had passed by which the train should normally have cleared the section ahead, which was about 2 – 3 minutes, he telephoned to Bridgeton Cross to ask about it.

On receiving the enquiry from Dalmarnock the signalman at Bridgeton Cross, who was making himself some tea and warming his lunch at the time, at once jumped to the conclusion that the train must have passed, that he had failed to notice it, and that there had been a treadle failure. He thereupon irregularly accepted the second train, with the result that the 12.35 p.m. was allowed into the section while the failing 12.30 p.m. train was still in it, and the collision followed.

In order to be able to accept the second train the signalman at Bridgeton Cross cleared the Dalmarnock Block instrument by forcing open the relieving instrument and operating it without the co-operation of the Glasgow Green signalman.

Evidence

Signalling Equipment.

The equipment was examined immediately after the accident and found to be fully in order. One irregularity was discovered. A piece of steel wire, roughly bent into the form of a spiral spring, had been inserted between the lever lock armature and the locking dog apparatus of the Down Starting (to Glasgow Green) and Up Home (from Parkhead) signal levers. The same thing was found on the Down Starting signal lever lock at Glasgow Green. The purpose of these coils is discussed later, but it is unlikely that it was connected with the circumstances of the collision.

The Engine.

The engine of the 12.30 p.m. train, which encountered steaming difficulty, was No. 40186, Class 3 PT standard tank type, with 2-6-2 wheel arrangement, and it was travelling with bunker leading at the time. Subsequent examination showed that it was in good condition and also that it was a good steamer. The reason for its failure on this occasion was that the fireman had been accustomed to a different type of engine, and had not previously worked this type. Moreover, he had only joined the train at Rutherglen a few minutes earlier, and had not time to adjust himself to the injector controls and method of firing.

Railway Staff.

Driver J. Duric, of the 12.30 p.m. train, said that the train proceeded normally until it passed Dalmarnock, when the engine began to lose steam and the brakes to rub. He thought the cause of the trouble was that the fireman experienced diffieulty with the injector.

The train did not come to a complete stand, but it lost about two minutes in the tunnel. Then the collision occurred, and the train was pushed forward about 100 yards, although the vacuum pipe had been broken by the impact and the brakes were fully applied.

Driver A. Fraser, of the 12.35 p.m. train, said that he had clear signals from Strathclyde Junction, and that when he passed Dalmarnock and entered the tunnel, the Bridgeton Cross Distant was off. Conditions in the tunnel were smoky and he did not see the tail lamp of the 12.30 p.m. before the collision took place.

Fraser thought that his train was travelling at about 15 m.p.h. at the time.

Signalman J. Mellin was on duty in Dalmarnock Signal box. He said that the 12.30 p.m. train left Dalmarnock at about 12.35 p.m., and appeared to be running normally. He thought it took a little longer than usual to strike the treadle, which was 400 yards ahead, but it was not enough to cause concern. At 12.37 p.m. he accepted the 12.35 p.m. train from Strathclyde Junetion and awaited the "Train out of Section" signal from Bridgeton Cross for the 12.30 p.m. train.

When the time had passed by which this train should have left Bridgeton Cross, and no signal having been received, Mellin telephoned to the signalman at Bridgeton Cross and asked about the train. He did not hear the reply, but almost immediately, at 12.38 p.m., he received the "Train out of Section" signal, which allowed him, in turn, to offer the 12.35 p.m. to Bridgeton Cross. An immediate acceptance was given, and Mellin pulled off the Starting signal. The 12.35 p.m. train then entered the section at 12.40 p.m. Shortly afterwards, the signalman at Bridgeton Cross told him on the telephone that there had been an accident.

Signalman H. McLaughlin, who was on duty at Bridgeton Cross, was 50 years of age, and joined the railway service in 1919. He had been a signalman for over 20 years, and since 1948 had been Rest Day Relief Signalman, stationed at Partick West. His experience extended to many signal boxes, for the most part in the Glasgow area, and he had relieved at Bridgeton Cross frequently.

