MINISTRY OF TRANSPORT & CIVIL AVIATION

RAILWAY ACCIDENTS

REPORT ON THE TRIPLE COLLISION

which occurred on 19th November 1958

at HITCHIN

in the EASTERN REGION BRITISH RAILWAYS

LONDON: HER MAJESTY'S STATIONERY OFFICE
1959
THREE SHILLINGS NET

MINISTRY OF TRANSPORT AND CIVIL AVIATION,
Berkeley Square House,
London, W.1.

20th March 1959

SIR,

I have the honour to report, for the information of the Minister of Transport and Civil Aviation, in accordance with the Order dated 20th November 1958, the result of my Inquiry into the triple collision which occurred at about 4.30 a.m. on Wednesday, 19th November 1958, at Hitchin on the East Coast four-track main line in the Eastern Region, British Railways. I was assisted by Colonel J. R. H. Robertson.

The 3.25 a.m. London to Peterborough Class E freight train passed an automatically operated intermediate semaphore stop signal at Danger and collided at about 15 m.p.h. with the rear of another Class E freight train. This was the 2.28 a.m. train, also from London to Peterborough which had just begun to move forward after having been stopped for about three minutes at the Down Main inner home signal. Some of its wagons were derailed across the Up Main where they were struck almost immediately by the 10.35 p.m. Class D freight train from Leeds to London at a speed of about 35 m.p.h. The driver of that train had heard the explosion of detonators placed on the line by the Hitchin South signalman in an attempt to warn him, but he had not had time to take action before the second collision occurred.

The engine and 17 wagons of the Up train were derailed or badly damaged and a light engine standing on the adjacent Up Slow line was struck and overturned. The 3.25 a.m. Down train which initiated this triple collision was, however, virtually undamaged except for the derailment of the engine. Another freight train was approaching from the south on the Down Goods line, but it was stopped at Stevenage North by the prompt action of the signalman who replaced the signals to Danger and operated the emergency detonators.

All four running lines were blocked. The permanent way in the Up and Down Main lines was extensively damaged and the two other tracks were thrown out of alignment and damaged in places. A signal gantry was demolished.

Of the train crews, five members were slightly injured or suffered from shock. Four of them were conveyed to hospital but none was detained. Ambulances were called promptly and the first arrived at 4.50 a.m. The police and fire brigades also arrived on the scene without delay, but fortunately their services were not required.

The breakdown trains from King's Cross and Peterborough were ordered within a few minutes of the accident and they arrived at 8.0 a.m. The Down Goods line was cleared by 11.15 a.m. but the removal of the wreckage was a formidable task and was not completed until the following day. All four lines were finally opened for traffic by 8.5 a.m. on 20th November.

Traffic on this important trunk route was seriously affected and long distance passenger trains were diverted to Stratford and Liverpool Street whilst others were cancelled or were terminated on either side of the blockage. A bus service was operated between Stevenage and Hitchin with three shuttle rail services —between Stevenage and King's Cross, Hitchin and Peterborough, and Hitchin and Cambridge. An information bureau which was set up at King's Cross station proved of great assistance.

The night was dark and at the time of the accident there was dense fog at Hitchin South, though conditions were much clearer at Stevenage, three miles away.

DESCRIPTION

The trains

1. The 3.25 a.m. Down train from London to Peterborough was drawn by a Class 9F freight engine with 2-10-0 wheel arrangement. It and its six-wheeled tender weighed 142 tons in working order with full tank and bunker. It was driven from the left hand side. The steam brake operated on the coupled and tender wheels and gave a pressure of 90 tons equivalent to 63% of the full weight. The load behind the tender comprised 47 loose coupled empty wagons weighing 338 tons and a 20 tons brake van, giving a total weight of 500 tons for the engine and train. The overall length was 337 yards.

2. The 2.28 a.m. Down train from London to Peterborough was drawn by a Class 9F engine similar to the one described above. The train comprised 9 loaded and 29 empty loose coupled wagons weighing 325 tons and a 20 tons brake van, giving a total weight of 487 tons. The overall length was 281 yards.

3. The 10.35 p.m. Up train from Leeds to London was drawn by a Class V2 engine with 2-6-2 wheel arrangement. It and its six-wheeled tender weighed 145 tons in full working order. It was driven from the left hand side. The steam brake operated on the coupled and tender wheels and gave a pressure of 78 tons equivalent to 54% of the full weight. The train comprised 27 loaded wagons, of which 18 were vacuum fitted, and a 20 tons brake van. The weight behind the tender was 310 tons, giving a total weight of 455 tons. The overall length was 218 yards.

4. The light engine was a Class L tank engine with 2-6-4 wheel arrangement. It weighed 89½ tons in full working order.

Effects of the collision

5. The initial collision derailed the engine of the 3.25 a.m. Down train but the vehicles behind it were not affected. The speed of impact was not high and no doubt the shock was largely absorbed by the train ahead. This train was broken into four parts as shown by Fig. 3 of the accompanying drawings. The engine and the following four wagons broke away and ran ahead for 11 yards : the next four were thrown on to the Up Main: 23 remained on the Down line, and the last seven wagons with the brake van were derailed and badly damaged. The Up train ran into the obstructing wagons and was seriously derailed. The light engine, stationary on the Up Slow line, was struck by debris and overturned on its left side. In total, three engines were derailed, one brake van and 23 wagons were demolished or badly damaged, five other wagons were slightly damaged and five loaded containers were destroyed.

6. The damage to the engines was comparatively slight. The buffer beam of the 3.25 a.m. Down train engine was bent and the buffers were broken off in addition to other superficial damage. The pony truck of the Up train engine was torn away and the front strengthening frame was cracked and bent; piping on both sides was bent, some of the cab windows were broken and there was other minor damage. The right cylinder of the tank engine was fractured, the footplate was buckled and the cab windows were broken; there was also some damage on the left side caused by the overturning.

7. One hundred and twenty yards of track in the Up and Down Main lines were destroyed and 200 yards were partially damaged or thrown out of alignment. The signal gantry carrying the Hitchin South Down Main and Down Goods Home and Junction signals, as well as the Hitchin Yard Distant signals, was demolished together with a ground disc and some lengths of point rodding.

The site

8. As shown by Fig. 1, the East Coast main line runs north from King's Cross through a number of suburban and outer suburban stations to Hitchin (32 miles from King's Cross) where the Cambridge line branches off to the north east at the country end of the station. Peterborough is on the main line 44 miles further north.

9. The relevant stations and signal boxes in the vicinity of Hitchin are, in their order from King's Cross: —

		Distance between signal boxes
Stevenage South S.B.		
Stevenage station	... ...	578 yards
Stevenage North S.B.	... ... 2 miles	1,623 yards
Hitchin South S.B.		
Hitchin station	... ...	748 yards
Hitchin Yard S.B.		
Hitchin Cambridge Junction S.B.	... ...	418 yards
Cadwell S.B.	... ... 1 mile	143 yards

The Wymondley automatically operated intermediate signal which was run past by the 3.25 a.m. train is approximately half way between Stevenage North and Hitchin South S.Bs. There is also a ground frame operating connections in the Goods line leading to some sidings.

The collision occurred approximately 120 yards south of Hitchin South S.B.

10. Between Stevenage and Hitchin there are four running lines, namely, Down Goods, Down Main, Up Main, Up Slow, in that order from west to east.

