DEPARTMENT OF TRANSPORT

RAILWAY ACCIDENT

Report on the Collision that occurred on 27th April 1980 at Portsmouth Harbour

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SOUTHERN REGION
BRITISH RAILWAYS

LONDON: HER MAJESTY'S STATIONERY OFFICE

£2·60 net

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RAILWAY INSPECTORATE,
DEPARTMENT OF TRANSPORT,
2 MARSHAM STREET,
LONDON SW1P 3EB.
19*th May* 1982.

SIR,

I have the honour to report for the information of the Secretary of State, in accordance with the Direction dated 29th April 1980, the result of my Inquiry into the collision between two electric passenger trains at 10.06 on Sunday, 27th April, 1980, on the immediate approach to Portsmouth Harbour Station in the Southern Region of British Railways.

On a dry but mainly overcast morning, the 08.20 Waterloo to Portsmouth Harbour electric multiple-unit passenger train, 2P17, consisting of 8 coaches and travelling on the Down Main line, passed a signal at Danger and collided sidelong with the 10.05 Portsmouth Harbour to Waterloo electric multiple-unit passenger train, 2P42, also consisting of 8 coaches, which was departing from No. 3 Platform at Portsmouth Harbour Station. The leading coach of train 2P17 struck the offside of the third and fourth coaches of train 2P42, causing extensive damage to both coaches and all wheels of the leading bogie of 2P17 were derailed; both bogies of the fourth coach and the leading bogie of the fifth coach of 2P42 were also derailed.

The ambulance services were promptly summoned and arrived at 10.23; members of the Hampshire Police also attended the accident. Three passengers were treated at the station by ambulance staff and the driver of train 2P17, who was badly shocked, was taken to hospital but discharged after treatment.

All lines at Portsmouth Harbour Station were blocked as a result of the accident and the traction current was initially short-circuited between there and Fratton. Subsequently the isolation was shortened to enable traffic to run to and from Portsmouth and Southsea Station. A special bus service was provided between the two stations throughout the day, in particular to provide a connecting service for passengers travelling to and from the Isle of Wight.

Portsmouth Harbour Station was re-opened to normal working upon the completion of re-railing operations and repairs to the track at 01.00 on Monday, 28th April.

DESCRIPTION

The Site

1. Portsmouth Harbour Station is the terminus of the London, Waterloo, to Portsmouth Main line, and is located approximately 74 miles from Waterloo. It is approximately ¾ mile from Portsmouth and Southsea, High Level, Station and the line between the two stations consists of two tracks until they diverge on immediately approaching the station into five platform lines and the Down siding. All running lines are electrified on the conductor rail system at 750 volts DC. Figure 1 of the plan at the back of this Report shows the track layout in the Portsmouth Harbour Station area, the point of collision, and the positions of the relevant signals. The maximum permitted speeds on the Down Main line are 15 mile/h through Portsmouth and Southsea High Level Station, then 75 mile/h until the curves from No. 281 points into Portsmouth Harbour Station where the maximum speed again is 15 mile/h.

The Signalling

2. Three aspect colour-light signalling is in operation in the Portsmouth area, controlled from an entrance/exit panel located in the signal box at the London end of Portsmouth and Southsea Station. There is a remote interlocking at Portsmouth Harbour Station controlled directly from the signal box by means of a microcore cable.

3. Following rationalisation of the track layout at the entrance to Portsmouth Harbour Station in 1978, access to No. 2 Platform from the Down Main line, in addition to No. 1, has been via the Up Main line from Signal PW 90, this signal being provided with a theatre type route indicator in place of the previous junction indicator and showing three running movements:

M—Along Down Main line to Signal PW 92.
1—To No. 1 Platform.
2—To No. 2 Platform.

In November 1979 British Railways Standard Signalling Principle No. 33 was implemented and both Signals PW 90 and 92 were altered to give only a single Yellow aspect for movements up to the buffer stops of Nos 1 and 2 Platforms and Nos 3–5 Platforms respectively. Signal PW 92 can no longer display a Green aspect in any situation and the AWS track equipment for this signal was altered to a permanent magnet only. Signal PW 90 displays a Green aspect with an 'M' indicator when the route is set from Signal PW 92 to the buffer stops of Nos 3–5 platforms. A single Yellow aspect at Signal PW 90 is displayed when the route is set to Signal PW 92 only, or to the buffer stops of Nos 1 or 2 platforms. A signalling diagram of the area is at Figure 1 at the back of this Report.

4. Signal PW 90 is first seen by the driver of a Down train when passing Signal WA 450 some 450 yards distant. Signal PW 92 can first be seen when passing Signal PW 90, 349 yards distant, but, owing to the curvature of the line, the aspect displayed by the signal does not come into full view until a driver is approximately 200 yards from it.

5. The signalling controls include approach locking when a route is set with a time release which commences to operate when a signal is replaced to Danger. A period of one minute applies in the case of the platform Starting signals and two minutes in the case of Signals PW 90 and PW 92. All signal lamps are of the double filament type with automatic changeover should one filament fail. A complete failure of the filaments of the Red aspect of Signal PW 92 places or maintains Signal PW 90 at Danger.

