MINISTRY OF TRANSPORT

RAILWAY ACCIDENT

REPORT ON THE COLLISION

that occurred on

21st April 1963

near

KING'S LANGLEY

in the

LONDON MIDLAND REGION BRITISH RAILWAYS

LONDON: HER MAJESTY'S STATIONERY OFFICE
1963
THREE SHILLINGS NET

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

28th August 1963.

SIR,

I have the honour to report for the information of the Minister of Transport, in accordance with the Order dated 24th April 1963, the result of my Inquiry into the collision that occurred at about 7.20 p.m. on Sunday 21st April between the 12.20 p.m. Holyhead to Euston passenger train running on the Up Fast line and a rail-mounted crane standing on the adjoining Down Slow line near King's Langley, on the Euston—Crewe main line in the London Midland Region, British Railways.

The crane was being used to unload material from wagons standing on the Up Slow line and as it swung it obstructed the Fast lines from time to time. Approaching trains on these lines were therefore being warned of the obstruction by handsignalmen. The outer handsignalman on the Up Fast line, however, had not been stationed as far out from the site of the work as is required under the Rules.

The passenger train, which consisted of 12 coaches hauled by a diesel-electric locomotive, was running at about 80 m.p.h. under clear signals on the falling gradient from Tring towards King's Langley when it exploded three detonators and the driver saw a man bend down to pick up a red flag. Realising it was a handsignalman he shut off the power and applied the brakes, but was unable to bring his train to a stand before it struck the crane, the tail of which was projecting towards the Up Fast line in the direction of the approaching train.

The left side of the nose of the diesel engine hit the tail counterpoise of the crane a glancing blow at a speed of about 20 m.p.h. and the resulting side thrust was sufficient to burst the offside rail causing the derailment of the engine and four leading coaches of the train which ran on for approximately 75 yards before coming to a stand foul of the Down Fast line. The derailed vehicles remained upright with couplings intact. Fortunately, apart from a member of the restaurant car staff who fell and injured his leg, nobody on the passenger train was hurt.

The crane was derailed and extensively damaged, its runner wagon was damaged and a goods brake van to which it was coupled was also derailed, the crane driver being lucky to escape with no more than a shaking.

As a result of the accident all four running lines were obstructed and protection was provided immediately. The emergency services were called promptly, and arrived within 20 minutes of the accident. The crane driver was taken to hospital but not detained.

The passengers from the derailed coaches were transferred to other parts of the train and the eight undamaged coaches of the express were drawn back to Hemel Hempstead whence the 349 passengers were taken by bus to Watford Junction to continue their journey to London by rail.

Considerable dislocation was caused to both passenger and freight services, and a bus service was introduced between Hemel Hempstead, King's Langley and Watford Junction until normal rail services were resumed. The Down Fast line was cleared by 11.50 p.m. on the 21st April and single line working put into operation over it from 3.55 a.m. on the 22nd April until the Up Slow line was reopened at 4.38 p.m. on the same day. Normal working was resumed at 6.33 p.m. on the 22nd April.

It had been raining, but it was fine at the time of the accident; it was still daylight and the visibility was good.

DESCRIPTION

Site and signalling

1. King's Langley lies 21 miles from Euston on the London Midland Region four track main line which is now in course of being resignalled and electrified on the overhead system.

2. In the Up direction, from a summit at Tring about 11 miles north of King's Langley there is a continuous falling gradient averaging 1 in 340. Over the last half mile before the point of collision the actual gradient is 1 in 508.

3. All four tracks are laid in 109 lbs. FB rail, the Up Fast being of long welded rail on prestressed concrete sleepers laid in 1961, the other three lines being in 60 ft. lengths on wooden sleepers. The distance between the running lines is the normal 6 ft. space in each case, no additional clearance being provided between the Fast and Slow lines.

4. The speed limit for the line is 90 m.p.h.

5. The present signalling consists of mechanically operated semaphore home signals with colour light distant signals. In addition, colour light Intermediate Block signals are provided between some signalboxes. Absolute Block signalling is in force over all four lines which from East to West are the Up Slow, Down Slow, Up Fast and Down Fast respectively.

6. Almost midway between the signalboxes at Boxmoor and King's Langley, at Nash Mills, I.B. Home signals are provided on both Up and Down lines. These are controlled by the signalbox in rear and released by Line Clear from the signalbox in advance. Telephones are provided between the I.B. signals and the controlling signalboxes.

7. The collision occurred 1653 yards South of Nash Mills I.B. signals, and details of the site are given in the accompanying diagram. The relevant distances to Euston and to the point of collision are:—

	To Euston	*To point of collision*
Tring	31¾ m.	10 m.
Hemel Hempstead and Boxmoor S.B.	24 m. 731 yds.	2 m. 1144 yds.
Nash Mills I.B. signals	22 m. 1240 yds.	1653 yds.
Bridge No. 79 (Red Lion Bridge)	22 m. 1040 yds.	1453 yds.
Bridge No. 78 (Grand Union Canal)	22 m. 575 yds.	988 yds.
King's Langley Up Distants	22 m. 23 yds.	436 yds.
Point of collision	21 m. 1347 yds.	—
King's Langley S.B.	20 m. 1406 yds.	1701 yds.
Watford Junction No. 2 S.B.	17¾ m.	2 m.

