DEPARTMENT OF THE ENVIRONMENT
FOR NORTHERN IRELAND

RAILWAY ACCIDENT

Report on the Collision that occurred on 25th March 1983 at Hilden

ON THE
RAILWAY OF THE
NORTHERN IRELAND RAILWAYS
COMPANY LIMITED

BELFAST: HER MAJESTY'S STATIONERY OFFICE

£4.25 net

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RAILWAY INSPECTORATE
DEPARTMENT OF TRANSPORT
2 MARSHAM STREET
LONDON SW1P 3EB

17th April 1985.

SIR,

I have the honour to report, in accordance with the Direction dated 29th March 1983 made under the provisions of the Regulation of Railways Act 1871, the result of my Inquiry into the collision between an empty coaching stock train and a local passenger train on 25th March 1983 at Hilden on the railway of Northern Ireland Railways Company Limited (NIR).

At about 17.48 on Friday 25th March 1983 a two-car diesel-electric multiple-unit, which formed the 17.43 empty coaching stock train from Lisburn to Belfast, collided violently with the rear of a three-car diesel-electric multiple-unit which formed the 17.05 passenger train from Portadown to Bangor and which had stopped out of course, due to a mechanical fault, on the Belfast side of Hilden Station. The occupation of the track circuit through Hilden Station by the stationary train held the signal in rear, Signal L62 the Lisburn Down Advance Starter, at Danger. Because, after conferring with the signalman at Belfast, the signalman at Lisburn thought that the track circuit had failed instead of being occupied by a train he authorised the following Down train to pass the signal at Danger. By the rules, the driver of a train authorised to pass a signal at Danger is required to drive cautiously and at such a reduced speed that the train can be stopped with care and collision with any obstruction avoided. The crew of the failed passenger train were attending to the fault and before the conductor had carried out protection of his train the empty coaching stock train, travelling at such a speed that it was unable to stop within the limited sighting distance to the rear of the passenger train, collided violently with it.

The force of the collision moved the stationary train forward some 35 metres and derailed the trailing car whose rear bogie was detached in the process. The leading bogie of the empty train was also derailed. The rear 6m of the trailing car of the stationary train was destroyed as were the driving cab and body as far back as the engine compartment of the leading car of the empty train. I regret to report that the driver of the empty coaching stock train, Driver H. Deane, was killed and two passengers on the other train received minor injuries. The emergency services were called promptly and the first ambulance arrived at the scene of the accident at 17.53 followed at 17.54 by the Police who called the Fire Brigade who arrived at 18.05.

At the time of the accident weather conditions were dry and bright, with intermittent sunshine. The railway was reopened to traffic at 22.30, with Single Line Working over the Up line. On the following day, 26th March, both lines were closed to traffic again between 11.45 and 17.00 to enable the derailed and damaged vehicles to be removed. The Up line was reopened at 17.00 and normal double line working resumed at 18.40.

DESCRIPTION

The Site

1. The collision took place approximately 18.5m on the Belfast side of the Down Platform at Hilden Station which is on the Belfast to Dublin line via Lisburn, Portadown and Dundalk. After leaving Lisburn in the Down direction (towards Belfast), where the line runs approximately West to East, the double track railway curves to the left before changing to a right-hand curve after passing through Hilden Station where the tracks lie approximately South to North. At this point the line is carried on an embankment which is about 2m high on the Down side. Hilden Station is some 1100m in advance of Signal L62 and 400m in rear of Signal No. 141. The area behind the Down Platform is covered by shrubs and trees which reduced the sighting distance of the rear of the stationary passenger train to approximately 159m. Underbridge No. 286 is situated about 15m on the Lisburn side of the sighting point of the stationary train and a further 42m towards Lisburn is the point at which the aspect of Signal No. 141 can first be seen. A plan of the site showing the approach from Lisburn and the relevant signalling details is at the back of this report. The line from Lisburn to Hilden is on a falling gradient averaging 1 in 265 and, because of the curvature, is subject to a speed restriction of 60 mile/h.

The Signalling

2. Trains are signalled between Lisburn and Belfast under the Track Circuit Block Regulations for Double Lines (TCB Regs). The multiple-aspect colour-light signalling system was extended from Belfast to Lisburn in 1981 and came into use on 8th March of that year. The resignalling eliminated the intermediate signal box at Dunmurry. The boundary between the signalling controlled from each end by Belfast Central

Signal Box and Lisburn Signal Box is between Hilden and Lambeg Stations but certain track circuits in the Hilden area are indicated in both signal boxes. No train describers were provided but there is a direct telephone line between the boxes which was used to advise any out of course running of trains.

3. The controlled signal at the beginning of the section is the Lisburn Down Advance Starter, Signal L62. This signal is a three-aspect colour-light signal controlled by Lever No. 62 in Lisburn Signal Box. When the lever is reversed the signal operates as an automatic signal and its aspect is controlled by the aspect of the signal in advance, Signal No. 141, an automatic three-aspect colour-light, and the occupation of Track Circuits DS1A (the overlap track circuit for Signal L62), DS1B and 141A (the overlap track circuit for Signal No. 141). The signal post telephone (SPT) at Signal L62 is connected to Lisburn Signal Box whereas that at Signal No. 141 is connected to Belfast Central Signal Box. Track circuits (TC) DS1A, DS1B and 141A are indicated in both signal boxes.

4. The layout at Lisburn Station is also shown on the plan. The Up (No. 1) Platform is single-sided but the Down (No. 2) and Bay (No. 3) Platforms together form an island platform joined to No. 1 Platform by a footbridge. The Lisburn Signal Box was on the Portadown (Dublin) end of the island platform. Facing and trailing crossovers at both ends of the station give access from all the platform lines to both Up and Down Main lines and to the single-line Antrim branch which runs for about 1000m beside the Down Main line before entering the Bay line at the Portadown end of the station. The Down direction starting signals are Nos. 21 (reading over Crossover No. 12 reversed), 63 and 22 for the Up, Down and Bay Platforms respectively. The Lisburn Down Advance Starter, Signal L62, lies some 350m in advance of Signal No. 21.

Rules, Signalling Regulations and Operating Instructions

5. Extracts from the NIR Rule Book, Regulations for Train Signalling and Operating Manual (Appendix to the Working Timetable) covering the various rules, regulations and instructions referred to in this report are given in Appendix A at the back of the report.

The Trains

6. The 17.05 Portadown to Bangor passenger train (Train 270) consisted of one NIR Class 70 3-car diesel-electric multiple-unit (DEMU) set comprising Power Car No. 77 (leading), Intermediate Trailer No. 726 and Driving Trailer No. 712. The total weight of the train was 123 tonnes and its length 56.46m. There were 16 passengers on the train at the time of the accident. The 17.43 Lisburn to Belfast empty coaching stock (ECS) train (Train 272) was one NIR Class 80 2-car DEMU set comprising Power Car No. 88 (leading) and Driving Trailer No. 735. The total weight of this train was 91.4 tonnes and its length 40.13m. Both trains were fitted with the standard NIR deadman's equipment and vigilance device and with a Westinghouse 3-pipe compressed-air braking system.

The Course of the Accident

7. The passenger train, Train 270, operated normally as far as Lisburn from where it departed one minute late at 17.35. It was booked to stop at Hilden and thereafter at all stations to Belfast Central. On approaching Hilden the driver made a normal service brake application but on reaching the platform realised that the brakes were not effective. He therefore made an emergency brake application which stopped the train with its rear 18.5m past the Belfast end of the platform. Use of the emergency brake resulted in the loss of control air pressure which prevented the train from being restarted. After the train crew had checked the various air pipes, cocks and connections, the driver returned to his cab, where he found the control air pressure beginning to build up again, and the conductor left the train to carry out protection. This he had not begun by the time the collision occurred.