Automatic Warning System

6. With effect from 3rd April, 1978, it was made a mandatory requirement throughout British Railways that stock equipped with AWS must not be allowed into service with the AWS equipment isolated, the only exception being on the Southern Region where it only applied to locomotives. Commencing on 1st April, 1979, however, the requirement was applied in four phases to South Western Division multiple-units and from 2nd March, 1980, multiple-units, including trailer units, based in the Division equipped with AWS, were only allowed into service with the isolating cock sealed in the operating position. Drivers finding the cock isolated and unsealed were instructed that they must place the cock in the operating position and to report the matter to their supervisor.

The Trains

7. The 08.20 Waterloo–Portsmouth Harbour passenger train, 2P17, consisted of two 4-car electric multiple-units (EMU), No. 7840 of Class 423 (4 VEP) leading and No. 7356 of Class 421 (4 CIG) trailing. The leading coach of unit No. 7840 was a driving trailer composite, followed by a trailer open second, a motor brake second, and a driving trailer composite; unit No. 7356 consisted of a driving trailer composite leading, followed by a motor brake second, a trailer second saloon, and a driving trailer composite. Both units were of all steel construction, built in 1968 and 1970 respectively. The coaches within each unit were permanently connected with buckeye couplings. Both units were fitted with electro-pneumatic and Westinghouse air brakes, and had British Railways standard AWS. The overall length of the train was 530 ft, its weight was 295 tons and the total brake force was 256 tons or 87% of the tare weight.

8. The 10.05 Portsmouth Harbour–Waterloo passenger train, 2P42, consisted of two 4-car EMU, Nos. 7736 and 7847, both of Class 423 (4 VEP), the general details being similar to those given in paragraph 7 above. The overall length of the train was 530 ft, its weight was 292 tons and the total brake force 258 tons or 88% of the tare weight.

Damage to the Trains

9. The damage to train 2P17 was almost completely confined to the front of the leading coach. The leading bogie was derailed all wheels, the solebars and headstocks being badly bent, buckled and torn. The suspension was badly damaged, as was the brake gear; the tyres of the wheels were also damaged. The underframe was also considerably damaged with the longitudinal members badly bent and torn. Body damage was concentrated on the front right hand corner of the coach and the side panels back to the drivers door. The corner was pushed in and the front panel was buckled from the underframe to the cantrail. The side panels were heavily grazed, pushed in about two inches and torn open at the forward end. Minor damage was done to door handles, handrails and panels along the right hand side of the coach.

10. The damage to train 2P42 was largely confined to the offside of the third and fourth coaches, although the leading bogie of the front coach of the second unit was also derailed all wheels. The damage to the third coach was mainly confined to body work and the interior fittings. The front end, which

consisted of the luggage and guards compartments, was virtually undamaged, but from thence back the side of the coach was increasingly heavily grazed and pushed in, up to 9 inches in places. Side, quarter and door lights were broken, and several doors were displaced towards the interior of the saloon part of the coach. The displacing of the body side in turn damaged the interior of the saloon, four sets of seats on the offside of the coach being displaced and damaged, standing pillar mouldings broken, and light frames damaged. Had the train been heavily loaded, there is no doubt that the number of injured would have been considerably greater.

11. The fourth coach was completely derailed, considerable damage occurring to both bogies. Again appreciable damage was done to the bodywork, the body side being pushed in from 12 to 15 inches for the first 12 ft. Panels were torn, buckled and bent, doors damaged, bottom hinges torn off, door and commode handles torn off or damaged. Luckily the displaced side of the coach was the corridor side which was unoccupied. At floor level the coach side was pushed virtually against the first class compartment partitions, while further along the side of the coach four sets of seats were pushed in with the body side; a number of standing pillar mouldings and light frames were also damaged.

The Course of the Accident

12. Train 2P17 was booked to arrive at Portsmouth Harbour Station at 10.10 and it was intended to run it into No. 3 Platform after the departure of train 2P42. The route from Signal PW 90 to PW 92 was set after the arrival of the former train at Portsmouth and Southsea High Level Station, causing Signal WA 450 to change to a Green aspect and Signal PW 90 to display a single Yellow aspect with an 'M' route indication; Signal PW 92 displayed a Red aspect.

13. When the route was set for train 2P42 from No. 3 Platform to the Up Main line via No. 285 points reversed, Signal PW 7 cleared to a proceed aspect. The train departed at 10.05. As it pulled out of the station and its front passed over No. 285 crossover, train 2P17 passed Signal PW 92 at Danger and was routed by No. 238 points reversed on a conflicting course with it, the sidelong collision initially occurring about 420 ft beyond Signal PW 92.

Evidence

14. *Driver W. F. Wilds* signed on at Fratton at 06.30. After carrying out several jobs in the Fratton–Portsmouth area, he worked the 09.48 empty stock train from Fratton to Portsmouth Harbour, Platform No. 3, to form train 2P42 to Waterloo. At 10.05 he noted that the platform Starting signal, PW 7, was displaying a Green aspect and, at the same time, he received the 'ready to start' bell signal from his guard. Wilds said that he passed the head of train 2P17 soon after he left the end of the platform, but did not realise at that time that it was on a collision course with his train; he estimated that it was travelling at 10–15 mile/h. Almost immediately thereafter there was a very erratic application of the brakes with a rapid loss of main reservoir and brake pipe pressure. Wilds noted that the brake cylinder gauges registered 50 p.s.i., a full brake application, and the train came to a rapid halt. He immediately isolated his controls and went back along the nearside of the train to establish what had occurred. He met Guard Day, who was travelling as a passenger on the train, who informed him that the train had been derailed.