8. After passing Hemel Hempstead and Boxmoor the driver of a train on the Up Fast line gets his first sight of Nash Mills I.B. Home signal at a distance of about 600 yards as he comes on to a straight stretch of about ¾ mile. As far as Nash Mills the line is in a cutting, and thereafter on an embankment of a height of approximately 20 ft. to beyond the point of collision. 200 yards south of Nash Mills the line passes over Red Lion Bridge and a quarter of a mile further on over the Grand Union Canal from where a right-hand curve averaging 120 chains radius extends to beyond the point of collision. From the canal bridge the King's Langley Up colour light Distant signal comes into view at 550 yards appearing from behind the newly erected electrification masts on the right of the line. Shortly before reaching this signal it would be possible to see a train standing on the Down Slow line at the point where the crane was working on the day of the collision at a distance of about 500 yards.

The train

9. The 12.20 p.m. express from Holyhead to Euston consisted of 12 coaches hauled by a 2000 H.P. type 4 English Electric diesel-electric locomotive No. D216 of wheel arrangement 1 Co-Co 1 and weighing 133 tons. The driver's seat is on the left in the direction of travel and the cab is set back from the front of the locomotive by about 6 feet, the nose space being occupied by the vacuum brake exhauster and other auxiliaries. The engine is fitted with compressed air brakes giving a braking force 64% of the total weight and the brakes are applied by a proportional brake handle which also applies the vacuum brakes of the train.

10. The first three coaches and the last coach were fitted with screw couplings, the remainder with buckeye couplings; all were equipped with standard automatic vacuum brakes with direct admission valves. The empty weight of the stock, excluding the engine, was 398 tons and the total weight of the train and engine, including passengers and luggage, was approximately 561 tons, of which the available braking force was approximately 70%.

11. The train had run non-stop from Crewe and had passed Tring on time at 7.8 p.m. It was due to arrive at Euston at 7.51 p.m.

The crane

12. The crane, No. 1769/12 which belonged to the Chief Mechanical and Electrical Engineer's Department was a diesel-electric crane on a four-axle undercarriage, weighing 68 tons with a 50 foot jib and a maximum lifting capacity of 12 tons.

13. It had a tail radius of 11 feet, and when standing on the Down Slow line at the angle to which it was slewed when the collision took place the tail corner of the superstructure would have been almost directly above the near side rail of the adjacent Up Fast line and about 6 feet above it.

14. Apart from to the front, the outlook from the driver's position, which is on the left of the cab, is very restricted and, owing to the noise of the diesel generator set mounted behind him in a transverse position, any attempt to communicate with him other than by visual means would be ineffectual.

15. At the moment of collision the driver had his back to the approaching train and was watching for the instructions of the contractor's foreman who was controlling the lift. The crane was coupled between its runner wagon and a goods brake van, the latter being at the southern end.

The damage

16. Diesel engine No. D 216 sustained severe damage to its steel nose panelling and to some of the auxiliary machinery mounted within the nose space, directly in front of the driver's seat, owing to contact with the crane. Damage was also caused to the underside of the bogies and to the traction motor gear housings as a result of contact with the permanent way after derailment.

17. The leading coach suffered severe damage to its trailing bogie and had its body scored by contact with the crane, several windows being broken on the corridor side and interior panels displaced. The second coach suffered similar but less severe damage, no windows being broken, and the third coach had one axle box broken. The remainder of the train was undamaged.

18. The crane suffered severe damage to the superstructure, the back end being stove in and the counterweights displaced. The diesel generator set was displaced on its mounting and damaged and the slewing gear was damaged.

19. Approximately 80 yards of the long welded track in the Up Fast line was completely destroyed and 30 yards in the Down Slow was badly damaged.

20. All the damage was consistent with the collision taking the form of a glancing impact at a speed of about 20 m.p.h.

Rules and Regulations

21. The method of obtaining absolute possession of a running line for engineering purposes is laid down in the General Appendix to Working Timetables and Books of Rules and Regulations. The relevant portion of these instructions is reproduced as Appendix 1 to this Report. Under these instructions the responsibility for taking over the line and making all necessary provisions for its protection is that of the department carrying out the work. It involves visiting the signalboxes at the ends of the section concerned and making appropriate entries in the block registers which must be signed by both the signalman and the Engineer's Department Inspector or other person in charge of the work, and placing handsignalmen with detonators to prevent trains entering the obstructed line.

22. The procedure for protection of trains on adjoining lines during the working of cranes in connection with mishaps or engineering operations is also laid down in the General Appendix and an extract is reproduced as Appendix 2. These instructions place the overall responsibility for safe working on a nominated responsible member of the Operating Department staff who is required to keep in touch with the signalmen concerned so as to obtain accurate information as to the running of trains. If necessary he should use a portable telephone for this purpose. Special provision is also made for the use of an Intermediate Block Home signal for stopping approaching trains where the signal lies within 1 mile of the place where a crane is working as was the case on the day of the accident.

23. The detailed procedure for the placing of handsignalmen to protect obstructions and details of their duties are laid down in Rule 217 of the British Railways Rule Book 1950. The relevant paragraphs are reproduced as Appendix 3. The principle of this rule is that a minimum of two handsignalmen shall be provided to protect any obstruction from each possible direction of approach and that where fixed signals do not intervene, each outer handsignalman shall be at least 1 mile from the obstruction and so placed that the driver of an approaching train obtains a good and distant view of the hand Danger signal. The rule also lays down that an intermediate handsignalman must be appointed when the outer handsignalman is out of sight of the inner handsignalman in order to repeat the signals made by the latter.

Narrative and Evidence

Work in progress

24. The task on which the crane was being employed was the erection of a series of new signal gantries in connection with the resignalling and electrification work in progress. On Sunday 21st April three such gantries had been erected, two at sites between Watford Junction and King's Langley and the third at the point where the collision occurred. For this purpose the Signal and Telecommunications Engineer's Department had been given an absolute possession of both Slow lines between Boxmoor and Watford Junction No. 2 signalboxes from 6.0 a.m. to 6.0 p.m.

