DEPARTMENT OF TRANSPORT

RAILWAY ACCIDENT

Report on the Collision that occurred on 1st March 1979 at Naas Public Level Crossing

IN THE WESTERN REGION BRITISH RAILWAYS

LONDON: HER MAJESTY'S STATIONERY OFFICE
View of the level crossing from the north-east (Lydney) approach. Taken from a point approximately 30m on Up side of the railway — Photograph by courtesy of Western Region British Railways.
SIR,

I have the honour to report, for the information of the Secretary of State in accordance with the Direction dated 13th March 1979, the result of my Inquiry into the collision between an express passenger train and a road vehicle which occurred at about 08.20 on 1st March 1979 at Naas Public Level Crossing on the Newport to Gloucester line of the Western Region of British Railways.

The train, which was the 10 coach 07.40 Cardiff to Newcastle passenger train hauled by a diesel locomotive and which was running under clear signals, collided with a refuse lorry which had been driven onto Naas Public Level Crossing despite the display of warning lights. The train which was travelling at about the maximum permitted speed of 60 mile/h in the Up direction demolished the lorry, which had appeared from the Up side, and pushed it some 80 m up the track. The cab of the locomotive was extensively damaged and I regret to report that the two men on the locomotive and the lorry driver were killed. In addition, slight injuries were caused to the guard and four passengers, one of whom was taken to hospital but discharged after 2 hours.

Protection of the accident was afforded by the signalman at Newport Signal Box who also called the emergency services. The latter had all arrived within about 15 minutes. At 10.10 the disabled train was drawn back to Lydney Station and the passengers were detrained and taken forward by bus to Gloucester from where they continued their journey. As a result of the collision both Up and Down lines were blocked until 14.53 when normal working was resumed. In the meantime other services had been diverted and special buses operated. At the time of the accident the weather was bright and sunny.

On 10th May 1979 in accordance with the Appointment dated 4th May 1979 I acted as Assessor to HM Coroner for Gloucester District Mr. R. Jessop at the resumed Inquest on Driver H. L. Hitchins, Relief Driver P. H. Bull and Mr. L. T. W. Small. Verdicts of Accidental Death were returned on Hitchins and Bull and one of Death by Misadventure on Small. I am in complete agreement with these verdicts and I have incorporated evidence given at the Inquest to amplify where necessary that given at my own Inquiry.

DESCRIPTION

The Site

1. Naas Public Level Crossing, which is at National Grid Reference SO 649025, lies approximately 1 mile north-east of Lydney Station and is where Naas Lane, an unclassified road connecting the A48 at Lydney to Naas Court, crosses the main double-track railway from Severn Tunnel Junction to Gloucester. About three-quarters of a mile to the north-west of the crossing the road from Lydney turns into a narrow, winding, farm lane between high hedge-rows. Some 150 metres before the level crossing the lane passes over the disused railway from Lydney to Sharpness by a bridge and then descends steeply to the level crossing. The lane ceases to be a public road 450 metres beyond the crossing. The railway at this point is on a rising gradient of 1 in 264 in the Up direction, which is towards Gloucester, and is on a long right-hand curve which follows a shorter left-hand curve, the transition occurring some 400 metres on the Lydney side of the crossing. From the railway the position of the crossing is discernable well over 800 metres before reaching it but the road approaches on either side are concealed by the lie of the land and the hedge-rows until less than 200 metres before the crossing.

The Level Crossing Equipment

2. The crossing is equipped with user-operated hydraulic lifting-barriers, pedestrian wicket gates and road signs and miniature red and green warning lights (MWL) installed in accordance with the standards issued in January 1970 by the Department of the Environment. The installation of the crossing equipment was authorised by an Order dated 23rd October 1970 made under Section 66 of the British Transport Commission Act 1957 and was taken into use on 25th October 1970. The miniature red and green warning lights, the red one having an optical performance similar to the brake lights on certain motor-cars, are mounted in a road sign giving instructions to users and have hoods which are designed to shield the lights from the sun and to prevent them from causing confusion with railway signals. The centre of the red lens on either side of the railway is 2030 mm above the level of the road and is approximately 3470 mm to the left of the road's centreline. Because the lights are not mandatory traffic signals, a 'Stop' sign to Diagram 601 in the Traffic Signs Regulations is erected approximately 2 metres before each barrier, 'Stop' lines (to Diagram 1002), in line with the 'Stop' sign, and the word 'Stop' (to Diagram 1022) are painted on the carriageway. On the Lydney side of the crossing the centre line of the carriageway is marked with a single line between 2 and 3 metres long. The carriageway is approximately 4650 mm wide over the crossing. Extracts from the relevant Requirements are given in Annexure 'A' at the back of this report and a photograph, showing the view of Naas Crossing in the direction in which the lorry was travelling, is on the facing page.
The Signalling

3. The line from Newport to Gloucester is worked under the Track Circuit Block Regulations and the three-aspect colour-light signalling in the Naas area is controlled from a standard Entrance-Exit panel in Newport Signal Box. The line is equipped with the British Railways standard Automatic Warning System (AWS). Signal N180 on the Down Main line and Signal N171 on the Up Main line lie within the control area of the level crossing. Under the normal arrangements the miniature warning lights for road users remain green until an approaching train strikes a treadle which is positioned so that the light changes to red at least 40 seconds before the train can arrive at the crossing. If one of the railway signals mentioned earlier is showing Red when a train approaching it strikes the appropriate treadle, then the clearance of the signal to Yellow or Green is delayed for 21 seconds in order to maintain the correct minimum warning time of 40 seconds after the road warning lights have changed from green to red. The warning lights remain red until the departing train has operated a further treadle and cleared the holding track circuit. The locations of the signals, treadles and track-circuits are shown on the plan at the back of the report.

