MINISTRY OF TRANSPORT

RAILWAY ACCIDENT

Report on the Collision that occurred on 9th September 1968 at Castlecary

IN THE
SCOTTISH REGION
BRITISH RAILWAYS

LONDON: HER MAJESTY'S STATIONERY OFFICE
1970

SBN 11 550110 X

MINISTRY OF TRANSPORT,
ST. CHRISTOPHER HOUSE,
SOUTHWARK STREET,
LONDON, S.E.1.

30*th December* 1969.

SIR,

I have the honour to report for the information of the Minister of Transport, in accordance with the Order dated 9th September 1968, the result of my Inquiry into the collision that occurred at about 09.15 on that day at Castlecary about 16 miles from Glasgow on the Glasgow to Edinburgh main line, in the Scottish Region of British Railways.

The 08.46 six-car diesel multiple-unit passenger train from Glasgow Queen Street to Edinburgh was standing at a signal when it was run into in the rear by a diesel locomotive running light from Glasgow to Perth. The impact, which occurred at between 35 and 40 m.p.h. caused the locomotive to become embedded in the rear coach of the passenger train, the leading wheels of the rear bogie of which were derailed, as were the leading wheels of the locomotive. About 10 minutes after the collision fire broke out in the derailed coach, which was gutted. The locomotive cab was also wrecked by the impact and badly damaged by the fire.

I regret to report that both the Driver and Secondman on the locomotive were killed instantly in the collision and three passengers received slight injuries. Immediate assistance was rendered by the train crew and a railwayman and doctor who were travelling on the train. The emergency services were quickly called and on arrival gave valuable assistance.

Only very minor damage was done to the track, and after removal of the damaged locomotive and train the lines were reopened for normal traffic at 14.30 the same day.

On the morning of the accident there had been a track-circuit failure on the Up line which had resulted in an automatic signal at Castlecary being held at Danger. Successive trains had stopped at this signal and after telephoning the signalman at Greenhill Upper Junction had been authorised to pass the signal at Danger. When the Glasgow–Edinburgh train reached the signal however, the driver received instructions to wait until a train had cleared the junction ahead, a message not intended for him but for the driver of a Down train waiting at another signal, as a result of an error made by the signalman. A few minutes later when the diesel locomotive stopped at the signal in rear of the passenger train the signalman once again failed to realize to whom he was speaking and gave authority to pass the signal at Danger, thinking he was speaking to the driver of the passenger train.

After restarting, the driver of the locomotive failed to comply with the rule that required him, after being authorised to pass a signal at Danger, to proceed cautiously at such a speed as to enable him to stop short of any obstruction, and collided with the rear of the passenger train at a point where curvature of the line restricted the view ahead.

The collision occurred on an overcast autumn morning with occasional light showers and some misty patches. Visibility, however, was reasonable at the time when the collision occurred.

DESCRIPTION

The Site and Signalling

1. The double track main line between Edinburgh and Glasgow runs generally East and West, the Up direction being towards Edinburgh. The line is Class "A", and the maximum permitted speed is 75 m.p.h. There are no significant gradients. At Greenhill Upper Junction, 17 miles from Glasgow a double track spur connects the Glasgow to Edinburgh main line with the main line from Carstairs to Stirling, and this is now the normal route for passenger trains from Glasgow to Stirling and beyond.

2. The signalling in the area was rearranged in 1966, when the adjacent signalbox to Greenhill Upper, at Castlecary, was closed and Track Circuit Block working was introduced on both lines between Dullatur, 13 miles from Glasgow, and Greenhill Upper. There are three automatic signal sections on the Up line and two on the Down line. The signals on the Up line are all 4-aspect colour lights and are GU5C, 5B and 5A in sequence in the Up direction, the last acting as an inner distant to GU5, the junction home signal at Greenhill Upper Junction. A motor-operated distant semaphore arm, GU5CR, located on the same post as the Dullatur Up Starting signal and slotted by it, repeats the aspect of GU5C. All these signals are provided with AWS ground equipment.

3. Each of the automatic signals between Dullatur and Greenhill Upper is provided with a signalpost telephone, those on the Up line being connected, each by its own pair of wires, to a telephone concentrator in Greenhill Upper signalbox. The signalpost telephones on the Down line are similarly terminated in the signalbox at Dullatur. When a signalpost telephone handset is lifted by a trainman a calling lamp is lit on the concentrator and an audible warning is given. Each circuit is provided with a separate speak key on the face of the concentrator and the operation of any one key, connecting the signalman's handset to the appropriate signalpost telephone and extinguishing the associated calling lamp, prevents the completion of any other circuit, though the calling lamp will remain lit while the handset at another signalpost telephone remains lifted.

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4. The general layout of the area and the relevant distances are shown on the attached plan, which indicates the point of collision 134 yards on the approach side of Signal GU5B, itself located a few yards short of the disused platform of the former Castlecary station. The line on the immediate approach to the point of collision lies in a cutting on a left-hand curve of 110 chains radius and the maximum distance at which the tail of a six-car train standing at Signal GU5B would come into the view of the driver of a locomotive approaching on the same line is just over 200 yards, though at first sight it would be difficult to tell on which line the train was standing.