25. It was also necessary, however, from time to time during the erection of each gantry, to obstruct the Up and Down Fast lines whilst some of the lifts were being made and protection was required on each occasion in accordance with the Instructions for the protection of trains on adjoining lines during the working of cranes in connection with engineering works. The responsible member of the Traffic Department staff who had been appointed to act as Traffic Inspector in accordance with these Instructions was Mr. H. D. D. Evans, Station Master at Hemel Hempstead and Boxmoor and also responsible for King's Langley.

26. The actual work was being carried out by employees of the British Insulated Callender Construction Company under the supervision of an Inspector from the Signal and Telecommunications Engineer's Department, who was the person responsible for obtaining possession of the Slow lines which were to be occupied by the crane and the materials train.

Notification of Engineering Works

27. The normal procedure is for all pre-planned engineering works to be notified to all concerned in the weekly Notice of Permanent Way Operations. Due to an administrative error the programme of work notified for Sunday 21st April which included the erection of the three signal gantries near King's Langley did not mention the obstruction of the Fast lines by the crane, but it was included in a District Circular of Amendments as taking place between 6.0 a.m. and 6.0 p.m. on Sunday 21st April 1963. This circular was issued on 18th April 1963, but had not been received by the driver of the train involved in the accident.

Evidence

28. *Signal Inspector C. M. J. Stannard* said that he was in charge of the erection of the three new signal gantries and that he had taken possession of the Up and Down Slow lines at 6.0 a.m. Work had been late starting owing to the non-arrival of Engineer's Department staff to act as handsignalmen under Rule 217. He had asked the Permanent Way Inspector for four men for this duty, but none had appeared. He admitted that handsignalmen were required for work at all three sites, but work had been started after Mr. Evans, the acting Traffic Inspector, had arranged with Control to get possession of the Fast lines between booked trains.

29. For work at the third site handsignalmen had been obtained and he was satisfied that he had adequate protection to carry on work. Because of the late start, the day's programme had not been completed by 6.0 p.m. and he was given permission by Mr. Evans to carry on. At the time when the accident occurred the crane was engaged on the last lift of the day, the unloading from a wagon standing on the Up Slow line of part of a signal cage unit which was to be placed for the time being in the cess at the far side of the line adjacent to the Down Fast. Whilst the lift was being made he saw a train approaching and when it was about 300 yards distant realized that it was not going to stop but he was not able to do anything to avert the collision.

30. Inspector Stannard, on being asked whether he had provided a portable telephone to the nearest signalbox, said that at the first site they had used a signal post telephone but that he had connected a portable telephone at the second site. He had not connected the portable telephone at the third site until after the accident occurred, as the Traffic Inspector had not asked for it.

31. *Overhead Line Inspector R. F. Broadhurst* said that he was the supervisor in charge of the diesel-electric crane and that his task was limited to making sure that the crane was being used in a safe and proper manner but because he had road transport available he had assisted in placing the handsignalmen for the third site. He said that Mr. Evans had instructed him to take a handsignalman to underbridge 79 and station him there. He was not aware of the exact distance of the bridge from where the crane was working but was satisfied that the protection would be adequate and that all approaching trains would be stopped clear of the site of work and not allowed to proceed until he had ensured that the crane was out of the way.

32. Inspector Broadhurst said that when he saw a train approaching at such speed that it could not stop he jumped up onto the crane and tried to attract the driver's attention to make him straighten up the crane, but was unable to make him understand because of the noise.

33. *Mr. H. D. D. Evans, Station Master at Hemel Hempstead and Boxmoor*, said that he was on duty on 21st April as acting Traffic Inspector for the Signal Engineer's work between Watford Junction and Boxmoor. He had met Inspector Stannard at King's Langley at 6.30 a.m. and had learnt that no men had reported for duty as handsignalmen. After some delay he had come to an arrangement with Control that he should secure an absolute blockage of the Fast lines between Watford No. 2 and King's Langley between booked trains so that the work could proceed. He said that he had done this with the two signalmen concerned by telephone from the site of work and had not visited the signalboxes and signed the Train Register Book as required by the Regulations. He admitted that he was aware that this was irregular, but that he had taken it upon himself to work in this manner solely in order not to have to cancel the day's programme of engineering works.

34. Mr. Evans went on to explain that, by the time the work at the first two sites had been successfully completed, three men had become available to act as handsignalmen, and though a minimum of four handsignalmen would be required to secure proper protection under Rule 217 he decided to use that method of protection, using himself as the inner handsignalman on the Up Fast line. Of the other three men one was to act as the Up Fast outer handsignalman and two on the Down Fast. To take up his position at King's Langley the outer man on the Down Fast would have to walk through the section from near Watford, so until he arrived at his post Mr. Evans arranged for the signalman at King's Langley to cover the duties by placing detonators on the line and stopping and warning trains. He did not himself speak to the Up Fast outer handsignalman but told Inspector Broadhurst to place him at "Red Lion Bridge" (bridge no. 79) which he estimated was the correct distance from the site of work. From his position as inner handsignalman he could not see the outer handsignalman at Red Lion Bridge but he did not appoint an intermediate handsignalman.

35. Mr. Evans said that work started at the third site at about 5.30 p.m. and several trains on the Up Fast line stopped short of his position as inner handsignalman and awaited his signal to proceed, but when the Holyhead Express was approaching he realized it was travelling faster than the preceding trains and did not appear to be going to stop in time. With blasts on his whistle he drew the crane supervisor's attention to the approaching train but there was no time to avert the collision which he estimated as taking place at between 30 and 40 m.p.h.

