MINISTRY OF TRANSPORT

RAILWAY ACCIDENT

REPORT ON THE COLLISIONS

which occurred on
15th December 1961

near

CONNINGTON

in the

EASTERN REGION
BRITISH RAILWAYS

LONDON: HER MAJESTY'S STATIONERY OFFICE
1962
THREE SHILLINGS NET

MINISTRY OF TRANSPORT,
ST. CHRISTOPHER HOUSE,
SOUTHWARK STREET,
LONDON, S.E.1.
31*st May*, 1962.

SIR,

I have the honour to report for the information of the Minister of Transport, in accordance with the Order dated 21st December, 1961, the result of my Inquiry into the three related collisions that occurred between about 10.15 p.m. and 10.23 p.m. on 15th December, 1961, near Connington, between Huntingdon and Peterborough, on the Great Northern section of the East Coast Main Line, in the Eastern Region, British Railways.

The first collision occurred on the Up Goods line which runs from Connington South signal box to Abbots Ripton, nearly 4 miles to the South, and which is worked on the Permissive Block System. It is the most easterly of four tracks, the others being the Up Main, Down Main and Down Goods in that order from East to West.

A Class C (fully fitted) goods train had been signalled into the Up Goods line at Connington South. There was thick fog and the train was travelling at about 10 m.p.h. and was following a Class H (unfitted) goods train when, at a point nearly 1½ miles beyond Connington South, an Up empty coaching stock train hauled by a Deltic diesel engine, which had also been signalled into the Goods line and was travelling at about 30 m.p.h., ran into its rear end. As a result of the collision the brake van of the Class C train, the two wagons next to it and the leading wagon were derailed, and the brake van was thrown on to its side on the Up Main line, in which position it also lay foul of the Down Main line. Some 3-4 minutes later another Class C train, which was travelling at about 50 m.p.h. on the Down Main line, struck the brake van a glancing blow. The engine was turned on to its side and 32 wagons were derailed and were spread over the Up and Down Main and Down Goods lines. Some 3-4 minutes later still, yet another Class C train, which was travelling at about 35 m.p.h. on the Up Main line, ran into the wreckage. Its engine also came to rest on its side and the first 15 wagons were piled on top of one another and on top of the derailed wagons of the Down train to form a large heap of wreckage, which blocked all the four tracks.

The guard of the Class C train on the Up Goods line was injured, and the driver and fireman of the Up empty coaching stock train sustained bruises and suffered from shock. They were conveyed to hospital with the least possible delay. The driver and fireman were discharged on the following day and the guard was discharged two days later.

The collisions occurred in a rather remote location and the first intimation that the signalman at Connington South had of them was at 10.28 p.m. when he received a telephone call from the Peterborough Telegraph Office. The call was the result of a farmer, who resides near the site of the accident, hearing the collisions and telephoning to the police. Very soon afterwards the fireman of the Up empty coaching stock train arrived in the box and told the signalman what had happened, whereupon he called for ambulances and the fire service. The site could be reached only over fields, and the first ambulance arrived at 11.10 p.m. and left with the injured men at 11.58 p.m. The fire service, the police and two doctors arrived at about the same time. This was a fine performance on the part of all these services.

Breakdown equipment was ordered from Peterborough, King's Cross and Doncaster, and arrived without delay. The work of clearing the very extensive wreckage was difficult, and it is a matter for congratulation that the Main lines were reopened for traffic by 3.30 p.m., and the Goods lines by 5 p.m., on Sunday, 17th December. The accident caused widespread dislocation of traffic. Some long distance passenger services were diverted via Cambridge, while others were cancelled. Local passenger services between London and Peterborough were started from and terminated at Huntingdon and a bus service was introduced between that station and Peterborough.

DESCRIPTION

The Site

1. The Great Northern section of the East Coast route between King's Cross and Doncaster runs roughly North and South. The plan shows the general layout of this line between Hitchin and Peterborough and the signalling at the time of the accident. It will be seen that there are generally four tracks and that these are from East to West, the Up Goods (or Slow), Up Main, Down Main and Down Goods (or Slow). There are, however, a number of bottlenecks where there are only two tracks, such as at Arlesey and Sandy, and between Yaxley and Holme, and others where there are three tracks, such as at Huntingdon and between Connington South and North boxes.

2. Some of the lines that lie outside the main lines are classified as "slow" lines; passenger and goods trains are run on them under the Absolute Block Regulations and, on some, goods trains may be run under the Permissive Block Regulations. Others are termed "goods" lines; normally they are worked under the Permissive Block Regulations and are used only by goods trains, but passenger trains are sometimes run on them and then the Absolute Block Regulations are applied. On the approach side of a bottleneck, the outside line is invariably classified as a goods line, to enable goods trains to be accumulated on it and to be passed quickly forward when the opportunity arises. The Up outside line between Connington South and Abbots Ripton is a goods line, and it continues as a goods line to Huntingdon. It will be noted that

whilst some of the outside lines are slow lines or goods lines throughout their length, others change their designation at intermediate boxes. For instance, the Up outside line between Huntingdon and Sandy starts as a goods line, becomes a slow line at Paxton, and then again becomes a goods line at Everton: the Down outside line between Sandy and Connington North starts as a slow line, becomes a goods line at St. Neots, again becomes a slow line through Huntingdon and finally becomes again a goods line beyond Huntingdon.

3. The train service over the East Coast Main line is extremely heavy and reaches a total of some 100 trains per day in each direction. Between Huntingdon and Peterborough the maximum speed permitted is 85 m.p.h. on the main lines and 40 m.p.h. on the slow and goods lines.

