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Railway Accidents :  
Report by the Government  
Inspectors of Railways of  
Inquiries into certain Accidents.  
31st March 1941  
No. 29



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# Railway Accidents

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Reports by the Government  
Inspectors of Railways of  
Inquiries into certain Accidents

which occurred during the

Half-year ending the 31st March 1941.

No. 29.

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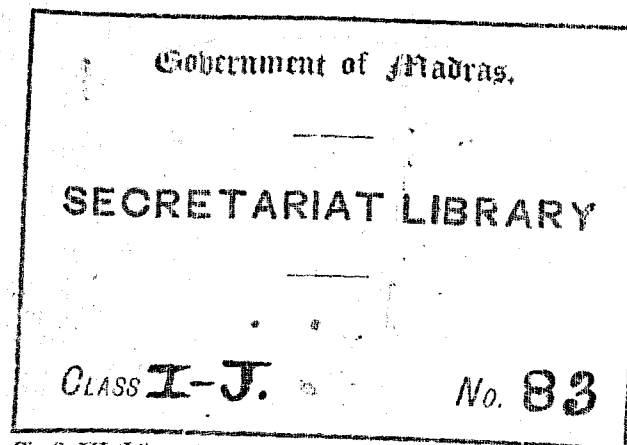
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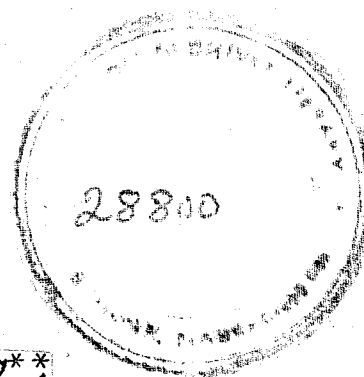
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**1. BOMBAY, BARODA AND CENTRAL INDIA RAILWAY.**

**Collision between No. 22/30 Up Goods and No. 3 Down Frontier Mail  
outside the down outer signal of Jekot station on the 15th May 1940.**

FROM MR. J. C. O'NEILL, SENIOR GOVERNMENT INSPECTOR OF RAILWAYS  
CIRCLE No. 5, BOMBAY, LETTER No. 908, DATED THE 17TH JULY 1940.  
(1352-T.T.)

**1. Description of the Accident.**—Jekot Station is situated 6 miles west of Dohad on the Baroda Ratlam single main line section of the B. B. & C. I. Railway and is 331 miles from Bombay. The adjoining stations are Usra in the Bombay direction and Rentia in the Dohad direction.

The station consists of a main through line on the straight with two loops which are isolated by sanded dead ends and a goods loop. It is provided with Home and Outer Signals which are interlocked with the points through the Station Master's Slide Control System working in conjunction with a ground frame at either end of the Yard.

2. Working on the section is by the Absolute Block System operated by Tyres Tablet Block Instruments and these are so fitted that only one tablet may be extracted at a time between Jekot and Usra or Jekot and Rentia. The operation of these instructions is recorded in Train Signal Registers at each station and a private number is given for each tablet issued.

Train Control System is operating on the section and by this a Train Controller arranges the running and crossing of trains. He may instruct that trains are to be received on certain lines or shunted but the safe working of trains in accordance with the rules remains in the Station Masters Control.

3. The terms Up and Down will be used and it may be stated that Up trains are trains running in the direction of Bombay and the points and signals used for their reception are classed 'Up'. Down trains run from Bombay and points and signals for their reception are classed 'Down'.

4. On the 15th May 1940, No. 22/30 Up Goods left Dohad at 4-30 hours (according to Control Chart) and ran through Rentia Station. After passing Rentia it was decided to cross the train with No. 3 Down Frontier Mail at Jekot.

5. Jekot Station had obtained the tablet for the train to run through to Usra, sent this out to the points to be picked up by the Driver and lowered all signals. On receiving instructions to arrange the cross at Jekot he replaced the warner signal and got the tablet back from the points. The train was received on the main line at 5-20 hours.

6. The Station Master issued a 'Memo' to the Driver of the train to back his train onto the loop for crossing No. 3 Down, and that his pointsman would pilot the Driver and that all points were correctly set. (The duplicate of this memo. was seized by the District Signal Engineer immediately after the accident and handed over to me and the original is in the possession of the 1st Class Magistrate, having been made over to him by the Driver of No. 22/30 Up Goods).

7. The Driver receiving his memo. and directed by the pointsman drew his train forward to back it onto the first loop. When signalled to back the train he was not able to move it back. Several attempts were made in the course of which the train moved forward and in its position at the time of the collision was approximately 580 feet outside the Down Outer Signal.

8. About the same time as he sent out the memo. for shunting the Station Master, Jekot, cancelled the tablet for N. 22/30 Up Goods to proceed to Usra and immediately after gave line clear and released a tablet for No. 3 Down Frontier Mail to leave Usra and approach his station. In succession to this he proceeded to obtain line clear and a tablet for No. 3 Down Frontier Mail to proceed from Jekot to Rentia.

9. No. 3 Down Frontier Mail had an unbooked stop at Limkhera but passed through Usra right time and received his correct tablet for proceeding to Jekot. The tablet was made over to the 1st Class Magistrate, Dohad, by the Driver of No. 3 Down Frontier Mail on the day of the accident and is in his possession.

When approaching round a curve to view Jekot Down Outer Signal the Driver sighted the goods train but failed in his efforts to stop his train and collided with No. 22/30 Up Goods at about 5-40 hours.

10. With the impact the 'G' class engine and leading wagon of the goods train were thrown down the bank and four or five wagons behind these damaged. The 'XC' engine of No. 3 Down Frontier Mail buried itself into the ballast. The vehicle next to the engine N. W. Railway Inter-class and Luggage Van had the front buffers bent upwards and the underframe somewhat damaged but the body of the coach was intact. The second vehicle 1st and 2nd Class Composite was telescoped by the following B. B. and C. I. Railway Air Conditioned Coach, the underframe of which went into the second coach at an upward angle to a distance of 45 feet. The fourth coach Inter class and Luggage Van was damaged at the front end only. The vehicle in rear of this were undamaged.

11. The accident resulted in 16 persons being killed, 9 persons being grievously injured and 9 persons being slightly injured. Four of the grievously injured died subsequently in hospital rising the total of killed to 20 persons of whom four still remain as unidentified.

12. Mr. Duncan, District Signal Engineer, who was in a saloon on the Goods train, went forward to see what had happened. While viewing the accident passengers had commenced to pour out of the train and there were demands for medical assistance.

Dr. Chico, a railway medical officer who was a passenger in the train, reported to Mr. Duncan and was immediately put on to give such assistance as was available. Captain O'Neal, I.M.S., also a passenger, was asked to assist and relief commenced with the Guard's First Aid Equipment. This is not sufficient to deal with an accident of this type but it was utilized to carry on pending the arrival of further assistance.