36. On being asked whether he took any action when he realized that the work was not going to be complete by 6.0 p.m., the time when the Engineer's possession of the Slow lines was supposed to be given up, Mr. Evans said that they had just carried on and that he had not informed Control of the situation.

37. *Sub-Ganger S. G. Beamish* who was sub-ganger of the King's Langley length had been on duty since 7.30 a.m. as a look-out man for some engineering works in progress to the north of Boxmoor and when this work was completed about 4.0 p.m., he agreed to do additional duty as a handsignalman for the crane work at the third site. He said that he had been taken to and stationed at Red Lion Bridge

by the crane supervisor and that he was fully qualified to act as a handsignalman. Since he was out of touch with the site of the work he was to flag all trains as they passed his post. He had no reason to suppose he had been wrongly positioned.

38. Beamish went on to say that most of the trains had been brought to a stand at Nash Mills I.B. signals and had passed his post at slow speed but that the Up Holyhead Express running under clear signals had been travelling much faster, he estimated between 75 and 80 m.p.h. He admitted to being in the Down Fast cess when the train first approached and to having left his red flag lying beside the Up Fast but claimed that he had crossed to the Up Fast and exhibited the flag before the train reached Nash Mills I.B. signals. He had not heard the train brakes go on, but thought that the driver had acknowledged his hand Danger signal with a single toot of his horn.

39. *Signalman E. J. Fowler* had only come on duty at Hemel Hempstead and Boxmoor at 7.0 p.m. on the day of the collision. When he took over he was told that the engineering work was still in progress and that Rule 217 was operating between his box and King's Langley. The first train he dealt with was the Up Holyhead Express which passed Hemel Hempstead and Boxmoor at 7.17 p.m. at a speed which Fowler estimated at 75 to 80 m.p.h., which was quite normal. Fowler had no idea of where the actual site of work was, except that it lay between his box and King's Langley.

40. *Relief Signalman H. Hardaker* had come on duty at King's Langley at 6.0 p.m. He had found the Slow lines still in Engineer's possession and Rule 217 being applied on the Fast lines, though he was not told exactly where the crane was working. The proper outer handsignalman for the Down Fast had not reported to him and he carried out the duties himself on his own initiative, placing detonators on the line and warning drivers after bringing each train to a stand. On the Up line the Up Fast Distant was not being cleared.

41. Hardaker went on to say that, shortly before 7.0 p.m. he was told by the signalman at Boxmoor that Rule 217 was being fully operated on the Up Fast and that he could work normally. He took this to mean that he could pull off all his signals, which he did for the next Up train which was the Holyhead Express. He was not aware that the site of work was within his distant signals.

42. *Driver S. Johnson* was the driver of the 12.20 p.m. Holyhead to Euston which he had taken over at Crewe. He had had three years experience on main line diesels and was fully conversant with them. He had received a signal check at Tring, but from there had run under clear signals until, on passing Nash Mills I.B. signals he had seen a man run across in front of the train only about 100 yards ahead. Before he had realized the man was a handsignalman the train had run over the detonators whereupon he had shut off power and made an immediate full application of the brakes.

43. Driver Johnson's estimate of his speed at that moment was a "good 75 m.p.h." but he had not looked at the speedometer. They were still travelling quite fast when the crane came in view, and realizing he would not stop in time he had shut down the diesel engine before moving over on to the fireman's side to take cover. He estimated his speed at the moment of impact as 15 m.p.h. On being asked to estimate the lapse of time between hearing the detonators and realizing that the man he had seen was a handsignalman, and making his brake application Driver Johnson said that he thought that about three seconds would have passed before he had shut off power and made a full brake application. He had not received any notification of work in progress between Boxmoor and King's Langley and said that the sudden appearance of a handsignalman was a complete surprise to him.

44. *Passed Fireman P. M. Keen* generally confirmed his driver's evidence. He said that he had been watching the build up of speed after the check at Tring and thought that the speed at Nash Mills was about 78 m.p.h. He said that it was not until after they had passed Nash Mills I.B. signals that he saw a man cross from the Down Fast cess and bend down to pick up a red flag just as they ran over the detonators, and that the driver made a full brake application at once. Keen went on to say that when they were about $\frac{1}{4}$ mile from the crane and becoming concerned about not stopping he sounded the horn continuously and shut down the train heating boiler. After the collision occurred, when they realized the Down Fast line was obstructed, he had gone forward at once to provide protection.

45. *Guard G. F. Penn* had been travelling in the last coach of the Holyhead train and had felt a sudden brake application. He said that, on looking out, he had seen a handsignalman just putting his flag down. The handsignalman was a tall man and stationed on the bridge where A.41 goes under the line. Penn said that, once the brakes were applied, the driver did not attempt to recreate the vacuum and the train came to a violent stop. His estimate of the speed of the train was 75 m.p.h. on passing Boxmoor which he regarded as normal on a first-class piece of track.

Tests and Observations

46. The minimum distance at which the outer handsignalman should be stationed from an obstruction such as a crane is laid down in Rule 217 as one mile, and since the hand danger signal must be displayed so that the driver of an approaching train has a good and distant view of it he should be able to make his initial brake application more than a mile from the obstruction. On this occasion, however, the actual distance from where Sub-Ganger Beamish placed his detonators, 30 yards to the north of Red Lion Bridge, to the point of collision was only 1483 yards. Moreover, owing to the last moment appearance of the handsignalman, no brake application was made until some seconds after the train had passed over the detonators. The driver's estimate of this delay was 3 seconds, but in my view it may well have been as much as five seconds, during which time the train would have covered a distance of at least 180 yards leaving only about 1300 yards to where the crane was standing.