The Trains

5. The DMU passenger train involved in the collision was the 08.46 Class 1(MO) from Glasgow to Edinburgh formed of a single six-car Inter-City type set comprising two power cars at the leading end, two intermediate trailer cars, one with a buffet, and two power cars at the trailing end. The total installed power of the 8 diesel engines was 1200 h.p. All the vehicles were of steel construction and were built at Swindon in 1956, on underframes designed to withstand without deformation a 200 tons end load on the side buffers or a 100-ton load on the centre coupler. The total weight of the six-car set was 221 tons 15 cwt., and its length was 396 feet 9 inches.

6. The train was fitted with automatic vacuum brakes operating on all wheels with a total available brake force of 157·2 tons or 70·2 per cent of the train weight. The train was fitted with AWS equipment. At the time of the collision it was carrying 30 passengers, of whom only 4 were travelling in the rear power car.

7. The light engine was diesel-electric locomotive No. 5122 of Class 24, a Bo-Bo design of 1160 h.p. with a full width driving cab at each end without projecting nose. It was built at Derby in 1960 and weighed 73 tons in working order. It was fitted with air brakes acting on all wheels giving a total brake force of 63 tons, controlled either by a straight air brake valve or through the driver's vacuum brake valve. It was also fitted with AWS apparatus.

8. The locomotive, which was allocated to Inverness, was running light from Glasgow to Perth after working a train from Perth to Glasgow earlier the same morning. It left Glasgow Queen Street at 08.53. The crew of the locomotive, both of whom lost their lives in the collision, were Driver W. McIntosh and Secondman R. Birrell, both stationed at Perth.

The Damage

9. The rear power car of the DMU train was very seriously damaged in the collision and subsequently completely destroyed by a fire which broke out about 10 minutes after the collision. There was no actual telescoping, however, and the rear driving cab, though completely crumpled, remained secured to the underframe. The leading five cars of the DMU train sustained various degrees of minor damage, displacement of fittings, etc., but none were so seriously damaged as to prevent them being moved forward under their own power.

10. The diesel locomotive was extensively damaged by the collision and subsequent fire, the cab at the No. 2 end, which was leading, was completely demolished and together with the boiler compartment behind it forced back against the engine room bulkhead. The main frames were broken and distorted and the engine and boiler room bulkheads damaged. The whole of the driving controls, electrical wiring and fittings at the No. 2 end were completely destroyed. Both the leading wheels of the locomotive and one pair of wheels on the rear bogie of the power car were derailed towards the cess, but a small portion of the twisted panelling from the locomotive cab extended foul of the Down line.

Other Trains Concerned

11. In describing the events leading up to this collision, reference must be made to three other trains passing through the control area of Greenhill Upper on the morning of the 9th September. These were, in the Up direction, the 08.40 Class 1 Glasgow Queen Street to Stirling, a DMU passenger train booked to pass Greenhill Upper at 08.59½ taking the divergent route at the junction, and in the Down direction, the 07.40 Dundee to Glasgow, Queen Street, due to pass Greenhill Upper at 09.05, coming off the branch, and the 08.30 Class 1 DMU from Edinburgh to Glasgow due to pass Greenhill Upper at 09.08½.

Rules and Regulations

12. The relevant rules and regulations covering the actions to be taken when trains are detained at Stop signals, and the proper procedures for authorising the passing of a signal at Danger are contained in three separate railway publications. The actions to be taken by a driver are set out in Rule 55(g) of the British Railways Rule Book; the procedure to be adopted by a signalman in the event of a track circuit failure causing a signal to be held at Danger are laid down in Regulation 25(d) of British Railways Regulations for Train signalling on Double Lines by the Track Circuit Block System; and the code of instructions to be followed by the trainman and signalman when using the telephone at a stop signal is included at page 63 of the General Appendix to Working Timetables. The relevant extracts from these Rules and Regulations are reproduced as Appendices to this Report.

EVIDENCE

13. The driver of the 08.40 train from Glasgow to Stirling, a single-manned DMU service, was *Driver A. Beattie*, stationed at Stirling. He described his journey after passing Dullatur and said that Signal GU5C was at Danger and he had gone at once to the telephone. Just as he was lifting the handset, however, the guard called to him "That's the signal at Caution" and he rejoined the train without actually speaking to the signalman. He then moved forward to GU5B, which was also at Danger; he went immediately to the telephone and spoke to the signalman. As far as Driver Beattie could recollect the actual words he used were "This is the 08.40 Queen Street standing here at 5B" and the signalman's reply, "pass the Signal at Danger, there is a track failure".

14. Driver Beattie confirmed that the AWS equipment worked correctly at each signal and said that the slight mist did not have any effect on the sighting of signals. The time at which his train had been stopped at GU5C according to his guard was 09.01.

15. The driver of the 07.40 Dundee to Glasgow was *Driver D. McDonald*, stationed at Dundee. His train was not checked through the control area of Greenhill Upper signalbox and they passed over the junction at about 40 m.p.h. increasing to about 55 m.p.h. between there and Dullatur. Driver McDonald remembered seeing a DMU train standing on the Up line near Castlecary Old station and further on he saw a light engine standing at a signal with a man wearing the old-fashioned steam-type footplate uniform walking towards the signalpost telephone.