4. The Up Goods line on which the first collision occurred, rises steadily at a gradient of 1 in 200 from Connington South to Abbots Ripton, nearly 4 miles to the South. After taking a slight curve to the left it runs more or less straight past a small box called Wood Walton, which is just over 1¼ miles beyond Connington South. Wood Walton is a block post controlling a home and distant signal on the Up Main line only. It is seldom open, and was closed at the time of the accident, which occurred close to it.

5. The lower part of the plan shows in greater detail the arrangements at Connington South and also the layout of the lines to the site of the accident. It will be seen that most of the signals are semaphores, as is the case on the rest of the section between Hitchin and Peterborough. It will also be noted that there are home and starting signals on the Up Main line, and that the home signal on the Up Goods line is the section signal and that there is no call-on signal. The Connington North Up home signal is a colour light signal, and it acts as an Up outer distant for Connington South.

6. The signal box at Connington South is close to the Up Main line, and the Up home signals are only 25 yards from the box. There is consequently no berth track circuit at these signals. The Down home signals, the back lights of which form the signalman's fog mark, are 128 yards from the box. Throughout this section of the line, block instruments of the 3-position type are in use on the main and slow lines, and non-recording permissive type instruments are used on the goods lines.

The Trains

7. The leading train on the Up Goods line was the 9.50 p.m. Class C goods train from New England (Peterborough) to King's Cross. It comprised 24 wagons mostly loaded with empty containers, and a brake van; it was hauled by a Class V2 steam engine which was driven from the left hand side and weighed 136 tons. Its total weight was approximately 350 tons and its length approximately 200 yards.

8. The train which ran into the rear of the 9.50 p.m. train was the 9.55 a.m. Up empty coaching stock (E.C.S.) Scotswood to Holloway train. It comprised 9 vans hauled by a Type 5 Deltic diesel electric engine with Co-Co wheel arrangement. This type of engine has two 18-cylinder (opposed pistons) two-stroke engines, each of 1650 h.p.; it also is driven from the left hand side, and it weighs approximately 100 tons. The total weight of the train including the engine was 328 tons and its length 182 yards. The brake power available was 276 tons, or 84% of the total weight.

9. The train on the Down Main line was the 8.10 p.m. Class C goods from King's Cross to Newcastle, and it comprised 34 empty wagons and a brake van hauled by a Class A3 engine. The train on the Up Main line was the 10.5 a.m. Class C Aberdeen to King's Cross meat train, and it comprised 25 loaded vans and a brake van, hauled by a Class V2 engine.

The Damage

10. As already mentioned, the brake van of the 9.50 p.m. Class C goods train and the two wagons next to it were derailed and wrecked, and the leading wagon was derailed. The coupling between the engine and leading wagon fractured, and the engine was propelled forward some 50 yards, but it was not derailed. The E.C.S. train stopped in some 20-30 yards and its Deltic engine and the leading van were derailed; they and the two vans next to it suffered some damage.

11. The steam engines of the two trains on the Main lines, which were turned over, received some damage, but it was not extensive. Of the 61 vehicles in these two trains, 28 were more or less wrecked, while 11 others were derailed or damaged.

12. Considerable damage was done to the track in all the four lines, particularly in the Up and Down Main lines.

Rules and Regulations

13. The Rules, Regulations and Sections of the General Appendix to the Working Time-Table which are relevant to this accident lay down—

(i) When a goods line worked under the Permissive Block System is clear to the home signal the signalman may accept a train from the box in rear by repeating the Is Line Clear bell signal. If however, the line is occupied he must accept the train by giving the 2-4-2 bell signal (Permissive Block Regulation 4(i)).

(ii) A train entering such a line, when occupied, must be brought nearly to a stand before the signal controlling the entrance to the line is cleared; this signal may be a "Call-on" signal or, if there is no "Call-on" signal, the main signal. Drivers must understand that when the main signal is cleared in this way the line ahead may be occupied (Permissive Block Regulation 4(iv) and page 21 of the General Appendix).

(iii) When permissive working is in force on a passenger line, other than a platform line, and the line is occupied by a goods train, a following goods train may be accepted by using the 2-4-2 bell signal. If the line is unoccupied, i.e. clear to the home signal only, the signalman may, if specially authorised, accept a train by using the 4-3 bell signal. In both cases the train must be brought to a stand at the main signal controlling the entry to the line; if there is no "call-on" signal, the main signal must then be lowered and, unless instructions are issued to the contrary, a green hand signal must be exhibited to the driver (Permissive Block Regulations).

(iv) If a passenger train or other train consisting of coaching stock, or a Class C or Class D goods train, which is booked in the Working Time-Table to travel over the main line, is to be diverted through a junction over which it is necessary for speed to be reduced, the signalman must not clear the signal controlling the entrance to the slow line or goods line until the train is close to that signal, and he is satisfied that its speed has been suitably reduced (Absolute Block Regulations page 2).

(v) On lines worked under the Absolute Block System a signalman may accept a train under Regulation 5 (Warning Arrangement), when it is authorised, when the line is clear to the home signal. The signalman in rear must—

(a) Where there is no Warning signal and the main signal is ahead of the box, exhibit a green hand signal to the driver and, having received the driver's acknowledgement by a short whistle, then lower the signal.

(b) If the train has already passed the box and is drawing up to the main signal (there being no Warning signal) ahead of it when the warning acceptance is received, not clear the signal until the train has been stopped at it.

(c) When there is no Warning signal and no main signal ahead of the box, stop the train at the box by exhibiting a red hand signal, and explain the situation to the driver. (Absolute Block Regulation 5(a) and Rule 41(a).

14. It should be noted that up to October, 1960 a signalman was additionally required to exhibit a green hand signal to the driver of a train entering an occupied goods line (see paragraph 13 (ii)) and, in one Region (not the Eastern Region), to inform the driver of the situation. This requirement was, however, cancelled on account of its similarity to the Instructions in paragraph 13 (v) and of the difficulty of giving a hand signal at certain places where the inlet to the goods line was remote from the signal box.