47. A practical braking test was carried out on 1st May using a test train hauled by a locomotive of the same class as the one involved in the collision. For this test the eight undamaged coaches from the Holyhead Express of 21st April were supplemented by a further four coaches of British Railways standard type giving an empty weight of 411½ tons as compared with the loaded weight of 428 tons of the train involved in the collision, and giving a slightly higher proportion of available braking force. With the same driver at the controls and a handsignalman placed at the point where Sub-Ganger Beamish had placed his detonators to indicate the braking point the test train approached Red Lion Bridge at 80 m.p.h. with the controller fully open. Driver Johnson was poised ready to make a full emergency brake application as the front of the locomotive passed the handsignalman and no reaction time was allowed. The train came to a stand in a distance of 1385 yards, 98 yards short of the point of collision on 21st April.

48. Both these stopping distances are less than the standard stopping distance from 80 m.p.h. for any train fitted with standard brake gear, which is 1525 yards on level track, but when the distance that the train ran on after the collision, about 75 yards, is taken into consideration, it is reasonable to suppose its speed on passing Nash Mills was little short of 80 m.p.h. and that this was reduced to about 20 m.p.h. at the moment of collision.

Conclusions

49. The primary cause of the collision was the incorrect positioning of the outer handsignalman on the Up Fast line by Mr. Evans, Station Master at Hemel Hempstead and Boxmoor, who was acting as the Traffic Inspector responsible for the safety of trains passing the place where the crane was working. If he had made a proper plan to cover the day's work, calculating the correct positions for the various handsignalmen that would be required at each site, he would have known that the third site lay within one mile of Nash Mills I.B. signals and issued the correct instructions for Sub-Ganger Beamish to be placed at the I.B. signal and to keep in touch with the signalman at Boxmoor by the telephone at the signal. The duties and responsibilities of the Traffic Inspector are very clearly laid down in the instructions for the working of cranes previously referred to in paragraph 22 and reproduced in Appendix 2 to this Report, and had Mr. Evans understood and followed these instructions safety would have been assured.

50. His actions throughout the day, however, revealed that he did not appreciate the basic principles of protection of engineering works or fully understand his responsibilities as acting Traffic Inspector. He set a bad example to the signalmen concerned in arranging what he described as an "absolute block between trains" in order to carry on work at the first two sites, which meant allowing work to take place obstructing the Up and Down Fast lines solely under the protection of telephone conversations, a procedure which he was well aware was irregular and unsafe. At the third site, by making himself the Up Fast inner handsignalman he placed himself where he did not know what was going on and could not exercise any form of effective supervision, and though a portable telephone was available it was not connected until after the accident occurred.

51. I therefore hold Mr. Evans responsible for this accident, but would like to comment that, at my Inquiry, he gave his evidence frankly and freely and made no effort to evade what he had come to realize was his responsibility. In the circumstances, he would have been entirely justified in cancelling the day's programme of work when he discovered that he had not the proper number of qualified handsignalmen to secure the laid down standard of protection. It was not within his responsibilities to alter the arrangements so that work could proceed, however keen he may have been to ensure that the electrification programme was not held up. He was at fault also in failing to inform the District Control Office of the fact that the absolute possession of the Slow lines by the Signal Engineer's Department was not going to be withdrawn by the planned time of 6.0 p.m. In his position of responsibility he should have realized that information of this kind is particularly important to a controller at a time when line capacity is adversely affected by engineering works.

52. A contributory cause lay in the manner in which Sub-Ganger Beamish carried out his duties as handsignalman after being placed at Red Lion Bridge. In this matter I accept the evidence of the engine crew of the express that, though they saw a man moving across from the Down Fast cess as the train approached, it was not until they heard the detonators that they had any reason to suppose he was a handsignalman. It is clearly laid down in Rule 217 that the handsignalman will be so placed as to ensure the driver of an approaching train having a good and distant view of his hand danger signal. Had Sub-Ganger Beamish had his red flag properly displayed, the driver of the Holyhead Express would have had at least 400 yards earlier warning, and despite the wrong placing of the handsignalman the accident should have been averted.

53. The fact that the King's Langley Up Fast Distant, which was situated 436 yards in rear of where the crane was working, was showing a green light in contravention of Rule 217(c) was not in my opinion a contributory cause, since by the time the driver came within sight of this signal he must already have made a full brake application; but the action of Signalman Hardaker, in pulling off all his signals for the Up Holyhead Express because he had heard from the Boxmoor signalman that he could work normally, without waiting for a visit to his box by a responsible person to sign his Train Register Book in accordance with Rule 217(d), underlines once more the general lack of discipline in the area for which Mr. Evans was responsible.

54. The administrative error that led to the omission of the relevant paragraph from the Weekly Notice of Permanent Way Operations was unfortunate and particular care should have been taken to ensure that the amendments reached all concerned before the notice came into effect, but in this instance

I do not consider that this had any bearing on the accident. I am satisfied that Driver Johnson's reaction on hearing the detonators and realizing he had passed a handsignalman was as quick as could be expected, in view of Sub-Ganger Beamish's last moment appearance, and I consider that he and his fireman did all they could to avert the accident for which they cannot be held to blame.

Remarks and Recommendations

55. The section of line on which this accident occurred is very busy, and if the electrification works are to be carried out safely and with a minimum of delay to passing traffic it is absolutely essential that proper forward planning is carried out by the responsible supervisors, and that the closest co-ordination is maintained between the Traffic and Engineering Departments involved. Even when work is efficiently planned, however, unexpected delays and difficulties may occur while it is being carried out and it is therefore important that close contact should be maintained between the person in charge of the work and the nearest signalman. I recommend, therefore, that the use of a portable telephone between the worksite and an adjacent signalbox be made mandatory, though its use must be supplementary to and not in place of the handsignalmen required under Rule 217.