15. Wilds said that he and Day then assisted a number of badly shaken passengers from the train back onto the platform, after which he went back along the platform to contact his motive power supervisor from Platform No. 1 and report what had occurred. On his way back to his train he met the driver of train 2P17 who looked very shaken and was being assisted by a guard. He walked up the offside of his train and it was only then that he fully realised that a collision had occurred. He then returned to Fratton as quickly as possible to report to his supervisor the details of the coaches involved.

16. I questioned Wilds concerning his journey into Portsmouth Harbour with the empty stock train and he said that he received a single Yellow aspect at Signal PW 90 and the correct AWS warning. As he approached Signal PW 92, he again received an AWS warning and the signal was displaying a single Yellow aspect with the theatre type indicator displaying the number 3. He noted nothing unusual with the signalling as he approached Portsmouth Harbour that morning nor indeed, in his opinion, was there any confusion between Signals PW 90 and PW 92, although he had paid particular attention since an incident on the 5th February, 1980, when a driver had passed Signal PW 92 at Danger and only stopped just short of the head of a train in Platform No. 4.

17. *Guard A. D. Phillips* said that he signed on duty at 09.23 and worked the 09.48 empty stock train from Fratton to Portsmouth Harbour with Driver Wilds. Before leaving Platform No. 3 at 10.05, he placed his equipment in the rear guard's compartment in the 7th coach of the eight-coach train. Due to the curvature of the platform, he was unable to see the Starting signal, PW 7, but he could clearly

see the signal repeater which was definitely in the 'Off' position prior to him giving the 'right away' signal to his driver. As the train started to move down the platform, Phillips did not notice if either the banner repeater or Signal PW 7 itself returned to Danger.

18. When the train came to a stand, Phillips saw that it was partially derailed and, as he walked through it, he saw that a collision had occurred. Passengers were attempting to get out of the train and so Phillips requested a member of the station staff to have the conductor rail isolated immediately, while he escorted a passenger through the train into the rear two coaches which were still in the platform. As soon as he was informed that the current had been isolated, he got the remainder of the passengers out of the train using the emergency ladders from the train and, helped by the station staff, escorted them back to the platform.

19. *Guard P. K. Ramuppillai* was in charge of train 2P17. He travelled from Wimbledon to Waterloo with Driver Hole to work the train from Waterloo to Portsmouth Harbour. Prior to the departure of the train from Waterloo he and his driver carried out an air-brake continuity test; he was fully satisfied that the brakes were working correctly. They had an uneventful journey to Portsmouth and Southsea High Level. He agreed that the train left there about 10.02 instead of the booked time of 10.06, the platform inspector giving the 'right away' signal and he in turn 'belling' the driver. He did not observe any of the signals between Portsmouth and Southsea High Level and Portsmouth Harbour.

20. After the collision, Ramuppillai walked through the train to contact his driver. He found him on the track, badly shaken, together with the station supervisor. The latter informed him that the current had been isolated and instructed him to evacuate the passengers using one of the emergency ladders and then escort them to the platform. He carried out protection to his train by putting one detonator on the Down Main line close to the rear of the train and, having spoken to the signalman on the telephone at Signal PW 90, he placed three detonators immediately on the approach to that signal.

21. Ramuppillai told me that he went into the front driver's cab of his train when looking for his driver. He did not notice any noise coming from the cab such as the sound of the AWS horn. Ramuppillai said that he had been entirely satisfied with the manner Driver Hole handled his train from Waterloo to Portsmouth. He stopped correctly at all the stations and only drove as he would expect. He had noticed nothing unusual with Hole while he accompanied him from Wimbledon to Waterloo and walked to the train. Hole appeared to be in good health and did not mention that he had any worries or other distractions which might have been bothering him. Ramuppillai considered that Hole appeared to be in a perfectly normal and happy frame of mind.

22. *Driver M. J. Hole* said that he booked on duty at 07.24 and worked the 07.52 empty stock train from Wimbledon Park to Waterloo where he took over a fresh eight-car train to form the 08.20 to Portsmouth Harbour. In conjunction with the guard he carried out a brake continuity test before leaving Waterloo and the brakes worked satisfactorily throughout the journey. The AWS equipment in the driving cab was also operating correctly and Hole confirmed that the isolating handle was correctly sealed.

23. The journey from Waterloo to Portsmouth and Southsea High Level was entirely uneventful. As the train ran into the High Level Down Platform Hole received a horn indication on the AWS for Signal WA 450 at the harbour end of the platform which was displaying a single Yellow aspect; this changed to a Green aspect before he received his guard's 'ready to start' signal. Hole said that on approaching Signal PW 90 it was displaying a single Yellow aspect and the theatre type route indicator was showing an 'M' which he knew meant that he was routed up to Signal PW 92 on the Down Main line. Hole said that he definitely remembered that he received an AWS horn indication on approaching Signal PW 92 and that he cancelled it, but he was quite unable to say what aspect the signal was displaying or what route indication he got, if any; he assumed it would have been for Platform No. 3, 4 or 5.