Evidence

Signalmen

15. Signalmen R. F. Mobbs and R. G. T. Thomas were on duty at Abbots Ripton and Connington South respectively. The following entries had been made in their Train Register Books for the trains concerned. It will be noted that they correspond closely.

Connington South. Up Lines, Forward Section — **Abbots Ripton. Up Lines, Rear Section**

Description of train	Offered but not accepted	Accepted under Reg. 5	Accepted under Reg. 4	T.E.S. sent	T.O.S. rec'd	I.L.C. rec'd but not accepted	Accepted under Reg. 5	Accepted under Reg. 4	T.E.S. rec'd	Train Arrived	T.O.S. sent	Remarks (M—Main Line) (G—Goods Line)
1–4 (Class H Goods		9.52		9.52	11.0		9.52		9.52	10.38	11.0	G
3–1–1 (Class C Goods)	10.0					10.1						M
3–1–1 (repeated)		10.3		10.3			10.4		10.4			G
2–2–1 (E.C.S.)		10.11		10.11			10.12		10.12			G
1–3–1 (Meat)			10.15	10.20				10.15	10.21			M

Abbots Ripton. Down Lines, Forward Section — **Connington South. Down Lines, Rear Section**

3–1–1 (Class C Goods)			10.13	10.16			10.13		10.16			M

NOTE: (i) Both boxes recorded Obstruction Danger at 10.28.
(ii) The train following the Dn class C goods was an express passenger—It was stopped at Abbots Ripton box.
(iii) Acceptances on the goods lines are entered in the "Accepted under Reg. 4" column if the trains are accepted by repetition of the I.L.C. bell signal (i.e. line unoccupied) and in "Accepted under Reg. 5" columns if accepted by the 2–4–2 bell signal (line occupied).

16. Signalman Mobbs said that when he came on duty at 10.0 p.m. the fog was thick: he could not see the fog mark, which was 200 yards distant, and fog signalmen were on duty. He stated that he refused the Up Class C goods train on the Main line so as to avoid delaying the Up meat train. The Class C train was therefore turned into the Up Goods line at Connington South on which it had been accepted with the 2-4-2 bell signal, the line being occupied by the Class H train. For the same reason the Up E.C.S. train was turned on to the Up Goods line, and it was accepted under the same bell signal, the line then being occupied by two trains. Mobbs said it was unusual for the E.C.S. train to be run through the Goods line.

17. Mobbs went on to say that he had cleared all the signals for the Class C goods train on the Down Main line but added that it was not travelling as fast as usual when it passed his box, probably on account of the fog. He did not think that the engine was steaming and he estimated its speed at about 40 m.p.h.

18. Signalman Thomas said that when he came on duty at 6.0 p.m. he could see the fog mark (128 yards distant), but the fog became thicker and by 9.30 p.m. he could not see it. Fog signalmen are not employed at Connington South because the distant signals are colour lights. Thomas said that after Line Clear on the Up Main line for the Up Class C goods train had been refused by Abbots Ripton he bell-signalled it on the Up Goods line; at that time the train had stopped at the home signal and he gave Train Entering Section for it immediately after receiving the 2-4-2 bell signal. He said that when the engine passed the box the driver and fireman were both looking out on the left hand side and he shouted to them that the Goods line was occupied by one train. He gave Train Out of Section to Connington North at 10.6 p.m. soon after the brake van had passed the box and when the train was fully inside the Goods line.

19. Thomas said that he then accepted the Up E.C.S. train from Connington North at 10.6 p.m. and was given Train Entering Section for it at the same time. He bell signalled that train to Abbots Ripton on the Goods line at 10.11 p.m. when it also had stopped at the home signal. He could see the head code of the engine and he thought that it was stationary for about one minute. He lowered the Up Main to Up Goods home signal for the train, which then started. He did not, however, tell the driver that there were trains ahead on the Goods line and the reason he gave for not having done so was that he was probably doing something else at the time. He gave Train out of Section to Connington North at 10.13 p.m., again soon after the rear vehicle had passed the box. He said that, when both the Up Class C goods train and the Up E.C.S. train were passing the box, they were travelling at no more than the usual speed which is reached by trains entering an occupied goods line. He remembered that he saw the tail lamp of the Class C train but he could not remember whether the light was a good one or not.

20. Thomas went on to say that he knew that the Regulations did not require him to advise the driver of a train entering a permissively worked goods line that the line was occupied, but he added that it was his usual practice to do so whenever he could manage it, irrespective of the weather. He also said that it was his practice to check a Class C or Class D goods train booked over the main line if it had to be diverted into the Goods line when it was clear, but to check it less severely than he would if the Goods line was occupied. He stated that, in the former case, he usually waited until the train had passed the distant and he had seen that its speed was under control before he cleared the home signal. When asked what was his practice in fog he replied "They usually creep down to the board (home signal) but if the board is (taken) off quickly, they go." It was, however, clear from what he said that he checked other trains going on to the Goods line irrespective of whether they were booked over the main line or over the Goods line, and he agreed that he had, a short time earlier, checked a Class E goods train which was booked over the Goods line but for which he had received Line Clear from Abbots Ripton by repetition of his bell signal, meaning that the line was unoccupied.

The Train Crews

21. The staff concerned were:—

L. J. P. Ahearne	—	Driver, Up Class C goods train
A. M. Shill	—	Fireman, " " " " "
W. J. Sarsby	—	Guard, " " " " "
J. S. C. Jones	—	Driver, Up empty coaching stock (E.C.S.) train
B. Sutton	—	Fireman, " " " " " "
J. H. Sizeland	—	Guard, " " " " " "
G. T. A. Finch	—	Driver, Down Class C goods train
B. W. Kirk	—	Driver, Up meat train

In addition I took evidence from Driver W. G. Floyd, who was travelling as a passenger in the Up empty coaching stock train.

