



MINISTRY OF TRANSPORT

RAILWAY ACCIDENTS

REPORT ON THE DERAILMENT

which occurred on

19th November 1951 at

POLESWORTH

in the

LONDON MIDLAND REGION

BRITISH RAILWAYS

LONDON : HER MAJESTY'S STATIONERY OFFICE

1952

SIXPENCE NET

7th May, 1952.

SIR,

I have the honour to report for the information of the Minister of Transport, in accordance with the Order dated 20th November 1951, the result of my Inquiry into the derailment which occurred at about 5.30 a.m. on Monday, 19th November, 1951, at Polesworth on the main line between Euston and Crewe in the London Midland Region, British Railways.

The train concerned was the 10.30 p.m. (18th November) Up express passenger from Glasgow to Euston and it comprised twelve bogie coaches. Owing to the failure of a signal at another box the train had to be diverted from the Fast line to the Slow line at Polesworth. The driver did not see the Distant signal which was at Caution, and he did not apply the brakes until he saw the Home signals at Danger close ahead. The train passed through the crossover between the Fast and the Slow lines at about 55 m.p.h., a speed considerably in excess of that authorised, and the engine and eight leading coaches became derailed. The engine struck the passenger platform on the Slow line which probably prevented it from turning over immediately and maintained the coaches generally in line.

There were 174 passengers in the train, of whom only two were slightly injured. One was removed to hospital without delay and discharged the same day after treatment, and first-aid was rendered to the other on the spot. Adequate arrangements were made for the remaining passengers to continue their journeys to London.

Both the Up lines were blocked, and arrangements were made to work traffic over the two Down lines and to divert some trains to other routes. The fast line was reopened at 7.45 a.m. and the Slow line at 12.00 noon on 20th November, after the considerable damage to the latter had been repaired.

It was a dark but clear night, and a light westerly wind was blowing.

DESCRIPTION

The Train.

2. The twelve coaches weighed 431 tons and included six sleeping cars, five first class and one third class. The train was hauled by the "City of Leicester", a class 8P tender engine of the 4-6-2 type which weighed 162 tons in working order, and was driven from the left hand side. The steam brake operated on the engine and tender and the vacuum brake on the train, and the braking power available was 68% of the total weight of the train, which was 593 tons.

The engine turned over to the left after it had passed along the whole length of the platform and the train had lost most of its speed; the tender did not turn over but was tilted to the same side. The left hand side of the engine, which had been in contact with the platform, was badly damaged. Subsequent examination showed that the profiles of the engine and tender tyres were good and that the wheels were true to gauge.

The seven leading coaches were completely derailed but remained upright; only the front bogie wheels of the eighth coach were off the track. All the coaches had steel underframes and were fitted with shock absorbing buffers. There was no telescoping, but the solebars of some coaches had started to ride over those of the vehicles in front of them and crushing of the coach ends had begun. Most of the derailed vehicles also sustained considerable other damage from contact with the platform.

The Site.

3. Polesworth lies 3½ miles south of Tamworth and 9½ miles north of Nuneaton. The adjacent signal boxes which were open were Amington Sidings, 1½ miles to the North (Down), and Baddesley Sidings, 3½ miles to the South (Up). From Tamworth to Nuneaton there are four lines of track which are, from left to right, the Up Slow, Up Fast, Down Fast and Down Slow. Approaching Polesworth they swing to the right in a long curve of 154 chains radius, which continues for just over two miles into the station. From Amington Sidings to Polesworth the lines are on a slight rising gradient.

4. At the north end of Polesworth station there is a facing crossover from the Up Fast to the Up Slow. Each Up line is equipped with a single Distant, followed by "Home 1", "Home 2" and Starting signals. The Up Fast has two bracketed "Home 1" signals, No. 53 for the straight on a taller post and No. 50 for the diverging movement to the Up Slow, and they are situated near the facing points of the crossover. The Homes and Starters are semaphores. Both the Up Distant, however, are colour light signals; they are situated 1,275 yards from the "Home 1" signals and are fitted on a cantilevered gantry each above the track to which it applies. All signals and points are controlled from one signal box situated between the Up and the Down lines, and almost in the centre of the station.

The locking of the frame in the signal box is such that the Up Fast Distant signal lever (No. 54) is free only when the crossover points are set normal for the straight and are bolted, and the levers of the Up Fast "Home 1" (No. 53), "Home 2" and Starting signal are pulled. The lever of "Home 1" (No. 50) requires the reversal and bolting of the crossover points, which locks lever No. 54 in its normal position. There is sequential locking between the signal levers. There is also a control which ensures that levers No. 50 and 53 are normal before "line clear" can be given on the Up Fast.