16. *Secondman A. Grant* confirmed his driver's evidence and distinctly remembered seeing the light engine standing at a colour light signal. The fireman, who was on the ground, acknowledged his wave as they went by.

17. *Driver W. Wilson* stationed at Leith worked the 08.30 DMU passenger train from Edinburgh to Glasgow on the day of the accident and on approaching Greenhill Upper had found the colour light distant at Caution. He had stopped at the semaphore Signal GU43 protecting the junction and tried to telephone the signalman, but got no response. After trying to attract the signalman's attention for about 3 minutes without success he saw a train pass across the junction ahead of him from the Stirling direction, and shortly afterwards the home signal was taken off for him to proceed. He then stopped at the signalbox and asked a man he had seen coming down the signalbox stairway to tell the signalman that he had been unable to get any reply on the telephone at the Home signal. He then went forward under clear signals and when approaching Castlecary at about 45 m.p.h. saw a passenger train standing on the opposite line. He then saw an obstruction at its rear and making an emergency brake application, came to a stand with about half his train past the point where the collision had occurred. A projecting piece of metal had scratched along the side of his cab but there was no significant damage. Driver Wilson, after conferring with the guard, found there was nothing he could usefully do where the collision had occurred so he ran on to Dullatur and informed the signalman what had happened.

18. In charge of the 08.30 Edinburgh to Glasgow was *Passenger Guard D. Jamieson*, who confirmed Driver Wilson's evidence and said that, after standing 3 minutes at the Home signal, they had passed Greenhill Upper signalbox at 09.14. He had not noted the time at which they stopped at the scene of the collision but he thought that it would have been about 09.17. He gained the impression that the collision had only just occurred. They remained there for about 10 minutes and during this time saw no signs of fire on the damaged locomotive and train.

19. The driver of the 08.46 Glasgow to Edinburgh (Mondays only), the DMU train actually involved in the collision, was *Driver W. Watson*, stationed at Leith Central. Apart from a signal check at Cowlairs he had a clear run as far as Dullatur, where the semaphore distant arm under the starting signal was at Caution. He then passed Signal GU5C at single yellow and Signal GU5B was at Danger as he approached it. He received an AWS warning at each of these signals. Driver Watson went to the signalpost telephone and told the signalman that he was the 08.46 from Glasgow standing at his signal, but he did not say at which signal he was standing. The signalman answered him to the effect that he was being detained because of a train crossing the junction in front and that, once it was clear, he would be let away; he made no mention of a track circuit failure and did not authorise him to pass the signal at Danger. Driver Watson understood that there must have been another train ahead of him, also waiting until the junction was clear, because the signal at which he was standing was not the one protecting the junction. He waited perhaps 5 or 6 minutes and a locomotive-hauled train passed on the other line; he assumed that this was the train off the branch for which he had been waiting. After about another minute he went again to the telephone but he was unable to get in contact with the signalman. While he was at the telephone he heard the crunch of a collision and saw his train move forward a few feet. He ran back and saw that a diesel locomotive had collided with the rear of his train. He then went back to the signalpost telephone and spoke to the signalman at Greenhill Upper telling him what had happened and asking him to stop all traffic. Driver Watson thought that the person to whom he spoke sounded garbled and did not answer in the normal manner, so he went across to a signalpost telephone on the Down line to inform the signalman at Dullatur, but there were two members of the Signal Engineer's staff, who had witnessed the collision, already at the telephone. At that moment they heard another train approaching on the Down line. The men at the telephone ran back to try and stop it, while Driver Watson fetched detonators from his cab. The approaching train was the 08.30 from Edinburgh to Glasgow, and it stopped near the rear of his train. Soon afterwards he realized that a fire had broken out at point of collision and he advised all the passengers to get out and go forward to the platform of the

disused station a few yards ahead. Driver Watson had realized that there was nothing he could do for the crew of the diesel locomotive as the leading cab had been crushed back to the engine room bulkhead and he set about uncoupling his train between the 5th and 6th vehicles to check the spread of the fire. As soon as he had done so he drew the front portion up to the platform, and a few minutes later the Fire Brigade and ambulance arrived on the scene.

20. In charge of the 08.46 train was *Passenger Guard A. Lumsden*, travelling in the rear coach. After the train came to a stand at Signal GU5B he looked out and saw the signal at danger and the driver going forward to the signalpost telephone. He remained looking out and eventually saw the driver go a second time to the telephone. He then glanced back and saw the light engine approach at a speed he estimated as 40 m.p.h. Realizing that a collision was imminent he went himself into the rearmost saloon compartment and told the four passengers in it to move quickly forward. Just then the collision occurred and he was thrown to the floor. After ensuring that some injured passengers were being cared for by a doctor who was a passenger on the train, Lumsden went to see whether he could do anything for the crew of the diesel locomotive but he saw the front was so smashed that there was no way he could get to the cab. He was unable to get at his detonators since the guard's compartment was damaged, but he then met a permanent way lengthman who told him that he would go back and protect in rear as he had some detonators. Shortly afterwards he saw smoke coming from the damaged locomotive and soon the fire spread to the rear coach of his train. He then helped the driver to part the train ahead of the rear vehicle.