22. Driver Ahearne stated that his train was stopped momentarily at the Connington South home signal. The Goods line signal was then cleared and he restarted, and when he passed the box the signalman shouted to him "One in" from which he understood that there was one train ahead of him on the Goods line. It was pitch dark and the fog was very thick. Ahearne said that he proceeded cautiously into the Goods line and caught up the goods train ahead, picking up the tail light at a distance of 10-15 wagon lengths (70-100 yards), and he then reduced speed somewhat. He proceeded at, he estimated, 8-12 m.p.h., and kept a constant distance from the train that he was following until, shortly after passing Wood Walton box, he felt a severe impact from the rear. The engine was propelled forward but it did not strike the train ahead. Ahearne said that, at the speed at which he was travelling, he was confident that he could have stopped short of the train he was following, if it had stopped. He was quite definite that he had not stopped his train. He thought that the impact had been severe enough for the Down lines as well as the Up Main line to be obstructed, and he told his fireman to go and protect them.

23. Ahearne went on to say that he was not rostered on the express train link, but that he sometimes drove express trains. He said that some signalmen advise drivers when they are entering an occupied goods line, but that some do not do so; it was a help when a signalman did advise him and made him more careful. Ahearne has a very quiet voice and it was at times difficult to follow his evidence. My impression of what he said was that, when a train was turned into a goods line, it was always checked, on some occasions more severely than on others; and that the manner in which the clearance of a goods line entrance signal was delayed, sometimes left him in doubt as to the situation on the line.

24. Fireman Shill, who had been a fireman for six years and had worked with Ahearne for five months, generally confirmed Ahearne's statement but said that he estimated that the train ahead was 15 to 20 wagon lengths away when he first saw its rear lights. When told however that that represented 100-150 yards, he was insistent that the distance was much less than 100 yards. He, also, thought that his train was travelling at only 8-10 m.p.h. and that the driver could easily have stopped short of the train ahead. Shill said that he was firing when the collision occurred and that the impact was violent. After the engine had stopped he took detonators and went towards the rear until he reached the rest of the train, and he then proceeded to the brake van. He saw that it was fouling the Up Main line and, he thought, the Down Main line also and he was on his way to protect the latter when the Down Class C goods train, which he thought was travelling at the usual speed of such a train, passed and struck the brake van. He did not think that Ahearne had told him to protect the Down lines, but added that it was difficult to understand what he said.

25. Shill went on to say that, when a goods line is occupied, some signalmen give this information to the driver of a train entering the line, while others do not; he thought that some but not all the signalmen at Connington South gave this information to a driver entering the Up goods line, when there was fog.

26. Guard Sarsby also generally confirmed Ahearne's statement. He realised that, having been stopped at Connington South home signal, the Goods line was occupied and he thought that the speed of the train was consistent with the circumstances. He felt the driver apply the brakes and reduce the speed and assumed that his train had caught up the train ahead. He estimated its speed thereafter was 8-10m.p.h. He said that his train definitely did not stop. He saw the Deltic engine of the following train only just before the collision. He was still in the wrecked brake van when it was struck by the Down train, but was then rescued.

27. Driver Jones of the Up E.C.S. train is nearly 63 years of age. He has been a driver for 25 years, during which time he has worked on the East Coast Main line; he has been in the top link for the past 10 years. He came on duty at 3.36 p.m. on the day of the accident and worked the 4.21 p.m. train from King's Cross to Peterborough with the Deltic engine involved in the collision. His engine was attached to the 10.51 p.m. Scotswood to Holloway empty coaching stock train at Eastfield, which is ½ mile north of Peterborough. That train was booked to run over the Main line from Peterborough onwards.

28. Jones said that he had a slow run from Peterborough to Connington South and was stopped at most of the signals. He saw that the outer colour light distant at Connington South was at caution. He did not see the semaphore inner distant signal on account of the thick fog but received a caution indication on the AWS equipment. He drew the train forward towards the home signals and said that he stopped before he could see them. He restarted slowly and when the signals first came into view he saw that the Main to Goods home signal was clear. He said that up to that time the fog was "moving"; it thinned out at Connington South signal box and he remembered that he had been able to see the arms of the home signals as he approached them, in the light of the box.

29. Jones went on to say that when he passed the signal box the signalman gave him no indication as to the state of the Goods line; he added that notwithstanding the new Regulation according to which signalmen are not required to give this information, some signalmen still give it by indicating the number of trains ahead with their fingers. Jones said, however, that even though he had not been given any information about the state of the goods line, he entered it carefully, fully expecting that there would be a train ahead of him. The Deltic was running on only one engine and he opened the controller to the full position. The head code lights were illuminated and made it difficult for him to see ahead in the fog, so he looked out of the side window.

30. Jones said that when he reached Wood Walton box he glanced inside the cab and saw that the speedometer was reading 20 m.p.h. (he had said 24 m.p.h. at the Regional Inquiry). He then ran into very thick fog in which he could see only about 10-15 ft. beyond the front of the engine. He closed the regulator and applied the brake and then released it, but the train had not gone far before he saw the outline of the brake van of the Class C goods train a few yards distant, and then the collision occurred. He said he did not see the tail light of the goods train, and he was definite on that point. He thought that his brake application had slowed down the train slightly before the collision.

31. Jones continued by saying that he had worked Deltic engines frequently (he had actually been passed for working these engines on 7th July last and had worked them on 25 occasions). He said that the Deltic was a powerful engine and that even with only one of its two engines working, its acceleration, with a light train such as he was driving, was considerable. He agreed that the speed could be deceptive unless a close watch was kept on the speedometer, and he added that it was more difficult to judge the speed of a Deltic than of a steam engine.