8. The 17.15 Belfast Central to Lisburn passenger train was booked to terminate at Lisburn and thereafter return to Belfast as empty coaching stock. On 25th March the train arrived in No. 1 Platform at Lisburn about 2 minutes early. The crew changed ends and the train departed on or just before the booked time of 17.43. From the starting signal, No. 21, the train was routed over Crossover No. 12 but was then detained at Signal L62 which was showing a Red aspect. The driver spoke on the signal post telephone to the Lisburn signalman. However before that conversation took place the latter had noticed on his diagram that TC DS1B was showing occupied and had conferred with the signalman at Belfast Central to determine the location of the previous Down train, Train 270, the 17.05 ex Portadown. The signalman at Belfast, who had just returned to his panel from a visit to the lavatory, saw on his diagram a track circuit (TC 149A) in the Finaghy area showing occupied, assumed that this was the 17.05 which should by then have been in that vicinity, and told the Lisburn signalman accordingly. He also saw that TC DS1B showed occupied but did not react when the Lisburn signalman contradicted his suggestion that TC DS1B was occupied by the 17.43 ECS train. The Lisburn signalman erroneously concluded that TC DS1B had failed. Therefore when the driver of the 17.43 spoke to him on the SPT he authorised the driver to pass Signal L62 at Danger and told him "to be careful".

9. The driver of the 17.43 ECS, Train 272, rejoined his train but did not relay his conversation with the signalman to his conductor. The latter said that the train made a normal start away from Signal L62 but thereafter ran at 20 mile/h, which he thought was the prescribed speed when running 'at Caution'. Contradictory evidence however suggests that the train's speed was between 40 and 50 mile/h. It is not clear whether or not the driver applied the brake before the train collided violently with the rear of the preceding train. The force of the collision pushed the stationary train forward some 35m with the trains coming to rest about a coach-length apart. The underframe of the trailing car (No. 712) of Train 270 sliced into the leading power car (No. 88) of Train 272 which was crushed back to and through the engine-room partition. Both bogies of No. 712 were derailed, the rear one becoming completely detached from the coach underframe. Only the leading bogie of No. 88 was derailed.

Damage

10. Besides the severe damage to the cab and engine bay of Car No. 88 the frame was bent and the remainder of the body sustained minor damage. Car No. 712 also had its driving cab totally destroyed by being pushed into the passenger saloon and its frame, too, was bent. Minor damage occurred in the saloon. Car No. 726, the intermediate trailer of the passenger train, also sustained compression damage to its frame and bodyshell. One rail length of permanent way was severely damaged and had to be replaced before the track was returned to traffic at full speed. Because of wheel marks on them the sleepers of another two rail lengths had to be replaced later.

EVIDENCE

As to the Running of the Trains

11. The 17.05 Portadown to Bangor passenger train (Train 270) was driven by *Driver T. G. Girvan*. He had taken over the 3-car set at Bangor at 15.45, driven it to Portadown where it then formed Train 270. He had had no trouble with the set until he applied the normal service brake on the approach to Hilden. Because he received no response from this brake application, he applied the emergency brake and succeeded in stopping the train about a coach length past the platform but short of Signal No. 141 which was showing Green. He checked to see that the service (the electro-pneumatic (EP)) brake switch was in the correct position which it was and then alighted on the cess side of the train to check the air-pipe connections. He saw that his conductor had also got down from the train and said that he met him at the back of the train. Together they completed their checks and, whilst he was in the rear driving cab, he noticed that the air pressure was beginning to build up again. He therefore returned to the front of the train with the conductor. He said that at that point he told the conductor to protect the train. He then climbed back into his cab where he noticed the indications on the pressure gauges rising. He estimated that some 5 to 6 minutes had by then elapsed since the train first came to a stand. He had been sitting in his cab for about two minutes when the collision occurred; by his reckoning about 8 minutes after the train had come to a stand.

12. Driver Girvan agreed that the provisions of Rule 179 applied to the circumstances at Hilden and that this required the train crew to take action immediately to protect the train. He considered that this action should be taken in less than 2 to 3 minutes but, because he had found that the air pressure was beginning to rise and therefore thought that the train would soon be ready to go, he had not protected the train. Neither had he made any attempt to use the radio to advise Control of the situation. After the accident he was dazed but saw the conductor running past his cab towards Belfast to put down detonators. He had not appreciated that his train was equipped with track-circuit operating clips. A few minutes later he used the telephone at Signal No. 141 to tell the signalman what had happened. He said that, in spite of the fact he was carrying a copy of the Working Timetable which clearly shows that the following train was due at Hilden about three minutes after his own train had come to a stand, he was unaware of that fact and therefore the passage of time, even 8 or 9 minutes, had not seemed unduly long before starting to provide protection.

13. The story told by the Conductor of Train 270, *Conductor M. J. O'Neill*, differed in several respects from that of his driver. However he said that the train had left Lisburn about 1 minute late at 17.35 (he had checked the time on his watch) and had made a normal start. He said that the train was booked to stop at Hilden at 17.37 but had actually stopped at a distance he estimated as about 35m beyond the platform. His guard's van was at the leading end of the rear coach and he attempted to make contact with his driver by looking out of the window. He noticed that the brakes were not releasing so he jumped down onto the track. He alleged that he had then walked down to the driver's cab and, getting no response to his shouted questions, had gone round the front of the train and climbed up through the door into the cab. He said that Girvan had said "I have lost my air and I am not getting it" and also "Go back and protect your train". He maintained that the conversation about protecting the train took place two minutes at the most after the train had stopped and that it lasted about a minute. He returned to his van and collected a red flag and some detonators. He had walked about 10m clear of the rear of his train when he heard another train coming. He jumped across to the Up line and saw the train coming round the bend. As he was getting clear he heard the smash. He thought it

had occurred about two minutes after he had left the driver's cab, in other words some 5 minutes after his train had come to a stand.

14. After the collision he ran towards the front of his own train along the Up line, where he could see a small amount of debris, in order to protect that line. As he ran he waved at an approaching Up train. He thought that Girvan had not realised what had happened so he told him and also told him to telephone for the emergency services. Because of the debris on the Up line he continued towards Lambeg putting down detonators; he said he did not have any track-circuit operating clips in the emergency gear or in his brake van. It was not until he returned to the trains that he met the conductor of the other train, Conductor Fisher, and asked him what had happened; he had just assumed up until then that Fisher was protecting in the rear of the accident. He said that he was unaware that there was a train closely following his and had he known he might have been quicker in carrying out protection but he pointed out he was required first to consult with his driver. His version of the story was that the driver checked the air-pipe hoses after his conversation with him and whilst he was going to carry out protection. He found it difficult to accept that 9 minutes had passed since he could only account for about 5.

15. The conductor of the following Down train (Train 272), the 17.43 Lisburn to Belfast ECS, was *Conductor S. M. Fisher*. He had met Driver Deane on the platform at Belfast Central Station where they were to form the crew of the 17.15 passenger train (Train 259) from there to Lisburn. He said that Deane seemed entirely to be his usual, jolly, self. The 17.15 train was due in No. 1 Platform at Lisburn at 17.40 and 3 minutes were allowed for the passengers to alight and the crew to change ends before it departed again as Train 272. Fisher said that they had in fact made a normal start on time at 17.43. Because the train has to cross over onto the Down line the speed was not excessive, besides he noticed that Signal L62 was showing Red. The train made a normal stop at the signal and Fisher estimated that it was less than a minute before Driver Deane got down and spoke on the signal post telephone; he estimated that the telephone conversation lasted about 45 seconds. Even though there was a loudaphone installed in the train Deane had not told him what had been said on the telephone. Fisher said that Deane had again made what he called a "normal" start away from the signal and was "proceeding with caution". He assumed that they had been authorised to pass the signal at Danger and were to drive at Caution, which he thought the Rule Book stipulated as 20 mile/h. He had been in the passenger compartment closing windows on leaving Signal L62 and had not looked out to observe the aspect of Signal No. 141 but felt that when they were approaching Hilden there had been a slight increase in speed. He could not recall if there had been any braking before the impact. After it he went to his guard's van to fetch detonators, got out of the train and went forward to the front to see if any assistance was needed and to find out what had actually happened. Because of the damage he saw that he could not help his driver so he went back and protected his train. He did not take any track-circuit operating clips which should have been in the rear cab. He assumed that clips had already been placed on the Up line by the other train crew but his main concern was the rear of his own train in case there was a further accident caused by an assisting train.