21. *District Relief Signalman W. Gray* had taken up duty in Dullatur signalbox at 07.00. He at once noticed that the distant arm beneath his Up Starting signal was not coming off. He spoke on the telephone to the Signalman at Greenhill Upper who told him there was a track circuit failure. Gray had recorded in his train register the passing times of the Up trains involved as follows:

08.40	Glasgow to Stirling	08.58
08.46	Glasgow to Edinburgh	09.06
	Light engine Glasgow to Perth	09.12
09.00	Glasgow to Edinburgh	09.16

22. At 09.17 Signalman Gray received the Obstruction Danger signal from Greenhill Upper and he at once placed his signals to Danger. He tried to speak to the signalman at Greenhill but got no reply but shortly afterwards the signalpost telephone at No. 4 signal on the Down line at Castlecary rang and a signal lineman reported the collision and asked him to call out the emergency services. This he did through Glasgow Control as there is no GPO telephone in Dullatur signalbox. Signalman Gray had not paid particular attention to the light diesel engine as it passed but it was not travelling fast and appeared to slow down as it approached the distant signal at Caution. He recalled that the driver had failed to route whistle for the Stirling line as he passed the signalbox but he was already aware that the engine was going to Perth. In Signalman Gray's opinion the visibility at the time was good.

23. The two members of the Signal and Telegraph department staff who were eye witnesses to the collision were *Technician A. Morrison and Assistant Technician B. Cooney*. On the day of the accident they had taken up duty at 07.40 at Grahamston when they were advised that there had been a track circuit failure at Greenhill Upper. They reached the signalbox at 08.20 and the signalman indicated the area of the failure as near Signal GU5B. They went first to Signal GU5A by road where they met *Permanent Way Lengthman J. Henderson*. Morrison and Henderson then set out along the track towards Castlecary examining the track circuits as they went along while Cooney went by road to Castlecary. Shortly after he arrived Cooney saw the Stirling train pulling away from a stand at Signal GU5B. At this time Morrison and Henderson were on Castlecary viaduct. He waited a few minutes for them to join him and then the three men walked along the disused Up platform. Standing at Signal GU5B was a DMU train. They walked past it on the cess side and when about 40 to 50 yards beyond it Cooney, who was ahead of the others, saw a diesel engine coming round the bend at a speed he estimated as between 40 and 45 m.p.h. He raised his arm and ran forward to try and alert the driver but the engine ran past without sounds of braking and ploughed into the rear of the stationary train. Cooney at once ran to the Down signal (Dullatur No. 4) and reported the accident to the signalman and asked him to call out the emergency services.

24. Of the three men, only Henderson was wearing a high visibility jacket and as he saw the engine coming he threw his tools down and ran forward waving to the driver. He thought that the driver had seen the stationary train and had started to make a brake application, but the speed had only slightly decreased before the impact. He did not believe that the driver had actually seen him waving.

25. Henderson tried to get into the damaged locomotive but was unable to gain access from either side; he then set about clearing some wreckage which was obstructing the Down line, on which he heard a train approaching a short time later. He signalled to it to stop but it ran a short distance past the point of collision on the other line, just scraping a piece of metal which was jutting out. He then met the Guard of the Up train, who looked somewhat shaken and so he undertook to protect the Up line on his behalf.

26. Technician Morrison, who was not normally responsible for the Castlecary area and was covering it on behalf of another man who was on holiday, was not fully conversant with the layout of the signalling equipment between Dullatur and Greenhill and agreed that this may have been the reason why he failed to locate the cause of the trouble during his first inspection. He described the tests he had used to identify the failed track circuit, using an Avometer at each insulated joint, and confirmed that at no time had he

occasion to open an equipment cupboard. The actual cause of the trouble was a bridged insulated joint in the area of Castlecary viaduct, where the rail fastenings had come into contact with a fishplate. He had found it after the mishap, when he had retraced his steps to the viaduct. Morrison confirmed the evidence given by Cooney and Henderson about the speed of the light engine which he estimated at 35 to 40 m.p.h. In his opinion the engine was running under power when it passed him.

27. Travelling as a passenger on the 08.46 train was *Work Study Practitioner H. Stanage*, employed by the Sundries Division of British Railways. After the accident occurred he climbed down on the cess side, identified himself to the driver and offered his assistance. He then helped detrain the remaining passengers and guided them forward towards the disused Up platform at Castlecary. He then went back to the train where the guard had met with some difficulty in uncoupling between the 5th and 6th coaches and was unable to recreate vacuum. Mr. Stanage went between the coaches and found that the vacuum pipe at the rear of the 5th coach was not seating properly and so held it on the stop until the driver had obtained the necessary vacuum to keep it there.

28. *Head Goods Shunter C. Morrison*, who was unable to be present at my Inquiry, in a statement made to the railway officers confirmed that he was the man to whom the driver of the 08.30 Edinburgh to Glasgow train spoke near Greenhill Upper signalbox. Morrison, who had just left the signalbox after making some telephone calls turned back to go up the box steps and passed on the message that the signalpost telephone at GU43, the Down Main Home signal, was not working. According to Morrison, the signalman had replied "That is not the only thing that is not working".