There is a track circuit, 220 yards long, on the Up Fast on the approach side of the "Home 1" signals which controls the block instrument and replaces signal No. 54 to Yellow. When the "Home 1" signals are at Danger, occupation of the track circuit operates a buzzer in the signalbox, which sounds for about 10 seconds or until either signal is lowered.

The aspects of the Distant signals are repeated in the signalbox. Each signal has an auxiliary yellow aspect which is lit automatically if the bulb in the main aspect fails. When this happens, or when there is a power failure, a "no light" indication appears and an audible warning is given in the box. In the event of a power failure, standby secondary batteries become switched in automatically.

5. The sighting distances of the Up Fast line signals as taken from the footplate of an engine were found to be :—

	<i>Distant signal</i>	<i>"Home 1" signals</i>
From the left hand side	154 yards	200 yards
From the right hand side	480 yards	384 yards

6. The track in the Up Fast line, the Up Slow platform line and in the 1 in 10 crossover is 95 lbs. R.B.S. rails in cast iron chairs on timber sleepers. There is a speed limit of 15 m.p.h. through the crossover. After the accident, the track in the Up Fast line and in the facing lead of the crossover was found in good condition. In the trailing lead the gauge had spread by half an inch and some chairs in the left hand lead rail were fractured. For some 25 yards beyond the trailing switches, the Up Slow line was intact but distorted, and more chairs were broken. Marks on fastenings indicated that the engine then became derailed to the right, and caused the complete destruction of the track for 175 yards to the point where it overturned.

After travelling derailed for about 30 yards, the engine had evidently lurched to the left and struck the platform a heavy blow, and it continued to hit the platform, smashing or displacing the coping stones, for a further 40 yards. An undamaged length of seven yards in the platform face indicated that the engine then rolled to the right before striking the platform again ; thereafter contact was maintained for the rest of the platform's length with considerable damage.

7. The relevant distances from the point where the engine came to rest are as follows :—

First point of derailment	175 yards North
Trailing switch of crossover	200 " "
Facing switch of crossover	263 " "
"Home 1" signals (Up Fast and Slow)	283 " "
Distant signals (Up Fast and Slow)	1,558 " "
Amington Sidings	1½ miles "
Tamworth	3½ " "

Rules

8. The following is an extract from the Regulations for train signalling on double lines by the absolute block system :—

"In the event of it being necessary for a passenger train or other train composed of coaching stock, or a Class "C" or Class "D" freight train to be run from one line to another through a junction over which it is necessary that speed should be reduced and such route is not the regular booked route for the train to travel, the junction stop signal must not be taken off until the train is close to such signal, and the signalman must, where practicable, satisfy himself that the speed of the train has been suitably reduced".

The Regulations also say that when a "no light" indication appears in the box, the signalman is to treat the distant signal concerned as having failed, unless the signalman of an adjacent box can see that the auxiliary light is burning.

REPORT

9. At about 4.10 a.m. on 19th November, a "no light" indication for the Baddesley Sidings Up Fast Distant signal appeared in the box. As the signalman at Polesworth could not see that signal it was treated as having failed, and he and the signalman at Baddesley decided that Up trains on the Fast line should be diverted to the Slow line at Polesworth. This was a correct decision. Three trains were dealt with in this way and the fourth train to be diverted was the 10.30 p.m. express from Glasgow which met with the accident.

That train is booked non-stop from Carlisle to Euston. It left Carlisle 7 minutes late, and as a result of subsequent signal checks it passed Tamworth 11 minutes late. Between that station and Nuneaton the booked speed is just under 60 m.p.h.

10. Signalman R. Willis was on duty at Polesworth. He accepted the train from Tamworth at 5.25 a.m. on the Up Fast line and obtained "line clear" for it from Baddesley Sidings on the Up Slow as soon as he received "train entering section" at 5.27 a.m. He had reset the facing crossover for the straight line after the last train had passed over it some 20 minutes before, but he reversed and bolted it for the crossing movement to the Up Slow line before he accepted the 10.30 p.m. express. He also looked at the Repeater of the Up Fast Distant and saw that it was at Caution.

Willis said that he watched the train approach and lowered the Up Fast to Up Slow "Home 1" signal (No. 50) two or three seconds after the track circuit buzzer started to sound. As it approached the Home signals the train was more or less head on to the box (the curvature is very gentle), and he did not realise that it was travelling too fast until it was passing through the crossover. Then everything seemed to happen at once. He heard the screech of the brakes and saw sparks, and he realised that the train was derailed.

11. Driver T. D. Irving was in charge of the 10.30 p.m. train. He knew the road well having driven on it for two years and fired on it for a similar period previously. He came on duty at 11.47 p.m. the previous day (Sunday) at Carlisle after having been on rest from 6.0 a.m. on the Saturday. Irving said that the engine of the train was in good fettle, that it was steaming well and that the gauge was showing 21 inches of vacuum.