24. Hole said that he was coasting at between 10 and 15 mile/h as he passed Signal PW 92. Although he saw train 2P42 leaving Platform No. 3, he did not realise initially that he was on a collision course as he had assumed that he was being routed into Platform No. 4 or 5 on a parallel course. It was not until the front of his train started to veer towards the other train that he realised that a collision was about to take place. Hole said that, despite this, he took no action to attempt to mitigate the effects of the collision. He did not make an emergency application of the brake, nor did he release the Driver's Safety Device because, in his opinion, he was so shocked to find that he was about to strike the other train. He did not look at the speedometer immediately before the collision, but estimated that the train's speed on impact was still between 10 and 15 mile/h.

25. Immediately after the collision Hole got down onto the track but, on hearing the AWS horn sounding in his cab, he returned to the cab and unsuccessfully attempted to silence it by pressing what he thought was the reset button. In order to silence it, therefore, he broke the seal on the isolating cock and isolated the AWS. He assured me that he had not broken the seal or interfered with the isolating

cock in any way during the journey. Hole agreed that the possible cause of his being unable to silence the AWS horn was that in his shocked state he pressed the exhauster speed up button which is located immediately below the AWS reset button and is similar to it.

26. I questioned Hole on the frequency that he worked from Waterloo to Portsmouth Harbour and was told that it was normally one week in 28 weeks and roughly the same frequency to Portsmouth and Southsea High Level. Thus in the two years before the accident he had driven down to the Harbour Station not more than 30 times. He admitted, however, that he had driven down there the day before the accident.

27. I pointed out to Hole that, if his train was travelling at 15 mile/h, it would have taken approximately 25 seconds to cover the 534 ft from Signal PW 92 to the point of the collision. Thus on his own estimate of the speed at which he was travelling he would probably have taken at least 30 seconds. He was still unable to explain why he had not made an emergency brake application.

28. *Supervisor E. Delaney* said he was on duty at Portsmouth Harbour Station on the morning of the accident. He was on the station concourse when he noted that the tail end of the departing 10.05 train had come to a halt at the end of the platform. He immediately made his way up the platform and saw that a collision had occurred. When he reached the scene of the accident he saw Driver Hole standing on the track and looking a bit dazed but he did not talk to him, as his main concern was to prevent the passengers from detraining until the current had been isolated. As he passed the front cab of the Down train he heard the sound of air escaping from the brake pipe but he did not hear the AWS horn.

29. Delaney contacted the signalman at Portsmouth Signal Box by radio for confirmation that the current had been isolated and also requested that an ambulance be summoned; no other emergency services were required as no passengers had been travelling in the coaches most damaged in the collision. After confirmation that the current was isolated, the station staff obtained ladders from the guards' vans, detrained the passengers and conducted them back into the station. One passenger had cuts in her head and leg, and was treated by the ambulance staff but declined to go to hospital. Several other passengers had small cuts in their hands from flying glass but refused treatment as they wished to catch the ferry to the Isle of Wight. The only person to be taken to hospital was Driver Hole who was suffering from shock; Delaney had no conversation with Hole prior to his departure. After dealing with the passengers, Delaney inspected both Signal PW 92 and Signal PW 7 and noted that each signal was displaying a Red aspect.

30. *Signalman A. J. H. Martin* was on duty in Portsmouth Signal Box on the morning of the accident, working the Portsmouth and Southsea and Harbour end of the panel. Work proceeded normally between 06.00 and 10.00 and, on receiving the 'train ready to start' signal from Platform 3 at Portsmouth Harbour at 10.02, he immediately set the route from the platform to Signal WA 449 on the Up Main line. He noted that train 2P17 from Waterloo was running three or four minutes early. The route was set as far as Signal PW 90 on the Down Main before the train reached Portsmouth and Southsea High Level and Martin then set up the route from Signal PW 90 to Signal PW 92 while the train was standing in the station.

31. Martin said that just after 10.05 he received a telephone call from someone at Signal PW 11 at the end of No. 1 Platform at Portsmouth Harbour informing him that there had been a collision. Shortly afterwards a leading railman telephoned from Platforms 2/3 to say that a train had been derailed, but he had no further details. Three or four minutes later Supervisor Delaney contacted him by radio, asking for an ambulance to be summoned and confirming that train 2P17 had collided with train 2P42 as it departed from No. 3 Platform. Martin immediately summoned an ambulance using the G.P.O. telephone and then, to prevent any further movement of traffic between High Level and Harbour Stations, placed reminder appliances on the entry buttons on the panel. Signalman Richardson then informed him that the traction current breakers had tripped and that all power was off between Fratton and Portsmouth Harbour Stations which information was passed on to Supervisor Delaney.

32. Signalman Martin was adamant that he had not cleared the route for train 2P17 to pass beyond Signal PW 92. He was waiting for the departure of train 2P42 to route it into No. 3 Platform and had no alternative, as Platforms 4 and 5 were both occupied by passenger trains; thus there was no question of him setting a route into one of the other platforms and then cancelling it. Even if a platform had been free and he had set the route and subsequently cancelled it, the approach locking on Signal PW 92 would have ensured that the route could not have been reset for two minutes after replacing the signal to Danger.

33. Martin confirmed that when he set the route for train 2P42 from No. 3 Platform to Signal WA 449 the route indication lights were illuminated at once and the indication of the aspect of signal PW 7 on the panel was Green. Signal PW 92 was indicating a Red aspect. After the accident, AD and AE track circuits were still showing white route lights and the entrance button at Signal PW 7 was still illuminated.