29. The signalman on duty at Greenhill Upper was *Divisional Relief Signalman D. Craig* stationed at Larbert. He had taken up duty at 06.00 on 9th September having booked off at 22.00 the previous evening. He was fully conversant with the signalbox, having worked in it a number of times. When he came on duty he was told by the man he relieved that there had been two track circuit failures during the night on the tracks controlling Signals GU5A and GU5B. The former, however, had corrected itself but track circuit 3596 was still showing occupied and Signal GU5B was held at red. Drivers of Up trains were stopping and calling him on the signalpost telephone. The instructions he gave in each case were the same. He told them to pass the signal at Danger as there was a track failure ahead: he did not, however, repeat the number of the signal or instruct the driver to proceed cautiously. This was the message he gave to the 08.40 Glasgow to Stirling, the last Up train to pass his box before the accident when the driver told him "This is the 08.40 and the signal is at red". After this the next train to pass the box was the 07.40 from Dundee and while it was approaching a DMU train from Edinburgh came to a stand at his No. 43 signal. When he went over to the telephone concentrator two lights were showing, for 5B and 43 and, thinking he was speaking to the driver of the 08.30 from Edinburgh, which train he could in fact see from the signalbox, told him that he was holding him for a train off the branch.

30. As soon as the train from Stirling had passed towards Castlecary, he set the road and cleared his signals for the train from Edinburgh to follow it. It was the driver of the latter train who stopped and spoke to Shunter Morrison, asking him to tell the signalman that the telephone at the Down Home signal was not working, but Craig denied that he had received such a message, saying that once Morrison had left the signalbox he had not returned to it.

31. According to Craig the next thing that happened was that the driver of the 08.46 Glasgow to Edinburgh came again on the signalpost telephone at Signal 5B and asked, "What are we standing here for". He had replied "Come up through the signal at Danger. There is a track failure ahead". It was only about a minute later that he received a further call from Signal 5B and the driver told him "Something hit me in the rear". Craig immediately sent the Obstruction Danger signal to Dullatur and called out the emergency services, using the GPO telephone in his signalbox. He assumed at once that the light engine had run past signal GU5C at Danger.

32. At that time he had no doubts in his mind about what had happened, and he had remained on duty in the signalbox for the remainder of his shift. However, when confronted with the evidence of the drivers concerned, Craig accepted that he must have operated the wrong key on the telephone concentrator on two separate occasions and on each occasion passed an inappropriate message to the man to whom he actually spoke. He was, however, quite unable to offer any explanation for his mistakes.

33. Signalman Craig, who was 61 years of age, had been a signalman since 1958 and a relief signalman since 1965. As far as he was aware he was perfectly fit and was properly rested when he came on duty on the morning of the accident. He had been on night shift the preceding week with a rest day on the Friday, and had subsequently worked alternate shifts over the weekend, being on duty from 22.00 Saturday to 06.00 Sunday and 14.00 Sunday to 22.00 Sunday.

34. I asked Craig whether he had any worries or whether he knew of any other factors which could have distracted his attention. He could only suggest that the work load was higher than usual on this particular Monday morning. He explained that, as a result of a reallocation of duties starting that day, the train register boy had been withdrawn from Greenhill Upper Junction and that the responsibility for reporting passing times of trains had been transferred to Greenhill Lower Junction. However, the necessary reporting forms were not yet available at Greenhill Lower and at about 08.00 that morning the Traffic Inspector had telephoned him and asked him to assist by reporting passing times to Control.

35. After the accident the signalling and telephone equipment at Greenhill Upper were examined by *Signal and Telecommunications Inspector G. B. Hunter* who carried out a series of tests. He established that all the controls associated with Signal GU5 and the preceding automatic signals were correct and that the associated track circuits were functioning correctly. He found all in order until he came to TC 3596, ahead of Signal GU5B. This was a divided track, and at the insulated joint between the two sections there was a short circuit through the rail fastenings. This caused the track circuit to show a lower voltage than the pick-up value of the relay. After correcting the fault, Inspector Hunter tested Signals 5B and 5C by a shunt test to ensure that both returned to danger with the TC ahead occupied.

36. He then carried out a careful examination of the signalpost telephones and the telephone concentrator in the signalbox to establish that there was no possibility of the signalman carrying on a simultaneous conversation with two persons at different telephones and that there was no risk of getting a wrong connection by the accidental raising of two keys simultaneously, which has the effect of isolating the hand set, or in any other way. He also carried out tests, by manning the various signalpost telephones, to find out whether a man at one telephone could overhear a conversation between the signalman and a man at another signalpost telephone. He found that this was impossible though he did discover that if two persons at different signalpost telephones had their hand sets off simultaneously it was just possible for them to speak to one another, provided there was no background noise, but this was not possible once a key had been operated on the concentrator. He was satisfied with the integrity of the system and found no faults with it.