He said that, on this occasion, the 12.30 p.m. train was offered in the usual way. He accepted it, and offered it on to Glasgow Green, who also accepted. He then pulled off his Home, Starting and Distant signals.

McLaughlin continued that he was making tea and warming his lunch at the time. He was not busy as he was dealing with only one other train, which was on the block to Parkhead. He explained that the Bridgeton Cross signalbox was large and that the stove was situated behind the frame, and on the far side of the box from the Dalmarnock line. It was therefore possible for a train to pass on this line, and escape his notice if he was not watching. While he was eating his lunch, he received the "Train entering Section" signal from Dalmarnock for the 12.30 p.m. train and, after acknowledging it, he continued with his meal.

After about five minutes, the signalman at Dalmarnock asked on the telephone whether the train had cleared the section. McLaughlin said that he glanced at the clock and, without looking at the indications on his instruments, immediately concluded that the train must have passed unnoticed. He thereupon hastily threw back his signals, irregularly opened and used the relieving instrument to clear the Dalmarnock Block, gave "Train out of Section" for the 12.30 p.m., accepted the 12.35 p.m. train, and finally pulled off

his signals again. McLaughlin said that, as soon as he had done this, it occurred to him that he should not have been able to pull the Starting signal a second time, and he then realised that the 12.30 p.m. train had not passed, and that he had allowed two trains into the section at the same time. By this time, however, the "Train entering Section" signal for the 12.35 p.m. had already been received from Dalmarnock, and there was nothing he could do, but he at once telephoned to Dalmarnock and told the signalman of his mistake. As he was doing this he heard the sound of the collision.

It should be noted that, in putting back the signals in the first place, the Starting signal lever cannot have been fully restored in the frame, as it would have been held by the check lock in the three-quarter restored position until "Train entering Section" had been acknowledged by Glasgow Green. This signal, however, had not been sent. Moreover, if the check lock had been overcome by some means, and the Starting signal lever had been fully restored, it would have been impossible to pull it a second time without obtaining another acceptance from Glasgow Green. It appears, therefore, that the signalman, in restoring this Starting signal and pulling it again, failed to realise, until too late, that the lever was not fully restored in the frame, and that he should not have been able to pull it a second time.

McLaughlin said that his sole purpose in acting as he did was to save delay. So far as the Starting signal was concerned, he said that he was convinced that he had restored it fully in the frame, but he also realised that if he had done so, he would not have been able to pull it again without another "Line Clear" from Glasgow Green.

McLaughlin was closely questioned about his method of opening the relieving instrument, and he explained that it was a knack learned many years ago, by means of which he could "jump" the hook out of the electric lock which was holding it, and thus open the door.

He said that he had used the method in other signal boxes as well as Bridgeton Cross, and he admitted that he had "been doing it so long it has become a habit". He thought that he was not the only signalman who acted in this way, and he added "we do it generally when a Cancel signal is sent rather than go through the proper means. It saves time and it is convenient". He agreed that when he used it, the signalman on either side must have known what he had done, but he had never been challenged. He thought that linemen might not know about it, because signalmen would not do it if they were in the box. He himself had never done it when a lineman was present, because he knew he would be challenged.

With regard to the pieces of wire in the lever blocks, McLaughlin said that he had never been underneath the floor of the signalbox, nor did he know anything about the wires. Even if they did allow the check locks to be overcome improperly, he could not see what advantage there would be.

District Traffic Inspector M. Taylor said that he had known McLaughlin for a long time and held a high opinion of him. He was not a man who would be likely to lose his head in an emergency, and he had never known him to be careless.

Mr. Taylor did not think that the irregular method of opening relieving instruments was common knowledge among signalmen, although he did remember a case which had come to light at Glasgow Green about two years before. This had been reported at the time.