The entrance button at Signal PW 92 was not illuminated and the signal was still indicating a Red aspect. Finally, the train description for train 2P17 was still in the berth in Track Circuit ND to the rear of Signal PW 92, indicating that the signal had been passed at Danger.

34. *Signalman A. D. Richardson* was on duty at the Portcreek end of the Portsmouth Signal Box panel on the morning of the accident. He confirmed that everything had been working normally until, at about 10.05, Signalman Martin was informed that there had been a derailment at Portsmouth Harbour, whereupon he informed Assistant Station Manager Green, who was at Fratton, by radio and also contacted the Area Manager, Mr. Sampson.

35. Richardson said he was contacted by the electrical control operator at about 10.10, who stated that the traction current breakers had 'tripped' and that he intended to attempt to replace them. Richardson informed him of the collision and told him to isolate the section between Fratton and Portsmouth Harbour; he confirmed that Signalman Martin later arranged with the control operator to reduce the length of the isolation to enable trains to be run between Fratton and Portsmouth and Southsea Low Level.

36. He was telephoned by Guard Ramuppillai from Signal PW 90 asking for instructions regarding protection. He instructed him to carry out full protection. He also requested Technician Peach to turn the emergency replacement switch on automatic Signal WA 450 to Danger to give added protection on the Down line; this was carried out immediately and the signal maintained at Danger throughout the emergency.

37. Richardson confirmed that he operated the Portsmouth Harbour end of the panel day and day about with Signalman Martin and thus was thoroughly familiar with the whole panel. He was not aware of any complaints concerning PW 92 Signal having been made during the month prior to the accident. He was quite certain that Signalman Martin had in no way interfered with the panel between the time of the collision and when he examined the signal, track circuit and train describer indications. The panel indicated that, on the Down line, track circuit NE was occupied in advance of the overlap of Signal PW 92, also that a number of the white lights were illuminated from Platform No. 3 to Signal WA 449 on the Up Main line, indicating that a route had been set up for a train to proceed on that route. The entrance button at Signal PW 92 was not illuminated and the signal aspect was still indicating Red. Finally, the train description for 2P17 was still in the berth of track circuit ND to the rear of Signal PW 92, indicating that the signal had been passed at Danger. Had the route been set for the train to proceed into Platform No. 3, the train description would have stepped forward into the final berth in the platform line.

38. *Assistant Station Manager J. R. Green* arrived at the site of the accident at about 10.20, already aware from various radio messages that all the necessary arrangements had been made to deal with casualties and also the detraining of passengers. He examined the turnouts in the area of the collision and found that Nos. 285A and B were 'reverse', Nos. 282A and B 'normal', No. 283 'reverse' and No. 284 'reverse', which is what he would have expected for the departure of train 2P42 from Platform No. 3 and train 2P17 being held at Signal PW 92. He next inspected the leading cab of 2P17 and found that the AWS switch was in the isolated position with the seal and wire broken but lying adjacent to the switch. From this he concluded that the isolation had only occurred shortly before or even after the accident took place. The AWS was, much to his surprise, giving an all black indication.

39. Mr. Green then visited Portsmouth Signal Box and examined all the indications on the panel most carefully, taking notes of what he found. This confirmed the evidence given by Signalmen Martin and Richardson (*see paragraphs 30–37 above*).

40. *Senior Signal and Telecommunications Technician T. J. Stephens* had just signed on duty at Portsmouth Signal Box before the accident occurred. After his Technician Officer, Mr. Clark, had telephoned Mr. Deeley, the Area Signal Manager, and informed him of the accident, they both inspected the Portsmouth Harbour end of the panel, noting in detail the indications of the points, signals and track circuits. He then proceeded to Portsmouth Harbour Station where he inspected the actual occupation of track circuits, the positions of the points, and the aspects displayed by the signals. This inspection confirmed the indications found in the panel and described by the signalmen and Mr. Green. He also checked the S & T equipment in the area but could find no damage to any of the components. He then assisted Mr. Deeley throughout the rest of the day in carrying out detailed tests to prove the integrity of the signalling equipment.

41. Stephens was particularly emphatic that the white route lights were illuminated on Track Circuits AD and AE indicating that the route had been set for train 2P42 to depart from Platform 3 to Signal WA 449 on the Up Main line; this was further confirmed by the illuminated entrance button for that route. He also confirmed that the fact that the train description for 2P17 had remained in the berth track circuit for Signal PW 92 clearly indicated that a route had not been set beyond it when the train

had passed it. The replacement of Signal PW 7 to 'Red' was caused by the passage of train 2P17 past the overlap to Signal PW 92 and onto Track Circuit NF and was yet further confirmation that the route had been set for the Up train, 2P42, and that the Down train, 2P17, had passed Signal PW 92 at Danger.

42. Finally, I asked Stephens whether any of the signal and telecommunications staff had been in the relay room in Portsmouth Signal Box immediately before or at the time of the accident. He assured me that all the staff were in the mess room during that period and that the relay room doors were locked, thus preventing any unauthorised access. Similarly the relay room at Portsmouth Harbour Station was fully secured at the time and any work there was carried out by the staff stationed in the signal box and, as already stated, they were in the mess room at the time.