Conclusions

37. I have no reason to doubt the evidence given by the enginemen of the 07.40 train from Dundee to Glasgow who saw the light engine standing at Signal GU5C with the secondman on the ground near the signal. I am satisfied therefore, that Driver McIntosh, in charge of the light engine, did not pass Signal GU5C at Danger until he had obtained what he thought was the signalman's authority to do so. I must conclude, however, that Secondman Birrell, in speaking to Signalman Craig, failed to identify himself or the signal from which he was speaking and thus received instructions intended for the driver of the train standing at the Signal ahead.

38. The immediate cause of this collision was thus the failure by Driver McIntosh to proceed with caution after being authorised to pass a signal at Danger, as required by Rule 55(g)(ii) of the British Railways Rule Book. An experienced driver, he should have been aware that in passing a signal at Danger for any reason he was no longer under the full protection of the signalling system, and that the line ahead might be clear only as far as he could see. In this instance, possibly out of impatience at the delay already incurred, Driver McIntosh accelerated to a speed of about 40 m.p.h. and was thus unable to stop short of the stationary DMU train when it came unexpectedly into his view as he came round the curve approaching Castlecary. From the speed at which he was travelling it also seems likely that he was expecting signal GU5B to be at a proceed aspect, and that he had assumed this from the tone of the exchange of messages between his secondman and the signalman which could be interpreted as implying that the track was clear ahead.

39. The whole chain of events which led to the presence of two trains in the section between Signals GU5C and GU5B arose from the slovenly observance of the laid down code of instructions for the use of telephones at stop signals on the part of both the signalman and the trainmen involved.

40. A gradual escalation of misunderstanding stemmed from the failure on the part of Driver Watson of the 08.46 train from Glasgow to Edinburgh when standing at Signal GU5B to identify the signal from which he was telephoning. The close agreement between the wording of the message he actually received and the instructions that Signalman Craig intended to give to the driver of the 08.30 Edinburgh–Glasgow train standing at Signal GU43 make it apparent that Signalman Craig spoke to the wrong driver. In view of the established integrity of the signalpost telephone system, the only way in which this could be brought about was by the operation of the wrong key on the telephone concentrator.

41. The location of the concentrator, behind and to the right of the signalman as he stood facing the frame, was such that he could operate it without turning fully towards it, though there seems no excuse for any confusion between the keys for GU5B and GU43, one of which was in the upper row and one in the lower. I can only suggest that, because Craig could actually see the train standing at GU43 from where he was standing, and was expecting the driver to come on the telephone at any moment, when the calling lamp for GU5B appeared he operated the key without conscious thought and spoke as if to the driver at GU43.

42. I formed the impression that Signalman Craig was a conscientious man, who was inclined to worry when under pressure. Though reluctant to admit it, he had found that not having a train register boy in the box to keep the train register and report passing trains to Control had caused him to get behind with his booking, and this had distracted his attention from his primary task. When Shunter Morrison went back to the signalbox to pass on the message that the signalpost telephone at GU43 was not working, and here I accept Morrison's evidence despite Craig's denial that he ever returned to the signalbox, the answer that he received, "That is not the only thing that is not working", rings true. I believe that Craig had just realized that he had given an instruction to the wrong train and was waiting anxiously for the driver to come

on the telephone again to put matters right. Confusion was added to when the calling lights for Signals 5B and 5C came up together. In his haste, Signalman Craig once again operated the wrong key, in this case they were side by side, and the impatient "What are we standing here for?" of the secondman of the light engine, without identification of his train or of the signal at which he was detained, only confirmed in the signalman's mind that he was speaking to the driver of the 08.46 train who by now had been standing about 6 minutes. He told him "Come up through the signal at danger, there is a track failure ahead". Furthermore, he failed to instruct the driver to proceed cautiously, as required by Rule 55.

43. At this stage I believe that Signalman Craig, who was becoming anxious about the mounting delays to traffic, thought his difficulties were over, so when the calling light for Signal GU5B came on yet again and the driver of the 08.46 told him that something had hit his train in the rear, he was shocked and surprised and could only assume that the light engine had passed Signal GU5C at Danger without authority.

44. It was only after going through the whole sequence of events again, and in the light of evidence given by the drivers of the other trains involved that Signalman Craig accepted that he had not once but twice been in telephone communication with the wrong driver and had passed incorrect instructions on each occasion. Though Signalman Craig's actions set the stage for a collision to occur by allowing two trains to occupy the section ahead of Signal GU5C at one time, his was not the prime responsibility for the collision.

Remarks

45. The circumstances of this accident, in which two men lost their lives, underline once again the vital importance of careful adherence to the laid down instructions and procedures in the event of any failure of signalling equipment, and in particular when a signal is required to be passed at Danger. Following on this collision the General Manager, Scottish Region, issued a personal message to all drivers, secondmen and guards calling their attention to the circumstances in which a signal may be passed at danger and reminding them of the precautions they should take. I reproduce this message at Appendix 4 to this Report.