16. As he was carrying out the protection of his train Fisher spoke to Driver Croft who had stopped his train, the 17.03 Bangor to Portadown, about half-a-train's length past the Hilden Up Platform. Croft asked Fisher if he should contact Control by radio. He thereupon did so and Fisher estimated that the radio call would have been made not more than 2 minutes after the accident. Then, after completing the task of protection, Fisher returned to the scene of the collision and spoke to Driver Girvan and asked the latter if he had any track-circuit operating clips because, at that time, neither of them were quite certain where Conductor O'Neill was. When O'Neill eventually returned Fisher checked that the Up line had been protected.

17. On duty in the control room at Belfast Central Station were *Controllers H. Grant* and *W. Greenwood*. Miss Grant said that at 17.52 she had received a call from Driver Croft notifying them of the accident. She had not had a call earlier or a message of any kind to say that there was a problem with Train 270. Overhearing the call from Croft, Mr Greenwood said he immediately contacted the Belfast Central signalman on the direct telephone line to tell him of the accident and instructed him to put all the signals to Danger in that area. Between them they called the Police and Ambulance Services. Mr Greenwood then tried to contact the Lisburn signalman using the Post Office ex-directory telephone but it was engaged. About 5 minutes later Miss Grant spoke to Relief Inspector Moore who was in the Lisburn Signal Box and who had telephoned to report an apparent track-circuit failure. In the meanwhile both Controllers had been trying to establish with the Belfast signalman which trains had been involved in the accident. Miss Grant said that eventually the Belfast signalman had concluded that TC 149A had failed and was not occupied by a train. Later Mrs Cooke, Marketing Services Manager NIR, who had been passing the scene of the accident in her car, had spoken to Control on Train 270's radio, told them of what was happening and thereafter acted as a relay for their instructions. The only time they had later spoken to Driver Girvan was when he responded to a call to the train from Control.

18. *Relief Inspector S. J. Moore* was on duty at Lisburn Station. He said that he had spoken to Driver

Deane earlier that day and the latter had seemed perfectly normal with no complaints or worries. He had not seen the arrival of the 17.15 from Belfast in Platform No. 1 but saw its departure as Train 272 at 17.43. He noticed that the train stopped at Signal L62 which he could see was at Danger. He then attended to the arrival of the Portrush train which was due at 17.44 on Platform No. 3 but he noticed Deane speaking on the signal post telephone. After the Portrush train, booked to depart at 17.45, had left he glanced towards the Belfast end of the station and saw that Deane's train had gone. He went into the signal box where he was told by the signalman that there was a track-circuit failure at Hilden. He telephoned Control at Belfast who responded by telling him to go at once to Hilden where there had been an accident. He had not stopped to take a note of the positions of the levers or the indications in the signal box. He said, however, that he was satisfied that the signalman was in a fit state to carry on with his duties. He did not know if there had been contact between the Lisburn and Belfast Signal Boxes. On arrival at Hilden he found Driver Girvan still shocked and unable to tell him what had happened. Under instructions he returned again to the Lisburn Signal Box; he did not check the positions of the signal levers then, either.

As to the Signalling of the Trains

19. *Signalman W. Gilmore* had taken duty in Lisburn Signal Box on 25th March at 14.40 and had worked the same turn for the whole of that week. He said that, although Signal L62 worked automatically when the lever was reversed, it was his usual practice to leave it normal in the frame until he needed to set a route for a train to Belfast. He also said he had not received any formal instruction in the revised Regulations for Train Signalling but had read them for himself, especially those affecting the revised signalling between Lisburn and Belfast, and had subsequently been tested in his knowledge during visits by the Traffic Inspectors. When the Track Circuit Block Regulations had been introduced he no longer had to exchange bell signals with the next signalman in the Down direction. If there were any alterations to the timetable working he and the Belfast signalman would exchange telephone messages. He also said that the occupation of track circuits was shown by lights on his signal box diagram; track circuits up to and including TC DS1B in the Down direction were shown. He had an indication of the aspect of Signal L62 but not of Signal No. 141.

20. Signalman Gilmore said that, on 25th March, he had set the route for Train 270 through Platform No. 2 and past Signal L62 when the train was near Maze on its way from Portadown. He watched the passage of the train as it occupied and then cleared each track circuit in turn. When the aspect of Signal L62 reverted to Danger he replaced the lever in the frame but he noticed that the track circuit through Hilden did not clear. As soon as the 17.15 from Belfast had arrived he set the route for it back down to Signal L62 and when it had departed as Train 272 he set the route from the Up Main line into Platform No. 3, the Bay line, for the Portrush train. At about the same time he telephoned the Belfast signalman to ask him where Train 270 was as TC DS1B was still showing occupied. Without any hesitation Signalman Bell in Belfast replied that it had passed Dunmurry. Knowing that TC DS1B also showed on the Belfast panel he drew Bell's attention to the fact that it was showing occupied. He did not recall Bell's reply. So when, about a minute later, Driver Deane telephoned him from the SPT at Signal L62 inquiring about the delay Gilmore told him that there was a track circuit failure at Hilden and Gilmore said "I told him to pass 62 signal and to be careful". He agreed that he had not used the precise wording required by the Operating Manual of pages 23 and 24 but was certain that Deane had understood what he meant. He had not, either, reminded Deane that he was required to stop at Signal No. 141 and inform him what was wrong with the track circuit. But he did make an entry in the Train Register Book that a track circuit had failed and that he had therefore authorised the driver of Train 272 to pass Signal L62 at Danger. Gilmore observed the movement of the train on his signal-box diagram. When it had cleared past the signal he observed that the aspect was still at Danger. Because the track circuit immediately in advance of Signal L62 is only a short one he was unable to tell whether or not the train was moving faster or slower than normal. The SPT at Signal No. 141 is connected to the Belfast Signal Box so Gilmore expected that Bell would have relayed the message to him about the state of TC DS1B. He had not considered telling Bell to expect a message from Deane.

21. The first that Signalman Gilmore knew of the accident was when Inspector Moore told him about it after the latter had telephoned Control to report the apparent failure of the track circuit at Hilden. As Inspector Moore left the signal box Gilmore threw back Lever No. 1 which controlled his outermost Up signal in the Belfast direction which is located about 600m on the Belfast side of Hilden Station. Signal No. 1, a three-aspect colour-light, had been cleared for the 17.03 Bangor to Portadown train (Driver Croft's train) which was already occupying the approach track circuit. He was later told by Croft that he had been able to pass the accident. He also spoke by telephone to the crossing keeper at Dunmurry but not at all to Signalman Bell in Belfast and had put reminder appliances on the levers of all the Down starting signals.

22. I asked Signalman Gilmore why he had not made more effort to confirm the exact location of Train 270 since this was a critical factor leading to his assumption that TC DS1B had failed and that he therefore was in a position to authorise Train 272 to pass Signal L62 at Danger. He had neither asked Control to speak to Train 270 on the radio nor asked the crossing keeper at Dunmurry if Train 270 had passed him. He said he had

relied entirely on Signalman Bell's information. He could not tell me why he had not asked Signalman Bell to caution the first Up train to pass the failed track circuit as is also required by TCB Regulation 25(d)(iv).

23. *Senior Porter C. D. Stewart* began his turn of duty as the crossing keeper at Dunmurry Level Crossing at 14.45 on 25th March. He is a regular crossing keeper there. He explained that the crossing keepers are warned of the approach of trains both audibly and visually. In the Down direction an audible warning is received when a train occupies TC 141 A. All the track circuits from there up to the protecting signal for the crossing, Signal No. 145 are shown visually as a single indication, thereafter they are individually indicated. Senior Porter Stewart said that crossing keepers would normally respond to the audible warning in time to lower the barriers without looking at the illuminated track diagram and that only if there was a severe disturbance to the normal timetable would they be contacted by the signalman. On the day of the accident neither the Belfast nor the Lisburn signalman had telephoned him to ask whether Train 270 had passed his level crossing. However Signalman Gilmore from Lisburn had telephoned him at about 17.55 (about 6 minutes after the accident had occurred) to tell him what had happened.