The lines are in cutting for most of the way between these two stations and are straight except for slight curves through Stevenage, on the south side of Wymondley, and between Hitchin South box and Hitchin station. The gradient is falling at 1 in 200 from Stevenage to Hitchin.

The signalling

11. The Down Main line between Stevenage North and Hitchin South signal boxes is fully track circuited, and it is divided virtually into two block sections by an automatically operated intermediate Stop signal at Wymondley. There is no block working between these boxes, and trains are described by code on the block bell. The Auto-Stop signal can, however, be held at Danger by the operation of an emergency switch in Hitchin South box. The adjoining Down Goods line is worked on the permissive block system.

Three-position block instruments control movements on the main line between Stevenage South and Stevenage North and between the Hitchin boxes. Distant signal indicator working is in force at Hitchin, and Hitchin South Down Main Distant must not be cleared until Hitchin Yard and Cambridge Junction Distant signals have first been cleared.

12. The relevant Down signals, which are shown on Fig. 2, are: —

Stevenage North Home signals

These are semaphores on tall brackets on the country side of an overbridge at the north end of the station. They comprise: —

Down Main Home (No. 17) Down Main to Goods Home (No. 11)	On one post in the 10 ft. way between the Down Main and Down Goods lines.
Down Goods Home Down Goods to Main Home	On one post on the cess side of the Down Goods.

The main line signals are repeated by miniature arms and lights fixed on the London side of the overbridge.

Stevenage North Starter (No. 18)

This is a three-aspect colour light well sited in the 10 ft. way between the Down Main and Down Goods. It acts as an Outer Distant for the Wymondley Auto-Stop signal and it displays Red, Double Yellow or Green aspects. There is no corresponding Goods signal.

Wymondley Auto Inner-Distant

This is a motor operated two-aspect colour light with an Adlake lamp. It works automatically with the Wymondley Stop signal and displays Yellow and Green aspects. It is also well sited in the 10 ft. way. Alongside the Goods line there is a semaphore upper quadrant Distant signal without a light. It is normally in the "off" position except when the ground frame is in use.

Wymondley Auto-Stop signal

This is an upper quadrant semaphore 29 ft. above rail level and carried on a post 5 ft. 6 ins. to the left of the Down Main. The Wymondley Down Goods Stop signal is carried on an arm which is projected over the Goods line. This is also an upper quadrant signal, but as the Wymondley sidings may only be used in clear weather in daylight, the arm is always "off" at night and no light is provided.

Hitchin South Main Outer-Distant

This is a two-position colour light well sited on a post in the 10 ft. way. It works automatically with the Down Main Inner Distant and it displays Double Yellow and Green aspects. There is no corresponding Goods signal.

Hitchin South Inner-Distants

These are upper quadrant semaphores carried on brackets on a post in the 10 ft. way. The signals read from left to right, Down Goods Distant, Down Main to Goods Inner Distant (No. 48), Down Main Inner Distant (No. 44).

Hitchin South Main Outer Home (No. 43)

This is a well sited single semaphore in the 10 ft. way. There is no corresponding Goods signal.

Hitchin South Main Inner Homes

These semaphores were carried on a gantry which was demolished. The relevant signals were the Down Main Inner Home (No. 42) and the Down Main to Slow Inner Home (No. 47). The Goods line Home signals were on the same gantry, and the Hitchin Yard Distant signal arms were underneath the respective stop signals.

Sighting distance of relevant signals

13. The distance in clear weather at which the undermentioned signals can first be seen from the footplate of a Class F freight engine are given below, together with the distances at which they are lost from view at the fireman's side: —

Table 1.

Sighting distance of signals from the footplate of a Class F freight train

Signal	*Distance at which first seen in clear weather by*		*Distance at which fireman loses sight of signal*
	Driver	*Fireman*	
	yds.	*yds.*	*yds.*
Stevenage North Home	613	613	30
Stevenage North Starter (Wymondley Outer Distant)	741	324	166
Wymondley Inner Distant	790	780	174
Wymondley Auto-Stop	463	166	25
Hitchin South Outer Distant	944	842	125

Down Main Line controls

14. The relevant signalling controls for the Down Main line between Stevenage North and Hitchin South are given in Table 2.

Table 2.

Table of Controls for the Down Main line between Stevenage North and Hitchin South

	Controls
Stevenage North	
Down Main Block	11, 17 levers normal. Down distant arms normal.
Down Main Home signal lever 17	T.C. G clear and 18 signal aspect normal with lever locked normal.
Down Main Starting signal lever 18	T.Cs. H. J. K. clear. Note: 18 signal cannot clear after being replaced to Red by occupation of T.C. H, until T.Cs. H. J. & K. are clear and in addition the Auto Distant and Stop signals have both returned to the "on" position.
18 Y.Y. aspect	T.C. H clear and 18 lever reversed.
18 G. aspect	T.C. H clear, 18 lever reversed, and Down Auto Distant controls clear and spectacle "off."
Wymondley	
Auto-Distant	T.C. J clear, and Auto-Stop arm "off" and controls clear.
Auto-Stop	T.Cs. K. L. M. clear. Hitchin South Down Main Outer Distant aspect normal: 42 and 47 levers having been replaced to normal: 43, 44 and 48 arms having returned to normal; and Hitchin South emergency switch normal. Note: this signal returns to Danger when T.C. K is occupied.
Hitchin South	
Down Main Outer Distant G. aspect	44 arm off (signal works automatically).
Down Main Inner Distant signal lever 44	43 and 42 levers reversed (mechanical).
Down Main Inner Home signal lever 42	Line Clear from Hitchin Yard on Down Main Block (one pull only).

Fog working

15. At Stevenage North the fog marks are the Up Home signals—197 yards from the box. The signalman is responsible for calling out the fogsignalmen for the Wymondley Auto-Stop signals as well as for his own signals and those at Stevenage South. During fog or falling snow, until the fogsignalman has arrived at the Wymondley Down Auto-Stop signal, trains on the Down Main must not proceed past Stevenage North Starting signal until the signalman has ascertained that the preceding train has passed Hitchin South signal box with the tail lamp complete.

At Hitchin South the fog marks are also the Up Home signals—190 yards from the box. The signalman is responsible for calling out the fogsignalmen for Hitchin Yard, Cambridge Junction and Cadwell boxes in addition to those for his own signals. During fog or falling snow, until the fogsignalman has arrived at the Hitchin South Down Main Outer Home signal, the Wymondley Auto-Stop emergency switch must be maintained in the "on" position to prevent the approach of a Down train on the main line until the Hitchin South signalman has received "Train Out of Section" from Hitchin Yard box. (This rule was not included in the special working arrangements, but it is a pre-requisite for safe working in fog, and it has now been added to the signal box instructions).

Automatic Warning Control

16. The British Railway system of Automatic Warning Control is in use on the main lines and the ground equipment is fixed in the 4 ft. way about 200 yards on the approach side of the distant semaphores and of all colour lights which display caution aspects. None of the engines involved in the accident had yet been equipped and consequently no warnings were received by any of the engine crews. As will be seen later this was not a significant factor in this accident.

Relevant distances

17. Relevant distances are given in Table 3.

Table 3.