13. Efforts had been made to ascertain the position in the telescoped coaches but everything inside was so jammed and dark that serious results could be assumed. Realizing that additional assistance was required Mr. Duncan ran to Jekot Station, gave a brief account of the accident to the Train Controller and asked for urgent medical assistance from Dohad. There is a Railway Hospital and Workshop at Dohad and this was the quickest and most effective aid that could be obtained.

Completing this Mr. Duncan returned to assist in rescue work. This had been commenced when Mr. Duncan returned at about 6-25 hours and the train Guard and Conductor with a number of passengers were breaking in through the roofs and sides of the telescoped coaches. The telescoping had pushed partitions forward, crushing and dislodging fittings, and shutting in and pinning down passengers. This accounts for the high total of killed and grievously injured. The careful extrication of the killed and injured from the debris was a difficult and lengthy proceeding. Work was organized from both ends where damage was least. Medical assistance was given as soon as it was possible to get to injured passengers even though they could not be extricated immediately.

14. The train was fitted with the normal equipment of hammer, saw, crowbar, axe and jemmy. These may be sufficient for normal cases but assistance which came later improved matters. Whether this was due merely to expert technical skill and knowledge or to additional equipment is not easy to estimate but I have no doubt that a certain amount of each was contributory. A re-examination of the equipment is necessary and large size augers, and a couple of small jacks of the motor car type with a step for getting into small gaps would prove valuable additional equipment.

15. The accident had been reported to Control at 5-55 hours and the further message from Mr. Duncan was received at 6-10 hours. Assistance was rapidly organized and despatched. The Medical Officer, Dohad, was informed at about 6-20 hours. He immediately arranged for the Assistant Surgeon to collect stretchers, blankets, sheets, bandages, splints, morphia, brandy, etc.

With these the Medical Officer, Dohad, accompanied by his Assistant Surgeon, Sub-Assistant Surgeon and five Ward Orderlies left Dohad in a Special Train at 7-15 hours and arrived at the site of accident at 7-45 hours.

This train also took out the District Locomotive Superintendent, Engineering and Police Officials and the Magistrate, Dohad. A staff nurse had also been instructed to follow and she together with a Ward Orderly went forward in a second Relief Train which left Dohad at 8-49 hours with Loco Staff and equipment.

16. Other assistance was also on the way. The three nearest breakdown trains available were at Ratlam, Godhra and Baroda. On receipt of information these trains were immediately mobilized and left their respective stations at 7-40, 7-15 and 8-55 hours. There was no delay and the trains from Ratlam and Godhra arrived at the scene of the accident at 10-55 and 9-00 hours. The train from Baroda arrived at Usra at 13-38 hours and was kept in reserve there as it was not required. The District Traffic Superintendent and Executive Engineer arrived with the Baroda train at 10-50 hours. A Special Train left Bombay at 11-30 hours with the Chief Mechanical Engineer, Chief Engineer, Traffic Superintendent and the Deputy Chief Engineer, Signals. The Agent and General Manager left by the night Mail for the site of accident.

On arrival at the scene at about 7-45 hours the Medical Officer, Dohad organized the medical arrangements for treating the injured in consultation with Captain O'Neal and was assisted by Dr. Chico. Very valuable medical aid was also given by Dr. Tiroadkar of Bombay and Dr. Barot and Dr. Kadadia of Dohad City.

17. Further assistance arrived with the Breakdown Train from Godhra about 9-00 hours. The Sub-Assistant Surgeon accompanied by a Ward Orderly arrived by this train. He had with him his Dispensary line box, extra dressings and private emergency bag. The Medical equipment on the train was also brought into use. This together with the medical supplies brought from Dohad and the Guard's First Aid equipment was more than adequate for all requirements.

18. The extrication of the injured from the wreckage continued. They were immediately given first aid and transferred to Luggage Vans brought out on the second Relief Train from Dohad. Somewhat before 11-00 hours the Medical Officer, Dohad, with the Staff Nurse and a Sub-Assistant Surgeon were ready at Jekot on a made-up train to return to Dohad with 15 injured.

About this time the Breakdown Train from Ratlam arrived at Jekot with an Assistant Surgeon, Sub-Assistant Surgeon, Ward Orderly and an Ambulance Van. This staff and Van were left with the Assistant Surgeon from Dohad to deal with two cases who were not ready to be moved and any further cases of injured extricated from the wreckage. Only one such further case was brought out alive but expired immediately.

19. The injured were met at Dohad Station by two lorries and an Ambulance Car and arrived at the Dohad Hospital by 11-45 hours. The two further cases were brought in by the Assistant Surgeons later. The whole of the Medical and Nursing Staff of the Hospital were busy with the cases till midnight. Three of the injured died in the course of the afternoon. Later sixteen bodies were brought to the Hospital by the Police for identification purposes.

20. The relief work and medical attention were good and utilized all facilities available locally. Only the relief train from Godhra arrived before the local arrangements had dealt with the situation. Public assistance was also provided from Dohad town and food and water were arranged early.

The Magistrate and Police from Dohad arrived by the first train from Dohad and in addition to assisting dealt with the identification and removal of the dead as well as taking into safe custody all surplus baggage and valuables. This was completed by 17-00 hours and the work of restoring communication taken in hand.

21. The preliminary work for restoring communication was simple. Damaged goods vehicles were thrown off the track which was repaired to enable the crane to get up to the engine. The telescoped and damaged vehicles of the Mail Train were worked back to Usra carefully on their own wheels. The tender of the 'XC' engine was next rerailed and removed. This gave some trouble as it was jammed on to the cab. This portion of the work was completed by midnight of the 15th and work was then commenced on the 'XC' engine which was embedded in ballast with badly-damaged track underneath and was the most serious obstacle to remove.

22. Had things gone according to plan it was anticipated that the work of rerailling and restoring communication would have been completed by 8 or 9 hours on 16th May 1940. When, however, pulling the engine forward so as to enable track to be laid under the rear wheels the buffer beam came away and although efforts were made to pull the engine by the axles these resulted in wheels coming off the track.

This failure caused considerable delay as the 65-ton crane could not be used and resort had to be made to jacks. Further when the engine was re-railed the track in rear had to be slewed for a considerable distance and the engine moved backwards to enable repairs to the track being carried out and get the engine to Jekot Station. This was finally completed by 20-30 hours. The work of lifting and moving the engine was done under the personal supervision of the Chief Engineer. Work was carried on continuously and could not have been expedited.