24. The signalman on duty in Belfast Central Signal Box on 25th March was *Signalman A. J. Bell* who had come on duty at 15.30 that day. He had worked the same turn for all of that week. He was well used to working under TCB Regulations as he had, until earlier that year, been a signalman at York Road. However at York Road Signal Box train describers are fitted whereas they were not used at Belfast Central. He had worked in Belfast Central Signal Box for about seven weeks before the accident and had been passed as competent to work the box by Chief Traffic Inspector Herron earlier that week. Bell said that no Train Register Book was kept at Belfast Central Signal Box but an occurrence log book was maintained. However routine telephone calls were not noted in the log. Therefore there was no formal record of the call from Lisburn Signal Box about the running of Train 270 but Bell recalled that it had occurred at approximately 17.43, very shortly after he had returned to his panel from a visit to the lavatory. He had observed the progress of the train up to Hilden before leaving the panel and he thought he had been away between two and three minutes. When he returned he noticed that TC 149A was showing occupied and because the normal running time between Hilden and that track circuit had elapsed he assumed that Train 270 was at or near Finaghy. He therefore told Signalman Gilmore when the latter telephoned at 17.43 that that train "should be at 149A". He had made no attempt to confirm that statement by asking the crossing keeper at Dunmurry or by watching to see if TC 149A cleared again after the passage of the train. Bell said that to have done so would have taken nearly two minutes because that was the length of time that that track circuit was usually occupied by a stopping train. He had not thought it necessary either to ask Control to confirm the whereabouts of the train by means of the radio. Bell was not very precise about the other part of his conversation with Gilmore about TC DS1B showing occupied although he agreed that Gilmore had mentioned it and said it might have been a track-circuit fault. Because Gilmore did not mention that he was waiting to let Train 272 past his signal No. L62 he formed the opinion that TC DS1B was showing occupied because of the presence of that train.

25. Signalman Bell claimed that sometime later he telephoned the crossing keeper at Dunmurry to ask if he could see anything on TC 149A. He said that he had not had time to relay the result of this conversation to Lisburn before he was telephoned by Locomotive Inspector Hoey to say there had been an accident at Hilden. Then within the space of about 1½ minutes he had also heard from both Control and Lisburn about the accident. He had not however exchanged a formal message with Lisburn under Regulation 12 "Obstruction Danger" nor had he made any attempt to caution the next Up train, Train 263 due to depart from Belfast Central at 17.42 for Portadown, under Regulation 25(d)(iv). He gave as his reason that the train was late in departing and he thought that the accident had probably happened by then. Besides which the previous Up train, Driver Croft's Train 261, had already successfully passed by both track circuits 149A and DS1B.

26. *Chief Traffic Inspector J. Herron* visited Signalman Bell in Belfast Central Signal Box shortly before 19.00. He checked to see that all the signals south of Belfast had been replaced to Danger, which they had, and then asked Bell what had happened. Bell had explained and Mr Herron's recollection was that Bell's version of the second part of his conversation with Gilmore had ended by Gilmore saying, of the empty coaching stock train (No. 272), that it was "lying at 62 and one of his tracks must be faulty". Mr Herron had also asked if Bell had telephoned Dunmurry to see if the Portadown train had passed and, on being told he hadn't, commented that it was a pity he had not done so. Mr Herron agreed that, in the circumstances, it had been a reasonable assumption that the train was occupying TC 149A but he considered also that it would have been prudent to have had some confirmation of this, even if it took some time, before being so positive about it. He said that it was entirely right to rely on carrying out the rules and regulations and to regard the availability of radio communications as a bonus but he agreed that, had Driver Girvan used the radio to alert Control of his problem, Control might in turn have corrected Bell's erroneous assumption.

Evidence as to the actual collision

27. A cyclist who wishes to remain anonymous was passing along the road parallel to the railway at

Hilden Station and saw the collision. He was passing Hilden Station at about 17.45 and noticed a train at the Belfast end of the station. He thought it had just started or was about to start for Belfast. He could see the leading car only; the remainder of the train was concealed by the bushes. He then heard the single blast of a train's horn and a train came from Lisburn, travelling he thought at about 50 mile/h. He heard the screech of brakes and then saw the second train run into the back of the first one.

Evidence as to the Relevant Rules and Regulations and the Examination of the Staff in Them

28. Chief Traffic Inspector Herron explained that, at the time of the accident, the following Rules and Regulations covered the circumstances of trains being authorised to pass signals which were held at Danger by faulty equipment; TCB Regulation 25(d), Rules 55f and 55g (as amended) and the Operating Manual pages 23 and 24. Rule 55f also carried a cross-reference to Rules 37 and 38 (See Appendix A). It should be noted that Signal L62 did not carry a distinguishing plate and therefore must be treated by train drivers as a Stop signal controlled from a signal box, i.e. covered by Rule 55f. He agreed that there were minor differences between the wording of that rule, which merely requires the driver to proceed cautiously after being authorised to pass the signal at Danger, and the TCB regulation which not only expands the requirement of proceeding cautiously but also requires the train driver to stop at the next Stop signal and to report the state of the line. The precise wording to be used by the signalman in giving the necessary authorisation is given in the Operating Manual and this includes the instruction to proceed cautiously to a named point.

29. The rules covering protection of trains which have experienced a mechanical or electrical failure necessitating fault finding are contained in Rule 179e (this also contains a cross reference to Rule 178a which requires Driver and Guard to walk towards each other on the right-hand side of the train in the running direction). The precise method of carrying out protection is given in Rule 179a which on lines worked under TCB Regulations is modified by Rule 179f (see Appendix A). Mr Herron agreed that the only difficulty faced by train crews in the interpretation of this rule lay in deciding what was meant by "immediately" because the order in which they were required to take action could be summarised as:

a. Secure the train;

b. Consult together either on the phone or in person;

c. Assume that failure will occur and assistance will be needed;

d. Write out a "Wrong Line Order" form if necessary;

e. Guard must immediately protect the rear of the train.

Under these circumstances Mr Herron said that guards were taught that "immediately" meant "within 2 or 3 minutes", especially on the more heavily-trafficked commuter lines such as between Lisburn and Belfast.

30. Chief Traffic Inspector Herron said that the current NIR practice was to hold formal courses when major rule or regulation changes occurred. Such courses had been held when the revised Regulations for Train Signalling and General Instructions to Signalmen were introduced in September 1980. He said that Signalman Bell had attended such a course but he now accepted that, because of his long-term illness, Signalman Gilmore had not. However both Bell and Gilmore had current certificates of competence to work the signal boxes to which they were assigned. He himself had passed out Bell on the Belfast Central Signal Box on 21st March 1983. Yearly written examinations on the Rules and Regulations were now taken by guards and both O'Neill and Fisher were up to date. Such examinations had always been taken by drivers and, as had been noted in the report[1] on the collision at Lisburn Station on 20th December 1978, NIR have implemented an improved programme for the testing and re-examination of those members of the staff who need to have a detailed knowledge of the Rules of Regulations.

Evidence as to post-accident tests

31. *Signal Inspector J. L. Vernon* said that he arrived at the scene of the accident at about 18.40, a little less than an hour after it had occurred. He immediately put track-circuit operating clips on each line to ensure the signals on either side of the accident were maintained at Danger. He noticed that detonators had been placed on the Down line some ¼ mile in rear of the accident but that there were none on the Up line towards Lambeg. He said that Signal L62 was tested to see if it returned to Danger if the track circuit in advance was occupied. It did. He also tested the telephone at Signal L62 which was in order but did not test the one at Signal No. 141. He said that later that night, at about 23.00, he was told of the failure of Track Circuit 149A. When

[1] Report on the Collision that occurred on 20th December 1978 at Lisburn Station on the Railway of the Northern Ireland Railways Company Limited. HMSO Belfast 1981 ISBN 0 337 081719.

he reached it he found that one of the connecting wires had been severed by being maliciously placed on the head of the rail, thus causing the track circuit to show occupied. When he had reconnected the wire he tested the track circuit which then operated normally.