Location	*Point to Point Distance*	*Distance from approx. point of first collision*
Stevenage North	*yds.*	*yds.*
Down Main Home	47	4,777 (2¾ miles)
Signal box	742	4,730 (2¾ miles)
Down Main Starter	455	3,988 (2¼ miles)
Wymondley		
Down Main Auto Inner Distant	901	3,533 (2 miles)
Down Main Auto-Stop	696	2,632 (1½ miles)
Hitchin South		
Down Main Outer Distant	704	1,936 (1⅛ miles)
Down Main Inner Distant	892	1,232
Beginning of T.C. "M"	200	340
Down Main Outer Home	140	140
Approx. point of first collision	300	-
Down Main Inner Home	5	300
Approx. point of second collision	96	305
Up Main emergency detonators	12	401
Signal box	108	413

Summary of Events

The weather

18. On the night of the accident the weather generally was clear to the south of Hitchin. Reports from the stations between New Barnet and Stevenage show that between midnight and 6.0 a.m. normal working was in operation, and although it was somewhat misty in places it had not been necessary to call out any fogmen. At Stevenage North, the signalman said that train working was in no way affected by fog, and at the time of the accident visibility towards Hitchin was about 1,200 yards; he could clearly see the Wymondley Auto Inner Distant signal from the box. The enginemen of the Down train which was stopped at Stevenage directly after the accident confirmed this. On the other hand, the enginemen of the 3.25 a.m. train alleged that it was very foggy from Knebworth onwards and the driver of the earlier 2.28 a.m. train said that he only saw the Wymondley Auto-Stop signal at close range.

A signalman, who lives at Wymondley, had got up at 4.40 a.m. on the morning of the accident and had noticed that the weather was clear except for a slight mist which might have been smoke and steam from a passing train. He was able to see the Atuo-Stop signal gantry at a range of about 300 yards. The evidence from Hitchin shows that fairly early in the night the fog had been patchy in the vicinity of the station and further north, but at about 4.0 a.m. the weather deteriorated rapidly and at 4.20 a.m. the fog had become so dense that the fogmen for all the Hitchin boxes were called out. By 4.30 a.m. visibility had dropped to between 10 and 30 yards.

The running of the trains

19. The two Down freight trains involved in the first collision had normal journeys as far as Stevenage North. The driver of the 2.28 a.m. train had no difficulty in observing signals although he said it was slightly misty. He passed through Stevenage North under clear signals at between 35 and 40 m.p.h. He saw the next colour lights clearly (Stevenage North Starter and Wymondley Auto Inner Distant), but the Green oil light in the Wymondley Auto-Stop signal came into view only at two engine lengths' distance. By contrast the Double Yellow of the Hitchin South Outer Distant colour light was clearly visible at a good range. The driver gathered the train on receipt of this warning and gradually reduced speed. The Hitchin South Inner Distant signal was at Caution and the driver prepared to stop at the Outer Home, but on seeing it at Clear he allowed the train to run forward very slowly, stopping it about an engine length from the Inner Home gantry.

The driver could not see this signal because of the fog so he sent his fireman forward to ascertain the position. The fireman of the light engine on the Up Slow shouted that the signal was "off" and the driver then started the train after a delay of about three minutes, but the collision occurred before he got properly under way.

20. The driver of the 3.25 a.m. train said that the weather began to get foggy after passing Hatfield, but he maintained a speed of about 40 m.p.h. through Stevenage. He said that he saw the Stevenage North Home signals at a distance of about 100 yards but he only just caught a glimpse of the Starting signal showing a Double Yellow through the fog. He said that he attempted to get his train under

control but the brake application did not appear to be very effective. The Auto Inner Distant signal was passed at Yellow and the train approached the Wymondley Auto-Stop signal at about 20 m.p.h. The driver said that as he passed it he saw in the glare from his fire a signal arm in the "off" position and he assumed it was for the main line (the main line signal was in fact at Danger but the unlighted arm of the Goods line signal was "off"). He thereupon released the brake and allowed the train to run forward down the falling gradient. He saw the Hitchin South Outer Distant colour light at Green, but he did not attempt to increase speed because by this time he began to doubt having seen the correct signal at Wymondley. He allowed the train, however, to continue at a speed of about 20 m.p.h. past the Outer Home at Green. He then saw a red light ahead and made a brake application, but the collision occurred before this took effect.

The position at the signal boxes

21. The signalman at Stevenage North accepted both the 2.28 a.m. and the 3.25 a.m. trains under clear signals and watched them pass, each travelling at a normal speed of about 40 m.p.h. The weather was clear and he could see the tail lights as they disappeared towards Hitchin.

22. The signalman at Hitchin South offered the 2.28 a.m. train to Hitchin Yard as soon as he received the bell signal from Stevenage North. This train was accepted immediately and the signalman pulled off the Outer and Inner Home signals. He had to wait for the indicator before clearing the Distant signal, and as he was busy doing other work in the box he did not pull the lever immediately. By the time he did so, the engine of the 2.28 a.m. train had already passed the signal. Having cleared the signal late he then failed to replace it until about a minute before the collision. The Home signals were "off" for the first train which was still occupying T.C. "M" and consequently the second train after passing the Wymondley Auto-Stop signal at Danger had clear signals up to the point of the collision.

Time table

23. Based on the enginemen's and signalmen's evidence summarised above and on an examination of the train registers, an approximate time table of the movements of the 2.28 a.m. and the 3.25 a.m. trains between Stevenage North and Hitchin South is given in Table 4. The signal aspects seen by the respective drivers have also been included.

Table 4.

Approximate time table of the 2.28 a.m. and 3.25 a.m. trains between Stevenage North and Hitchin South

Signal	*Type*	*Point to Point Distance yards*	2.28 *a.m. train*			3.25 *a.m. train*		
			Signal aspect	*Passing time*	*Average speed m.p.h.*	*Signal aspect*	*Passing time*	*Average speed m.p.h.*
Stevenage North Home	Semaphore		G	4.16		G	4.23	
		789						
Stevenage Starter	Colour Light		G	4.16½		YY	4.24	
		455						
Wymondley Auto Inner Distant	Colour Light		G	4.17	30	Y	4.24½	30
		901						
Wymondley Auto-Stop	Semaphore		G	4.18		R	4.25½	
		696						
Hitchin South Outer Distant	Colour Light		YY	4.19		G	4.26½	
		704						
Hitchin South Inner Distant	Semaphore		Y (possibly G)	4.20	12	G	4.27½	
		892						
Beginning of T. C. 'M'				4.22½				
		200						20
Hitchin South Outer Home	Semaphore		G	4.24		G	4.29½	
		140						
Point of Collision					5		4.30	
		300						
Hitchin South Inner Home (a)	Semaphore		G	4.27				
(d)			G	4.30		G		

Signalmen and station staff

24. Signalman S. R. Revell, who is a Class 1 relief signalman, came on duty at Stevenage North box at 10.0 p.m. He said that the weather was clear from the time he arrived until after the accident, and throughout the night he could see quite clearly not only the Down Main Starter but also the colour light of the Wymondley Down Auto Inner Distant signal which was nearly 1,200 yards from the box.

He accepted the 2.28 a.m. train on the Down Main line at 4.11 a.m. and cleared all signals for it. The train passed at 4.16 a.m. at about 35 m.p.h. He immediately sent the train description forward by bell code to Hitchin South and then spoke to the signalman there to give him the number of the train, as was the normal custom. The Hitchin South signalman told him it was "a bit foggy," to which Revell replied "Well it is all right this end—it's as clear as a bell."

25. He accepted the 3.25 a.m. Down train at 4.17 a.m., but he could not clear the signals for it because the first train was still on the track circuits leading up to the Wymondley Auto-Stop signal. He thought that while he was waiting for the train to pass this signal the Hitchin signalman again referred to the fog. The track circuits cleared just after 4.19 a.m. and Revell pulled off his signals in time to allow the second train a clear run. It passed at 4.24 a.m. travelling at about the same speed as the first one.