Mr. Taylor could see no point in the wire coils in the locking mechanism.

Five other signalmen who were working, or had previously worked, at Bridgeton Cross were questioned about the relieving instrument, but all denied any knowledge of its irregular use or of the method.

Relief Telegraph Lineman T. Dobie said that Bridgeton Cross signalbox had been in his care for about eight months. He examined the locking about once a month, and the last occasion was 28th July, three weeks before the accident. Everything was then correct, and he was quite certain that there was no piece of wire in the lever lock. He had no idea why it was there at the time of the accident, and said it would not have been for the purpose of adjusting the lock. Dobie had never heard of the method of opening the relieving instrument which had been disclosed. If he had, he would have reported it at once.

Conclusion

The collision was caused and made possible by the irregular actions of Signalman McLaughlin, who allowed two trains into the section at the same time by tampering with an instrument, and thus destroying the very adequate protection afforded by the signalling installation.

Remarks

McLaughlin's actions are difficult to understand, the more so because of his long experience and good record. He himself said that he could not account for them, and the only explanation which he advanced, that he was anxious to save delay, though doubtless true, is hardly sufficient. It should be recorded, however, that a few weeks earlier some question had been raised with him about delay to trains, and this may have been uppermost in his mind at the time. His actions in putting back his signals, manipulating the relieving instrument, releasing the block control, giving "Train out of Section" for the first train, accepting the second, and pulling off the signals again, were too deliberate and calculated to have been done on a sudden thoughtless impulse. McLaughlin should have been too experienced to lose his head ; nevertheless, that he did so completely on this occasion seems to be the only explanation.

However, to assume a treadle failure and attempt to operate the relieving instrument, properly or improperly, without looking at the indications on the block instruments which would have clearly shewn the position, and to pull a signal lever, which instinct alone must have told a signalman of his experience that he should not be able to pull, were actions for which no explanation can be found.

These were serious mistakes, but they would all have been avoided if it had not been for the irregular opening and use of the relieving instrument. This was plain wrong doing, which McLaughlin admitted had been his practice for so long that it had become a habit. In other words, it was his habit, in the full knowledge of what he was doing, to destroy the protection afforded by the signalling apparatus and so to jeopardize the safety of both passengers and train crews. For this there can be no excuse.

Although a number of signalmen stated in evidence that this wrongful method of cancelling was unknown to them, I have no doubt that it was widely known, if not practised, in the area. As District Traffic Inspector Taylor stated in his evidence, a similar case was discovered in Glasgow Green signal box two years ago. Moreover, whenever a cancellation was effected in this way by McLaughlin, the signalman on either side, whose co-operation should have been necessary, can hardly have failed to notice, and the dangers of the practice must have been immediately obvious to them.

So far as the wire coil in the Starting signal lever lock is concerned, I do not think that it had any direct connection with this accident. Tests were made afterwards to try and overcome the check lock on the Starting signal, and by using great force it was found possible, with the aid of the coil, to bounce the locking dog and free the lock. The force required, however, was so great that it could not have been used often without seriously damaging the frame ; also, from a signalman's point of view, nothing was to be gained by overcoming the lock. Altogether three locks in two signal boxes were found to have been adjusted in this way. The only explanation which seems possible is that the coils would assist the working of the locks if the batteries were allowed to run down and the voltages to drop. This would be the responsibility of the lineman and not that of a signalman. Be this as it may, tampering with the mechanism of a lock is as wrong and dangerous as tampering with an instrument.

All relieving instruments have now been examined and, where necessary, altered so that it is no longer possible to open them in the manner disclosed by this accident.

I have the honour to be,
Sir,
Your obedient Servant,
R. J. WALKER,
Colonel.

The Secretary,
Ministry of Transport.

APPENDIX A.