The Train

4. The train, IE32, consisted of diesel-electric locomotive No. 46 036; seven TSO, one RB and one FK passenger coaches; and a BG. The total weight of the train was 469.5 tonnes and its length 214 metres. The standard braking distance for this train travelling at 60 mile/h on a rising gradient of 1 in 264 is 521 metres.

The Lorry

5. The lorry, registration number QNH 883M, was a standard Scammell Routeman '8-Wheel' chassis with a specially-designed body capable of carrying 30 cubic yard and 40 cubic yard skips and was owned and operated by Mixconcrete Waste Disposal (South Western) Limited. The chassis weight was approximately 12.5 tonnes and the 30 cubic yard skip it was carrying on the day of the accident had an unladen weight of approximately 2.3 tonnes. The estimated weight of the load of refuse from the London Rubber Company was 10 tonnes and the total weight of the lorry at the time of the accident would have been approximately 25 tonnes. The lorry had last been inspected and serviced on 13th February (a fortnight before the accident) and no serious defects had been reported since then.

The Course of the Accident and Resulting Damage

6. The previous Up train to IE32 had passed Naas Level Crossing at about 08.00 and a Down train at about 08.10. Neither driver was able to say positively if the barriers were lowered but considered that if they had been raised they would have noticed that fact. IE32 had departed from Cardiff on time at 07.40, was on time at Newport and had passed Severn Tunnel Junction at 08.04½ and Lydney at approximately 08.19; running under clear signals towards Gloucester. The lorry left the premises of the London Rubber Company in Harbour Road, Lydney at 08.00 bound for the tip. As the driver appeared to be a stranger he was given directions as to the route he should follow but at about 08.07 the lorry was seen to turn into Naas Lane, which was not the correct route to the tip. A few minutes later it was seen passing the school which is at the point where the road narrows to become a true lane and go on towards the level crossing. At about 08.15 it was heard passing a farm about a half mile to the west of the crossing. A farmer working in the farmyard adjacent to the crossing heard the noise of the collision and straightaway used the telephone at the crossing to inform the signalman at Newport of the accident. This telephone call was recorded as being received at 08.20. None of the railwaymen travelling on duty in the train felt any brake application before the collision and the train, which was not derailed, eventually came to a stand with the leading end of the locomotive 562 metres from the crossing.

7. The skip-body of the lorry was separated from the chassis and came to rest, badly damaged, astride the Down line some 90 metres from the crossing. The overturned chassis, with the engine still running, landed in the ditch on the Down side cess. Pieces of the demolished cab of the lorry were scattered from the crossing up to 14 metres away and at this distance the body of Mr. Small was lying surrounded by debris and detritus from the cab. The leading cab of the locomotive was completely crushed and all the rolling stock had suffered minor damage, mainly to the couplings, none of which had parted. Insignificant damage was caused to the permanent way and signalling equipment.

Evidence

As to the Running of the Trains and the Course of the Accident

8. Signalman B. Jenkins was on duty in Newport Signal Box on the morning of 1st March 1979, having come on duty at 06.00. He had worked the same turn the previous day. At 08.00 he had relieved a colleague on the Severn Tunnel part of the panel and at that time no trains were signalled on the line from Gloucester. Shortly after he took over, the description for the Down Didcot to Cardiff Parcels train stepped forward from Gloucester Signal Box onto his desriber and he cleared the signals through Lydney for it. Signalman Jenkins told me that it was customary to leave the Up line signals at that end of the panel on automatic working. He had received the description for the Up Cardiff to Newcastle passenger train, IE32, from another part of the Newport panel also shortly after taking over. He had set the route for it through the Severn Tunnel Junction area, cancelled the route after it had passed and then went to work other movements in the Severn Tunnel West area. As it had been the only Up train in that area he was aware that it had been making normal progress.
At approximately 08.20 he received a call on his telephone, together with an indication that it was from Naas Level Crossing. The caller had some difficulty with the telephone at the crossing and Signalman Jenkins was unable to identify him clearly or to receive a coherent message. However he understood that the emergency services were needed and he asked the Supervisor to call them. When the telephone rang he noticed that the Down line track circuit at Naas showed occupied and he asked the caller if the Down line was obstructed, but the caller was unable to tell him. Jenkins concluded that the Down line was obstructed and sent the Obstruction Danger signal to Gloucester Signal Box. Some 20 minutes later he said that he was called from the signal post telephone at Signal N180 by somebody who identified himself as the guard of 1E32 and who confirmed that there had been an accident and that he and other railwaymen had carried out protection. Signalman Jenkins said that he had not had a previous telephone call that morning from Naas Level Crossing asking permission for a large vehicle to cross. It would appear, from Guard Dommett’s evidence in paragraph 10, that Signalman Jenkins has combined in one the subject of two telephone calls, one from Signal N180 shortly after the accident had occurred and one some 20 minutes later from Signal N180.

9. The guard of 1E32 was Guard L. W. Dommett, who said that he had booked on duty at 06.00 on that morning. He had prepared the stock for the Cardiff to Newcastle train and, after the train locomotive had arrived at about 06.45, he had performed a vacuum-brake continuity test. This had been satisfactory. He joined Driver Hitchins and Relief Driver Bull in the cab and rode with them to Cardiff Central Station. He had known them both for a number of years. They were both in good spirits and appeared to be in good health. The train had handled normally and no comments on its running had been made. He rejoined his guard’s compartment at Cardiff Central after checking the train which subsequently departed on time at 07.40. When they were near Chepstow, he had begun to check tickets, starting at the front of the train. He had reached the Down line track circuit at N180 which Donoghue saw was showing a Red aspect. He then to the rear of the train where the two machine operators, who had been travelling with him, told him that the Down line was blocked. He saw somebody using the telephone at Signal N180 but then noticed the guard at the doorway of his compartment. As the guard looked very shaken, Mr. Bartlett said that he had attempted to use the telephone at Signal N171 but the telephone seemed not to be working. By this time the guard had caught up with him. Together they walked to Signal N182 where they telephoned the signal box and then returned to the train. Mr. Bartlett said that he had noticed that the barriers were both straight up in the air and that his operators had subsequently lowered them.