He described it on the block bell and again spoke to the Hitchin South signalman who, on this occasion, told him that he had sent for his fogmen, and he asked Revell whether he wanted his man for the Up Main and Up Slow Distant signals. (This fogman lives at Hitchin). Revell replied that it was still perfectly clear and he could see the tail light of the 3.25 a.m. train going down the main line. There was no consultation on any occasion about the Wymondley Auto-Stop signal; (the fogman for this post is called by Stevenage North). Revell explained that as he could see the Wymondley Auto Inner Distant colour light signal so clearly he did not consider there was any justification for calling out the fogman for the Stop signal. Looking back on the events of the night, he agreed that it might have been wiser to have called out this man when the Hitchin signalman told him that he had sent for his fogmen. Double block working would then have been introduced until the fogman arrived at Wymondley, although in this case it would not have been effective since Revell did not know that the fogmen had been summoned until after the 3.25 a.m. train had passed.

26. Revell said that he received the "Obstruction Danger" signal at 4.30 a.m. and he immediately put back to Danger the signals on the Down Slow line which he had cleared for the 2.50 a.m. freight train. He also pulled the detonator placer and exhibited a red hand signal. The driver, however, had not sufficient warning to stop at the Down Goods Starter, which he overran by about 50 yards.

Revell recollected that a few seconds before he received the "Obstruction Danger" signal the Hitchin South signalman rang up again to enquire about the 3.25 a.m. train. Revell replied "He is down there, he's passed my tracks" and when asked about the condition of the tracks he replied "They are out" which meant that the train had passed the Wymondley Auto-Stop signal and cleared the overlap track circuit "H".

27. Signalman H. L. J. Green, who was on duty at Stevenage South box, generally confirmed Signalman Revell's evidence regarding the weather and the running of the trains. He said that the 3.25 a.m. train passed his box at 4.22 a.m. and that he received "Out of Section" from Stevenage North a minute later. He accepted the 2.50 a.m. train at 4.10 a.m. on the Slow line and it passed his box under clear signals at 4.31 a.m. travelling at about 20 m.p.h.

28. Signalman S. A. Crouch, who was in charge of Hitchin South box, said that he had been there for nearly two years. On the night of the accident he booked on duty at 6.0 p.m. for a 12-hour shift, having booked off at 6.0 a.m. that morning on completion of a previous 12-hour shift. He acted as train register lad until 10.0 p.m. when he took charge of the signalling. He was expecting to work four 12-hour shifts during that week owing to a shortage of booking lads.

He said that at 10.0 p.m. the weather was quite clear, but it got worse during the night. He did not notice any serious deterioration until about 4.0 a.m. when it became murky towards the station although conditions still seemed to be all right towards the south. He was able to see the archway of the overbridge (90 yards north of the box), but he did not recollect looking at the fog marks which were the Up Home signals (190 yards from the box), nor did he consider it was necessary to call out the fogmen at that time. At 4.18 a.m., however, the station inspector spoke on the telephone and asked whether he required these men. Crouch then noticed that the fog had become thicker and he consulted the Cadwell signalman who said he required his fogman. On the other hand, the Stevenage North signalman said that the weather was clear there. Crouch accordingly asked the station inspector to call out the fogmen for the Hitchin group of boxes, namely Hitchin South, Hitchin Yard, Cambridge Junction and Cadwell. This was at about 4.20 a.m.

29. Prior to these conversations, the 2.28 a.m. train had been described on the Down Main from Stevenage North at 4.15 a.m. Crouch offered it forward to Hitchin Yard and it was immediately accepted. He then pulled off the Outer and Inner Home signals but he had to wait for the indicator before clearing the Distant. In the meantime, the Stevenage North signalman spoke to him on the telephone and gave him the number of the train, but he did not recollect discussing the weather. Crouch could not remember

when he cleared the Distant signal for the 2.28 a.m. train, but he said that he was busy about this time cleaning up the box and he also had an express on the Up line. He thought he must have cleared the signal before the freight train reached it, but he was very vague about this.

30. At 4.23 a.m. he received the describing signal for the 3.25 a.m. Down train and he spoke to the Stevenage signalman again. He told him that he was calling out his fogmen, but there was no discussion about the Wymondley man. Crouch agreed that in view of the poor visibility at Hitchin it would have been a wise precaution to call out the Wymondley fogman even though it was clear at Stevenage.

A minute later he accepted an Up freight train and cleared all signals for it, and at about the same time he cleared signals for a light engine to come out from the depot on to the Up Slow line where it was held in order to cross to the Down line after the Up train had passed.

At about 4.25 a.m. or 4.26 a.m. he heard the 2.28 a.m. train approaching on the Down line, but as the K, L and M track circuits were still occupied he thought it must be a very long train. (The K and L track circuits are not shown separately on the diagram in the box; M begins 200 yards on the approach side of the Outer Home and it extends for 640 yards to the Inner Home which is 113 yards from the box. The 2.28 a.m. train must have been close to this signal for Crouch to have heard it and in normal circumstances T.Cs. K and L would have been clear by then). No doubt it was for this reason that he said that he was a little concerned about the next train so he spoke again to the signalman at Stevenage North and asked him whether the 3.25 a.m. train had cleared his tracks. He was told that it had already passed, and almost immediately afterwards he heard the noise of the collision between the two Down trains. Just before this he had received "Train Entering Section" for the Up train, so he immediately returned the Up signals to Danger, pulled the detonator placer and then sent "Obstruction Danger" in both directions. The time recorded in his train register was 4.29 a.m. (Although the detonators were exploded, the Up train engine driver had no chance of stopping before his train struck the wreckage from the collision).

31. Crouch was closely questioned about the aspects of the Down Main signals. He said that at the time of the first collision Nos. 42 and 43, the Inner and Outer Homes, were still off for the 2.28 a.m. train, but he returned the Distant signal No. 44 to normal. He had done this just before he telephoned to Stevenage for the last time and he agreed it must have been about a minute before the accident. He admitted that he should have returned this signal to caution as soon as track circuit M was occupied, i.e. about six or seven minutes earlier.

He explained that he was busy doing other jobs and that he also had trains and the light engine on the Up line. Consequently he did not notice for some time that the Down Distant signal was still "off". When asked whether he was getting tired, he replied "We always feel a bit weary about 4 o'clock in the morning, but nothing more than normal".

32. Signalman G. Wakefield, who was on duty at Hitchin Yard box, said that it had been hazy all night but visibility was not affected to any extent until about 4.20 a.m. when the fog came down very quickly and the fogman was sent for. As regards train movements, Wakefield said that he was offered the 2.28 a.m. train at 4.16 a.m. and he immediately offered it to Cambridge Junction. There was no delay in acceptance, but he did not clear his signals until the Distant signal indicator bell rang at about 4.18 a.m. at the latest. The train register books for Cambridge Junction and Cadwell record acceptance of the train at 4.18 a.m. and 4.19 a.m. respectively.