43. *Mr. C. F. Deeley, the Area Signal Manager, Eastleigh*, said that he made his way to Portsmouth Harbour Station immediately he was informed of the accident by Senior Technician Stephens. He confirmed the evidence of previous witnesses regarding the positions of the points, the aspects of the signals, and the occupation of the track circuits. He then described in detail the series of tests that he and his staff carried out; these included:—

(1) The testing of all cables to Signal PW 92 for earth and insulation—no faults found.
(2) The testing for earth faults on the 110v power supply on either bus bar—no faults found.
(3) The testing of the relays controlling the operation of Signal PW 92 for extraneous voltages when no route was set—no faults found.
(4) The testing of the relays controlling the operation of Signal PW 90 for extraneous voltages and, in particular, to prove that the DR relay could not give a false Green aspect as opposed to a single Yellow aspect—no faults found.
(5) The testing of the integrity of the electro-magnets of the AWS at Signal PW 90 and the permanent magnet at Signal PW 92—no faults found.
(6) The testing of the lamps of Signal PW 92—the focussing of both aspects was correct, the voltage within laid down limits, and the aspects clean.
(7) The examination and testing of the theatre type route indicator above Signal PW 92—operating correctly and adequately conspicuous.

44. Mr. Deeley explained that after the site had been cleared of all vehicles he checked the interlocking at the panel in Portsmouth Signal Box. The route was set up for a train from Platform 3 to the Up line at Signal WA 449 and he then attempted to set up all the conflicting routes from the Down line, which proved impossible. He also checked the route locking from Signal PW 92 and found that, on the replacement of the main aspect to 'Red' there was a delay of 2 minutes before the route could be altered. Finally, he checked that the train describers were operating correctly on the Down line.

45. *Chief Motive Power Inspector C. A. Stephens* explained that mandatory arrangements were introduced on 1st December 1979, for the use of AWS on all the Waterloo–Portsmouth Harbour services and that this was extended to the whole of the South Western Division of the Southern Region on 2nd March 1980. During the week ending 26th April 1980 a motive power inspector was checking and monitoring the AWS cab equipment for the whole week at Portsmouth Harbour and on 25th April he had checked Units Nos 7807 and 7840 before they were used to work the 10.05 train to Waterloo. The AWS equipment in all cabs was found to be working correctly and all the isolating handles were sealed. The seals of the two units forming train 2P17 on the day of the accident, Nos 7840 and 7356, had been checked at the Farnham Carriage Sheds prior to its going into service as the 07.07 Farnham to Waterloo train; the driver preparing the train reported that the AWS was operating correctly and that the isolating cocks were all sealed.

46. Chief Inspector Stephens informed me that he saw Driver Hole on the day of the accident after he had been discharged from hospital. He was obviously still suffering from shock and beyond volunteering the fact that he had isolated the AWS equipment in the front cab of his train before leaving the scene of the accident he felt unable to discuss the events leading up to it. Driver Hole visited him the following day, however, and they had discussed the journey down from Waterloo and the events leading up to the accident. He was definite that he received an AWS warning as he approached Signal PW 90, which was displaying a single Yellow aspect, and cancelled it. He also received a warning, which he cancelled, on the approach to Signal PW 92. On being asked what aspect the signal was displaying, however, Driver Hole said "I have no knowledge whatsoever", nor was he able to say whether or not he saw a platform indication on the route indicator above the signal. Once again, he confirmed that he had not isolated the AWS until after the collision when he was unable to stop the warning horn sounding; he had not observed the AWS visual indicator.

47. *Mr. A. Shepherd, the Depot Engineer at Fratton*, said that he examined the cab of the leading coach of Unit No. 7840 of train 2P17 at about 11.30 on the morning of the accident. He found the brake controller in 'running and release', the master power controller locked off and the key removed, the AWS

indicator showing all black and its isolating handle in the isolated position; the EP selector switch by the brake controller was in the electro-pneumatic position. All the circuit breakers were set and working correctly including that for the AWS. All the brake gauges in the cab, the main reservoir pipe, the train pipe and the brake cylinder pressure gauge, were registering zero.

48. Mr. Shepherd confirmed the details of the damage to both trains as summarised in paragraphs 9–10. Subsequently at Fratton Depot Mr. Shepherd carried out a series of tests on the stock of train 2P17. The brakes of the trailing unit, No. 7356, operated entirely correctly. After it had been reformed, the brakes of the leading unit, No. 7840, were tested, with the exception of those of the leading bogie which had to be isolated because of damage: they also proved to be entirely satisfactory. A detailed examination indicated that the brakes of the leading bogie, although quite badly damaged in the accident, had been operating satisfactorily during the train's journey down to Portsmouth Harbour.

49. Mr. Shepherd said that he also carried out tests on the Driver's Safety Device (D.S.D.) and on the AWS in the cab used by Driver Hole. The D.S.D. functioned correctly, operating the train's brakes in an entirely normal manner. They also reconnected the AWS and used magnets under the receiver to simulate the track conditions; the equipment was found to be working normally. Further tests were then carried out to determine why the AWS indicator was giving an all black as opposed to a 'sunflower' indication after the accident. The cause of such alterations to indications has been investigated in connection with various accidents in the past and is dealt with in detail in paragraphs 37 and 38 of Major C. F. Rose's Report on the collision near Albion Sidings, Oldbury, London Midland Region, on 27th May 1970,* and thus will not be quoted in full in this report.