23. The arrangements for transshipping and forwarding passengers were most unsatisfactory and a special officer had been deputed immediately after my enquiry to investigate this. Details of delays are as follows:—

|                                   | Arrived.                                      | Left.                              | Total detention. |
|-----------------------------------|-----------------------------------------------|------------------------------------|------------------|
| 3 Down of 14/5 ex Bombay Central. | 5.40 on 15/5                                  | 1.30 on 16/5 after transshipment.  | 19 hrs. 45 mts.  |
| 4 Up of 15/5 ex Delhi             | 12.50 on 16/5 having been detained at Ratlam. | 16.52 on 16/5 after transshipment. | 17 „ 8 „         |
| 3 Down of 15/5 ex Bombay Central. | 13.50 on 16/5 having been detained at Godhra. | 16.55 on 16/5 after transshipment. | 11 „ 10 „        |

|                                    | Arrived.                                                          | Left. | Total detention. |
|------------------------------------|-------------------------------------------------------------------|-------|------------------|
| 19 Down of 14/5 ex Bombay Central. | Passed through at 22/37 on 16/5 having been detained at Limkhera. |       | 36 hrs. —        |
| 20 Up of 14/5 ex Delhi             | Was cancelled at Dohad.                                           |       | — —              |
| 19 Down of 15/5 ex Bombay Central. | Passed through at 3/30 on 17/5 having been detained on the road.  |       | 17 hrs. —        |
| 20 Up of 15/5 ex Delhi             | Passed through at 23/36 on 16/5 having been detained on the road. |       | 6 „ —            |

Local trains were cancelled.

24. After the accident at about 9-15 hours the District Locomotive and Carriage Superintendent enquired from the Mail Van Staff whether they wanted to be transhipped to Jekot or preferred being taken back into Usra to await arrangements for transshipment. The passengers were also informed of the two alternatives and advised that coolies would be made available. Those returning to Usra would have to depend on the Dining Car for food and drinking arrangements. Those going forward to Jekot would have found no arrangements but could get forward to Dohad which has a tea room and the usual station vendors as well as quite a good sized town for supplies of any kind.

Stock has been arranged for the transshipment of passengers of the Mail and 63 Up with this stock left Dohad at 14-20 hours and arrived at Jekot at 17-46 hours having been detained at Rentia.

25. The District Locomotive and Carriage Superintendent had given a forecast of being able to clear the line by 18-00 hours and if this had been fulfilled the necessity for transshipment would not have arisen. The Executive Engineer who was the senior officer present objected to transshipment on the grounds:—

- that the telescoped coaches had not been cleared of killed persons. This was not completed till 16-00 hours,
- the dead had not been removed,
- that the removal of telescoped coaches would be difficult if not impossible after dark and this was necessary in the interests of getting the cranes to work to clear the other wreckage.

26. When it became obvious that the line would not be cleared by 18-00 hours transshipment was arranged for 20-00 hours but was delayed till 22-00 hours owing to the removal of telescoped coaches to Usra. This transshipment was completed by 1-00 hour on the 16th May.

The next transshipment contemplated was of Nos. 19 Down and 20 Up. The Chief Engineer had arrived at site about this time and as it was anticipated that the line would be clear by about 8-00 hours and the surrounding country was not very suitable for transshipment suggested that these trains were held up.

27. The failure mentioned in para. 22 however caused further delay and this transshipment was never carried through. Instead of this Nos. 3 Down and 4 Up of the following day had arrived and the transshipment of these two trains was arranged and carried through by 17-00 hours on the 16th May.

The question of transshipping 19 Down and 20 Up was then considered but as this would take 3 hours and would have meant a corresponding delay in the rerailling operations it was decided to wait for the restoration of through communication. This transshipment would not really have been justified.

28. The delays to the transshipment and conveyance of passengers are reputed to be due to the undue optimism displayed by those responsible for restoring through communication. This might be so if the only passage were along the railway formation. I could see no reason why a rough track could not have been cleared, roughly levelled and passed round the scene of the accident from one cutting to the other. This would not have interfered with the rerailing arrangements and if carried out early on would have enabled transshipment and rerailing operations to proceed as and when required with very little obstruction.

It would appear that dependence was placed on the senior officer present in accordance with para. 16, Part I of the Administration Accident Rules. This is true as regards para. (a) which deals with clearing the line but para. (b) of the same rules puts the senior member of each Department in absolute executive control of the work done by his staff and I have no doubt that if the District Traffic Superintendent had made the necessary efforts he would have been able to deal with all emergencies. Even on 16th morning the Traffic Superintendent from Bombay could have dealt with the situation better if the arrangements for transshipment had been carried through early.

29. The telegraphic information giving particulars of the accident were equally unsatisfactory. The first telegram from the Divisional Signal Engineer reported the collision outside signals and extensive damage to coaching stock of the Frontier Mail. This was followed by a similar telegram from the Station Master, Jekot, with the addition of extensive damage to passengers and coaching stock. Though particulars were given to the Controller and must have been available further details were not telegraphed till 13-00 hours by the District Traffic Superintendent. The issue of information devolves on the District Traffic Superintendent and it is incomprehensible that he should be moving aid towards an accident without being able to give any information about it. Information about casualties was indefinite and a final list of killed and injured was not issued till 8-30 hours on the 16th May though all had been cleared by 17-00 hours on the 15th. Both in this and in transshipment the action taken by the District Traffic Superintendent does not reflect any credit on him.

30. Approximate damage to Rolling Stock and Permanent Way amounted to Rs. 2,14,400.

31. **Description of the site of the Accident.**—Jekot is a 'B' class way-side station situated at mile 331 on the Baroda-Ratlam Section of the B. B. and C. I. Railway Main Line. It is provided with Home and Outer Signals. Points and signals are interlocked with the Station Master's Slide Control System working in conjunction with a ground frame at either end of the yard. The adjoining stations are Usra in the Bombay direction and Rentia in the Ratlam direction.

In the station yard the line is on a level grade between the facing points. At the Usra end the line commences to fall on a grade of 1 in 182 about 61 feet beyond the Down Home Signal. This gradient continues upto about mile 330 and beyond this the line continues to fall at varying grades of 1 in 133 to 1 in 200 upto Usra Station.

Near the Down Outer Signal there is a shallow cutting after which the line passes over a bank of 28 feet maximum height and goes round a left hand curve of 2 degrees into a cutting of maximum height 64 feet.

32. **Evidence.**—Evidence commences with the departure of No. 22/30 Up Goods from Dohad and the arrangement for a crossing with No. 3 Down Frontier Mail at Usra and the later alteration of this to Jekot. In this the evidence of the Assistant Controller is unsatisfactory in that I believe a cross was arranged as stated by the Station Master, Usra. This resulted in a shunting move at Jekot and the accident was the outcome of the shunt. However the safe working of trains in accordance with rules is entirely under the control of the Station Master and changes in the

controller's instructions should not have resulted in any unsafe working. Late instructions may give rise to certain difficulties and the evidence on this point will be examined.