56. Rule 217 provides adequate protection if carried out conscientiously but I consider that where the 1 mile distance results in the handsignalman being placed only a short distance ahead of a stop signal provided with a telephone, that signal and not a hand danger signal should be used to stop approaching trains, particularly where colour light signals are in use and their brightness may render a hand danger signal inconspicuous in comparison. Whether this should be done in any particular case should be left to the decision of the person in charge, but I suggest that it should be taken into consideration wherever the position for a handsignalman falls within a quarter of a mile ahead of such a signal.

57. The use of an Intermediate Block Home signal in this manner is provided for when it falls within one mile of the site of work in the Instructions for Working of Cranes mentioned in paragraph 22 and reproduced as Appendix 2 to this Report, but the use of such a signal is not mentioned in Rule 217. I hope that the opportunity will be taken during the revision of this portion of the Rule Book now in progress to bring these two Instructions into line with one another.

I have the honour to be,

Sir,

Your obedient Servant,

I. K. A. McNAUGHTON,

Lieutenant-Colonel.

The Secretary,
Ministry of Transport.

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

ABSOLUTE POSSESSION OF RUNNING LINES FOR ENGINEERING PURPOSES NECESSITATING A COMPLETE STOPPAGE OF TRAFFIC ON SUCH LINES.

When it is necessary for the Engineer to have absolute possession of any running line at places where such possession does not necessitate the introduction of Single Line Working in accordance with Rules 189-208, the work must be protected as follows:—

1. Three detonators, 10 yards apart, must be placed on the line concerned in advance of the work, ¼ mile on the approach side of the first Stop signal of the signalbox in advance. Where this distance cannot be obtained the detonators must be placed as far from this Stop signal as circumstances will allow.

2. (*a*) Three detonators, 10 yards apart, must be placed on the line concerned at the box in rear, but where there is a connection at this box giving access to that line the detonators must be placed ¼ mile ahead of such connection or as far ahead as circumstances permit. A Handsignalman must be appointed to exhibit a hand danger signal at the detonators.

   (*b*) In cases where the work to be undertaken falls within close proximity of the junction giving access to the line over which traffic will be worked and the distance of ¼ mile referred to in clause (*a*) cannot be obtained, the detonators and Handsignalman must be stationed as far from the fouling point as circumstances will allow. In such cases no movements must be permitted on the obstructed line in the wrong direction towards the detonators until the authority of the Signalman controlling the junction has been obtained. The Signalman must not give his permission whilst the signals are "off" for a train to pass through the junction.

In addition the name of the line and time of taking possession must be entered in the Train Register at the signalbox controlling the entrance to the line, in accordance with the following:—

> "Down (or up) . . . line from detonators laid down in advance of the junction at . . . box to detonators laid down on the approach side of the first Stop signal at . . . box has been taken possession of by the Engineer at . . . (time)"

This entry must be signed by the Engineer's Inspector or person in charge of the work and also by the Signalman. After this has been done Engineer's trains or engines may be allowed to use the line between these two sets of detonators without being signalled on the block, but no other train must enter upon the line until any Engineer's trains have been cleared from the section and possession has been given up.

No movement by train, engine, or vehicle must be made beyond the detonators towards the signalbox in advance unless the permission of the Signalman has been obtained. Wrong Line Order Form D must be obtained for movements outside the detonators towards the signalbox in the rear.

The signals controlling the entrance to the affected line must be maintained at Danger during the period the line is in the possession of the Engineer and Drivers of Engineer's trains requiring to proceed on to this line must obtain the permission of the Signalman to pass the signal at Danger.

In those cases where, owing to the line requiring to be blocked at a certain point, more than one section must be closed to ordinary working, the Engineer's trains must be signalled in the ordinary way up to the signalbox controlling the entrance to the section in which the blockage exists. In these circumstances the detonators and Handsignalmen referred to in (2) (*a*) above must, where possible, be stationed ¼ mile ahead of the Home signal of the signalbox controlling the entrance to the block section in which the actual blockage exists. Where the detonators and Handsignalman cannot be stationed at this distance Engineer's trains may be accepted under Block Regulation 5.

When the Engineer no longer requires possession of the line and it is clear of all obstruction and fit to run upon, another entry must be made in the Train Register at the same signalbox, stating:—

> "Down (or up) . . . line between . . . and . . . clear and fit to run over and possession given up by the Engineer at . . . (time)"

This note must be signed by the Engineer's Inspector or person in charge of the work and by the Signalman.

The Signalman at the signalbox where possession of the line is taken must advise the Signalman at the box ahead, also, when practicable, any Crossing Keeper who may be concerned, both when the Engineer's Department takes and gives up possession of the line.

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

WORKING OF CRANES IN CONNECTION WITH MISHAPS OR ENGINEERING OPERATIONS--PROTECTION OF TRAINS ON ADJOINING LINES.

Where a crane is being used in connection with mishaps or engineering operations and it is necessary for trains to travel over any line which may be fouled by the movement of the crane the following precautions must be taken:—

(i) A District Inspector (or other responsible member of the Operating Department staff) must be in attendance and no line must be fouled by the operation of the crane until his permission has been given. He must keep in touch with the Signalman or Signalmen concerned so as to obtain accurate information as to the running of trains. Where necessary a portable telephone in communication with the signalbox or boxes concerned must be provided.

(ii) No train must be allowed to pass the site where the crane is working without the permission of the Operating Department District Inspector who must not give his permission until (*a*) the person in charge of the crane has ensured that it is clear of the line on which the train will run and no further movement of the crane will be made, and (*b*) the hook and lifting beam (where used) is secured to prevent movement.