46. Though the particular circumstances did not arise on this occasion, because the trainmen concerned entirely failed to identify the signals from which they were telephoning, there is in my view a certain risk of misunderstanding where a series of signals are identified by a single number with letter suffixes, as in the present case. The difficulty in distinguishing between certain letters when spelt out over the telephone is well known and has given rise to the widespread use of phonetic alphabets. In the case of signals, however, I consider it preferable for each stop signal, whether controlled or automatic, to have its own individual number, thus eliminating one possible cause of misunderstanding.

47. Although there is no suggestion that it had any bearing on this particular accident, the discovery made by Inspector Hunter during his examination of the signalpost telephone arrangements, that it was possible for two persons at different signalpost telephones to speak to one another, revealed an undesirable state of affairs, particularly since more recent evidence has indicated that in some circumstances the level of clarity of speech can be greater than that found by Inspector Hunter. I am pleased to be able to report, therefore, that I have been informed by the General Manager of the Scottish Region of British Railways that arrangements are being made to modify the circuits to overcome this feature both in the Greenhill area and at other places in the Region where the same conditions apply.

I have the honour to be,

Sir,

Your obedient servant,

I. K. A. McNAUGHTON,

Lieutenant Colonel.

The Secretary,

Ministry of Transport.

APPENDIX 1

Extract from the British Railways Rule Book

DETENTION OF TRAINS ON RUNNING LINES

Rule 55

(*g*) (i) When a train has been brought to a stand owing to a stop signal being at Danger and a telephone (indicated by a sign as shown in Diagram No. 1) is provided, the Guard, Shunter or Fireman need not go to the Signal box but the Driver must wait two minutes or other prescribed period and except where special instructions are issued to the contrary communicate with the Signalman by telephone, inform him at which signal his train is detained and give the description of his train. If it is necessary for the train to remain at the stop signal the Signalman must so advise the Driver and the Driver must communicate with the Signalman at intervals of not more than five minutes unless otherwise instructed.

If it is necessary owing to a failure of the signal or other emergency, for the train to pass the signal concerned at Danger, the Signalman must advise the Driver of the circumstances and instruct him to proceed cautiously.

(ii) In every case when a train proceeds past a stop signal at Danger, in accordance with the preceding paragraph (i) or clause (*h*), as the case may be, the Driver must give one long whistle and proceed cautiously as far as the line is clear towards the next stop signal in advance and at such speed as to enable him to stop short of any obstruction, due regard being paid to such conditions as curvature of line, weather, etc.

The Driver must realise that the signal is possibly at Danger due to the presence of a train ahead, a broken or displaced rail, or an obstruction on the track or to the points ahead not being properly set, and he must, therefore, exercise the greatest caution.

In such cases if the next stop signal in advance, whether automatic or not, is not at Danger, the Driver must continue to proceed cautiously to the next stop signal beyond.

Extract from the Regulations for Train Signalling on Double lines by the Track Circuit Block System

(Supplement No. 3 to the Regulations for Train Signalling)

25. FAILURE OF TRAIN DESCRIBERS AND/OR BELLS AND/OR TRACK CIRCUITS

In the event of a failure of signalling apparatus so that trains cannot be signalled and dealt with in the usual way, arrangements must immediately be made to have the apparatus put into working order and the following instructions observed in the meantime for the line or lines affected:—

* * * *

(d) **Track Circuits**

If a track circuit fails to clear after the passage of a train, or otherwise shows occupied, and the Signalman is satisfied (after consultation with the Signalman at the box in advance, or in the rear, if necessary) that there is no train occupying that portion of line, the following instructions will apply:—

(i) The first train requiring to pass over the affected line must be stopped at the signal held at Danger and when an assurance has been obtained from the Driver that the line is clear as far as can be seen, he must be told to pass the signal at Danger, and to proceed cautiously towards the next signal, prepared to stop short of any obstruction. He must also be told to stop at the latter signal, even if it is showing a proceed aspect, and to report the state of the line to the Signalman at the box ahead, from the telephone there.

(ii) If the Driver reports that the line is clear, then until the failure has been rectified the most suitable of the following arrangements must be brought into operation:—

(a) A Handsignalman/men must be appointed in accordance with Rule 77(e).

(b) Each train requiring to pass over the affected track must be stopped, the Driver authorised to pass the signal at Danger and to proceed cautiously over the affected portion of the line.

(c) Block working in accordance with Regulation 1B, Drivers being instructed to pass the signal held at Danger.

(iii) If the track circuited portion of line is within a tunnel, trains must not be allowed to proceed until it has been ascertained that the line through the tunnel is clear and safe for the passage of trains.

(iv) Unless it has previously been ascertained that the line is clear the first train travelling towards the affected track circuit on an opposite or adjoining line which can be stopped must be stopped, the Driver advised of the circumstances and told to proceed cautiously and to report to the Signalman from the telephone at the first signal ahead of the affected portion of the track.

* * * *

APPENDIX 3

Extracts from the British Railways General Appendix to Working Timetables and Books of Rules and Regulations

TELEPHONES AT STOP SIGNALS

When a train has been brought to a stand at a signal where telephone communication with a signal box is provided, the following code of instructions must, after telephonic communication has been established, be observed by the Trainman and Signalman.

The Trainman must be careful to ascertain the name of the signal box with which he has established telephonic communication, and that it is the box from which he requires to obtain instructions.