10. After the impact Guard Dommett said that he took some minutes to recover and asked a passenger to look out of the window on the offside. He was told that they appeared to have hit something. He saw Driver M. Donoghue, whom he knew, using the telephone at Signal N180. He joined him at the telephone and then spoke to the Newport Signal Box himself. He agreed with the signalman that Donoghue would carry out forward protection whilst he protected the rear of the train. He returned to his compartment and collected the necessary equipment. He was met by a railwayman whom he now knew to be Machine Supervisor L. Bartlett who offered to carry out the protection on his behalf. Dommett agreed, as he was still feeling shaken, but said that he would follow on as soon as he could. He eventually spoke to the signalman again, this time from the signal post telephone at Signal N182, to confirm that protection had been carried out. He then returned to the train and remained there until relieved.

11. Drivers M. Donoghue and G. Passmore were riding as passengers to Gloucester in the second coach from the front of train 1E32. The journey had seemed perfectly normal and Driver Donoghue said that, up to the time of the impact, the locomotive was under power and the train was running at about 60 mile/h. Neither Donoghue nor Passmore were conscious of the locomotive’s horn being sounded during the journey. The train had stopped about six carriage-lengths past Signal N180 which Donoghue saw was showing a Red aspect. He ran to the front of the train, saw the smashed locomotive cab, and ran back to the signal to telephone the signalman. He told the latter that the guard had been hurt, that both the Up and the Down Main lines were blocked and that he would carry out forward protection. The guard then took over the telephone and Donoghue returned to the locomotive where he collected the protection equipment from Passmore who had obtained it from the rear cab. Passmore said that apart from obtaining this equipment he had done nothing other than to turn off the battery isolating switch, the engine itself had already stopped running. Donoghue at once put down a track-circuit operating clip on the Downline opposite the crippled locomotive and then went forward about a mile to place the detonators. He tried to use the telephone at the nearby Signal DM131 but, as it would not work, walked back towards the train and used the telephone at the first Up line signal which he passed to tell the signalman what had been done. He then rejoined the train.

12. Machine Supervisor L. Bartlett was also a passenger on the train, travelling in the fourth coach. He said that the first indication he had had of the accident was a loud bang which he likened to something striking the side of the train. He had got down from the train on the eves side and had gone first to the locomotive and then to the rear of the train where the two machine operators, who had been travelling with him, told him that the Down line was blocked. He saw somebody using the telephone at Signal N180 but then noticed the guard at the doorway of his compartment. As the guard looked very shaken, Mr. Bartlett said that he had volunteered to protect the rear of the train on the guard’s behalf. He had carried out this protection and then had attempted to use the telephone at Signal N171 but the telephone seemed not to be working. By this time the guard had caught up with him. Together they walked to Signal N182 where they telephoned the signal box and then returned to the train. Mr. Bartlett said that he had noticed that the barriers were both straight up in the air and that his operators had subsequently lowered them.
13. Travelling with Machine Supervisor Bartlett were Track Machinemen C. Facey and G. Pearce. They too had not noticed any sound of the locomotive horn or of the brakes being applied before hearing a bang and the train shuddering to a stop. They also got down from the train on the cess side but went immediately to the rear of the train. As they walked towards Naas Level Crossing they noticed the skip body of the lorry lying across the Down Main line and Small's body lying in the six-foot. They also saw the farmer who lived next to the crossing walking about in the vicinity of it. When they reached the crossing the farmer, Mr. Liddington, told them he had already telephoned the signal box but Pearce considered that he ought to telephone as well and did so whilst Facey lowered the barriers. Facey confirmed that the barriers were fully vertical and although he had never operated level crossing equipment of this type before had no difficulty in understanding the instructions and lowering the barriers. Pearce said that whilst he was using the telephone he noticed that the miniature warning light at the crossing was showing red.

14. Police Constable R. A. Collier Gloucestershire Constabulary described the scene of the accident and explained that he had seen pieces of the smashed fibre-glass cab of the lorry scattered along the track. Small's body had been entangled with pieces of debris and some of the contents of the lorry cab. He also said Hitchins and Bull had been facing towards the rear of the train when the cab of the locomotive had been crushed.

As to the Lorry and its Driver

15. Mr. G. C. Whatley, Sales Manager Mixcrete Waste Disposal (South West) Limited described Small's record as a driver for his firm. The latter was first employed on 10th May 1977 as a driver of waste disposal vehicles and he had driven the lorry involved in the accident almost daily for the previous six months. On 1st March 1979 Small had started work at about 06.30 at the Hartcliffe Way Depot, having been given his instructions personally on the previous evening for the first two tasks. He would then have been given instructions for any subsequent tasks by radio. Mr. Whatley thought that Small had previously been to the London Rubber Company's site in Harbour Road Lydney in order to take waste to the designated tipping areas.

16. Mr. E. E. Hooper, Compactor Operator, London Rubber Company had arrived at work in Harbour Road at about 07.30 where Small was in the process of loading a skip full of rubbish onto his lorry. He did not know Small as it was the first time the latter had been to the rubber company's works. Hooper therefore gave Small directions as to how to get to the tip, but he had not appeared to be particularly interested in them. The lorry had left the yard, not in any particular hurry, at 08.00.