According to his statement the journey from Carlisle was uneventful except for the checks at signals, and he was travelling at the usual speed of about 60 m.p.h. through Tamworth and approaching Polesworth. There was a light westerly wind which was causing the smoke from the engine to beat down badly on the left hand (driving) side. That did not affect the sighting of signals, sempahore or colour light, until he was approaching Polesworth; then the black smoke from a heavy fire and steam obscured the Distant signals until the engine was passing underneath them, when he got a glimpse of the yellow light of the Fast line signal.

Irving said that he immediately closed the regulator and applied the brakes by reducing the vacuum to 15 inches. This reduced the speed but he thought the train was still travelling at 50-55 m.p.h. when the fireman shouted to him that both the "Home 1" signals were at Danger. Irving himself then saw the signals 20-30 yards in front of the engine and noticed the Fast to Slow line signal change from Red to Green. He made a full brake application but there was no time for it to take effect before the engine passed through the crossover at about the same speed, swayed heavily and became derailed. It hit the platform and continued to lurch until it fell over gently to the left.

Irving stated that it was not usual for the fireman to look for the Up signals at Polesworth and considered that the driver's view of them from the left hand side of the engine was adequate. He did not cross to the fireman's side to see the Home signals.

I questioned Irving closely but he insisted that he was looking out and caught a glimpse of the distant at Yellow; he was equally insistent that he applied the brakes. He could not, however, explain why the speed of the train was still so high at the Home signals. He said that the brakes had worked satisfactorily on previous occasions during the journey and he did not suggest that they were in any way defective. At one period during his evidence he said—"I was thinking it was Monday morning and he (the signalman) would surely have the Home signal off, as very often does happen"; he meant, of course, with the Distant at Caution. He repeated, however, that he was applying the brakes so as to stop the train at the Home signal if necessary.

Irving said that he had a good rest on Saturday night, and slept again for six hours before going on duty on Sunday. He assured me that he was not feeling sleepy, that he was quite well and that he had no troubles at home. Although not strictly teetotal he drank little but had taken no alcohol that evening. There had, he said, been practically no conversation with his fireman during the journey and they were not talking at the time. He had not recently looked at the fire which was causing no more reflection on the wind shield than usual.

12. Passed Fireman J. A. E. Parkinson had been Irving's mate for seven weeks. He had fired on the main line for two years but had not learned the road as a driver. He said that after seeing the Amington Distant signal at Clear he put on a light fire, and then extricated an awkwardly shaped lump of coal from the tender. He had just finished doing that when he heard the brakes being applied fully. After turning off the injector he looked up and saw the Polesworth "Home 1" signals, the Fast line signal at Danger and the Fast to Slow line signal at Clear. He thought that the signals were then considerably more than an engine length ahead. He could not recollect that the brakes had been applied before the full application and he did not think that the driver had mentioned that the Distant signal was at Caution.

Parkinson said that it was his usual custom to look for the Polesworth Distant signal but on this occasion he was otherwise engaged. He said also that when he knew that the Distant was at Caution he would, as a rule, look for the Home signals. He was certain that on this occasion he did not see the Home signals until after the driver had made the full brake application, and that then the Fast to Slow line signal was at Clear. Parkinson confirmed that there had been little conversation on the footplate, and he thought that Driver Irving was in his usual state of health. He said that they had both taken breakfast before passing Stafford.

13. Guard J. Kent related that he had returned to the brakevan at the trailing end of the rear coach just before the train passed Amington Sidings, when it was running at its usual speed. Shortly afterwards there was a sudden and fierce brake application, which lifted the valve of the van brake and caused the needle of the gauge to drop to zero quickly. He was certain that it had not been preceded by an application of the brakes such as is usual when a Distant signal is at Caution.

14. J. Fagan was driving the 10.20 p.m. train from Glasgow to Euston which passed Polesworth about 20 minutes before the accident. He confirmed that the weather conditions caused the smoke from the engine to "beat down" on the left hand side, but said that it did not interfere with his view of the Polesworth Up Distant which he described as "very good signals". He said also that the Home signals were showing good lights.

15. Signal Lineman A. E. Hughes and Telegraph Lineman J. W. Rodgers stated that they saw the Up Distant signals at Polesworth shortly after the accident, and that both the signals were displaying good yellow lights. Evidence was also given that the equipment and controls associated with these signals, and the locking of the frame were tested after the accident and found in order.

CONCLUSION

16. This accident was caused by the driver missing the Distant signal as a result of which the train travelled through the crossover at an excessive speed of about 55 m.p.h.