(iii) After a train has passed the site of the work the crane may re-commence operations as soon as the Operating Department District Inspector has ascertained that there is a suitable interval for work to proceed and after the protective arrangements shown in clause (iv) have been carried out.

(iv) When the site at which the crane is working is not within the protection of the fixed signals of the lines on which trains require to run Handsignalmen must be appointed in accordance with Rule 217. When the Handsignalmen have taken up their positions a train may be allowed to enter the section but, in connection with Rule 217 (*b*), second paragraph, the train must first be brought to a stand at the signalbox in rear and the circumstances explained to the Driver. The Handsignalmen at the site of the work must continue to exhibit a danger signal until the Operating Department District Inspector authorises the train to proceed.

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In the case of an Intermediate Block Home signal controlled from the signalbox in the rear if the site where the crane is working is within the clearing point of such signal the Operating Department District Inspector must request the Signalman at the box in rear to place a lever collar on the lever controlling the Intermediate Block Home signal and also on the lever of the signal controlling the entrance to the Intermediate Block section until the conditions in clause (ii) are carried out. Where the site at which the crane is working is ahead of the clearing point of the Intermediate Block Home signal Handsignalmen must be appointed in accordance with Rule 217. If however the Handsignalman when going out to protect an obstruction should arrive at an Intermediate Block Home signal before he has reached the distance of 1 mile, he must make use of the telephone provided, and request the Signalman to maintain the Intermediate Block Home signal at Danger until the Handsignalman has informed him that the obstruction has been removed, and that the line is clear and safe for the passage of trains. Under these circumstances the Handsignalman must remain at the Intermediate Block Home signal, place on the rail 3 detonators, 10 yards apart, and exhibit a hand danger signal, until the Operating Department District Inspector authorises the train to proceed. Should the telephone at the Intermediate Block Home signal have failed, the Handsignalman must proceed for the prescribed distance in accordance with Rule 217.

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Extracts from British Railways Rule Book, 1950

RELAYING, REPAIR AND OBSTRUCTIONS

217. (*a*) The times for carrying out work involving the stopping of trains must be selected so as to interfere as little as possible with the passage of the traffic.

Unless absolutely necessary, a rail must not be displaced, nor must any other work be performed after sunset or during fog or falling snow by which an obstruction may be caused to the passage of trains.

Before a rail is taken out or relaying operations are commenced, or any stationary obstruction (except a trolley or ballast train, for which see Rules 215 and 216) is placed on the line, or in the case of any slip or failure of the works, or if from any cause the line is unsafe, the Ganger or man in charge must, except as otherwise provided in this clause (*a*) appoint a Handsignalman to protect the obstruction. The Handsignalman must, except as provided in clause (*b*), be stationed at a distance of one mile, or at such further distance as may be necessary, to the rear of the obstruction to ensure the Driver of an approaching train having a good and distant view of his hand Danger signal. The Handsignalman must place on the rail 3 detonators, 10 yards apart, and exhibit a hand Danger signal. The Ganger or man in charge must not allow a rail to be taken out or any obstruction to be placed on the line until this has been done.

The Ganger or man in charge must not withdraw the Handsignalman until the line is clear and safe for the passage of trains.

When the obstruction affects more than one line, the necessary steps must be taken to protect all the lines obstructed.

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(*b*) When a Handsignalman is going out to protect a line which from any cause is unsafe, he must exhibit a hand Danger signal, and if a train approach him on the obstructed line before he has reached the prescribed distance, must place on the rail 3 detonators, 10 yards apart, and continue to exhibit the hand Danger signal.

If the Handsignalman when going out to protect an obstruction should arrive at a signalbox before he has reached a distance of one mile, he must request the Signalman to keep the necessary signals at Danger for the protection of the obstruction. The Signalman must not lower his signals or allow any train to pass his box in the direction of the obstruction until the Handsignalman has informed him that the obstruction has been removed, and that the line is clear and safe for the passage of trains.

Until he is recalled by the Ganger or man in charge, the Handsignalman must remain at the signalbox, place on the rail 3 detonators, 10 yards apart, and exhibit a hand Danger signal.

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(*c*) Before a rail is taken out or relaying operations are commenced, or any stationary obstruction (except a trolley or ballast train, for which see Rules 215 and 216) is placed on the line between a distant signal and any stop signal worked from the same signalbox, or within ¼-mile in advance of a home signal where another stop signal is not provided ahead of such home signal, the Ganger or man in charge must, in addition to sending out a Handsignalman, obtain the permission of the Signalman, and request him to keep his signals at Danger for the protection of the obstruction. In the case of any slip or failure of the works, or if from any cause the line is unsafe, the Ganger or man in charge must, in addition to sending out a Handsignalman, inform the Signalman who must take the necessary steps to protect the line or lines affected.

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(*d*) Whenever the Signalman is requested by the Ganger or man in charge or the Handsignalman to keep his signals at Danger for the protection of the obstruction, the Signalman must make an entry, ". . . line obstructed" and record the time in the Train Register and he and the person who requests him to keep his signals at Danger must each sign his name.

When the obstruction has been removed, the Signalman must be advised by the Ganger or man in charge or by the Handsignalman, as the case may be, and the entry "Obstruction removed, . . . line clear", must be made and the time recorded by the Signalman in the Train Register. Each man must sign his name.

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(*e*) When the obstruction is not within the protection of the home signal, the Ganger or man in charge must, in addition to sending out a Handsignalman the prescribed distance, also station near to the obstruction a second Handsignalman, who must place on the rail 3 detonators, 10 yards apart, and exhibit a hand Danger signal.

When the distant Handsignalman is out of sight of the Handsignalman stationed near the obstruction, one or more Handsignalmen as may be necessary must be stationed intermediately, for the purpose of repeating to the distant Handsignalman the signals exhibited by the Handsignalman near the obstruction.