32. I questioned Jones closely on his evidence. He stated that, in the top link, he worked only one freight trip in 36 weeks, and that, in consequence, it was rare for him to run over a slow or goods line. This was the first occasion on which he had been turned into such a line when working a Deltic locomotive. I asked Jones to explain the difference between a "slow line" and a "goods line" and he replied that a slow line was one on which passenger trains were allowed to run and a goods line was one on which passenger trains were not permitted; he thought, however, that permissive working was allowed on slow lines, except for passenger trains. He thought that the line from Connington South to Abbots Ripton was and always had been a slow line and he repeatedly referred to it as such; he thought that he had once been diverted through that line with a passenger train. I also asked him the classification of some of the other outside lines on the main line route, and he was uncertain about them.

33. Jones had said repeatedly at the Regional Inquiry, and when giving his evidence to me, that he had assumed that there may have been a train ahead of him. I put it to him, however that he was an experienced driver; that the result of the collision indicated that the speed of the E.C.S. train must have been nearly 30 m.p.h. instead of 20 m.p.h. as stated by him, and that such speeds were quite inconsistent with his statement that he could see only a few yards ahead of the engine. I asked him whether he may have thought that his train had a clear run to Abbots Ripton, or whether he still maintained that he had assumed that there may have been a train ahead: after some deliberation he replied that perhaps he had assumed that the line to Abbots Ripton was clear. He added that it would have been helpful if the signalman had given him an indication with his finger, as was done in the past.

34. Jones was questioned further as to his reason for looking out of the side window of the engine instead of through the front window. He replied that the engine head code is so powerfully lighted that it produces a glare in the fog, and that the lights on the panel and elsewhere in the cab, the outline of the cab and of himself, were reflected in the front window, with the result that he definitely could not see anything through it. He added that the head code lights could not be extinguished because there were no other head lights.

35. Jones said that after the collision he told Fireman Sutton to break into Wood Walton box and telephone to the signalman at Connington South. He himself went to the derailed brake van of the goods train. He saw that it was fouling the Up Main line and he thought that it also lay foul of the Down Main line. Just then, somebody shouted that a Down train was approaching, and Jones had to get out of the way quickly before the second collision occurred.

36. Fireman Sutton had been a fireman for about 9 years and had worked regularly with Driver Jones for nearly three years; he had worked on Deltic engines quite frequently. He said that, after getting caution indications at the Connington South outer and inner distant signals, the train approached the home signals at about 4-5 m.p.h. and he saw, at a very short distance, the goods line home signal become clear. He was sure that the train did not stop.

37. Sutton went on to say that he thought that the outside line from Connington South to Abbots Ripton was a slow line and that, although the delayed clearance of the home signal indicated caution, it had not occurred to him that there might be a train ahead of them on it. He said, however, that on account of the fog and, perhaps, on account of the state of the track which he did not consider was very good, the driver was, to use Sutton's own words, "just crawling along".

38. Sutton stated that he was looking out forward with head against the window but, because of the thickness of the fog and the brilliance of the head code lights, he could see only a few yards. He saw the tail lamp of the Class C goods train as a red glow and was about to shout when the driver said "hold tight": then the collision occurred.

39. Sutton's evidence about the effect of the head code lights on visibility in fog was much the same as that of Driver Jones (see paragraph 34). Sutton added, however, that the difficulty did not arise on Deltic engines only, but on other types of diesel engines also.

40. Sutton could not recollect that Jones had told him immediately after the collision to break into Wood Walton signal box. He also evidently had a look round after the first collision and it was not until after the second collision occurred that he went back to protect the Up Main line. He said that he had reached a point 6-7 coach lengths beyond the rear end of his train when he heard the Up train approaching. He placed detonators on the line and the train exploded them as it passed. Sutton then proceeded rapidly to Connington South box to advise the signalman of the situation.

41. Guard Sizeland was riding in the brake compartment at the rear end of the leading van of the E.C.S. train. He said that the train was stopped slightly short of the Connington South home signals, and he looked out and saw them at danger. After about half a minute he saw the Goods line home signal become clear, and the train then proceeded slowly into that line. Sizeland thought that there was a train ahead of them and he said that the speed of his train was constant and consistent with such a situation: he thought that it could have been stopped in 20-30 yards

42. After the impact, which Sizeland said was only slight, he looked out of his van but could see nothing. He got down and went to the front of his train, and saw that the Up Main line was blocked. He then went to get his detonators and was about to start towards the rear of his train when the second collision occurred. He started to walk towards the rear but was overtaken by Fireman Sutton who took the detonators from him.

43. Driver Floyd, who was travelling as a passenger in the E.C.S. train, had been a driver since 1944 and was also stationed at the King's Cross Motive Power Depot; he had frequently worked Deltic engines. He was sitting in the second compartment of the leading van. He was eating some food at the time and was not paying attention to the running of the train, although he remembered that it had stopped not long before the collision and that it was not travelling fast when the collision occurred. He said that the impact was very slight.

44. Floyd said that after the collision he looked out and saw that the Deltic engine had become derailed and then he saw the brake van on its side. He therefore got down and went up to the engine; he found the driver, who was not injured and who said that the fireman had gone back to protect the Up Main line. Floyd then turned his attention to the guard of the Up Class C train who was in the brake van. He thought that visibility at that time was not more than 20 yards.

45. Floyd said that he was in the top link and was sometimes diverted into a slow line when working a passenger train, but it was a rare occurrence for him to be diverted into a goods line. It was only when working an empty coaching stock train that the latter situation ever arose. He knew that the Up outside line from Connington South to Abbots Ripton was a goods line. He thought also that he knew the designation of all the outside lines, but when he was asked about the line from Huntingdon to Sandy he was uncertain which sections were worked by Absolute Block and which by Permissive Block. Floyd said that since the Regulations had been changed signalmen do not advise a driver going into a goods line whether the line is occupied or not, and he added that the delayed clearance of the home signal does not give the driver any definite information about the state of the line ahead.