33. Station Inspector F. H. Denny said that he was on duty at Hitchin station on the night of the accident. The weather was clear, but very cold, when he booked on at 10.0 p.m; it began to get misty towards the north by about 2.0 a.m. and at 3.30 a.m. he received information that conditions at Sandy, 10 miles to the north, were getting bad. Till then the fog was not thick at Hitchin, but thenceforward the weather deteriorated and around 4.20 a.m. it had got so bad that Denny spoke to the signalman at Hitchin South. The latter consulted the signalmen at Cadwell to the north and Stevenage to the south, and then asked the inspector to call out the fogmen for all the Hitchin boxes. He said that no reference was made to weather conditions at the Wymondley Auto-Stop signal because the fogman for that post was called out by Stevenage North and apparently the signalman there had said that the weather was clear.

The station porter left at 4.25 a.m. to call the Hitchin group of fogmen. Five minutes later Denny heard of the collision from the Hitchin South signalman and, after sending a message to the stationmaster, he left for the scene of the accident. He said that visibility was down to about 10 yards near the overbridge just to the north of Hitchin South box. Signalman Crouch, who was in charge there, told him that he had not touched the frame since the accident except to replace the Up Main signal and detonator levers and Nos. 44 and 43 levers. (The Down Main Distant and Outer Home signal levers). The inspector noted these numbers in his book and he also noted that the Inner Home signal lever No. 42 was normal in the frame, although he had no recollection of the signalman mentioning this. Denny was a little uncertain as to whether he had recorded the right numbers and he said that the signalman might have told him Nos. 42 and 43, instead of 44 and 43.

The inspector described in detail the excellent arrangements which were made to call for assistance of all types and to render first aid to the injured.

34. Signalman S. W. Bunn, who lives at Wymondley about 300 yards from the Down Auto-Stop signals, said that he got up at 4.40 a.m. on the morning of the accident and noticed that the weather was misty, but visibility was not seriously impaired. At about 5.15 a.m. he left his house to go on duty at

Langley and bicycled through the Wymondley sidings and thence to Stevenage. He had no difficulty in finding his way through the slight mist, and he did not think that conditions warranted the calling out of fogsignalmen in that area.

Trainmen

35. Driver S. Coates, who was in charge of the 2.28 a.m. train engine, said that he had a normal run as far as Stevenage and he had little difficulty in observing the signals, although it was slightly misty around Knebworth. He passed through Stevenage at about 35-40 m.p.h. under clear signals. He saw the repeater arms of the Stevenage North Home signal underneath the bridge, and the Stevenage Starter was showing a clear Green colour light at good range. The Wymondley Auto Inner Distant being also at Green he continued at the same speed. The Wymondley Auto-Stop signal was "off", but he did not see it until he was close to it.

The Hitchin South Outer Distant colour light, however, came into view at a good range and was showing Double Yellow. Coates, therefore, closed the regulator and made a steady brake application. He saw the light of the Inner Distant semaphore at Yellow from a distance of about two engine lengths. He continued to reduce speed and he saw the Hitchin South Outer Home at Green when about one and a half engine lengths from it. The fog was getting bad by this time and the train was only "crawling". He proceeded very cautiously to the next signal, releasing the brake gradually, and the train ran forward slowly down the gradient; finally he stopped with his engine about a length from the Inner Home signal post.

He could not see the signal arm so he told his fireman to go forward to find out the aspect, but as soon as he had got down from the footplate Coates heard someone shouting from an engine on the Up Slow line that the signal was "off". He stopped for a minute or two until the fireman rejoined and then went forward cautiously past the signal which he confirmed was "off". He had not gone very far when he felt the impact of the collision. (Marks and debris on the track proved, however, that the first collision must have taken place before the engine passed the signal, but with a long loosely coupled train the driver would not have felt the shock immediately). Coates sent the fireman forward to the signal box and went back himself to see what had happened. On discovering that the Up line was blocked he also went to the signal box where the signalman informed him that all precautions had been taken.

36. Fireman R. Townshend generally confirmed Driver Coates' evidence about the weather conditions, signal aspects and speed. When the train stopped at the Hitchin South Inner Home signal he got off the footplate in order to find out its aspect, but on hearing someone on the Slow line shout that "the board was off" he returned and informed his driver. He did not actually see the signal at Clear.

37. Goods Guard A. E. Sauer of the 2.28 a.m. train, who was travelling in the brake van at the rear, said that he had little difficulty in seeing most of the Distant signals on the London side of Stevenage, which was passed at a speed of about 40 m.p.h. He did not see the Home semaphores at the north end of the station but the Starter, which is also the Wymondley Outer Distant, was showing a clear Green. (Since this signal is returned to danger by occupation of the track circuit H, he must have seen it from a distance of at least a train length, i.e. about 300 yards). He saw the Wymondley Inner Distant at Green, but he did not observe the Down Main Auto-Stop semaphore, although he saw the arm of the Down Goods signal in the "off" position at a distance of about 20 yards. He explained that the tall arm of the main line signal was close to the track, hence it was not easy to see it at close range from the window of a brake van.

The next signal which Sauer observed was the Hitchin South Outer Distant colour light showing a Green aspect, but he did not see this until he was fairly close to it. (It may have cleared after the engine had passed it—see paragraphs 29, 35 and Table 4). He missed the Inner Distant semaphores, but as the speed of the train was being reduced he thought that the driver must have seen the Distant signals at Caution. He also missed the Hitchin South Outer Home semaphore, although by this time the train had "braked right down" and shortly afterwards it stopped.

After about a minute he went on to the verandah at the back of his van and heard what he thought was the rumble of a train. He therefore re-entered the van, seized his hand lamp which he turned to Danger and ran back to the verandah. He had no sooner got there when he saw the headlight of the overtaking train and he only just had time to jump clear. Sauer thought that his train had begun to move forward before it was struck. He was very fortunate to escape with only a shaking.

38. Driver G. W. Howlett, who was in charge of the 3.25 a.m. train engine, said that he came on duty at New England shed, Peterborough, at 10.33 p.m. on the night of the accident, having booked off at 8.0 a.m. that morning. He travelled by parcels train to Harringay and walked from there to Hornsey where he took charge of engine No. 92187. The engine was in good condition and he had an uneventful run to Stevenage, although he said that it was foggy at Hatfield and much worse from Knebworth onwards, and that he could only see signals at a distance of about one and a half engine lengths.

On the other hand, he was quite sure that he saw the Stevenage North Home semaphore when his engine was half way along the platform, i.e. at a range of about 100 yards. He said that on reaching the Starter "there was an absolute dense fog and I did not see them until they went past my window, two Yellows". Speed was about 40 m.p.h. so he closed the regulator and made a gentle application of the steam brake. He explained that he "kept nudging it on" in order to gather the train of loose coupled

vehicles. This did not seem to have much effect and after passing the Wymondley Inner Distant at Yellow he opened the steam sanders and put back the reversing gear in order to reverse the engine if necessary. At the same time he kept applying the brake fully and then releasing it in an endeavour to pull up the train without snatching it.

Although Howlett did not tell him to do so, the fireman applied the hand brake at about this time. The speed had only dropped to about 20 m.p.h. as the train approached the Wymondley Auto-Stop signal, but it was so foggy that he did not see it until the engine was passing when he saw in the glare from the fire a signal arm in the "off" position. He took it to be the main line signal and turned to his fireman and said "Oh it's all right, I have seen him in the light. You can take that off, we're right away." Howlett said that he also released the steam brake and shortly afterwards he saw the Hitchin South Outer Distant colour light at Green. Although in normal circumstances this should have indicated that all signals were "off" as far as Cadwell, Howlett said that he did not increase speed because "something seemed to warn me that something was wrong." Even though he saw the Inner Distant signal "off" he felt he must not take too much risk, so he allowed the train to run slowly on to the Outer Home which was also "off". Almost immediately afterwards he saw a red light waving in front of him, but before he could take any action his engine collided with the train ahead.