17. At about 08.07 Mr. P. A. Simms, a passing motorist, saw the Scammell Routeman lorry, which had attracted his attention because of its size and shape, turn quickly and without hesitation first right into Hams Road and then left into Naas Lane. The route to the tip should have been straight down Hams Road. In her statement Mrs. E. Turner, who lives in Naas Lane, said that her attention had been drawn to a very large lorry carrying rubbish passing her house and going on past the school towards the level crossing. The time had been about 08.15.

18. Mr. R. W. E. Retter General Manager Mixcrete Waste Disposal (South West) Limited confirmed that the Scammell Routeman lorry carrying the skip was owned by his firm and had been regularly serviced and inspected. The last inspection had been on 13th February 1979 which had revealed no defects on the vehicle. Since that inspection Small had reported a slight defect to the rear lights which had been repaired and therefore Mr. Retter considered that the vehicle had been in full working order on the day of the accident. He estimated that the total weight of the vehicle and its contents would have been about 25.5t. He did not believe that Small had used the tip before.

19. Mr. Retter had been present at the reconstruction of the accident which had been conducted by the Police. The lorry used had an identical chassis and cab to the one involved in the accident. He agreed that the miniature warning lights had been difficult to see from the driver's position in the cab because of the hoods but the view depended upon how far from the Stop line the vehicle had been drawn up.

20. Acting Police Sergeant C. J. Knight Gloucestershire Constabulary explained that, during the reconstruction, he was unable to see the miniature warning lights from the driver's seat in the lorry cab. He said that it had taken between 40 and 50 seconds for a driver, whose vehicle had been stopped on the Stop line to leave his cab, raise the level crossing barriers, return to his vehicle and drive across the crossing. He considered that a laden lorry would have taken 5 seconds longer. Although he had not taken the time from when the driver should have taken his final look at the warning lights to when the lorry was clear of the crossing, the time from when it was once in motion to being clear had averaged 11 seconds. He had noticed that, during the tests, the barrier on the eastern side of the crossing had a tendency to droop. Police Sergeant Knight considered that although this would not have hampered most vehicles which used the crossing it would have impeded a high-sided lorry such as the one involved in the accident. At the time of the reconstruction, 08.45 on 17th March 1979, the sun was shining directly into the cab from slightly to its left.
As to the Position of the Barriers at Naas Level Crossing

21. The previous Up train to IE32 was the 07.00 Cardiff to Gloucester which was driven by Driver R. C. Riggs. He said that he had passed over Naas Level Crossing just after 08.00. If the barriers had been up he would have noticed this, but he had not done so. He had not seen any vehicles waiting to cross the line. He personally had never seen the barriers left up although he had heard reports of this happening.

22. The last train over Naas Crossing before IE32 was 4C17, the 05.18 Didcot to Cardiff parcels train, driven by Driver L. E. G. Trevett, who said that he had been running under clear signals and had passed over the crossing at approximately 08.10. He had not made a particular note of the position of the barriers but thought that if they had been up he would have remembered the fact. He said that on average he drove over Naas Crossing once every 10 days and that he had never had to report the level crossing barriers being left up when they should have been down.

23. I questioned all the other locomotive drivers who gave evidence and the two track-machinemen who also drive over the crossing in the course of their duties. None of them could remember ever seeing the barriers raised. However Leading Trackman B. F. Hughes who patrols over the crossing three times a week said that he had had to lower the barriers about six times in eight years. He was however aware that Mr. and Mrs. Liddington, who live next to the crossing, have also had to lower the barriers. He said that he normally passed over the crossing between 07.30 and 08.00 when he was patrolling the track. He thought that the position of the MWL signs had not altered since they were first installed. Until the accident he had not been responsible for checking the warning lights or the telephone, but he now is and has had no occasion to report a fault.

24. Mr. W. C. G. Liddington, who lives in Plummers Farm which is adjacent to the Up side of Naas Level Crossing and is on the Gloucester side of the lane, was working in the farmyard when at about 08.20 he heard a bang which came from the direction of the level crossing. He went to the crossing, saw that there had been a serious accident and telephoned Newport Signal Box from the telephone at the crossing. He then walked up the track towards Gloucester and towards the lorry chassis, which was upside down over the ditch. As he reached it the lorry engine, which had been running, stopped. He returned to the crossing and met two railwaymen. He had not heard the lorry coming down the lane or the train approaching or sounding its horn. He was unable to recollect if the barriers had been up or down before the lorry had arrived; he and his family had often had to lower them because road users had failed to do so. This happened about once every one or two weeks. He said that on that morning there was no difficulty in seeing the miniature warning lights although at certain times of the day in strong sunlight some difficulty could arise.

25. Mr. E. Biddle occupies Naas Court Farm some 800m to the east of the level crossing and is just over the rise of the hill from the crossing. He explained that the part of Naas Lane past his farm was a private road which he closed once a year in order to preserve his rights but during the remainder of the year it was used mainly by traffic from the industrial estate at Harbour Road, Lydney. This traffic was generally small vehicles. He said that he quite often saw the barriers raised between 08.00 and 09.00, but agreed that he was unable to see the crossing itself because of the rise in the hill.

26. Signalman Jenkins said that before the accident not many calls from train crews were received about the barriers being left up but he had taken action on each occasion to have them lowered. He had only had one call from a member of the public from the crossing itself who had complained that the warning lights had remained red whilst there was no train near. Since the accident there had been several calls, all complaining that the barriers had been left up; the calls had come both from train crews and members of the public.

As to the Maintenance and Testing of the Equipment at Naas Level Crossing

27. Signal and Telecommunications Senior Technician R. Davey, based at Severn Tunnel Junction, had been called out to rectify a fault on the barriers at Naas Level Crossing on the evening before the accident. It had been reported that the barriers would not lower completely. He had repaired a fault in the skirt of the Up side barrier and had noticed that the Down side barrier was slightly warped so that it would not fit snugly into its crutch. He had then checked the working of the barriers, using the hydraulic pump to raise and the release valve to lower them. By 18.15 he had been satisfied that they were working correctly but had stayed for a further half hour to check the operation of the miniature warning lights by trains. These, too, were satisfactory and he had not interfered with any electrical circuits.