50. *Mr. J. E. Vine, Rolling Stock Engineer, Southern Region,* confirmed that the AWS equipment from the driving trailer of Unit 7840, which had been involved in the collision, had been tested subsequent to the accident by the Signal and Telecommunications laboratory at Crewe. When tested, the equipment functioned correctly and nothing was found to cause either a right or a wrong side failure. On being told that the Southern Region believed that the AWS equipment had operated as a result of the shock of the collision or on being struck at that time, the laboratory agreed that with many receivers a sharp blow will operate the receiver armature to either the north or south contacting positions; previous tests had established that the minimum velocity to operate a similar receiver on impact with a solid object was in the region of 3 mile/h. In this case, operation of the receiver to the south contacting position at the time of the collision would undoubtedly have caused the horn to sound and the indicator to display an all black indication. The laboratory stressed, however, that at no time during their tests were they able to find anything to cause a failure of the cancelling button. Mr. Vine agreed that the laboratory report confirmed the evidence given by Mr. Shepherd and did not contradict that given by Driver Hole.

51. Finally, Mr. Vine confirmed that his staff had worked out the theoretical braking distance if Driver Hole had passed the AWS ramp protecting Signal PW 92 at 15 mile/h and had not cancelled the AWS warning. The train would have come to a stand approximately 220 ft beyond the ramp which would have been no less than 870 ft before the point of impact. In his opinion, this confirmed that Driver Hole did cancel the AWS on approaching Signal PW 92.

Conclusions

52. The immediate cause of this collision was the passing of Signal PW 92 at Danger by the 08.20 Waterloo–Portsmouth Harbour train, 2P17, driven by Driver Hole.

53. The reason why Driver Hole passed the signal at Danger is hard to understand. I am satisfied from the evidence that the signalling and AWS were operating correctly and, from my personal observations, I consider that the sighting distance of Signal PW 92 of 200 yards is adequate, bearing in mind that Signal PW 90 is only 349 yards in rear of the former signal and gives a positive reminder to the driver of the route that is set and the aspect that he must expect to find at Signal PW 92. The fact that a permanent speed restriction of 15 mile/h applies from No. 281 points, some 100 yards beyond Signal PW 90 into Portsmouth Harbour Station and, according to the evidence, was obeyed by Driver Hole—thus giving him some 27 seconds to observe the signal—makes it all the harder to understand why he failed to obey the signal. Again all the evidence supports Driver Hole's assertion that he received an AWS horn warning on the approach to Signal PW 92 and that he cancelled it, thus preventing the automatic application of the brakes. That the AWS did not alert him to observe the signal and its route indicator can, in my opinion, only be explained by the fact that he was distracted from his driving duties at the time, either by something that he saw from the cab, or by his mental condition. I do not consider that the action, known as "automatic cancellation", carried out on occasions by certain drivers, allegedly on receiving a large number of similar consecutive restrictive aspects, can apply in this case. The fact that

*SBN 11 550207 6

Wimbledon Park drivers, such as Driver Hole, work trains to Portsmouth Harbour only one week in each 28 week cycle, together with a small number of occasional journeys is, in my opinion, an added factor why he should have been paying close attention to the signalling and not cancelling the AWS automatically.

54. There is no evidence that Driver Hole was suffering from ill health at the time of the accident or that he was taking any drugs or other medicine that might have affected his alertness. He stated that he had six or seven hours sleep the previous night and that he had taken no alcoholic drinks on the Saturday evening. He did agree, however, that he had some domestic worries. It is a matter for conjecture whether his thoughts were focussed on his domestic affairs as he approached Signal PW 92 or whether, although he was unable to remember it, his attention was distracted by some lineside activity.

Remarks and Recommendations

55. While this is the only accident that has occurred as a result of a train being driven past Signal PW 92 at Danger, this signal was passed at Danger on 5th February 1980 and on 29th August 1981. In the first instance the driver claimed that, shortly before being brought to a stand at the signal it cleared to a single Yellow aspect, but he was unable to recall the route indication. At the time the route had been set for an Up train to proceed from No. 4 Platform to the Up Main line and the subsequent investigations confirmed that Signal PW 5 was displaying a Green aspect. The Down train ran through No. 282 points and came to a stand approximately 10 ft from the front of the Up train. All the tests of the signalling proved conclusively that Signal PW 92 had remained at 'Red' throughout the incident and that in the conditions existing at the time it was completely impossible for the signal to have displayed any other aspect. I am satisfied that this incident was due entirely to an error on the part of the driver. The second incident involved the 15.53 Reading to Portsmouth Harbour DEMU, not fitted with AWS, which passed Signal PW 92 at Danger, ran through No. 282 points which were in the 'reverse' position, the route having been set and Signal PW 5 having been cleared for the 17.53 EMU Portsmouth Harbour to Waterloo passenger train to depart from No. 4 Platform. The Down train came to a stand about 30 yards from the head of the train in No. 4 Platform, the latter train having not moved on account of Signal PW 5 having reverted to Danger when the Down train occupied track circuit NE. Subsequent investigations revealed that the driver failed to observe Signal PW 92 and he reported that he did not realise anything was amiss until his train took the route towards No. 4 Platform and he saw that it was occupied.