In the course of his examination he agreed that the signal which he saw at Wymondley must have been the unlit arm of the Goods line signal which is always "off" at night. He said that his suspicions were aroused when he saw the Hitchin South Outer Distant at Green because he would not have expected it to have been cleared so quickly after having been checked at Wymondley. He did not stop his train to find out the position because he knew that there was a passenger train following him and he wished to avoid any delay to it. Consequently he ran on at what he considered to be a safe speed towards the Hitchin Stop signals.

Regarding his home life, he said that he was a widower aged 59 and he lived at home with his daughter aged 16, who looked after him. When he had come off duty at 8.0 a.m. on the morning before the accident he had a good meal and then worked in the house and garden until he went to bed at 2.0 p.m. He had seven hours sleep and another meal before leaving his house at 10.15 p.m. He was feeling quite fresh when he took charge of the engine. He had an unfamiliar fireman with him who, however, did everything expected of him, and he had no complaints about his work.

39. Fireman B. J. Howell of the 3.25 a.m. train engine, who is 23 years old with seven years experience of firing, said that he booked on duty at Peterborough to act as Driver Howlett's mate for the first time. He generally confirmed his driver's evidence about the fog. He saw the Langley colour light Distant signal which was on the driver's side when he was about an engine length away. After taking water at the troughs he looked out for the signals at Stevenage through which the train passed at about 38 to 40 m.p.h. He caught a glimpse of all of these signals, except the North Home, which he could not see through the fog. He saw the Starter at a range of about an engine length and it was showing a Double Yellow aspect. As the engine passed the signal the driver closed the regulator and made an immediate brake application. Howell did not notice either of the next two signals because he was applying the hand brake. He did this because he thought the driver was having difficulty in stopping—he had seen him apply the steam sanders. On passing the Wymondley Auto-Stop signal at about 20 m.p.h. the driver called out "Right, it's off", and then he released the steam brake and turned off the sanders, although he did not open the regulator again. Consequently Howell took off the hand brake.

After this he looked ahead for signals and saw the Hitchin Outer Distant at Green but only from a range of about an engine length. The Inner Distant was also Green, but the driver did not increase speed, and he appeared to be dubious about the aspect of the Auto-Stop signal. Howell, however, could not recollect anything the driver had said to give him this impression and he made no attempt to explain what had happened on the footplate to throw doubts in their minds about the signal aspect.

40. The evidence of Guard W. Bewick of the 3.25 a.m. train, who was travelling in the brake van at the rear, was vague and of little value. He said that during the journey he only glanced out occasionally and he did not observe many of the signals. He thought that the weather was very foggy in patches. The speed through Stevenage was about 45 m.p.h. and shortly afterwards the driver began to check the train. Bewick looked out of the window again and saw two yellow lights but he was not sure where they were. The speed was reduced to about 20 m.p.h. and then the train continued without further check until the collision when he felt a bump and his hand lamp was knocked over. He re-lit it but he did not realise there had been an accident until the driver arrived and told him to go back and protect the train. Bewick walked about three quarters of a mile and put down detonators, but he did not notice the aspects of the Inner Distant signals although he passed them in each direction. He stumbled a good deal and thought that visibility was only a few yards.

41. Driver C. R. Moffatt, who was in charge of the 10.35 p.m. Up train, said that he passed through Hitchin under clear signals at about 30 m.p.h. The fog was thick from Cadwell onwards and he only saw the signals at the London end of Hitchin station from a range of about 10 to 15 yards. On passing Hitchin South box he heard a detonator explode and be immediately closed the regulator, but before he could apply the brake the engine struck the obstruction. He and his fireman were badly shaken and bruised but when they recovered themselves they got off the footplate and, having been told that the train was properly protected, they made their way back to the signal box via the overbridge. Visibility at this time was about 20 yards.

42. Driver A. W. Atkins, who was in charge of the light engine, said that the visibility was about 25 yards when he left the motive power depot and stopped on the Up Slow line. On arriving there he saw a train standing on the Down Main line apparently waiting for the Home signal. His fireman, having seen that the signal was "off", shouted across to the Down train driver. Atkins thought that this train was standing there for two or three minutes and it had just begun to move forward when the second collision occurred. His own engine was struck and turned on to its side, and he received head injuries.

43. Driver S. Chatman, who was in charge of the Down train engine which was stopped at Stevenage North directly after the accident, said that it was foggy at Langley but clear at Stevenage where he could see the North Home signal when he passed the South signal box at about 20 m.p.h. The signal was Clear but it was replaced to Danger when his engine reached the south end of the station. He immediately applied the brakes but he could not quite stop at the signal which he overran by about 50 yards. As he passed the North box he heard a detonator explode and saw the signalman holding a red light. He sent his fireman to ascertain the trouble, and on hearing of the accident Chatman himself went up to the box. The signalman asked about the weather and drew his attention to the view from the box. Chatman said that both the Stevenage North Starter and the Wymondley Inner Distant colour lights could be seen at that time namely, 4.45 a.m. Fireman P. D. Dawson gave confirmatory evidence.

Tests and Inspections

44. In view of Driver Howlett's complaint about the working of the engine brake, a test was carried out on 23rd November with the same engine, No. 92187, which had been so little damaged that it was fit to run with the brake equipment unaltered. Chief Motive Power Inspector A. G. Dixon was in charge, and he said that the engine was hauling a train of 47 loose coupled empty wagons and a goods brake which was of the same composition and weight as Driver Howlett's train. The test was carried out between Knebworth and Hitchin and on passing the Stevenage North Starter at 41 m.p.h. the regulator was closed and the steam brake was fully applied. The train travelled for 1,240 yards before stopping 116 yards on the approach side of the Wymondley Auto-Stop signal. When the brake application was made the boiler steam pressure was 230 lbs. per sq. in. compared with a maximum of 250 lbs. per sq. in. In order to simulate the previous conditions even closer, the steam brake had not been applied for the last 30 minutes, i.e. about the same lapse of time between applications as had occurred on the night of the accident. At the time of the test the weather was clear and the rails were dry. Although the train had not been gathered by making partial brake applications, the stop was gradual and without incident.

45. I inspected the signals between Stevenage and Hitchin by day and by night, both in fog and in clear weather. All of them are well sited in relation to the Down Main line and they are visible at good range in clear weather; the siting distances of some of them are given in Table 1. The Wymondley Auto-Stop signal stood out very clearly in daylight but during my inspection from the cab of a freight engine on the clear night of the 20th November the red Danger aspect was quite overpowered by the brilliant Double Yellow of the Hitchin South Outer Distant colour light, even though it was 700 yards away.

On the night of 28th January 1959, Colonel Robertson and I accompanied the Line Traffic Manager on an inspection of all Down Main signals between King's Cross and Doncaster with the object of checking whether there were other signals which might be "read through". On this occasion the weather was variable with dense fog in places and the visibility ranged from over a mile to less than 5 yards. The inspection was made from the front of a diesel car with an excellent view of the signals ahead. Speed was maintained at about 40 m.p.h., except where the fog prevailed, and speed at times had to be reduced to walking pace. Conditions up to Stevenage were generally good, but at Wymondley visibility was down to about 300 yards, so that the Auto-Stop signal was not "read through" on this occasion.