28. Signal and Telecommunications Supervisor M. G. Howells said that, on the morning of the accident, he had walked along the line from Lydney and had arrived at Naas Level Crossing at about 09.25. He noticed that the barriers were lowered and the miniature warning lights were showing red. He straightened the Down side barrier skirt which was twisted and raised and lowered the barriers to check that they were working correctly. He had noticed that the Exit treadle on the Up line had a bent arm so that it was ineffective. He considered that it had been damaged in the accident. After the train had been drawn clear of the crossing the arm was straightened. Technicians under his control had made the standard disconnections to maintain the protecting signals at Danger. He assisted later in the full functional test of the crossing installation.
29. Mr. Howells also confirmed that the routine maintenance inspections were up to date; the last full one had been made on 29th January 1979 and the last maintenance check on 7th February 1979. He explained that the lamp bulbs in the warning lights were changed on a regular two-monthly cycle and that there were no records of a bulb failure between these changes. As far as he was concerned the crossing had been maintained to the same standard as it was when it was first installed. He had measured the heights of the red lights from the ground and found them to be 6ft 8in in each case. The hoods over the lights were between 5 and 6 inches long.

30. A full functional test of the level crossing was made on the day of the accident by Mr. E. A. Huntington Assistant to Divisional Engineer (Testing and Electronics), Cardiff Division. He described the tests which he had made and confirmed that the insulation and earth tests of the control and power circuits gave satisfactory results. He had had the treadles operated as if a train had passed over them. He had also checked the timing circuits and had confirmed that apart from the restoration of the standard circuit disconnections and the repair to the Exit treadle no work which would have affected the control circuits had been done. The mechanical and hydraulic condition of the barrier operating mechanism was also checked, approximately 14 full strokes of the pump handle being needed to raise the barriers fully. From these tests Mr. Huntington was satisfied that the crossing equipment was working properly and that 1E32 would have operated the miniature warning lights in the correct manner. He also confirmed that the road traffic signs, which include a Stop sign on each side of the crossing, were in good order.

31. Mr. Huntington was also present at the police reconstruction of the accident and had sat in the lorry cab. From the driver's seat he could see about a 60° segment of the green light; the remainder was cut off by the hood. He did not see the red light lit. He only managed to see the green light by craning round to see past the central pillar of the windscreen, but having to do this depended entirely where the vehicle was drawn up in relation to the Stop line. He agreed that the level of the red light, the top one, at 2019 mm, the height agreed after the formal inspection of the crossing on the 29th April 1971, would have been well below the lorry driver's eye level but was somewhat above the eye level for a driver of a private car or pedestrian. The hoods would have affected the lorry driver's view of the lights but not a private car driver's.

As to the Condition of the Locomotive and Rolling Stock

32. Locomotive No. 46 036 had been driven on the day before the accident by Driver R. A. Ireland who said that it was in good working order when he had booked it on shed at Canton Motive Power Depot. He confirmed the brakes and AWS were working normally. Whilst the locomotive was on shed it was examined by Fitter R. G. Hayward who also considered it to be in full working order.

33. After the accident the locomotive and rolling stock, none of which had been derailed, were examined by Mr. G. Hanks Area Maintenance Engineer Newport, Mr. L. Jarvis Acting Assistant Area Maintenance Engineer Gloucester, and Area Rolling Stock Maintenance Supervisor H. G. Cawthorne who all confirmed that the damage and defects which they found were consistent with having been sustained in an accident and had not in any way contributed to it. Mr. Hanks said that from his examination of the controls he was certain that the driver had shut off power and had applied the emergency brake before the impact. Mr. Cawthorne said that, after the brakes had been released, the rolling stock had been fit to run back to Cardiff.

As to the Fitness of the Train and Lorry Drivers

34. Train Crew Supervisor T. M. Jenkins said that he was on duty when Driver Hitchins and Relief Driver Bull booked on duty at about 06.00. He said that he had spoken to them both and both were perfectly normal. They were both fully refreshed. Hitchins having booked off duty the previous day at 12.10 and Bull at 15.25.

35. Mrs. J. D. Small was not awake when her husband had left for work early on 1st March 1979 but he had been very tired the previous evening and had gone to bed early. She was not aware of any worries which her husband might have had. He was in good spirits when he retired and had not complained about trouble with his eyes or of headaches; the latter only occurred after long journeys with an early start. Mrs. Small said that her husband could read but was unable to say if his eyesight had improved or not since he had first consulted his doctor about it. However on a more recent visit an appointment had been made for him to attend Bristol Hospital in April 1979.

36. Dr. D. N. Anderson explained that Small had first consulted him about having double vision in March 1972 and had finally been referred to the Bristol Eye Hospital in September of that year. An operation to correct the double vision when looking to the left was offered but declined. However in December 1978 Small had decided that he would undergo the operation. He had been told during a more recent visit to the surgery when he had seen Dr. Hubert that it was unwise to go on driving until the operation; although in 1972 the consultant had considered his vision defect was more of a nuisance than an impairment to driving. Apart from this, his visual standard in each eye was considered normal but there was no record of his colour vision assessment.
The post-mortem examination on all three men was carried out by Dr. B. Codling. He said that both Hitchins and Bull had died as a result of multiple injuries. Neither man appeared to have suffered from pre-existing disease or from heart trouble. Dr. Codling said that he was unable to tell if Small had been in or out of his lorry cab at the time of the accident. He too had died of multiple injuries and although the heart had been ruptured in the collision it had not shown any signs of pre-existing disease. Small had not had any alcohol in his blood.