1. **Trainman to Signalman** To intimate that train has been brought to a stand owing to the signal being at Danger.	**To communicate as follows:—** †.....train waiting at ‡.....Signal on.....Line †Full description to be given. ‡Name or number of signal and name of line on which train is standing to be given.
2. **Signalman to Trainman** If train to be held at signal.	**To communicate as follows:—** Stop till signal clears. (If after waiting 5 minutes, or other prescribed period, signal does not clear, Trainman must again communicate with the Signalman.)
If signal is defective or cannot be lowered and train **must not** proceed.	Wait at telephone for further instructions. (Trainman must communicate with Signalman at intervals of not more than 5 minutes, or other prescribed period, unless otherwise instructed.)
If signal is defective or cannot be lowered, but train **may** proceed.	**Applicable at signal controlled from a Signal Box.** Pass*.....Signal at Danger and proceed cautiously to.....(name point to which train can proceed). **Applicable at Automatic Signal or Semi-Automatic Signal working Automatically.** Pass*.....Signal at Danger and proceed cautiously. * Name or number of signal to be given.

3. The Trainman and Signalman must not terminate a conversation until they are sure that a clear understanding has been reached.

APPENDIX 4

BRITISH RAILWAYS: SCOTTISH REGION

General Manager,
Buchanan House,
GLASGOW.
4th October 1968

TO ALL DRIVERS, SECONDMEN AND GUARDS

The past few years have brought about a marked increase in the number of track circuits and colour light signals in use in the Scottish Region.

There may be circumstances when signals require to be passed at danger when you, personally, are involved.

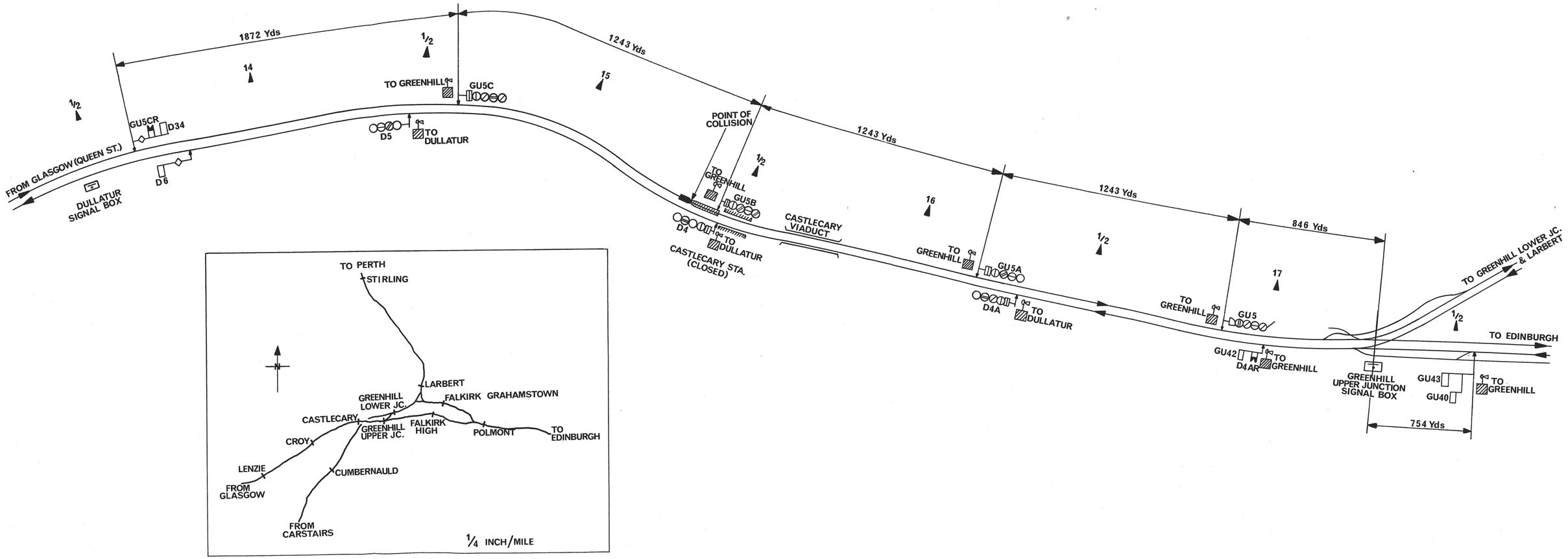
When any fixed signal is passed at danger the clear and explicit message normally given by the signal is lost and many safeguards normally built into the clearing of the signal are reduced.

It is important that YOU should:—

(1) know the circumstances in which a fixed signal may be passed at danger.
(2) conform to the disciplines set out in the General Appendix in using telephones at stop signals to establish positively WHO you are and WHERE you are.
(3) when authorised, proceed with caution, as detailed in Rule 55(g)(ii).

Nothing should be assumed and nothing should be taken for granted.

(Signed) *G. W. Stewart*
GENERAL MANAGER

(133108) Dd. 500140 K.9 3/70 Hw.

COLLISION AT CASTLECARY, SCOTTISH REGION 9th SEPTEMBER, 1968.