Throughout the journey the contrast between the semaphores and the colour lights was most marked. Although the semaphores are well sited and were easily located in clear weather, one or two of them tended to be overpowered by the brilliance of the colour lights. These modern signals are all excellently sited with the lights at about the level of a locomotive driver's eye. Also they are much more powerful than the oil lamps of the semaphores and consequently they could be seen at much longer distances. This was particularly noticeable in fog when the semaphore lights frequently could be seen only from a few yards. On approaching Doncaster, the train was stopped at one tall post because the fog was so dense that the signal could not be seen from the cab and an inspector had to climb the post to ascertain the aspect. On the other hand, a colour light a short distance away in similar fog was visible from a distance of about 40 yards.

46. On the night of the accident the relevant signalling equipment at Stevenage North, Wymondley and Hitchin South was thoroughly tested and further tests were made two days later. The tests covered the mechanical interlocking, track circuit and other electrical controls, the working and control of the automatic signals, the sequential locking at Stevenage North, the block controls and all repeater arm and light circuits. The insulation of the electrical circuits was also checked. Everything was found correct and there was nothing to suggest any failure of the signalling equipment.

Conclusion

47. I am satisfied that the Wymondley Auto-Stop signal was properly at Danger when Howlett passed it. The comprehensive tests after the accident proved that the signalling was in good order. Consequently the signal must have returned to Danger as soon as the 2.28 a.m. train occupied track circuit K

and it would have been held at Danger by track circuit M on which this train was still standing at the time of the accident.

48. All the reliable evidence points to the weather having been clear all night at Stevenage North but having deteriorated rapidly at Hitchin from 4.0 a.m. onwards until by the time of the accident visibility was reduced to between 10 and 30 yards. Signalman Revell's statement that he could see the lights of the Stevenage North Starter and the Wymondley Inner Distant, 1,200 yards from the box, was confirmed by the enginemen of the Down train which was stopped there just after the accident, and the witnesses were unanimous about the denseness of the fog at Hitchin.

Signalman Bunn, an independent witness who lives close to the Wymondley Auto-Stop signal, stated that it was misty there at about the time of the accident, and the engine driver of the 2.28 a.m. train said that he had no difficulty in observing the colour lights in the vicinity, although he did not see the light of the semaphore Auto-Stop signal until he was close to it. I conclude, therefore, that the colour light signals were visible for several hundred yards but the mist around Wymondley was sufficient to prevent a driver from "reading through" the Auto-Stop signal to the Hitchin South Outer Distant colour light.

49. In view of this evidence I have no hesitation in rejecting Driver Howlett's account of the weather conditions. Although he stated that he saw the Stevenage North Home semaphores when half way along the station platform, i.e. at a distance of about 100 yards, he insisted that there was an "an absolute dense fog" at the Starter and that he could not see this brilliant colour light until he was passing it. Not only does the evidence of impartial witnesses discount this, but the evidence of Howlett's own fireman confirms indirectly that the signal was in view for a long distance. He said that he saw the signal "at an engine's length", but as the boiler cut off the fireman's view at a distance of 166 yards he must have seen this signal from a range of at least 180 yards, probably further.

50. It is clear that Driver Howlett was not keeping a proper look out approaching the Stevenage North Starter and that he did not attempt to reduce speed until he had passed this colour light showing a Double Yellow. Thereafter he mismanaged the brake so that the train was travelling much too fast when it reached the Wymondley Auto-Stop signal. Howlett was right to "gather the train" by making a partial application initially, but he should have followed this with a full application until the speed was so reduced that he could have stopped at the Wymondley Auto-Stop signal. The test of the engine brakes showed that they were working efficiently after the accident, and I do not accept Howlett's excuse that they did not respond properly when he was approaching this signal.

51. I accept Howlett's statement that, as he passed the Auto-Stop signal at about 20 m.p.h., he saw in the light of the fire a semaphore arm in the "off" position, and I believe that shortly afterwards he realised that he must have mistaken the unlighted Goods line arm for the Down Main Home signal. Instead, however, of stopping the train he continued forward without reducing speed until the engine collided with the train ahead.

52. I conclude, therefore, that this accident was due to Driver Howlett's failure to keep a proper look out, to his mismanagement of the engine brakes, and to his serious misjudgment after he suspected that he had run by a Stop signal without seeing it.

Driver Howlett is now 60 years old with nearly 40 years railway service. He has been a driver for nearly 14 years with a good record until recently. About three weeks before this accident, however, he was involved in a very similar incident when he approached a Stop signal at too high a speed in dense fog. Although detonators were exploded by the engine he ran by the signal for a long distance before realising his mistake, after which he continued forward to the next signal box where he was stopped. These two serious errors indicate that Driver Howlett's ability and judgment are questionable.

53. Driver Coates was controlling the 2.28 a.m. train correctly. Having received a Double Yellow warning at the Hitchin South Outer Distant he promptly reduced speed in order to stop if necessary at the Outer Home signal. This signal was clear, but in view of the dense fog he went on very cautiously and stopped at the Inner Home until he had made sure that it was "off".

54. Distant signal indicator working is in force between the Hitchin boxes and hence after accepting the 2.28 a.m. train at 4.15 a.m. Signalman Crouch of Hitchin South box had to wait until the other boxes had cleared their signals before pulling his Distant signal lever. He should have been able to do this between 4.18 a.m. and 4.19 a.m., but as he was engaged in other duties he did not do so until after the train had passed the *Outer* Distant. Guard Sauer's evidence suggests that this signal may have been cleared just before it came into his view at close range, in which case the *Inner* Distant semaphore would have been "off" when Driver Coates passed it. He was, however, justified in continuing forward slowly because if he was in any doubt about its aspect he should, as in fact he did, assume that it was at Caution.

55. Driver Moffatt, who was in charge of the 10.35 p.m. Up train, was travelling through Hitchin under clear signals at a speed of 35 m.p.h. which was quite justifiable in the circumstances. The detonators which his engine exploded on passing Hitchin South box were only 96 yards from the obstruction ahead, and Driver Moffatt had no chance of avoiding the collision.

56. Signalman Crouch's failure to clear the Distant signal for the 2.28 a.m. train as soon as the indicator bell rang delayed the train unduly, but it should not have endangered it. Crouch was, however, seriously at fault in failing to return this signal to caution when the train reached track circuit M, occupation of which is clearly indicated on the diagram in the box. The train must have reached this track circuit between 4.22 a.m. and 4.23 a.m., and Crouch, on his own admission, did not replace the signal

until about a minute before the accident, i.e. after a delay of between six and seven minutes. Signalman Crouch, who is nearly 41 years old, had been on duty for over ten hours and no doubt was beginning to get tired. He had other work to do as was to be expected in a busy box, but he should not have allowed this to interfere with his fundamental duty of returning signals to normal as soon as possible after a train had passed them.

57. With the weather so clear at Stevenage North it is understandable that Signalman Revell did not consider it necessary to call out the Wymondley fogsignalman, but, since this post is half way to Hitchin, it would have been prudent to have taken such action when he heard that the Hitchin fogsignalman had been sent for at 4.24 a.m. In such circumstances double block working would have been introduced until the fogsignalman had arrived at Wymondley, although on this occasion it would not have affected the running of the 3.25 a.m. train which passed Stevenage North box at 4.23 a.m.