As to the Use of Naas Level Crossing

38. A census of vehicles using Naas Level Crossing was taken by Relief Signalman K. J. Wood and J. W. Hurries. The census had been taken over two periods of 24 hours: from 06.00 Tuesday 13th March 1979 to 06.00 Wednesday 14th March and from 06.00 Wednesday 21st March 1979 to 06.00 Thursday 22nd March. On the first occasion 60 vehicles had used the crossing and on the second 65. There were two peak periods of use: the lower between 07.00 and 08.00 and the higher between 16.00 and 17.00. The peaks appeared to be caused by people going to or coming from the trading estate at Lydney Harbour. Both men had operated the crossing before it had been converted to user-worked barriers with MWL and they commented that the level of traffic seemed to be much higher now. They also said that they thought the general level of discipline at the crossing was good but agreed that their presence might have contributed to this. They considered that most of the people who used the crossing lived locally; either the local farmers or those who lived in the housing estate at the top of Naas Lane and who worked in the trading estate. The vehicles were mainly private cars but included light vans and motor cycles. The heaviest vehicle to use the crossing normally would have been the local council's dust cart.

39. Because the lorry driver was surrounded by debris and detritus of the cab and because Mr. Liddington, the farmer, heard the lorry engine stop, I am certain that Small was in the act of driving his lorry over the crossing at the time of the accident and that it had not stalled on the crossing. Tests subsequently conducted on the level crossing equipment showed that the latter was in full working order and that the warning lights would have turned red at least 40 seconds before the train reached the crossing. Because the train was running to time and because it was under power on the curve approaching the level crossing at a speed estimated to have been about 60 mile/h, the maximum permitted speed over this part of the line, the warning time was unlikely to have been much more than the minimum of 40 seconds. The road traffic signs required by the Order for the level crossing were present and in good order.

40. It is a pity that I was not told about or asked to attend the Police reconstruction of the accident. I would then have been able to ensure that relevant timings were taken and recorded. As it is I have had to rely on my own experience with similar road vehicles in breaking down the overall times given by Police Sergeant Knight, which include his estimated time of 11 seconds for the lorry to clear the crossing once in motion. In the following table I have shown the times which I consider may have been taken by the driver during the reconstruction (the test driver) to perform the various tasks. I have then used these to estimate Small's actions.

<table>
<thead>
<tr>
<th>Action</th>
<th>Time in seconds taken by</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Test Driver</td>
</tr>
<tr>
<td>Read instructions</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Fully raise barriers with hand pump</td>
<td>16</td>
</tr>
<tr>
<td>Walk to cab and climb in</td>
<td>15</td>
</tr>
<tr>
<td>Start warm engine and engage gear</td>
<td>5</td>
</tr>
<tr>
<td>Drive onto crossing</td>
<td>11 (to clear)</td>
</tr>
<tr>
<td>Add for laden lorry?</td>
<td>5</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>47 (52 laden)</td>
</tr>
</tbody>
</table>

Note. Police gave times varying from 40 to 50 seconds to correspond with total shown above.
I estimate that the test driver would have taken approximately 31 seconds from the time he left the pump handle to when the lorry was clear of the crossing. If the lorry had been laden the estimate would have been 36 seconds. If the MWL had turned red at the instant the driver had begun his walk back to the vehicle there would still have been a margin of at least 4 seconds between the laden lorry being clear and a train travelling at the fastest permitted speed reaching the crossing. Similarly I estimate the lights would have changed to red during the time Small was pumping up the barriers.

41. Having failed to notice that the warning lights were red, as he used the pump handle, Small must then have failed to make a final check on them before starting off. However had he tried to do so, his view of the lights would have been hampered not only because of their height relative to that of his eye whilst he was in the driving seat but also because their hoods were larger than standard. It is likely that, apart from the lights being down to his left, the one position which was affected by his double vision, Small's view of the lights might also have been obscured by the central pillar of the cab's windscreen. I conclude therefore that Small failed to check that the warning lights were still green and that he drove onto the crossing against the red light.

42. It is not possible to establish conclusively whether or not the barriers were lowered when Small arrived at the crossing. The drivers of the previous trains over the crossing considered that they would have noticed if they had been raised. The last train to pass over the crossing had done so after the morning peak of road vehicle use of the crossing and I have no reason to believe that they were not lowered when the lorry arrived. Only one of the railwaymen who gave evidence at my Inquiry had ever seen the barriers left up. He was the track patrolman who normally walked his length during the peak hour road traffic flow and he had only seen them left up on six occasions in eight years. However there have undoubtedly been other occasions when the barriers have been left up; the neighbouring farmer and his wife not only complaining but also lowering the barriers on their own volition as well as when asked to do so by the signalmen at Newport. Because of the high sides of the lorry I believe that even had the barriers been almost fully raised Small may well have had to pump them up to their full height in order to pass beside them. However I believe that it is more likely that Small would have found the barriers down. In either event I think he must have stopped his lorry in order to use the pump handle in which case he probably would have had to read the instructions on how to use the crossing. These quite plainly tell users to 'Check green light still shows' and then to 'Cross quickly'. If Small did not stop because of the barrier position, he still should have done so in response to the mandatory road traffic 'Stop' sign; this is provided so that road vehicle drivers have a full opportunity to take note of the miniature warning lights and instructions.