33. The Station Master, Jekot, states that he received the instructions to arrange the cross between No. 22/30 Up Goods and No. 3 Down Frontier Mail at about 5-15 or 5-16 hours after certain discussions with the Station Master, Usra, and the Assistant Controller. Both these witnesses make no mention of such discussion and indicate that the instructions were issued earlier.

The Station Master, Jekot, after receiving the instructions had the warner put back to danger, called Pointsman Raiji and sent him to get the tablet from Pointsman Mania. Raiji called to Mania and Mania brought the tablet back to the Station Master. Mania then received instructions for setting the points and returned to the points. The tablet is handed to the Driver near the facing points which are about 1,600 feet from the station and as Mania records that he arrived back at the points as the train was entering the yard it is clear that earlier notice of the crossing was given.

34. The Driver of No. 22/30 Up Goods records that when he came in sight of the Outer and Warner Signal, the Warner Signal was at danger and as such his stop at the station was just the normal stop.

The position at this stage is that No. 22/30 Up Goods had been received on the Main Line at Jekot Station at 5-20 hours and the Station Master had to arrange a cross with No. 3 Down Frontier Mail which was due to pass through his station at 5-45 hours. The Margin of time was sufficient and the evidence shows that the arrangements were made before the arrival of the train and instructions given to Mania before he returned to the facing points.

In accordance with Subsidiary Rule 147 (8) and General Rule 148, the Station Master is solely responsible for carrying out the shunting and also to see that it is carried out only at such times and in such manner as will not involve danger.

35. Accordingly the Station Master arranged the shunt and issued a memo. to the Driver of No. 22/30 Up Goods. This was sent out by Pointsman Ram Singh, who had to pilot the train, and he states that he had received instructions to draw the train ahead and back it into the loop. The memo. would also convey the same intention as the train would have to be drawn forward to be backed into the loop. Pointsman Mania also confirms that his instructions conveyed that the shunting was to be at the Usra end of the yard.

The Station Master states that he meant that the train was to be backed and piloted forward into the first loop and that his menials were instructed accordingly when all three were present. The menials do not bear out any of this statement. The intention to back the train would have been a safe shunt and is clearly an afterthought. The fact that the Station Master came out of his office while the train was being drawn forward and raised no objection would confirm this.

36. Immediately after issuing the memo. the Station Master cancelled line clear for No. 22/30 Up Goods to Usra and shortly after gave line clear and released the tablet for Usra to permit No. 3 Down Frontier Mail to leave his and approach Jekot Station.

37. The working of trains on this section of line is in accordance with the Absolute Block System laid down in Chapter X of the General Rules. For the working of 'B' Class stations on the Single Line, General Rules 254 to 258 are applicable.

The conditions under which permission to approach may be given are clearly defined in General Rule 254. As there are no shunting boards or starters at this station General Rule 254 (c) (ii) clearly lays down that the line must be clear up to the Home Signal.

Subsidiary Rule 254 (1) is even more emphatic in that permission to approach shall not be given unless the line is clear up to the Home Signal whether there are Advanced Starters or not and reads as follows:—

"S. R. 254 (1)—Permission to approach shall not be given unless the line is clear up to the Home Signal whether there are Advanced Starters or not."

38. As the Station Master had arranged for a shunt movement to be carried out beyond the Home Signal he was aware that the conditions of this rule would be broken at the time of giving line clear.

To further guard against shunting operations being commenced after permission to approach is given General Rule 255 specifies certain conditions but as there are no shunting boards or advanced starters such shunting is prohibited.

39. Subsidiary Rule 255 is more emphatic that such shunting shall not be permitted under any conditions and reads:—

"S. R. 255—Shunting beyond the Home Signal or the outermost facing points if there is no Home Signal is absolutely prohibited after permission to approach has been given, whether stations are provided with shunting boards or advanced starters or not."

40. The Station Master admits in his statement that about five minutes after giving instructions he came out of his office and saw the train ahead of the station building. Having come out and seen this position he returned to his office and obtained line clear for No. 3 Down Frontier Mail to proceed to Rentia Station. Raiji continues the story by stating that the tablet for Rentia was given to him by the Station Master near the station name board and he was going with it to the Down Facing Points.

The Guard of 22/30 Up Goods corroborates the arrival of this token at the points and on hearing what it was and that the Mail had left Usra ordered the pointsman Raiji to run ahead and warn the Driver. He had not got very far when the crash was heard.

41. The Station Master, Jekot, states and has recorded in the Train Signal Register that he attempted to call Usra at 5-30 hours with the intention of stopping the Mail. This was stated to have been done when he returned from the end of the platform which connects with the story of Pointsman Raiji in para. 40 above. The Station Master, Usra, denies that any such signals were heard before train departure signal was given by him. Allowing three minutes for the shunt movement to commence and six minutes for the forward movement it is quite impracticable for the Station Master to have arrived at the conclusion that the train could not get back and then return to the station by 5-30 hours. The Station Master, Usra's statement would appear correct. The Signal Bell can be clearly heard in his office verandah and even on the platform near his signal cabin.

42. Going back to the commencement of the shunt move the loads of 'G' Class engines for Up and Down Goods trains on this section are fixed at 1,500 and 1,000 tons respectively. These loads are fixed with 50 vehicles but are subject to variation in accordance with the load and number of vehicles.

Enquiries showed that the general opinion was that it was impracticable for a 'G' Class engine to push a train of over 1400 tons back in the down direction into the station. In the past difficulties had evidently been experienced in re-starting Down Goods trains which had come to a stand at the Down Outer Signal. This was commented on by the test train driver and the Station Working Rules contain the following:—

"10. Up Goods Trains.—All Up Goods or Ballast Trains which have not 75 per cent. of the A. V. B. wagon brakes in operation should be stopped to enable the train staff to pin down the

necessary wagon brakes. Up Goods trains which have 75 per cent. of the A. V. B. wagon brakes in operation should not be stopped by the Guard for pinning down the hand brakes.

11. Down Goods Trains.—Owing to the steep gradient down goods trains should not as far as possible be detained outside signals."

43. A test held on the 26th May 1940, did not support these views. The test train on the second attempt got away and pushed a load of 52/1473 up the grade into the station yard. The test engine had a slightly full pressure of steam, seemed in good order and was well handled. The result may hence be regarded as above average and somewhat exceptional.

44. The Driver of No. 22/30 Up Goods had been losing time on grades of 1 in 200 between Dohad and Jekot and it is quite probable that his engine would not be able to re-start the load on an up grade of 1 in 182. I accept his statement on this.