The Handsignalman must remain at the appointed place until he is recalled by the Ganger or man in charge.

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COLLISION NEAR KING'S LANGLEY - L.M. REGION - 21st. APRIL 1963.

FIGURE 1. - DETAIL OF SITE AND SIGNALLING

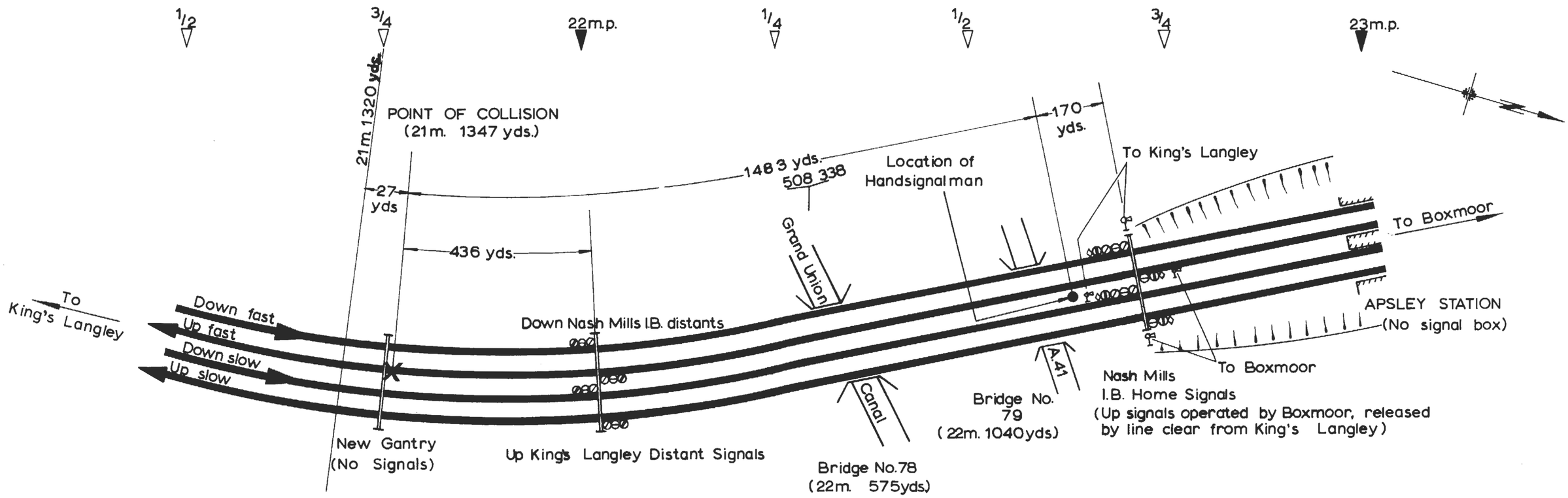
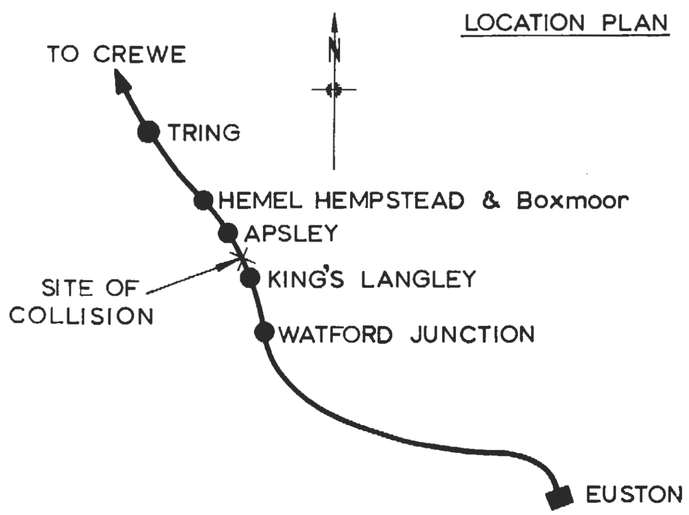


FIGURE 2.
LOCATION PLAN



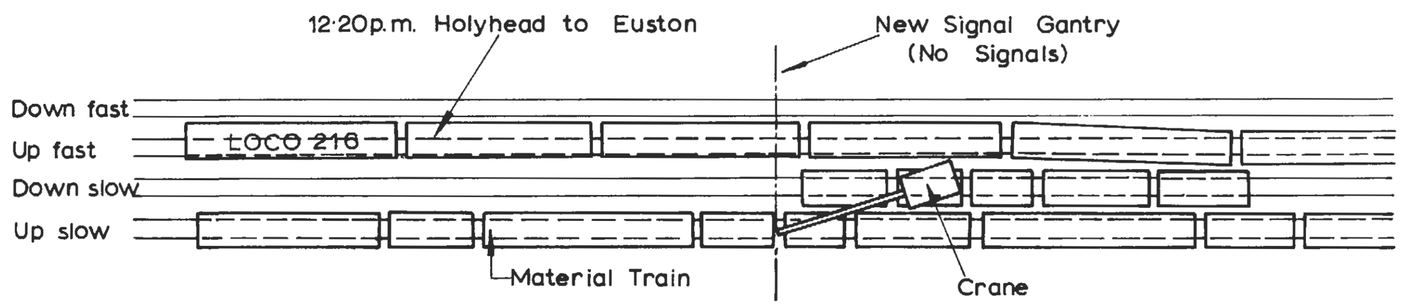


FIGURE 3. DETAIL AT POINT OF COLLISION (21 mls. 1347 yds.)

SCALE:- 40 feet to One Inch