32. *Mr D. T. Aicken, Signal Superintendent NIR* said that when he arrived at Lisburn Signal Box at 19.05 he made a check of the frame. He found that all the Down direction starting signal levers Nos. 21, 22 and 63 were normal. Lever No. 63 had a collar on. Lever No. 62, for the Down Advance Starter, was also normal and the aspect repeater showed red. Track Circuits DS1B on the Down line and UD1A and UD1B on the Up line were showing occupied. Signalman Gilmore had told that he had thought that TC DS1B had failed so he had authorised the driver of the "empty diesel" to pass Signal L62 at Danger. Mr Aicken said that Gilmore did not quote the exact words that he had used. Gilmore had also said that, because there had been no point in doing so as the occupied track circuit would have prevented the signal coming off, he had not reversed Lever No. 62. Later Mr Aicken had walked down the track towards Hilden, noting as he went that Signals Nos. 21, 22, 62 and 63 were at Danger. Before he reached the scene of the accident he found detonators and a track-circuit operating clip on the Down Line. Later he had had Lever No. 62 reversed to check for earth leakage faults. There were none. Subsequently all the signalling and circuits at Lisburn were fully tested and no faults found. Mr Aicken said that he was satisfied that there was no fault whatsoever in the signalling in the Hilden area and that Train 270 by occupying Track Circuit DS1B was correctly holding Signal L62 at Danger.

33. *Mr D. Grimshaw, Operating Executive NIR* described the acceleration and braking tests which had been conducted after the track had been fully reinstated. Similar trains to those involved in the accident were used to establish the sighting points of the rear of the stationary train and of Signal No. 141. These points and their distances are shown on the plan at the back of the report. Three different tests were made. In the first two the empty coaching stock train was started from a stand behind Signal L62 and was run under full power until the sighting point of the stationary train was reached. At this point emergency braking was begun. Speeds of 48 and 50 mile/h were reached before braking and the point of collision passed at 28 and 32 mile/h respectively. In the third test the train was driven under caution until the sighting point of Signal No. 141 was reached whereupon full power was applied. The speed had risen from 25 to 27 mile/h at the second sighting point (of the rear of the train). After a full emergency brake application the train stopped approximately 137 metres short of the obstruction. Mr Grimshaw had therefore concluded that, if the train had been driven at only 25 mile/h and in spite of the driver possibly accelerating once he had seen Signal No. 141 at Green, the train could have been stopped well short of the obstruction. He considered that providing the driver's reaction was very quick the train could have been stopped short of the obstruction from a speed of 35 mile/h but no higher.

DISCUSSION

Analysis of Conflicting Evidence

34. There are two points on which the evidence conflicts. The first is the exact length of time that the failed train was stationary before its crew attempted to protect it and the second is the speed of the train up to the point at which braking began. From the evidence given by the two Controllers and Conductor Fisher about the time of Driver Croft's radio call and of how long it was made after the collision, the collision probably occurred between 17.48 and 17.50. Train 270 left Lisburn 1 minute late at 17.35 and was booked to stop at Hilden at 17.37. It therefore probably stopped at or just after 17.38. Hence the actual length of time the train was stationary before the collision must have been at least 10 minutes. Therefore Conductor O'Neill, who could only account for about 5 minutes, is likely to have given a less accurate version of the events whilst the train was stationary than Driver Girvan who could account for about 8 minutes.

35. Both O'Neill and Girvan therefore seriously underestimated the time which had elapsed before the latter reminded O'Neill of the need to protect the train. Even if a train crew reacted quickly and decided that assistance would come from the rear, thereby obviating the need for form-filling, I doubt very much if a guard would start to walk back to protect his train in much less than 3 minutes; the time quoted by both Girvan himself and Chief Traffic Inspector Herron. To achieve full protection would normally take another 20 minutes or so although in this case there was a signal within the full distance which would have reduced the additional time to about 15 minutes. Clearly if a train crew feel that they will be able to restart their train quicker than this it is a powerful disincentive even to contemplate carrying out protection. Thus the wording of the rule "The Guard must immediately protect his train in rear" falls into disrepute. This is a matter which was addressed by Major Rose in his report(1) on the rear end collision near Seer Green on 11th December 1981, an accident in which many of the characteristics were the same as at Hilden; a train stopped, coupled with the belief by the crew that they would quickly be away again and a driver driving too fast after he had been cautioned past the signal held at Danger by the preceding train. He came to the conclusion that the crew of a stopped train have a right to feel that they are protected by the signalling and that if a following train is

(1) Report on the Collision that occurred on 11th December 1981 near Seer Green HMSO 1983 ISBN 011 550593 8.

allowed into the section it can only be under caution. Hence even on lines not operated under the Track Circuit Block Regulations it was only necessary for detonator protection to be placed ¼ mile in rear of the obstruction. I agree with this view but must point out that it brings with it two consequences. There is no time for the train crew to be involved in lengthy discussion and the words "immediately protected" must be rigidly enforced. Train drivers also most be punctilious in their observance of driving at Caution when authorised to pass a signal at Danger for they can expect little warning of an obstruction.

36. The speed profile of Train 270's run from Signal L62 to Hilden is less easy to determine or to assess whether or not its running met the criterion of being driven at Caution. Conductor Fisher said that the speed of the train whilst running down to Signal L62 was not excessive. The signal is about 350 metres from where the train started and allowing for the low permitted speed over the crossovers it is reasonable to assume that the train reached the signal about 1½ minutes after starting. Again according to Fisher it was less than a minute before Deane got down to the telephone and the conversation lasted about 45 seconds. Such short times are notoriously difficult to judge but I believe the total time for the train to have been detained at the signal must have been between 2 and 3 minutes. Hence, if the train started on time at 17.43 it would have left Signal L62 at 17.47 approximately; maybe a little sooner. The collision occurred about 2 minutes later. During the train-running tests the total elapsed time from starting at Signal L62 to passing the point of the collision for each of the first two tests would have been approximately 110 seconds. Whereas, if it is assumed that the train only reached 34 mile/h and was then stopped just short of the collision point, the time taken would rise to about 160 seconds. In making these calculations no allowance has been made for driver's reaction time or for the time taken for the brakes to apply; a total allowance of about 2 seconds would be reasonable in practice and therefore would not be significant. It seems likely therefore that Train 272 built up to a speed of between 35 and 40 mile/h before the application of the emergency brake and this broadly agrees with the eyewitness's estimate of the speed of the approaching train.

Application of the Rules and Regulations

37. The relevant part of the Track Circuit Block Regulation 25 reads "If a track circuit fails to clear after the passage of a train, or otherwise shows occupied, and the Signalman is satisfied (after consultation with the Signalman at the box in advance, or in the rear or.....) that there is no train occupying that portion of line, the following instructions will apply:

(i) The first train requiring to pass over the affected line must be stopped at the signal held at Danger and.....".

The key points in relation to this accident are that Signalman Gilmore was aware that TC DS1B had failed to clear after the passage of a train and he was therefore required to establish whether or not that portion of the line was occupied by a train. He correctly sought advice from Signalman Bell in the box in advance. It was therefore a cruel mischance that not only had Bell been absent from his panel but also another track circuit should suddenly show occupied at the place where Bell could reasonably have expected the train to be. I believe him when he says that TC 149A was showing occupied when he returned to the panel otherwise he probably would have noticed that the preceding track circuits had not been occupied and would have then concluded that it was TC 149A that was at fault. In the circumstances it would have been wiser for Bell to have made some additional checks before telling Gilmore so positively that Train 270 was at Finaghy.