Some question might arise on the capability of a 'G' Class engine re-starting a Down load based the 50/1000 mark on the 1 in 182 up grade at the Outer Signal. A glance at the description of site will show that there are steeper grades than this between Jekot and Usra and the loads would be adjusted for these grades. The test would indicate that it should be quite possible to re-start at the Outer Signal with an engine in average condition. Abnormal conditions may have given rise to a popular fallacy and the rules added to cover such cases.

45. The opinions quoted in para. 42 whether correct or not indicate a cautious view and must be considered in this case as a driver's normal procedure would be governed by what he heard as well as his experience. The Driver of No. 22/30 Up Goods had worked on this section for many years and admits that he knew he could not push the load back into the station.

46. In his evidence the Driver states that he raised certain objections on receiving the instructions to shunt forward. This is not supported by his own crew or any other evidence.

He next stated that he carried out the shunt as he received the memo. and had to obey traffic orders. The orders are laid down in General Rule 101 (b) and are applicable only in so far as the safe and proper working of an engine will admit.

47. The normal procedure followed on the railway is that at the beginning of a trip the Guard of a shunting train gives the Driver a memo. telling him where he has shunting to do. The movement at Jekot was not covered by these instructions and the Station Master issued a memo. to obviate any delay due to obstructive working by the Driver.

The fact that the Station Master wrote out a memo. and sent it to the Driver indicates that he anticipated that the Driver might refuse to move without a written order and he sent the memo. to save delay.

Further enquiries from the Administration show that drivers in general have not the impression that they are bound to obey Traffic orders regardless of the proviso in the latter part of General Rule 101 (b) to the effect that such orders are to be carried out only so far as the safe and proper working of their engines will permit. It is usually the reverse and Drivers sometimes refuse to carry out orders for inadequate reasons.

48. The procedure followed does not in any way indicate an obligation for the driver of No. 22/30 Up Goods to obey Traffic Orders in contravention of the latter part of General Rule 101 (b) and as he knew that it was impossible for him to comply with the order he should have refused to shunt.

Having commenced the shunt he admits to having passed the Down Outer Signal by 4 wagon lengths before coming to a stand on the forward movement. The Guard of the train and Rainsingh both state that the guard's van was about 10 to 15 feet past the trailing points and with the length of the train this would be about correct.

49. General Rule 258 which forms one of the main rules for the Absolute Block System of working for Single line 'B' Class stations lays down that the line shall not be obstructed outside the Outer Signal unless the line has been blocked back.

Subsidiary Rule 258 explains how this is worked and reads as follows :—

"S. R. 258. Obstructing the line outside the Outer Signal is prohibited unless a tablet or line clear has been obtained in accordance with the rule applicable to push back ballast trains. See S. R. 156 (6)."

To clear the reference to Subsidiary Rule 156 (6) this is reproduced :—

"S. R. 156 (6). On the single line, in case a ballast train has to run out part of the way between two stations, and then push back to the station from which it started, the Driver must obtain, in addition to the usual 'authority to proceed', a written permission from the Station Master to be allowed to push back into the station. This written permission will be returned to the Station Master on arrival of the train."

The Driver by passing the Outer Signal in the course of his shunting acted contrary to this rule in not having a tablet in his possession.

50. Having come to a stand the Driver states that he was not able to push his train back. He made several attempts and each time his train was pushed forward. I was not able to accept the point that the train was pushed forward and the test confirmed my opinion. The forward movement to such large extent as took place could only be due to bad handling. This aggravated the position considerably.

At this stage the train had been brought to a stand and the Driver states that he had given up hope of getting back and was making arrangements to protect his engine. The firemen do not support this in that they state that the 1st fireman was firing just before the collision and the 2nd fireman noticed the mail approaching and the whole crew jumped.

51. The Driver of No. 3 Down Frontier Mail passed through Usra and received his tablet for Jekot correctly. This tablet was made over to the 1st Class Magistrate, Dohad, and is verified by him as being No. 18, which corresponds to the number shown in the Train Signal Register.

Continuing his statement the Mail Driver said that he was coming out of the cutting at about 40 miles per hour and was expecting to view the signals. Instead he saw the headlight of a train which obscured his view of the signals. Anticipating a collision he closed his regulator, applied his brake and whistled but in spite of this collided with the goods train engine. His crew support the application of brake and anticipation of collision.

52. The guard of the train states that he noticed a slight application of the vacuum but that it only appeared to be a few seconds before he was thrown out of his brake van. Further evidence has been obtained on this point from Mr. A. Freitas who is employed in the Chief Mechanical Engineer's Office and was a passenger on the train. He noted the closing of the regulator as the train was coming out of the cutting but did not observe any application of the brakes before the collision. After the collision the position of the brake handle indicated full application of the brakes and the Driver stated he had closed his regulator and applied his brakes. Mr. Freitas has carried out tests for the railway and his experience makes his evidence of value.

53. The sighting of the signal is evidently regarded by some drivers as difficult and the test train driver said it was his usual practice to shut off steam when coming round the curve. This would indicate excessive caution as the test made showed that the same driver could view the signal within 34 feet of its becoming visible and bring the train to a stand with over 500 feet in hand.

The distance, though ample, is not so excessive that care must not be exercised. The signal does not show first on the firemen's side of the engine and I accept that the driver was on the look-out and alert. The closing of the regulator noted by Mr. Freitas would confirm this.

54. To examine the braking effort further a test was arranged on the 26th May 1940 and the results of this are given in Appendix\* J. The train was brought to a stand in 23.3 seconds and the stopping distance was 864 feet. Allowing for 10 tons difference in tare and 20 tons additional weight of passengers, etc., the distance would increase by about 35 feet. There are other factors which may have caused a variation in the figures. Differences in actual and tare weight might have an effect either way. Differences in vacuum pressure and adjustment of brakes may also have effected the distances.

55. Comparing the test with the actual conditions on the day of the accident the test train driver estimated his speed at 40 to 41 miles per hour which agrees with the estimate of No. 3 Down Frontier Mail driver. The calculations attached to the report would indicate a slightly higher speed which approximate closely to the driver's estimates. The test thus shows that with a train travelling normally it should have been practicable to stop just before or with a very slight impact with the goods train if the brakes had been applied immediately as in the test. Any delay would make impact certain and basing calculations on Wellington's Energy of Potential Lift of moving trains at various velocities (Table 118, page 335) it would indicate that a delay of 5 seconds would leave the train travelling in the neighbourhood of 30 miles per hour at the time of impact.