43. It was noted that the hoods over the warning lights at Naas were larger than the British Railways standard, which had been approved by the Ministry of Transport. The need for increased shielding of the red light at MWL had arisen because train drivers had complained that at skew crossings a steady red light was visible and this could have have been misread as a railway signal at Danger. Therefore at many, but not all, crossings equipped with MWL additional shielding has been provided, generally taking the form of bigger hoods. At some tests of this equipment arranged for me by the Chief Signal and Telecommunications Engineer of the British Railways Board, it was shown that increasing the size of the hoods had no great effect on the view of the lights from the driving seat of a private car but it had a marked effect on their view from the cab of even a relatively small lorry, let alone a large one such as the Scammell. The greater the offset of the driver's eye the greater this obscuration became. A survey of all MWL crossings revealed that 41 out of the 91 crossings on both public and private roads had non-standard hoods. British Railways Board therefore agreed that a further redesign of the shielding arrangements would be undertaken.

CONCLUSION

44. I conclude that the accident was caused by the refuse lorry being improperly driven onto Naas Level Crossing into the path of the oncoming train; its driver, Mr. L. T. W. Small, having ignored the warning given by the equipment at the crossing which was working correctly at the time. Whatever the position of the barriers was at the time he approached them, Small was required by law to stop. If he was then unable to see whether the warning lights were showing red or green from his seat in the cab he should, in accordance with the sign located below the Stop sign, have used the telephone provided to seek permission to cross. Therefore, for failing to take the action required by him, Small must bear the whole of the blame for the accident. I am therefore in full agreement with the verdicts reached at the Coroner's Inquest; those of Accidental Death on Driver Hitchins and Relief Driver Bull and of Death by Misadventure on Mr. Small.

REMARKS AND RECOMMENDATIONS

45. Doubts have been expressed in several quarters about the efficacy of MWL at vehicle crossings. I share those doubts for such crossings on public roads. Because the gates or lifting barriers are operated by the user they are sometimes left open or up; at some crossings this occurs very much more frequently than at
others. An approaching road user can then be presented with conflicting messages if a train is also approaching the crossing. On one hand the open gate or raised barrier is an invitation to the motorist to cross the railway; on the other, notwithstanding the stop sign, there is a much less obvious red light telling him to stop. When such crossings were first introduced the conditions for suitability were that the road user was to be not more than about 25 vehicles per day (rather more with linked barriers such as at Naas) and had to be essentially local in character. It was considered that these stipulations should have ensured that this type of level crossing protection would have only been installed where it was in the interests of the users to work it properly because their own safety depended upon it. This remains manifestly true at some farm crossings which have had MWL installed because the visibility distance of very fast trains is insufficient. I believe it is no longer true at some or all of those 43 crossings on public roads. The standard of observance of the instructions by the public at large sometimes leaves much to be desired. The Report on Level Crossing Protection by Officers of the Department of Transport and of the British Railways Board (a) agreed with the view held by the Board that MWL should not, in future, be fitted to level crossings on public roads. Both the British Railways Board and the Secretary of State have formally accepted the recommendations of the Report about MWL.

46. The legal distinction between public and private level crossings on such little used roads where MWL are installed is unlikely to be appreciated by the average motorist. Therefore, whilst the use of MWL at private crossings without a significant public user is considered acceptable for a volume of road traffic of up to 100 vehicles per day, it is essential that those road users are well versed in the MWL system. The previous test was that this road traffic should be "essentially local in character" and I recommend that this be strictly interpreted when proposals for future MWL installations on private roads are considered. It should be borne in mind that any development, which leads to an increase in or a change in the character of the road user, can alter the acceptability of the protection system at a level crossing. MWL are particularly sensitive to such changes and I therefore wish to stress once again the need for local planning authorities to observe the provisions of paragraph 15(1)(b) of the Town and Country Planning General Development Order 1977 which requires them to consult with the Secretary of State should a proposed development be likely to create or attract traffic which will result in a material increase in the volume of traffic using a level crossing over a railway: Colonel Reed first drew attention to this need in his Report (b) on the Accident which occurred at Strande Castle OLC on 6th January 1961.

47. Following acceptance of all the major recommendations of the Level Crossing Protection Report, revised Construction and Operation Requirements for Level Crossings were issued by the Department of Transport in January 1980. These included the requirements of a new system of protection called Automatic Open Crossing, Remotely Monitored (AOCR). AOCRs will have the standard steady amber and flashing twin-red road traffic light signals which are installed at other modernised level crossings and these will be activated automatically by an approaching train. In this latter respect they are similar to MWL but the lights are much larger and are duplicated on both sides of the road. The standard time cycle will be such that a train will not reach the crossing until the amber light has shown for 3 seconds followed by the flashing red lights for at least 24 seconds. As neither gates nor barriers will be associated with the traffic lights, the message passed to the approaching motorist will be unambiguous and, unlike MWL, the correct operation of the traffic lights will be monitored at the signal box controlling the stretch of the railway which includes the level crossing. Although the protection afforded by MWL is adequate if it is properly observed and the criteria for suitability continue to be met at any particular crossing, I nevertheless believe that the warning of the approach of a train given by an AOCR is so much better that I have considered whether or not to recommend that all public level crossings protected by MWL be converted to AOCR or to another enhanced form of protection. I understand that the British Railways Board are not willing at the moment to commit funds required for work at level crossings which are more urgently in need of modernisation to the wholesale task of converting those MWL. They have, however, identified six public level crossings which are no longer fully suitable for MWL. I therefore recommend that these six, of which Naas is one, be converted as soon as possible and that it should be the long term aim, when circumstances permit, to convert the remainder of those MWL on public roads.

48. Lastly I recommend that British Railways Board should complete as soon as practicable the programme of conversion to the revised design standard of those MWL crossings which are fitted with non-standard hoods.

I have the honour to be,
Sir,
Your obedient Servant,
C. B. HOLDEN,
Major.

The Permanent Secretary,
Department of Transport.

(a) HMSO 1978 (ISBN 0 11 550482 6).
(b) HMSO 1961 (WL. 2563/V.398. k.3).