38. Neither signalman seems to be entirely clear as to exactly what was said between them about TC DS1B showing on both their panels as being occupied and I think much more could have been done by both of them to clarify the situation. Be that as it may, Signalman Gilmore, having been assured that TC DS1B was not occupied by a train, was then entitled by the Regulations to authorise the train to pass Signal L62 at Danger. Thus if the train driver knew his TCB Regulations, whatever else he might have expected to find, it was not a train. However this is by no means the first accident to have occurred because a driver failed to drive his train at Caution after being authorised to pass a signal at Danger by a signalman who had been given an erroneous report of the reason for an apparent track-circuit failure and the circumstances at Hilden also bear a remarkable resemblance to those which occurred at Hyndland Junction[1].

39. There were several discrepancies between the precise wording to be used when authorising a driver to pass a signal at Danger and the things which he was required to be told under the TCB Regulations. These in turn differed from the requirements of the Rule Book. Signalman Gilmore certainly failed to use the words prescribed in the Operating Manual and he barely complied with the provisions of the Rule Book. Nevertheless I am satisfied that Driver Deane, as an experienced driver, should have known what was required of him. Because Deane did not tell his guard anything of what Gilmore had said there is no conclusive evidence

[1] Report on the Collision that occurred on 5th June 1980 at Hyndland Junction near Glasgow HMSO 1981 — ISBN 0 11 5505466

whether or not Deane was led to believe that all he was faced with was a track-circuit failure. If he was, this might provide some explanation as to why he drove his train as fast as he did.

40. Signal L62 was regarded as a controlled Stop Signal and shown as such on plans but nevertheless it could be set to work automatically when its lever was reversed. If it is a controlled signal then Rule 55f applies. If however it is semi-automatic then Rule 55g is the applicable rule. Because the actual signal did not carry a plate showing that it was either automatic or semi-automatic then, as far as train drivers were concerned, it must have been regarded as a controlled signal. Whereas the amended Rule 55g draws attention to the possibility that the signal may be held at Danger because of the presence of a train ahead Rule 55f does not. This too reinforces the possibility that Driver Deane may have concluded that there was no need to expect a train in the section ahead.

Conclusions

41. The collision occurred for two reasons. Firstly Train 272, the 17.43 empty coaching stock train, was allowed into the signal section which was still occupied by Train 270, the passenger train which had preceded it and which had been detained by a failure. Secondly the driver of Train 272, Driver Deane, did not drive his train with the caution that the circumstances and the various Rules and Regulations demanded. Because of a series of misjudgements by both Signalman Bell and Gilmore the latter thought the section to be unoccupied and that it was a track-circuit failure that was preventing Signal L62 from clearing. The Track Circuit Block Regulations permit the driver of a train to be authorised, in these circumstances, to pass the signal at Danger. In so doing Signalman Gilmore did not use the proper form of caution and thereafter Driver Deane did not drive his train in accordance with the Rules. The crew of Train 270 failed to carry out the provisions of the rules covering the protection of a failed train and therefore must share partial responsibility for the severity of the accident. Nevertheless, notwithstanding the errors and omissions of others, Driver Deane, because he did not drive his train with the proper caution was primarily responsible for the accident.

Remarks and Recommendations

42. Since the time of the accident NIR have introduced a new Rule Book and have reissued the Block Signalling Regulations to reflect the new rules. This has therefore removed many of the anomalies to which I have referred. In particular Rule E.8.1, which in essence replaces the parts of both Rules 55f and 55g which detail the duties of drivers authorised to pass signals at Danger, draws the attention of drivers to the fact that an obstruction could well be a train and to the matters which have to be taken into consideration when deciding how fast to drive under 'Caution'; something to which Rule 55g drew attention but Rule 55f did not. However the Operating Manual has yet to be revised and when it is I recommend that the precise form of caution to be used by Signalmen should incorporate as much of the Signalling Regulations as is practicable.

43. Rule M.3.2 in the new Rule Book has radically altered the requirements for protecting a failed train on lines signalled under the TCB Regulations. Where, on a double line, the other line is not obstructed, detonators have to be placed at only ¼ mile from the failed train and then only if the view to the rear of the train is less than ¼ mile. However the requirement to do this "immediately" has been removed and on Absolute Block lines full detonator protection is still required. This means that the guard still has to walk back a full mile unless he comes to a signal box or telephone connected to a signal box. Thus the dilemma faced by train crews when they expect to be able to restart a failed train without too much loss of time still remains. Major Rose, in his Seer Green report, invited British Railways to reconsider the requirement for full detonator protection on other than TCB lines and I invite NIR to do the same. In my view this would have the advantage of having only one rule for train crews to remember. However, as at present on TCB lines, it imposes great responsibility on train drivers to ensure that they obey the provisions of Rule E.8.1 implicitly. It therefore seems to me that, where the view of the rear of the disabled train is restricted, there is a degree of urgency required in placing detonators at the ¼ mile point and I recommend that this should be reflected in Rule M.3.1 or M.3.2. I have criticised Driver Girvan and Conductor O'Neill for their failure to protect their train in accordance with the rules which applied at the time. Had the new Rule Book been in force, because the view to the rear of the train was only some 160m, it would have been necessary to place detonators at the ¼ mile point but there would have been no need for O'Neill to have hurried any more than he did. In order to prevent the occurrance of another accident of this kind some degree of urgency needs to be restored to the wording of the rule. The practical braking curves for NIR trains on level track show that trains can stop in ¼ mile from a speed exceeding 50 mile/h. Because this speed is greatly in excess of that now implied by driving at Caution, ¼ mile is, in my view, a proper distance to specify.

44. It has been suggested that the Rules should be altered to require the crews of failed trains to use a telephone immediately to inform the signalman of their predicament. This change would leave precisely the same doubt in the train-crews' minds as the protection rules do at present because the chance of there being a telephone closer to the failed train than the point at which detonators would have to be placed is small. Even use of the radio system, which has been provided for security rather than signalling and safety reasons, would

not guarantee to provide the same level of protection which proper observance of the present Rule Book does. A study of the accidents which occur on railways overseas which rely extensively on the use of radio communication shows this only too clearly. I am not therefore in favour of such a change to the Rules. However one cannot escape from the feeling that had Driver Girvan made use of his radio Signalman Bell might have been prevented from jumping to the conclusion that led, ultimately, to one of the reasons for the collision occurring.

45. It has also often been suggested, following accidents where a train has been driven too fast in the prevailing circumstances after its driver had been authorised to pass a signal at Danger that a maximum speed should be laid down. However whatever speed was selected it would not cater for all the circumstances to be found, for example, on NIR. I consider that the wording of the present rule is sufficiently explicit for experienced drivers to know what is required of them and I recommend that no change be made to the Rules on this account.

46. At the time of the accident no train describers were fitted in either Lisburn or Belfast Central Signal Box. Since then a VDU has been installed in each of these boxes which displays, on a track-layout diagram, a three-character train description against any train-occupied, signal-berth track circuit. It is therefore possible for a signalman to tell the positions of specific trains relative to signals and hence to be able to distinguish those track cricuits which are showing occupied for any reason other than by the presence of a train. Such an installation would probably have prevented Signalman Bell from jumping to his unfortunate conclusion and I therefore recommend that there is no need to make any further alternations or additions to the signalling equipment between Lisburn and Belfast.

Summary of Conclusions and Recommendations

47. *Conclusions.* The accident was caused because, having been given a piece of incorrect information, the signalman authorised, in accordance with the Rules, a train to proceed into a section that was, in fact, still occupied by the preceding train which had failed and because, having been so authorised, the driver of the train then drove this train at such a speed that he was unable to stop it short of an obstruction within his sighting distance and in contravention of the Rules. A contributory reason was the failure of the crew of the failed train to protect their train in accordance with the Rules.