56. The test was carried out under definite instructions to stop as soon as the Down Outer Signal was sighted. In the case of No. 3 Down Frontier Mail the driver was faced with an unexpected and unusual situation and would not have acted as quickly as the test driver. The evidence in para. 52 indicates that he did not apply the brakes at any early stage but rather that the application was made at a very late stage. The time taken to realize the position is slow but is a personal factor. The driver was personally concerned and would certainly do his best under the circumstances. Even with a very short delay the collision would have taken place with considerable force and as it is not possible to assess the results I would not place any responsibility on the driver. The driver was very much under rest at Baroda but claims that he and his crew were fit to continue duty.

57. Conclusions.—The Station Master, Jekot, is primarily responsible in that :—

- (a) In contravention of General Rule 254 (c) (ii) and Subsidiary Rule 254 (i) he gave permission for No. 3 Down Frontier Mail to approach his station when he had arranged a shunting movement which was to obstruct the line beyond his Home Signal.
- (b) In contravention of General Rule 255 and Subsidiary Rule 255 he continued shunting and obstructing the Main Line outside the Home Signal after giving permission for No. 3 Down Frontier Mail to approach his station.
- (c) In contravention of General Rule 148, he carried out shunting at such times and in such manner as involved danger.

\* Not printed.

58. The Driver of 22/30 Up Goods is responsible in that :—

- (a) In contravention of General Rule 101 (b) he commenced a train shunting move which he knew to be impossible. If he had refused the Station Master would have been warned.
- (b) In contravention of General Rule and Subsidiary Rule 258 he passed the Down Outer Signal without a tablet or line clear.
- (c) He aggravated the position when due to bad handling he permitted the train to roll forward over 400 feet in attempting a task which he knew to be impossible.

## 2. NORTH WESTERN RAILWAY.

Collision between No. 191 Up Passenger and No. 528 Down Goods at Khairpur Mirs Station on the 18th December 1940.

FROM MR. P. W. WILTON DAVIES, V. D., SENIOR GOVERNMENT INSPECTOR OF RAILWAYS, CIRCLE NO. 4, LAHORE, LETTER NO. 85/T, DATED 6TH MARCH 1941.

(1457-T.T.)

I beg to report on the circumstances attending the above accident in accordance with Rule 8 of Railway Board's Notification No. 1926-T., dated 19th March 1930.

The accident message issued by the station master Khairpur Mirs at 9-45 hours on the date of the accident (18th December 1940) was as follows :—

"Driver of 528 Down entered against signals, engine capsized with T. No. 2753 and F. C. S. C. Q. 535 of 191 Up started from third line at the foot of Down Home Signal and Down cross-over resulted in derailment of front five wheels of engine of 528 Down and damage to 2 said bogies and blocked both the Up and Down main lines 528 Down E. No. 2187; Driver Allah Dawaya, 191 Up Engine No. 1848 XC, Driver D. C. Mackintire. No person injured—Relief Train required."

A wire from me on the following day as to the approximate cost of damage elicited a reply late on the 21st that this was approximately Rs. 41,000. The telegraphic information in this connection, as will be seen later, was somewhat deficient, and at variance in certain important respects. A Divisional Officers' enquiry into the accident had already been held on December 19th, 1940—the day following the occurrence. The report and proceedings of this enquiry reached me early in January. After an inspection of the damaged rolling stock, subsequent to the arrival of these for Shops at Lahore, I proceeded to Khairpur Mirs to make a further enquiry, which I held on the 12th January 1941. Further information had then to be collected and awaited.

**2. Description of the Accident.**—At about 7-30 hours on the 18th December 1940, while No. 191 Up Passenger Train was leaving Line No. 3 and was crossing the down main line in order to reach the up main line, at the Rohri (or North) end of Khairpur Mirs Station, it was run into by No. 528 Down Shunting Goods that had entered the station against signals. The point of impact was about the middle of the length of No. 191 Up, where a 3rd class bogie which was the 5th vehicle from the engine and an upper class bogie which was the following, or the 6th, vehicle were damaged in varying degrees on the right hand side on their underframes, the lower portion of their side panelling, and their bogie trucks. These two coaches were also derailed, though still standing on their wheels, and the coupling between the 5th and the 4th vehicles was broken. The engine of No. 528 Down was more severely derailed though still standing on all its wheels, had its right steam cylinder smashed off, and suffered considerable damage to its cowcatcher and to the right hand length of the front buffer, and the portion of its frame immediately behind this. In its final position the engine was partially interlocked with the upper class bogie, and consequently took some little time to release. The track (90 lb. F. F. rails on wooden sleepers) under the derailed vehicles and Locomotive was damaged and knocked about. Owing to the above mentioned failure of the coupling on No. 191 Up and the fact that No. 528 Down had slowed down considerably to a speed estimated at about half a mile an hour just before impact,

the damage was not so extensive as it might otherwise have been. The cost of damage to property was, however, high and was estimated as follows:—

|                              |            |
|------------------------------|------------|
| Bogie 3rd class.....         | Rs. 15,000 |
| Bogie 1st and 2nd class..... | Rs. 20,000 |
| Engine No. 2187 HG/S.....    | Rs. 5,000  |

|                              |            |
|------------------------------|------------|
| Total for Rolling Stock..... | Rs. 40,000 |
| Damage to Track.....         | Rs. 436    |

Total cost of damage.....Rs. 40,436

3. The load and composition of the two trains involved were as follows and in the order given below:—

No. 191 Up.

Engine No. 1848 XC (Pacific). (1) Four wheeled Freight Van, (2) Bogie Military car, (3) Bogie third class luggage and Brake Van, (4) Bogie Intermediate and third class, (5) Bogie third class, (6) Bogie 1st and 2nd class, (7) Bogie intermediate and third class, (8) Bogie third and Postal Van, (9) Bogie third class, luggage and Brake Van.

No. 528 Down.

Engine No. 2187 HG/S (B. E. S. A.), Four wheeled covered wagons, 28. Bogie rail and timber truck, 1. Four wheeled liquid fuel oil tank, 1. Four wheeled covered wagons, 19. Four wheeled goods brake van, 1.

4. The Relief Train from Rohri with a 35 Ton-Steam Crane was the first to arrive at the site of the accident. It was ordered out by Control at 8-5, left Rohri at 9-25, arrived at Begmanji, the adjacent block station, at 9-50, left there at 10-55 and arrived at site at 11-20 hours. In order to enable the derailed vehicles to be conveniently got at, the crane had to be reversed and various shunting movements carried out between the site of the accident and this station. In addition it took some little time to release the upper class bogie from the derailed engine to draw it clear and to renew its badly damaged bogie trolley. Consequently it was not till 15-45 hours that afternoon that the block on the up line was removed. Single line working was then restored at 16 hours. It was found about then that the derailed engine could not be lifted from one side and with one crane, unless a good deal of further shuttling was done to Begmanji and back. Consequently the 35-Ton Steam Crane was ordered from Kotri (near Hyderabad), which it left at 15-10, arriving at the site at 21-55 hours. The derailed engine was then finally lifted and cleared at 23 hours. This enabled track repairs to be then undertaken and to be completed by 3-55 and double line working finally restored at about 4-10 hours the following morning (19th December 1940). There were additional apparent delays due to the engines on both relief trains running short of water and having to go to the nearest watering station 17 miles away. In view of the fact that Control operates on the section, and in view of the facilities available, I feel that, with better planning, the time taken to restore communication could have been considerably reduced in the circumstances.