46. Floyd also confirmed the opinions expressed by Driver Jones and Fireman Sutton about the view ahead from diesel engines in fog, and he added that in such conditions the view was not as good as from a steam engine.

47. Driver Finch of the Down Class C goods train said that he passed Abbots Ripton box, where all the signals were clear, at about 50 m.p.h. It was foggy and he thought that the fog became thicker as he approached Wood Walton. He saw nothing before his train struck the derailed brake van of the Up Class C goods train, and his engine was overturned.

48. Finch also was stationed at King's Cross Motive Power Depot and he was in link No. 3. He said that it was therefore not infrequent for him to be diverted from the main line. He stated that drivers referred to all the outside lines as slow lines and not goods lines, though he was aware that some of the lines were worked by Absolute Block and some by Permissive Block. He knew that the Up line from Connington South to Abbots Ripton was worked by Permissive Block, but he was uncertain about some others. He said that signalmen no longer advised a driver entering a permissive line as to whether the line was occupied or not. He added, however, that they invariably checked the train at the entrance signal to a loop line irrespective of whether the line was worked by Absolute Block or the Permissive Block.

49. Driver Kirk, of the Up meat train, who was stationed at Grantham Motive Power Depot, said that all the signals at Connington South were clear for his train which was travelling at 45-50 m.p.h. A detonator was exploded and at the same time he saw the tail lamp of the E.C.S. train at, he estimated, a distance of 15-20 yards. He immediately applied the brakes and he thought that the speed of his train had been reduced to 30-35 m.p.h. when it struck the wreckage, and became derailed.

50. Kirk also was questioned about working on the slow lines and goods lines. He replied that he drove mainly fast trains which were not frequently diverted into such lines. He said that he had an idea which of the outside lines were slow lines and which were goods lines, but he added that he did not know them all. When asked the difference between a slow line and a goods line, Kirk replied "A goods line can be made Absolute Block or Permissive Block, and a slow line just Permissive Block". When asked the question again, he repeated this answer.

51. Kirk also confirmed the evidence of the other drivers and the firemen about the view from diesel engines in fog, and he also said that in such conditions signals could be seen more clearly from a steam than from a diesel engine.

Tests

52. At my request a test train of similar composition and weight to that of the empty coaching stock train involved in the accident was prepared. It was hauled by a Deltic with only one of its two engines running, and I travelled in the cab from Peterborough to Abbots Ripton, and beyond. The train was stopped at Connington South home signals. The Goods line signal was then cleared and the train was started in the same way that Driver Jones said that he had started the empty coaching stock train on the day of the accident, i.e. the control handle was placed in the fully open position as soon as the whole of the train had passed on to the Goods line. As already mentioned, that line is on a steady rising gradient of 1 in 200 (paragraph 4). The following speeds were recorded:

Opposite Connington Up main starter (483 yards from the home signal)	22 m.p.h.
Opposite Wood Walton Distant (1232 yards from the home signal).....	30 m.p.h.
Opposite Wood Walton box (1 mile 555 yards from the home signal).....	36 m.p.h.

The time taken from starting the train to passing Wood Walton box was four minutes.

53. In addition, two stopping tests were carried out on the rising gradient by making a full brake application when the train was travelling at 30 m.p.h. In the first test, the train stopped in 108 yards, and in the second, in 119 yards. In both, the driver was ready for what was to happen, and his reaction time was short. If an allowance were to be made for normal reaction time, the stopping distance from such a speed would be about 150 yards.

54. I questioned the driver of the test train, a most experienced man, about the effect of fog on the sighting of signals at night from a cab of a Deltic engine. His views corresponded with those of the other footplate staff whose evidence I have recorded. He added, however, that in fog it was his practice to extinguish the lights in the head code indicator and to place an oil lamp on the front of the engine.

Conclusions

55. The first collision was the result of the empty coaching stock train travelling at an excessive speed on the occupied Up Goods line, having regard to the bad weather conditions. From Driver Jones's statement on how he handled the train, from the result of the test carried out, and from the results of that collision, I have little doubt that it was travelling at a speed which was not far short of 30 m.p.h. at the time of the impact.

56. Neither Driver Finch of the Down Class C goods train nor Driver Kirk of the Up meat train could have avoided the two subsequent collisions.

57. It will be recalled that Jones stated that he stopped the empty coaching stock train short of the Connington South home signals, and he then drew it forward slowly and that, when he first saw the signals, the one leading to the Goods line was clear. Both the fireman and the guard, however, said that when they first saw the home signals, when the train was either stopped or nearly stopped at them, they were at Danger, and that they saw the Goods line signal become clear. Jones should therefore also have seen that signal become clear, and I think that he must have done so; its delayed clearance should have been an indication to him that the Goods line was occupied (see paragraph 13 (ii)). His train was however booked over the main line, and the clearance of the home signal would have been delayed in much the same way even if the Goods line were clear. (See paragraphs 13 (iv) and 65.)

58. I am by no means certain just what Jones had thought the situation was on the line ahead of him. At the Regional Inquiry and on many occasions when giving evidence at my Inquiry, he said that he had assumed that the line was occupied, and that he had thought that the speed of his train was such that he could have stopped it short of any train ahead. On the other hand, when I asked him whether he may have thought that the line was clear to Abbots Ripton, he agreed that he may have done so. Jones repeatedly referred to the line on which his train was running as a slow line, but he thought that permissive working was allowed on it, except for passenger trains. Taking everything into consideration, I incline to the view that Jones must have assumed that the line ahead of him may have been occupied.