48. *Recommendations.* The form of caution to be used by signalmen when authorising train drivers to pass signals at Danger should be amended to reflect more closely the current Signalling Regulations. The Rules should be amended to restore a sense of urgency to the provision of protection for a failed train which should be the same whichever Block Signalling Regulations are applicable to the line but should not be amended to substitute a telephone or radio call for such protection or to impose a set maximum speed for a train after its driver has been authorised to pass a signal at Danger. There is no need, as a result of this accident, to make further alterations or additions to the signalling equipment between Lisburn and Belfast than have already been made.

I have the honour to be,

Sir,

Your obedient Servant,

C. B. Holden
Major

The Permanent Under-Secretary of State
Department of the Environment for
Northern Ireland

EXTRACTS FROM NIR REGULATIONS FOR TRAIN SIGNALLING, RULE BOOK AND OPERATING MANUAL (APPENDIX TO WORKING TIMETABLE) IN FORCE AT THE TIME OF THE ACCIDENT

Regulations for Train Signalling

Regulations for train signalling on double lines by track circuit block system

25. Failure of train describers and/or bells and/or track circuits continued

(d) **Track circuits**

If a track circuit fails to clear after the passage of a train, or otherwise shows occupied, and the Signalman is satisfied (after consultation with the Signalman at the box in advance, or in the rear or with a Handsignalman in accordance with Rule 77, if necessary) that there is no train occupying the portion of line, the following instructions will apply:

(i) The first train requiring to pass over the affected line must be stopped at the signal held at Danger and when an assurance has been obtained from the Driver that the line is clear as far as can be seen, he must be told to pass the signal at Danger, and to ensure that all points in the direction of travel are properly set before passing over them and to proceed cautiously towards the next stop signal, prepared to stop short of any obstruction, automatic level crossing, or level crossing with which telephonic communication has failed. He must also be told to stop at the latter signal, even if it is showing a proceed aspect, and to report the state of the line to the Signalman from the telephone there.

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

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

(b) Each train requiring to pass over the affected track must be stopped, the Driver told to pass the signal at Danger and to ensure that all points in the direction of travel are properly set before passing over them and to proceed cautiously over the affected portion of the line.

(c) Block working in accordance with Regulation 4, Drivers being instructed to pass the signal held at Danger.

(iii) If any part of the affected track circuit is within a tunnel, except as provided for in Regulation 14A, no train must be allowed to enter the tunnel on any line until it has been ascertained that the line through the tunnel is clear and safe for the passage of trains.

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

Rule Book 1973

Rule 55

Passing stop signal at Danger

(f) When a train has been brought to a stand owing to a stop signal being at danger and a telephone is provided the Driver must immediately sound the hooter and if the signal concerned is not lowered for the train to proceed the Driver must, in clear weather, wait not more than two minutes or other prescribed period, communicate with the Signalman and inform him at which signal the train is detained and give description of his train. If it is necessary for the train to remain at the stop signal the Signalman must so advise the Driver and the Driver must communicate with the Signalman at intervals of not more than five minutes, unless otherwise instructed. When there is fog or falling snow the Driver must use the telephone at once. When it is necessary owing to a failure of the signal or other emergency, for the train to pass the signal concerned at danger the Signalman must advise the Driver of the circumstances and instruct him to proceed cautiously.

CAUTION. ***A Driver must not pass a stop signal if at Danger without being authorised by the Signalman to do so, in accordance with the provisions of Rules 37 and 38.***

Passing automatic stop signal or semi-automatic stop signal at danger.

(g) When a train has been brought to a stand owing to an automatic stop signal or semi-automatic stop signal being at Danger, the Driver must immediately communicate with the Signalman by telephone, inform him at which signal his train is detained and give description of his train. If it is necessary for the train to remain at the stop signal the Signalman must so advise the Driver and the Driver must communicate with the

Signalman at intervals of not more than five minutes unless otherwise instructed. If it is necessary owing to a failure of the signal or other emergency, for the train to pass at danger an automatic stop signal or a semi-automatic stop signal, the Driver will be authorised to do so by the Signalman.

In every case when a train proceeds past an automatic stop signal or semi-automatic stop signal at Danger, in accordance with the preceeding paragraph or clause (h) as the case may be, the Driver must give one long blast on the hooter and proceed cautiously as far as the line is clear towards the next stop signal in advance and at such a reduced speed so that allowing for visibility, condition of the rails and the gradients of the line the train can be stopped with care and collision with any obstruction avoided. The Driver must realise that the signal is possible at danger due to the presence of a train ahead, a broken or displaced rail, or an obstruction on the track, and he must therefore exercise the greatest caution. During the hours of darkness and when visibility is reduced due to bad weather conditions the Driver must switch on the headlights before proceeding beyond the signal concerned. In such cases if the next stop signal in advance, whether automatic or not, is not at danger, the Driver must continue to proceed cautiously to the next stop signal beyond.

Rule 178

Protection of obstruction on double lines

(a) When a train is stopped by accident, failure, obstruction, or other exceptional cause the following instructions must be carried out:

(1) Should the Driver observe that a line in the opposite direction is obstructed he must immediately protect the obstruction on that line in accordance with Rule 180.

(2) However, if this is not apparent to the Driver when the train comes to a stand, he must immediately proceed to the Guard along the right hand side of the train in the running direction. The Guard must secure his train by applying brakes, and immediately proceed along the same side of the train towards the Driver. Should they observe that any line or lines used by trains running in the opposite or in the same direction are obstructed they must immediately protect the obstruction on those lines in accordance with Rule 180.

(3) If, however, the Guard has been advised or is aware that the block apparatus has failed, he must, after satisfying himself that the Driver is protecting any line or lines used by trains running in the opposite direction, should they be obstructed, at once go back and protect his train in the rear in accordance with Rule 179.

(4) Should it be ascertained that the line or lines used by trains running in the opposite or in the same directioon are not obstructed, and, provided also that the Guard has not been advised and is not aware of a failure of the block apparatus, the Guard and Driver on arriving together must make arrangements, at once, to obtain assistance. Having so arranged the Guard must proceed immediately to protect the train in the rear in accordance with Rule 179.

Obstruction at home signal or within the protection of home signal

(b) Should a train be stopped by accident, failure, obstruction or other exceptional cause at the home signal or any line be obstructed within the protection of home signals worked from a signal box the Guard or Driver, whoever is nearer the box, must immediately advise the Signalman of the circumstances. The Guard and Driver must, however, first protect the train in accordance with Rules 179 and 180 should any of the following situations arise:

(1) If a train be approaching on the obstructed line or lines the Guard or Driver must immediately go towards such train exhibiting a hand danger signal and put down detonators as far as possible from the obstruction.

(2) If the block apparatus has failed and the train is standing at the home signal, or the whole of the train is not within the protection of that signal, or if the train has arrived within the home signal and the signal remains in the clear position, the Guard must go back at once exhibiting a hand danger signal and put down detonators as far as possible from the obstruction.

(c) If a train is detained for more than five minutes beyond its booked time at a station where the signal box is switched out of circuit, the Signalman at the box in advance and at the box in rear must be advised that the train is so detained.

Protection of train when only line on which train is running is obstructed.

Rule 179

(a) Should a train be stopped by accident, failure, or obstruction or other exceptional cause and not foul or not be dangerously near to any other line the following instructions must be carried out:

(1) The Guard and Driver must secure their train and then walk towards each other as

described in Rule 178(a). Having consulted with the Driver the Guard must decide on the most suitable arrangements to obtain assistance, and then proceed immediately to protect the train in the rear. A white light must be exhibited at the front and a red light at the rear of the disabled train in daylight or during the hours of darkness.

(2) The Guard must go back not less than 1 mile, unless he arrives at a signal box within that distance exhibiting a hand danger signal to stop any train approaching on the obstructed line, and he must place detonators upon one rail of the obstructed line as under:

1 detonator $\frac{1}{4}$ mile from his train
1 detonator $\frac{1}{2}$ mile from his train
1 detonator $\frac{3}{4}$ mile from his train
3 detonators, 20 yards apart, not less than 1 mile from his train.