5. Medical.—No reliable evidence could be obtained as to injuries suffered by persons as a result of the accident. No member of the staff and crew of the two trains involved was injured in any way and the evidence of injuries to passengers was somewhat confused. At any rate these, if any, were of so slight a nature as not to interfere with their onward journey in any way. Specific "Express" enquiry, dated 3rd January 1941, of the

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Superintendent, Government Railway Police, Sindh, as to reliable information in this matter elicited a reply, dated 18/29th February 1941, that no person or passenger was injured.

6. Description of the locality.—Khairpur Mirs is a "B" class Double Line crossing station at mile 252½ on the main line between Rohri (mile 298½) and Hyderabad (mile 113½) of the Karachi Division of the North Western Railway. It is the next but one station from Rohri to the South on the way towards Karachi. Block stations on either side of it are Begmanji, 7½ miles to the North, and Tando Mustikhan 8½ miles to the South. The approach on either side is straight as far as the eye can see. From the Begmanji direction the line is straight and more or less level for about 5 miles to mile 285 where the line bends to the left on a 1° curve just over a mile long and on a rising grade of 1 in 500. Thereafter it runs straight, first on a 500 foot length of level, then on a falling grade of 1 in 500 to mile 283½ where the Down Outer Signal of Khairpur Mirs is situated and then level past the Home Signal some 1,400 feet onwards (near mile 283), and so on through Khairpur Mirs station yard. The line thus described is on fairly high bank all the way—varying from 15' to 10' upto within 1,000' of the Down Outer Signal after which this height falls to between 5' and 6' through the station yard.

7. Khairpur Mirs is signalled for 4 lines and is a N. W. Railway type of key interlocked station—Standard 1. Signals provided are outers with warners, Bracketed Homes and Starters only. All these train signals are controlled from a frame on the up platform just outside the station building under the control of the station master. These again are controlled by keys through key transmitters from relevant ground frames. All points are controlled by these ground frames in the vicinity: the levers in these are in turn controlled by keys from locks on points, ~~gates~~ <sup>gates</sup>. The whole interlocking is such that no relevant train signal can be lowered till its relevant road is set and locked correctly, and all other conflicting approach signals thereto correctly locked at 'danger'. There is the further safeguard that signals are of the 'slotted counterlight' variety making 'drooping' or manipulation of signal wires by unauthorised persons very difficult indeed, if not impossible.

8. The up and down main lines are situated respectively between the main passenger platform situated to the west of these (the up passenger platform) and the island platform to the east constituting the down passenger platform. These are the only two lines between these platforms. Immediately to the east of the island platform is situated the goods yard consisting of an up and down goods reception line respectively, connected by suitable cross-overs with single slips at each end to the up and down main lines and signalled and usually reserved for goods trains only. It will be seen from this that normal double line working conditions do not strictly obtain for the down main line at this station. To the east of these is another goods loop (not signalled) some 1936' clear with a small dead end siding therefrom at the south end serving a goods platform. There are two small dead ends each about 350' long at the ends of this goods yard taking off the turnouts to the goods lines and running adjacent to the down main line. There is also a small dead end siding taking off the up main line, some 200' long and near the north end of the up passenger platform. An important level crossing is situated on the turnout connecting the down main line to the goods yard at the north end. This serves a busy road from the town to the station building situated on the up passenger platform. The gates of this level crossing are interlocked with all relevant reception and departure signals. As mentioned in para. 2 above, the accident occurred on this cross-over.

9. Weather and Visibility.—The weather was fine and visibility good for the time of the day—about 15/20 minutes before sunrise. There was some evidence as to there being a fog or mist at the time, but a reference to

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the Khairpur State Authorities resulted in the following information for the relevant time and date:—

- (i) the time of sunrise was about 7-45 A.M.
- (ii) weather was clear and there was no ground mist, fog or rain between 7 and 8 A.M.

10. Evidence.—Altogether 12 witnesses were examined at the Divisional Officers' enquiry. These consisted of the guards, drivers and crews of the two trains (nine persons in all), the assistant station master and two pointsmen on duty at Khairpur Mirs at the time. All these witnesses were again examined by me in order to confirm or supplement certain points arising from the Divisional Officers' enquiry. In addition, the train examiner from Rohri, where No. 528 Down Goods was last examined, was also called. His statement, not recorded, was to the effect that he gave this train a general visual examination only: that the vacuum, which he stated showed 14 inches in the Engine and 8 " in the Brake Van at the time, was in working order, and that accordingly he gave a general 'Fit Memo.'. He could give no reliable details as to the number of vehicles on the train that were 'piped', the number with defective brakes and the number with brakes in good working order, as he had no instructions to record this. This was confirmed by the Divisional Mechanical Engineer who assisted me at the enquiry.

11. As to the possible causes of the accident, the evidence was considered and obtained on the following bases:—

- (a) Failure in regard to efficient and safe working of Khairpur Mirs station on the part of the assistant station master and/or his staff who were on duty at the time.
- (b) Failure or defect in the Signal and Interlocking arrangements and the general visibility of Signals.
- (c) Failure on the part of the driver of No. 528 Down Goods Train to observe the position and condition of relevant signals and to control his train.
- (d) Similar considerations concerning the driver of No. 191 Up Passenger Train.

12. In regard to (a) the evidence of the assistant station master on duty indicated the following state of affairs at his station at the time:—

- (i) No. 509 Up Goods had arrived at 6-02 hours on his up main line for which line clear had been asked ahead and received from Begmanji at 5-51 hours. He had also given line clear for No. 528 Down to Begmanji at 6-46 hours and was expecting No. 191 Up Passenger from Tando Mustikhan to which he had given line clear for it at 6-41 hours.
- (ii) Owing to congestion at Rohri and Begmanji, and the due arrival of No. 191 Up, Control ordered the detention of No. 509 Up at Khairpur Mirs, to enable No. 191 Up to get ahead of it. This was at 6-55.
- (iii) As line clear had already been given for No. 191 Up and its time of departure from the previous block station (Tando Mustikhan) was 6-55, the A. S. M. very rightly decided that there was no time to shunt No. 509 Up into one of the goods lines.
- (iv) After stopping it at his Up Outer Signal, he accordingly decided to receive No. 191 Up on his up goods line (No. 3) and start it from there while holding up No. 528 Down Goods at his Down Outer Signal to which line clear had already been given as in (i).