59. In this connection it is necessary to consider the density of the fog. The visibility at Connington South must have been at least 40-50 yards because the guard of the empty coaching stock train, who was travelling at the rear end of the leading van, said he could see the home signals when the train stopped, rather short of them. Driver Jones said that he suddenly ran into very thick fog near Wood Walton box and both he and Fireman Sutton estimated visibility at only a few yards ahead of the engine, say a maximum of 5 yards. Driver Floyd, a passenger in the empty coaching stock train, said that after the accident it was no more than 20 yards. Driver Ahearne, of the Up Class C goods train, said that the tail lamp of the freight train ahead came into his view at 70-100 yards and that he was able to maintain that distance from it. His fireman, Sutton, put the distance of the train ahead at "much less than 100 yards" when the tail lamp came in view. Neither Ahearne nor Sutton made any mention of the sudden thickening of the fog. Sutton said that the detonator that he placed on the Up main line was 6-7 coach lengths (120-140 yards) in the rear of the empty coaching stock train, but Driver Kirk, of the Up Meat train, thought that the tail lamp of the stationary train came into his view at the same moment that his engine exploded the detonator, and he estimated the distance of the lamp at 10-15 yards. It is difficult to estimate visibility in fog and it is therefore understandable that the opinions differed so much. Taking all the evidence into account, I think that visibility probably varied between 30 and 50 yards, which represented a dense fog.

60. As mentioned above, the empty coaching stock train was travelling at about 30 m.p.h. and the tail lamp or the brake van of the Up Class C goods train, which was travelling at 8-10 m.p.h., would therefore have come into Jones's and Sutton's view about four seconds before the impact; it is therefore not surprising that they thought that the goods train was very close to them when they first saw it. I think that Jones may well have been deceived about the speed of his train and under-estimated it because, on account of the fog, he was looking out of the side window. As already mentioned, the Deltic is a powerful engine and I can understand that its speed can be deceptive unless the speedometer is watched. Jones said that he had looked at the speedometer on one occasion and had seen that it read 20 m.p.h. But, in such thick fog, even 20 miles an hour was too fast for the train to travel on an occupied permissively worked line.

61. From the Train Register times given in paragraph 15 and on the assumption that the empty coaching stock train took about the same time (four minutes) to reach the site of the accident at Wood Walton box as was taken by the test train, the first collision on the Up Goods line must have occurred at 10.15 p.m. or 10.16 p.m. The Down Class C train passed Abbots Ripton at 10.16 p.m. and its running time, at 50 m.p.h., for the 2½ miles to Wood Walton box would have been about three minutes. The

second collision must therefore have occurred at about 10.19 p.m. The Up meat train passed Connington South at 10.20 p.m. or 10.21 p.m. at about 50 m.p.h. and the third collision must therefore have occurred some two minutes later at 10.22 p.m. or 10.23 p.m. (its speed had been reduced to about 35 m.p.h. at the time of the impact). There was, therefore, an interval of 3-4 minutes between the first two collisions and between the last two collisions, and one of about 7 minutes between the first and third collision. I accept the statement of Fireman Shill of the Up Class C train on the Up Goods line, that he did not understand his driver's instruction to protect the Down Main line Their engine had been propelled forward 50 yards from the train and Shill's natural action was to go back to find the train and then to proceed to the brake van. By that time it was too late for him to protect the Down Main line. It is clear that a few minutes must have elapsed before any of the staff of the empty coaching stock train realised that the Down Main line was fouled and it was then too late also for any of them to protect that line. It was, however, immediately evident to the staff of that train that the Up Main line was fouled, and I think that the guard could have taken more rapid action to protect it. It may not have been possible to prevent the Up meat train from running into the wreckage but, if the detonators had been placed further from it, the speed of that train at the time of the impact would have been still further reduced.

Remarks and Recommendations

62. The first collision on the permissively worked Up Goods line caused the Up and Down Main lines to be obstructed and resulted in two further collisions in which fast goods trains were involved. It was indeed fortunate that neither of these was a passenger train: if it had been, there would inevitably have been loss of life. As it was, the dislocation of traffic on the important East Coast route was widespread, and the destruction of rolling stock was great.

63. Permissive working on goods lines is a legacy of the past. At my request, an investigation was made by the Regional Officers to ascertain whether it would be practicable to prohibit it altogether during fog on lines adjacent to fast passenger lines, but it was found that if such a prohibition had been in force on the evening of the accident, four Up goods trains would have had to be cancelled. This is a situation which I agree could not be accepted. It must therefore remain a necessary method of working in all weather conditions.

64. With this method of working, it is important that the driver of a train should be given an *unmistakable* indication of whether the section he is entering is clear or whether it is occupied. This unmistakable indication is given on sections equipped with colour light signals and on sections equipped with semaphore main and call-on signals. As shown in the following paragraph, however, the Rules and Regulations coupled with the lack of call-on signals on some semaphore sections, as on the section of the line on which this accident occurred, do not enable this unmistakable indication to be given.

65. The relevant Rules and Regulations are quoted in paragraph 13. As mentioned in paragraph 14, the Regulation that required a driver to be shown a green hand signal as an indication that a permissively worked goods line is occupied, was cancelled on account of its similarity to the instructions for working under Regulation 5. Although the cancellation of that Regulation removed one anomaly, it has introduced further complications which are explained below:

If a train is brought to a stand, or nearly to a stand, at a diverting semaphore home signal (there being no call-on signal) which is then cleared without a green hand signal being shown to the driver, the indication thereby given to the driver about the situation on the line to which the signal refers will be as follows:

(i) if the signal leads to a permissively worked goods line and the train is a Class C or D goods train booked over that line or a lower class goods train booked over that line or any other line	the line is occupied
(ii) if the signal leads to a permissively worked goods line and the train is a Class C or D goods, not booked over that line	the line may be occupied or clear
(iii) if the signal leads to a slow line on which there is no permissive working and the train is a passenger, coaching, or Class C or D goods, not booked over that line	the line is clear

Furthermore, if the signal is ahead of the box, the line, if a goods line, may be occupied; if a slow line, it will be clear, the train having been accepted under Regulation 5.