Remarks and Recommendations

58. This accident occurred on a night when fog had reduced visibility in places and made the observance of signals more difficult, and it was due to a driver's passing a Stop signal at Danger on a line equipped with Automatic Warning Control. The ground inductors are in position about 200 yards on the approach side of the Distant and colour light signals on the Main lines between King's Cross and York, but as the engine of the train concerned had not yet been equipped the driver did not receive the additional audible warnings of the signal aspects. Had he done so he might have been alerted sufficiently to have taken more positive action. So far over 220 steam and diesel locomotives have been equipped; others are being fitted at a rate of 20 per week, and it is expected that by the end of the year the majority of drivers operating on this important line will have the benefit of this valuable warning device.

59. The inspection on the night of 28th January demonstrated vividly the problems of working in fog and the relative effectiveness of semaphore and colour light signals. Even under the worst conditions of visibility when a semaphore aspect could not be seen from the cab, a nearby colour light was identified without much difficulty. The extension of colour lights to the East Coast main line is proceeding, but it will be some years yet before the modernisation of all the signalling is completed.

60. The Wymondley Auto-Stop semaphore signal, which was overrun on this occasion, was installed many years ago. It was well sited and originally was but one more in a series of semaphores. However, with the advent of high speed trains before the war it was necessary to give longer warning of Stop signal aspects and many Outer Distant signals were installed. Usually these were colour lights and, between Stevenage and Hitchin, the Stevenage North Starter was converted from a semaphore to a three-aspect colour light combining the functions of Stevenage North Starter and Wymondley Outer Distant. The Wymondley semaphore Distant was converted to a two-aspect colour light Inner Distant and the Hitchin South Outer Distant colour light was placed some 700 yards ahead of the Wymondley Auto-Stop signal. Thus this signal was left as a lone semaphore among a group of colour lights.

This arrangement is unsatisfactory, especially at night when the brilliant colour lights tend to overpower the oil lit lamps, as was clearly demonstrated during my first inspection on the night of 20th November when the red Danger aspect of the Wymondley Auto-Stop signal was overpowered by the Double Yellow light of the Hitchin South Outer Distant, even though the latter was so far away.

Four times since 1950 this Auto-Stop signal has been overrun, and plans have now been made to change it. It is proposed to replace it by a three-aspect colour light combining the functions of the Auto-Stop with the Hitchin South Outer Distant, and to remove the Wymondley Inner Distant which will be redundant. At the same time the Wymondley Goods line stop and Distant signals will also be removed. Such arrangements should do much to improve and simplify the signalling on this section.

61. The inspection of the Down Main line from King's Cross to Doncaster on 28th January showed that drivers might "read through" other semaphores, and I am glad to report that the Line Traffic Manager is examining the siting of all main line signals on the Great Northern Line of the Eastern Region to decide whether the introduction of colour lights has created difficulties in other places. Similar conditions may exist elsewhere, and I suggest that comparable reviews might be undertaken in other Regions.

62. Fog working instructions placed on the Stevenage North signalman the responsibility of calling out the Wymondley fogman, but as this post is over a mile from the Stevenage box and half way to Hitchin South it would have been prudent to call out this man whenever fog working was introduced at either box. The signal box instructions have already been amended accordingly and I suggest that similar arrangements might be made at other places where such conditions exist.

63. The signalman at Hitchin South was working a 12-hour shift and he had been on duty for over ten hours at the time of the accident. Although he did not make any complaint he agreed that by 4.0 a.m. he was understandably somewhat tired. This may have accounted for his slow re-actions about the 2.28 a.m. train and may have contributed to his failure to return the Distant signal to normal until long after the train had passed it.

Since most signal boxes have to be manned continuously, occasional 12-hour shifts are inevitable but the constant working of these long hours is to be deprecated. When a 12-hour shift must be worked I suggest that, where practicable, it should be planned so that the crucial early hours of the morning, when a man's mental alertness is at its lowest, fall in the earlier period of the tour of duty. I am glad to note that the difficulties at Hitchin South have now been overcome and that the signalmen there have resumed normal working hours. In some areas the signalling staff are still below establishment and consequently some signalmen have to work frequent 12-hour shifts. I hope, however, that further efforts will be made to eliminate this undesirable practice.

I have the honour to be,

Sir,

Your obedient Servant,

C. A. LANGLEY,
Brigadier.

The Secretary,
Ministry of Transport and Civil Aviation.

Wt. 2505/V.231. Pa.404227. 6/59. 1,000. Pnt. Ltd. 314.

EASTERN REGION

TRIPLE COLLISION AT HITCHIN SOUTH ON 19th. NOVEMBER, 1958

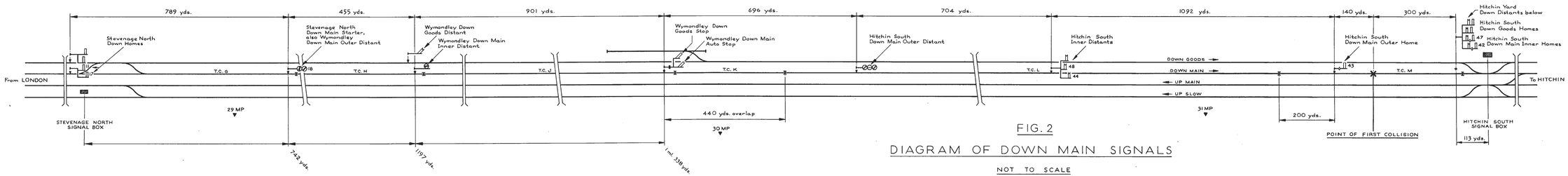

FIG. 2

DIAGRAM OF DOWN MAIN SIGNALS

NOT TO SCALE

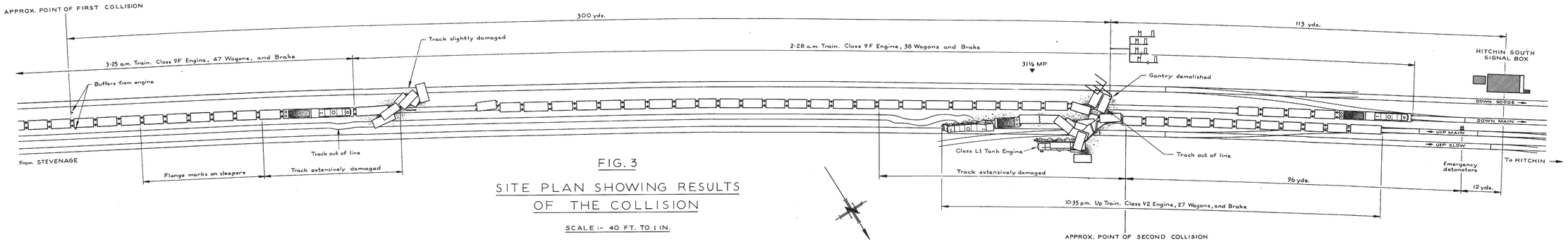

FIG. 3

SITE PLAN SHOWING RESULTS OF THE COLLISION

SCALE :- 40 FT. TO 1 IN.

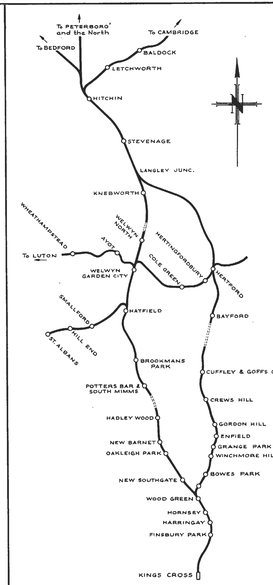

FIG. 1

LOCATION PLAN

SCALE :- ¼ INCH TO 1 MILE