56. Signal PW 92 was checked by Lieut. Colonel A. G. Townsend-Rose during his inspection of the new track and signalling layout at Portsmouth in January 1981 and, although the brilliance and the conspicuity of the signal was considered to be adequate for the slow movements involved, it was agreed that "spreadlight" lenses should be fitted to both aspects to increase the signal's conspicuity and also that the permanent AWS magnet should be moved to a point 75 yards from the signal. These alterations were carried out in April/May 1981 and undoubtedly have increased the effectiveness of the signal. From my own observations of the signal prior to the alterations, however, I had no doubt that it was adequately brilliant and conspicuous and, as stated in paragraph 53, the sighting distance of 200 yards is, in my opinion, perfectly satisfactory in view of the speed restriction of 15 mile/h on the approach to the signal. I consider that the accident and both incidents were entirely due to the drivers failing to pay sufficient attention to the signalling on their approach to Portsmouth Harbour.

57. In order to reduce the possibility of a collision, however, in the event of Signal PW 92 being passed at Danger, certain alterations have been made to the signalling at Portsmouth Harbour. In particular, the Starting Signals PW 5 and PW 7 at the London ends of Nos. 4 and 3 Platforms now have their aspects restored to Danger by the occupation of track circuits NE and NF respectively. The controls have also been altered so that No. 3 Platform Starting Signal, PW 7, requires No. 283 points to be in the "normal" position before it will clear, thus giving additional overrun protection. I am satisfied that these arrangements will improve safety in the event of further incidents of this nature.

I have the honour to be,

Sir,

Your obedient Servant,

P. M. Olver

Major

The Permanent Secretary,
Department of Transport.

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COLLISION AT PORTSMOUTH HARBOUR, SOUTHERN REGION, ON 27th APRIL 1980

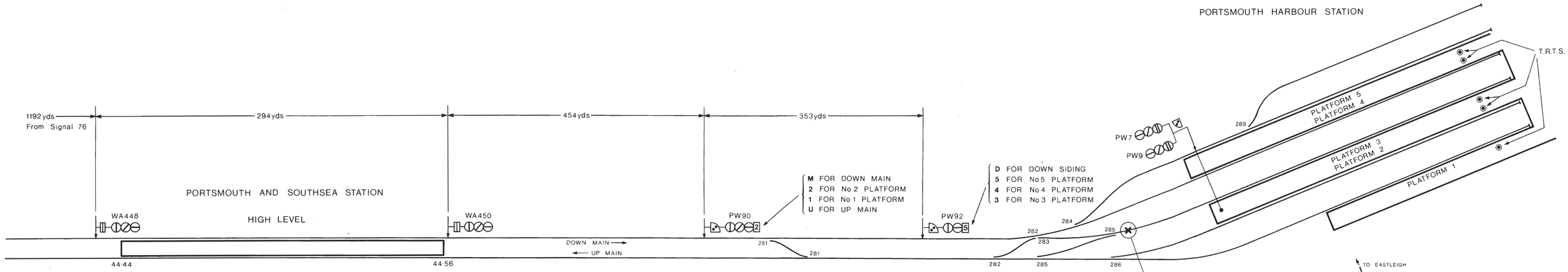

Fig. 1 GENERAL SITE PLAN SHOWING SIGNALLING, TRACK LAYOUT AND SITE OF COLLISION

NOT TO SCALE

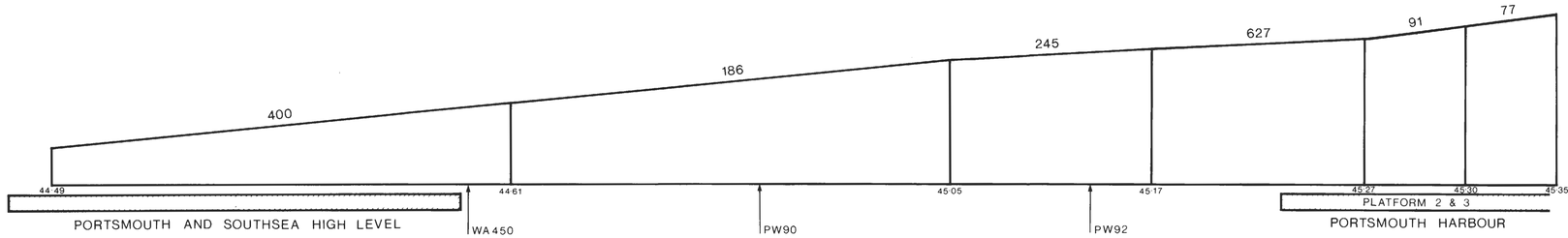

Fig. 2 GRADIENT DIAGRAM

DISTANCES IN MILES & CHAINS

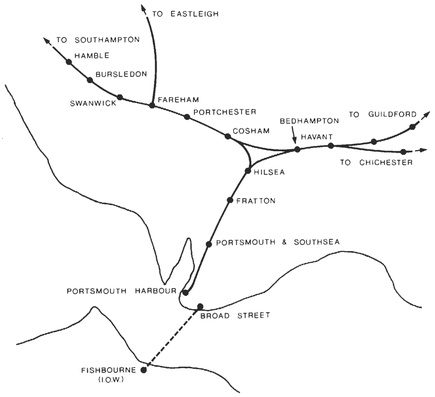

Fig. 3 LOCATION DIAGRAM