1. DESCRIPTION OF THE RELIEVING INSTRUMENT AND ITS METHOD OF OPERATION.

"In the event of either a train being cancelled or a treadle failure, cancelling instruments are provided which enable the signalman to clear his block. In the boxes Stobcross Junction to Bridgeton Cross inclusive, these consist of a rectangular box in two portions, the upper consisting of a door fitted with an electric lock behind which are provided push-buttons or keys for releasing the circuits concerned. The lower portion of the box consists of a commutator and indicator with four indications, viz. :—"NORMAL", "RELEASE TO WEST", "RELEASE TO EAST", "KEY". Should a signalman require a release he communicates by a special bell signal with the boxes on either side of him. These boxes turn their commutators to "RELEASE TO" the appropriate direction and the signalman requiring the release turns his commutator to "KEY" releasing the lock of the upper portion of the instrument revealing the push-buttons or keys, the appropriate one of which must be used to release the block lock coil. During the time the upper door is open a buzzer rings continuously as a reminder to the signalman.

At Partick Central No. 1 and Kelvinbridge on the Stobcross Junction side and at Parkhead and Dalmarnock on the Bridgeton Cross side, a non-co-operative release is provided, i.e., to obtain the required release the signalman fractures a card-sealed box from which he procures a key to the box containing the push-button release. The Lineman is then sent for to re-seal the key in its place and the matter reported to the appropriate Officer on each occasion it is used."

2. EXTRACT FROM "REGULATIONS FOR TRAIN SIGNALLING ON DOUBLE LINES OF RAILWAY BY THE ELECTRIC LOCK AND BLOCK (TYER'S) SYSTEM" ISSUED TO SIGNALMEN.

"*Instructions for Working:*

If, for any of the purposes, and under the conditions set forth in sections (*b*) and (*c*) of this Regulation, the Signalman requires the electric locking to be relieved, he must advise the Signalman in the signal box in circuit on each side by telephone what he wishes to do, and explain to him fully why his assistance is necessary.

If both Signalmen are in a position to give the relief asked for, and are satisfied that it is in order to do so, they will intimate the fact by telephone.

When the necessary sanction is received, as prescribed in the preceding paragraph, the Signalman who wishes the electric locking released will send a special signal of 9 beats on the ringing key of the block instrument, thus—5–3–1—to the signal box in circuit on each side, and the Signalman in each box will acknowledge this signal by repeating it, and will immediately turn the disc of the instrument to the position which gives the relief wanted.

The Signalman requiring relief must thereupon turn the disc of the instrument to show the word "key", and on hearing the movement of the electric lock he must open the upper portion of the instrument and place the plug in position to give the needful service.

After release has been obtained, the Signalman must replace the plug in its normal position, close and hook the upper portion of the instrument, and indicate to the Signalman in the box in circuit on each side that the operation is completed, by sending a special signal of 9 beats on the ringing key of the block instrument, thus—3–1–5—and turn the disc of the instrument to "normal".

The Signalman in the box in circuit on each side will acknowledge this signal by repeating it, and will immediately thereafter turn the disc of the instrument to "normal".

A full record of the circumstances in each case must be inserted in the Train Register Book at each of the three boxes concerned, with the times at which the special signals are given and the time the operation is completed.

Clause (*e*) of this Regulation, as to the reporting of failures, must be strictly carried out, and a return of all the cases where authority has been asked, or granted, for the use of the relieving instrument must be sent weekly by each Signalman to the District Officer.

In signal boxes where the special arrangement terminates, the relieving instrument will be controlled from the signal box in circuit on one side only.

(*e*) All failures, from whatever cause, must be immediately reported by wire or other available means to the District Telecommunications Lineman, and to the Signal and Telecommunications Engineer, Glasgow, so that the failure may be rectified without delay.

Signalmen are specially cautioned not to resort to the key or to the relieving instrument until they are **quite satisfied** *that its use is really necessary under the circumstances indicated in these Regulations.*

Any improper use of the key or relieving instrument will be considered a serious offence".

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