The Guard must ensure that the Driver of an approaching train has a good and distant view of the hand danger signal. Should the presence of a tunnel, the formation of the line or some other circumstances at the 1-mile point obstruct the view, he must go a greater distance to a point which would give the increased view to the Driver and place an additional 3 detonators, 20 yards apart, on the line and exhibit a hand danger signal at that point. (The 1-mile point or the greater distance is referred to in these Rules as the prescribed distance.)

Should any tunnel intervene before the Guard reaches the prescribed distance he must place 3 detonators, 20 yards apart, on the line before entering it.

Should a train approach on the obstructed line before the detonators have been placed as instructed, the Guard must immediately place 3 detonators on the line, as far as possible from the obstruction and exhibit a hand danger signal.

(3) Having carried out these instructions the Guard must, either remain at the prescribed distance, exhibiting a hand danger signal to stop any train approaching on the obstructed line or go to the signal box in rear continuing to exhibit a hand danger signal. His further action will depend on the arrangements he has made with the Driver to obtain assistance. This action is described at the appropriate stage in these Rules.

However should he be recalled by the Driver sounding the hooter, or by other means, either before or after reaching the prescribed distance, he must leave on the rail at the point from which he is recalled 3 detonators, 20 yards apart, and return to his train, taking up on the way any other detonators he may have put down.

(4) Should the Guard proceed from the prescribed distance, after placing detonators on the obstructed line and arrive at a station, level crossing or other point where telephone communiction exists which would enable earlier intimation to be given to the Signalman in regard to the obstruction and as to whether assistance is required this must be used; the Guard must afterwards proceed to the signal box if necessary or wait to conduct an assisting train or breakdown train to the obstruction.

Rule 179

Mechanical or electrical fault in locomotive or railcar

(e) When a train has come to a stand, due to the locomotive or railcar developing a mechanical or electrical fault necessitating the Driver carrying out fault finding and correction procedures the following instructions must be carried out:

(1) Immediately the train comes to a stand the Guard and Driver must secure their train, and then proceed towards each other as described in Rule 178(a) or make use of the train telephone if available. The Driver must inform the Guard that he intends to carry out fault finding and correction procedures. The Guard and Driver should assume that a failure may ensue and the Guard must decide from which end of the section assistance is to be obtained.

(2) Should the Guard decide to obtain assistance from the signal box in rear he must advise the Driver accordingly. Should he decide to obtain assistance from the signal box in advance he must write out "Wrong Line" order (Form A) and hand it to the Driver, and instruct him to convey the form to the signal box in advance if the fault finding and correction procedures prove unsuccessful.

(3) The Driver must return at once and carry out the fault finding and correction procedures. The Guard must immediately protect his train in rear in accordance with clause (a) of this Rule.

(4) If the Driver is successful in overcoming the fault he must recall the Guard by sounding the

hooter. Should the Guard be recalled either before or after reaching the prescribed distance he must leave on the rail, at the point from which he is recalled, 3 detonators, 20 yards apart, and return to his train taking up on his way any other detonators he may have put down. The Driver must later return the "Wrong Line" order (Form A) to the Guard for cancellation. The cancelled form should be retained by the Guard.

(5) Should the Guard not be recalled on reaching the prescribed distance he must assume that the Driver has been unable to correct the fault and he must act in accordance with the arrangements he has made with the Driver.

Protection and assistance in track circuit block area.

(f) When a train is stopped by accident, failure, obstruction or other exceptional cause in a section in advance of an automatic or semi-automatic stop signal, the provisions of Clause (a) of the Rule must be carried out, except that the Guard need not go back the prescribed distance if he previously reaches an automatic or semi-automatic colour light signal in rear of his train, and that signal is showing Danger. In such circumstances he must place 3 detonators, 20 yards apart, on the obstructed line at the signal and advise the Signalman, by telephone, of the circumstances. If assistance is required from the rear he must, if no other line is obstructed, remain there until the assisting train arrives and then ride on the engine of the assisting train and conduct the Driver to the disabled train.

If, however, this automatic or semi-automatic colour light signal is not showing Danger the Guard must carry out clause (a) of this Rule unless he arrives at a signal applicable to the same line, within this distance, which is showing Danger, when he must place the detonators at such signal. Thereafter, he must proceed to the nearest telephone and advise the Signalman of the circumstances. If assistance is required from the rear the Guard must, if no other line is obstructed station himself at the point where the 3 detonators have been placed on the rail and there await the arrival of the assisting train.

TELEPHONES AT STOP SIGNALS

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

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

(a) **Driver to Signalman:**	**To communicate as follows:**
To intimate that train has been brought to a stand, owing to the signal being at danger.	*..... Train waiting at # ..... Signal on..... Line. * Full description to be given. # Name of Number of Signal and name of Line on which train is standing to be given.
(b) **Signalman to Driver:**	**To communicate as follows:**
If train to be held at signal.	Stop till signal clears. (If after waiting 5 minutes, or other prescribed period, signal does not clear, driver must again communicate with the signalman).
If signal is defective or cannot be cleared and train must not proceed:	Wait at telephone for further instructions. (Driver must communicate with signalman at intervals of not more than 5 minutes, or other prescribed period, unless otherwise instructed).
If signal is defective or cannot be cleared, but train may proceed	**Applicable at Signal controlled from a signal box.** Past* ..... signal at danger and proceed cautiously to..... (name of point to which train can proceed). **Applicable at Automatic Signal or Semi-Automatic Signal working automatically.** Pass * ..... signal at danger and proceed cautiously. (* Name or number of signal to be given).

The driver and signalman must not terminate a conversation until they are sure that a clear understanding has been reached. Should the telephone fail at a stop signal the instructions contained in Rule 55 must be observed.

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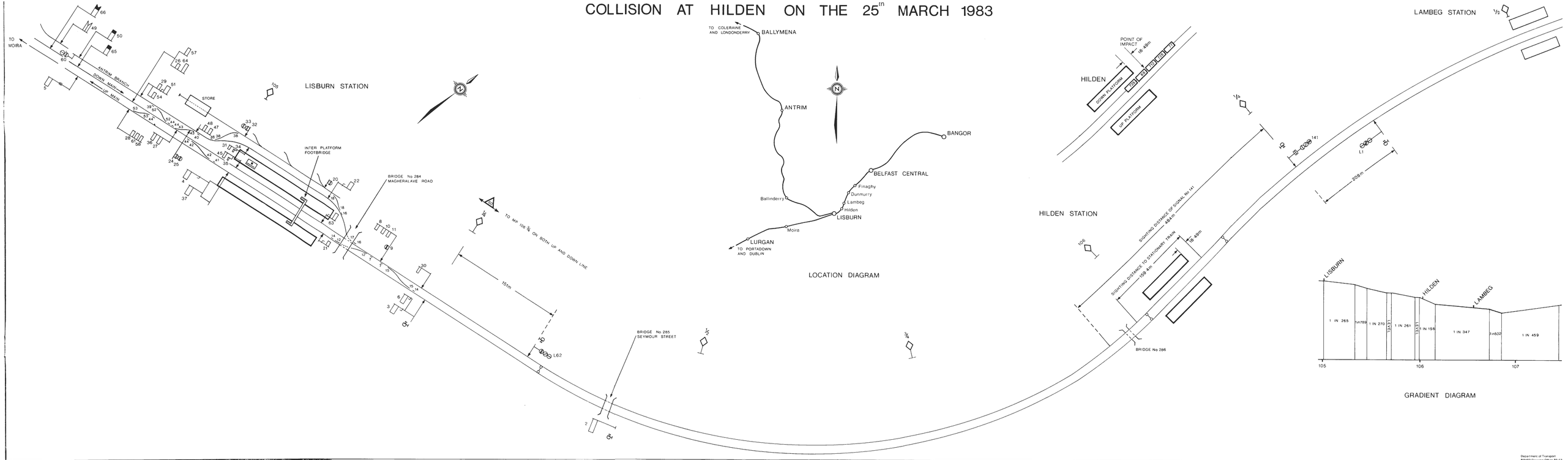
COLLISION AT HILDEN ON THE 25th MARCH 1983



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