9
EXTRACTS FROM REQUIREMENTS OF THE MINISTER OF TRANSPORT FOR LEVEL CROSSINGS EQUIPPED WITH AUTOMATICALLY OPERATED MINIATURE RED/GREEN LIGHTS. JANUARY 1970

I. CONDITIONS

1. Road and Rail Traffic

a. This type of protection is suitable for little used crossings including field to field type (accommodation), private road type (occupation or accommodation) and public crossings. There is no attendant and the gates or full barriers are operated by the road user, but a display sign incorporating the miniature lights is provided to inform the user when he may and when he must not cross.

b. On public crossings the railway shall have not more than two running tracks and preferably the road users' view of trains shall be good. Vehicular use of the crossings shall be very light, say not more than 25 vehicles per day, or somewhat more with linked barriers, and shall be local in character.

II. ROAD TRAFFIC SIGNS AND ROAD MARKINGS AT PUBLIC LEVEL CROSSINGS

4. Signs and road markings shall be as prescribed in the Traffic Signs Regulations and General Directions 1964 (SI 1964 No 1857) as amended by the Traffic Signs (Amendment) Regulations 1966 and 1969 (SI 1966 No 490 and SI 1969 No 1269). The diagram numbers mentioned throughout these Requirements are those given in the aforesaid Regulations except where otherwise stated.

*Note These signs and markings may also be required at occupation or accommodation crossings where the road approaches are public or are used appreciably by the public.

5. a. Directly illuminated or reflectorised warning signs for a level crossing with gates or barriers shall be provided (Diagram 537).

b. Where the vertical curve of the road profile does not exceed 600 metres (2000 ft approx) radius, reflectorised "Uneven Road" signs (Diagram 556), with reflectorised "Uneven crossing. Risk of grounding" plate (Diagram 556.1) beneath, shall be provided on road approaches.

c. A standard 750 mm (30 inches) diameter reflectorised STOP sign (Diagram 601) supplemented by road markings to Diagram 1002 and, unless special exemption is given, to Diagram 1022, shall be provided on each road approach in a position authorised by the Divisional Road Engineer.

8. The Miniature Red Green Lights

a. The optical system shall be fitted with one red coloured and one green coloured lens, preferably of polymethylmethacrylate (Acrylic) or other Ministry approved tough plastic material having good properties of light transmission and colour permanence, such that the colour of light transmitted falls within the limits of the requirements of Table 1 of BS 1376. Class B1 for the red lens and Class B for the green lens.

b. The red and green lights shall each show a steady light when illuminated. The intensity of light measured on the beam axis shall be not less than 22 candela and the light distribution shall be such that the intensity is not reduced to less than 4 candela within a viewing zone extending to an angle of 30' all round the beam axis. These conditions shall be complied with under the normal limits of mains supply.

c. Reflectors may be used to achieve the required intensities.

d. The red and green lenses shall each have a diameter of not less than 63 mm (21/4 inches) and not more than 76 mm (3 inches), and shall be spaced at 120 mm (41/4 inches approx) centres. A tolerance of ± 5 per cent shall be admissible on the latter dimension.

e. Single filament, low voltage lamps shall be used, powered from a transformed mains supply. Arrangements shall be made for regular changing of the lamps at intervals less than their normal life under the conditions in which they are being used.

f. Each light shall be fitted with a hood extending round the upper half of the circumference of the lens and forward from the front face of the lens for a distance to be determined in accordance with the local conditions.

g. Means shall be provided for testing locally that the lights are working.
9. **Mandatory Sign for Miniature Red/Green Lights**

A sign to Diagram 857 shall be provided. The Requirement to “STOP” given by the red light shall be mandatory and the sign shall appear as follows —

![Diagram](image)

10. **Informatory Signs**

a. At all crossings signs to Diagram 858 (gates) or 858.1 (barriers), as appropriate, shall be provided.

![Diagram](image)

b. Where there is a railway telephone, signs to diagram 853 and 859 shall be provided.

![Diagram](image)

11. **Arrangement of Equipment**

a. Mandatory sign (Diagram 857)

i. Shall be on left side of the road (to approaching traffic) adjacent to gate latch post or barrier pivot post, facing oncoming traffic;

ii. shall be at a height such that the red light is about 1800 mm (6ft approx) above the road, subject to site conditions.
b. Informatory signs
   i. Signs to Diagram 858 or 858.1 shall be positioned immediately below the mandatory sign (Diagram 857). (In practice it may be possible for both signs to be displayed on a single board).
   ii. Sign to Diagram 853, where provided, shall be affixed close to sign 858 or 858.1 and shall face towards the crossing.
   iii. Sign to Diagram 859, where provided, shall be affixed to the post below the STOP sign mentioned in Section II above, or to a similarly placed special post where there is no STOP sign.
   iv. Sign to Diagram 860 or 860.1, where provided, shall be mounted on a short post about 15 metres (50 feet approx) beyond the crossing on the left side of the road (to traffic leaving crossing), facing the traffic leaving the crossing.

c. Telephone, where provided, shall be immediately below or adjacent to sign 858 or 858.1.

d. Wicket gate, where provided, shall be to the left of sign 857 and adjacent to it. The main gate or barrier, sign 857 and wicket gate shall be sited in line with each other.

12. Whistle Boards

A Whistle Board shall be provided on each of the railway approaches to the crossing to instruct drivers of trains passing between 0700 and 2330 hours to whistle. The board shall be positioned at a point 7 to 10 seconds travelling time away from the crossing for a train travelling at the maximum speed permitted on the line.
FROM LYONEY AND NEWPORT & L

FROM NEWPORT AND LYONEY IN

NAAS PUBLIC LEVEL CROSSING
Passenger Train in Collision with Road Vehicle 1st March 1979