17. It is remarkable that the engine passed through the crossover at such high speed without derailling on it. As it was, the high lateral forces more or less spread the gauge slightly in the trailing lead and broke some chairs. Severe oscillation resulted which distorted the track for 25 yards beyond the trailing switches and finally caused the engine to become derailed.

18. Driver Irving insisted that he saw the Distant signal at Caution as the engine passed under it, and that he made a partial application of the brakes by reducing the vacuum from 21 inches to 15 inches, but that this did not reduce the speed of the train appreciably. The fireman, however, was unaware of any such application and the guard was certain that it had not been made.

The brakes of the train were in good order, and subsequent tests established that a reduction of vacuum by 6 inches near the Distant signal would have reduced the speed of the train from 60 m.p.h. to about 35 m.p.h. at the "Home 1" signals.

I must conclude, therefore, that the brakes were not applied at the Distant signal.

Irving's suggestion that, after seeing the Distant at Caution, he was expecting the Home signal to be Clear is not acceptable, and I think that he put it forward as an excuse; it is unbelievable that a driver with a good record, as he had, in charge of an important express passenger train would act in such an irresponsible manner.

I am, therefore, certain that Irving missed the Distant signal altogether, despite his insistence that he did see it, and that the first Polesworth signals which he saw were the Homes. It is understandable that he did not see those signals until the engine was close to them, for he had not moved across to the right hand side of the engine and their sighting distance from the driver's side is only 200 yards; smoke and steam from the engine may also have obscured his view of them for a few seconds.

19. It is difficult to appreciate why Irving missed the Distant. Its sighting distance from the left hand side of an engine is not great, but is adequate, and both that signal and the adjacent Slow line Distant are powerful colour lights. I travelled by night over the Up Fast line on an engine of the same class, and according to the Inspector who accompanied me, and the driver, the smoke was "beating down" on the left hand side of the engine as badly as ever it did. As a result it made the sighting of some semaphores difficult. It did not, however, obscure any colour light Distant signal for more than a fraction of a second, though it sometimes produced a flickering effect. The Fast line Distant at Polesworth was clearly in view at Yellow for 6-7 seconds from the left hand side of the engine. The driver made a steady brake application reducing the vacuum by 9-10 inches and at the point where the Home signals were observed at Clear from the right hand side (about 900 yards from the Distant and 375 yards from the Home signal), the speedometer on the engine showed that the speed had been reduced from 58 m.p.h. to 32 m.p.h. The weather at the time of the accident was much the same as on my footplate trip, and on neither occasion was there a train on any of the other lines to affect the sighting of the Polesworth Distant signals.

I can only conclude, therefore, that Driver Irving was not keeping a good look out. His sight has been tested and found satisfactory, and a medical examination has shown him to be in good health. He assured me he did not feel sleepy and that he was not engaged in conversation with the fireman. He was not forthcoming, and it is, therefore, idle to speculate on the cause of his failure.

REMARKS

20. This accident was caused by a driver failing in his fundamental duty to observe and obey signals. The particular signal which he missed was a bright colour light Distant, situated at an ample distance from the Home signals, and it was showing a caution indication as the train was to be diverted.

21. The diversion of trains from one line to another out of their ordinary course is an everyday occurrence on railways, and the safety of the movements is entirely dependent on the drivers' obedience to signals. When diversions are pre-arranged the driver is reminded before he leaves the shed, but when they have to be made at short notice, as in this case, he cannot be informed in advance.

22. Turnout derailments resulting from a driver failing to obey signals have occurred before, and the accidents at Bourne End in 1945 and Goswick in 1947 are recent examples. In both, the casualties were heavy, as well they might have been in this instance ; indeed, the speeds and the other circumstances were much the same in all three cases, and it was probably only the existence of the Slow line platform which prevented this accident from being equally serious.

23. This accident once again demonstrates the value of Automatic Train Control of the Warning type. Warning Control would in all probability have prevented the derailments at Bourne End and Goswick, and there is little doubt that it would have prevented this derailment. It would also almost certainly have avoided the recent collisions at, to name only a few places, Brentwood in 1941, Ilford in 1944, and Gidea Park in 1947, in each of which there was considerable loss of life.

Warning Control has been in use for many years on the former Great Western Railway and it was introduced, in a different form, on the Southend line of the former London, Midland & Scottish Railway in 1947. In their Annual Report for 1948, the British Transport Commission accepted in principle the desirability of extending the use of the Control. Neither of the existing systems was, however, considered suitable for general adoption with semaphore and multi-aspect signalling and steam and electric traction, and extensive experiments were, therefore, put in hand by the Railway Executive with a view to developing an apparatus to meet all modern requirements. These are still continuing and it is to be hoped that finality will soon be reached.

I have the honour to be,

Sir,

Your obedient Servant,

D. McMULLEN,

Colonel.

The Secretary,
Ministry of Transport.