These complications arise from the need to give two different indications with the same signal and in paragraph 67 I make a recommendation which will remove them.

66. Some of the complications arise on the Great Northern section because many drivers find it difficult to remember which are the slow lines and which are the goods lines. This information is given in the Appendix to the Working Time-Table, but the classification of some of the lines changes at several points (see paragraph 2) and I can appreciate their difficulty, especially as the men in the top engine links are so seldom required to travel over the slow and goods lines. Apart from this aspect of the case, however, it is evident that drivers on the Great Northern section and on other sections with similar signalling equipment do not invariably receive the unmistakable indication of the state of a goods line that is so necessary.

67. The most unmistakable way of giving this information to a driver is by clearing a main signal when the line is clear and a call-on signal when it is occupied. This would eliminate all the complications mentioned in paragraph 65, but it would involve the provision of a number of call-on signals. I have discussed this matter with the officers of the British Transport Commission and an investigation is at present being undertaken on an all Regional basis to ascertain the number of additional call-on signals that would have to be provided for this purpose. I consider that the very existence of permissively worked goods lines adjacent to main lines on which speeds of up to 100 m.p.h. are to be permitted is a real source of danger, and I recommend that call-on signals should be provided on all such goods lines. I also recommend that in view of the special circumstances obtaining on the Great Northern section and pending the provision of call-on signals, consideration should be given to the adoption of some method of removing the difficulty during fog, even if it should involve some operating inconvenience. If, however, this is found to be impracticable, I hope that it will be possible for the call-on signals to be provided on this section as soon as possible and in any case before next winter's fog season.

68. A misunderstanding can also arise when a goods train has to enter an occupied passenger line (other than a platform line) on which Permissive Block is allowed, or has to enter such a line under Regulation 5. In both cases the train has to be checked at the home signal and a green hand signal has to be shown to the driver, irrespective of whether the line is occupied or clear. Again, an unmistakable indication should be given to the driver when the line is occupied, and I recommend that call-on signals should be provided on these lines also, where they do not already exist.

69. Several drivers stated that the brightness of the electric lights illuminating the head code on diesel engines causes a glare in a fog and makes the viewing of the line ahead and the sighting of signals difficult, more difficult in fact than from a steam engine. This matter has been discussed with the Chief Mechanical Engineer of the British Transport Commission, and I am glad to report that steps are being taken to overcome the difficulty. The need for the head code lights to be of sufficient power to be conspicuous to signalmen, to staff working on the line and to the users of private level crossings, is being taken into account.

I have the honour to be,

Sir,

Your obedient Servant,

D. McMULLEN,
Colonel.

The Secretary,
Ministry of Transport.

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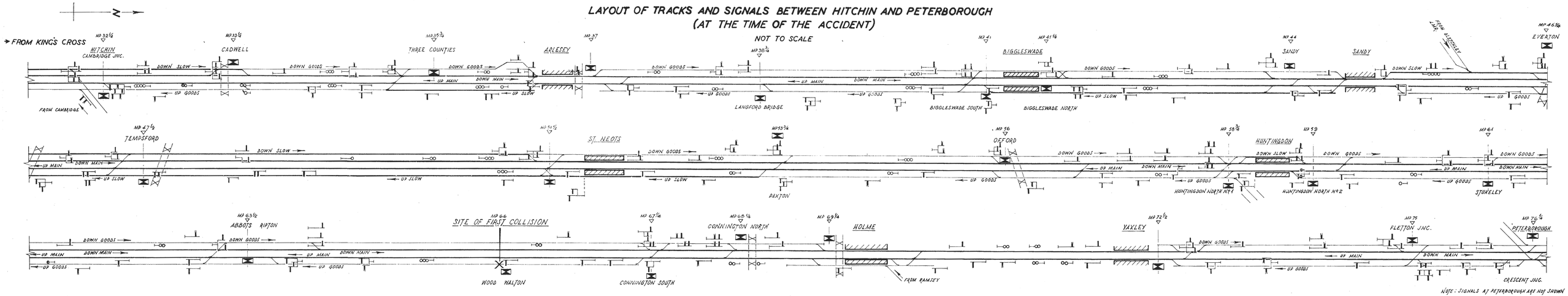
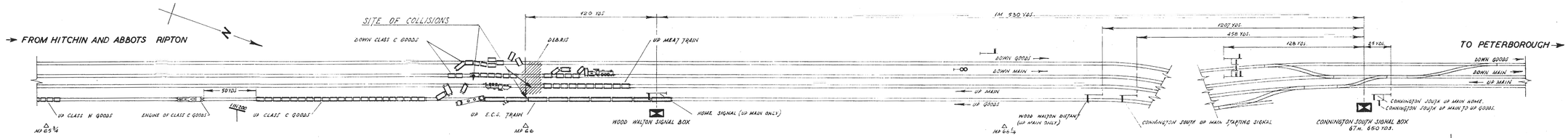
COLLISIONS NEAR CONNINGTON 15th DECEMBER 1961.

LAYOUT OF TRACKS AND SIGNALS BETWEEN HITCHIN AND PETERBOROUGH
(AT THE TIME OF THE ACCIDENT)

NOT TO SCALE





LAYOUT AT CONNINGTON SOUTH AT SITE OF ACCIDENT
NOT TO SCALE

J.S. MAYNARD