These facts are important because if No. 191 Up Passenger had been received as usual on the up main line instead of on up goods line No. 3, the

collision would not have occurred, even though the driver of No. 528 Down had made a mistake. In this respect I am of opinion that the assistant station master acted rightly in the circumstances in which he was placed, and all the evidence and my investigations go to show that he took all the necessary and correct precautions to safeguard matters as far as it was possible for him to do so. If there is any criticism possible in this connection it is that Control might have given longer notice of the change envisaged in (ii) above—as he was in a much better position to appreciate such conditions than the A. S. M. This A. S. M., Mr. Shesha Singh, however, was somewhat at fault in regard to signal lights as will be explained in the next paragraph.

13. In regard to (b) para. 11, the Signalling and Interlocking is described in para. 7 above. I tested this thoroughly, found it in very good order and could find no possible loophole for the Down Outer and Warner Signals to droop or be lowered in any way when the level crossing gates (north side) were closed and the Up Starter from No. 3 line lowered—as was the case at the time. The Committee very rightly, however, drew attention to the fact that the position of the down Home Signal did not fully protect the cross-over road from the goods yard for No. 191 Up—being sited at its crossing on the down main line instead of at the outermost fouling mark between this cross-over and the down main line, and that accordingly the assistant station master infringed the block rules by giving line clear to No. 528 Down and lowering the starter for No. 191 Up when the conditions laid down in General Rule 248 (c) for the line to be clear for No. 528 Down upto the down Home Signal was not thus possible. This distance was something short of 100' and from the circumstances of the accident described in para. 2 above, relating to the speed of No. 528 Down at the time of impact (*viz.*, dead slow at half mile per hour), I am doubtful if this would have prevented the actual collision. At any rate it was a point that had not struck the A. S. M. on duty because the position in this respect was one that had obtained for many years, and I am certain he was not aware of it. In point of fact the matter had only recently been considered by the Interlocking Staff who have already remedied matters. There are also the factors commented on in para. 12. I, therefore, do not hold him guilty of any neglect on this account. There is, however, the question of signal lights. The evidence on this is conflicting. The A. S. M. and pointsman, Ghulam Ali, stated that the relevant signal lights were lit. The driver, the first two firemen and the guard of No. 191 Up state that up Outers and Home Signals were lit for them, but their up Starter and the down Home and Outers were not lit—the latter being observed after spending about 5 minutes at the station subsequent to their arrival. The driver and guard of No. 528 Down stated that the down Outer and Home were not lit. The pointsman acting as gatekeeper at the level crossing in the north end of the yard stated that the lights of the down Outer and Home were not burning. I am inclined to accept that the balance of this evidence goes to show that lights of the down Outer and Home Signals were not lit. For this I hold the A. S. M., Mr. Shesha Singh, to blame for not observing General Rule 45 (d). Again there is some conflict in regard to the position of the arms of the down Outer Signal. The driver and fireman of No. 528 Down say the Outer and Warners were drooping, though the driver took this to be "at danger"—this can be taken as "tainted" evidence. Nearly all the other witnesses mentioned are clear as to these signals being at danger. From what is said in para. 7 above on this subject, I have no hesitation in accepting that these signals were at danger and in this respect the driver of No. 528 Down is seriously at fault. There remains the question of visibility of signals. The evidence in this connection is confusing and quite unreliable. The driver of No. 528 Down states there was a haze, the relieving pointsman acting as gatekeeper stated it was slightly foggy. The driver of No. 191 Up states it was daylight and he could see the signal arms but could not see the down Outer from the down Home owing to fog.

The first and 3rd firemen of No. 191 Up stated it was "slightly misty" and "foggy" respectively. All the other witnesses say visibility was good and it was quite daylight. As stated in para. 9 above, it is clear that the accident took place before sunrise, and that the visibility was good for this time of the day. I accordingly hold that these conditions were normal in this respect and, therefore, that the driver of No. 528 Down had no excuse on this score.

14. In regard to item (c) of para. 11, *viz.*, failure on the part of the driver of No. 528 Down—his statement that the Outer Signal was drooping cannot be accepted as already explained, nor can his mention of the weather being misty. He has an excuse in that his signals were not lit and that the time was before sunrise. At any rate, if his headlight was on, and it should have been on, he should have been able to see the Outer quicker than he did. He is also clear that he did not take the down Outer to be in his favour. His reactions to these conditions are, however, confused and his evidence in this respect found unreliable. It is clear, however, that on this occasion the action taken in shutting off steam and applying his vacuum did not depart from his ordinary practice in this connection. He further stated he left Rohri with his vacuum showing 10", that he had been in the habit of working No. 528 Down two to four times a month for the past 3 years with a load of from 30 to 72 with this amount of vacuum, which he found sufficient to control his train. He was supported in this aspect of the case by his Divisional Officers who stated that, with a higher vacuum, detentions occur because of difficult starting from stopping stations owing to the drag otherwise caused by binding brakes. This point will be considered later. The 1st fireman on No. 528 Down stated the engine vacuum to be 9". The down Outer at this station is 1,400 feet from the Home. From what was stated by the train examiner, Rohri, in para. 10 above, and in the absence of definite information as to the number of piped vehicles, or vehicles with inefficient brakes, on No. 528 Down that day, it is difficult to check up in detail on this aspect of the case. The train examiner at Rohri stated the driver's vacuum there showed 14" and the Guard's vacuum 8"—this accords with the Rules. The guard of this train states likewise that his vacuum was 8": the evidence of this guard, whose statements generally were so strictly in conformity with the rules, appeared to be somewhat suspicious. In the absence of records being kept at Rohri this also cannot be checked. That the driver applied his brakes there is no doubt, for his brake handle was "full on" when seen after the accident. The doubt arises, however, as to whether he took the correct action under the circumstances. Generally the action of the driver appeared to conform with his past practice when normal conditions prevailed at Khairpur Mirs and his way into it clear of obstruction. It is thus clear he was not alert to actual occurrences that morning. With a vacuum of 14" on the engine and 8" in the brake van with 75 per cent. of the stock properly vacuum braked (as laid down in the rules for goods trains with a load of more than 50) the train should have been stopped in a much shorter distance than that between the down Outer and Home Signals, and the actual collision thus avoided. There is no doubt to me that the driver's vacuum was not more than 10" and that the braking power of his train was inadequate both in this respect and in respect of the number of vehicles that had efficient brakes. For this both the driver and the train examiner at Rohri are responsible. This driver has a good record, had recently been tested successfully for eyesight, was medically proved to be a sober man and had more than sufficient rest at Rohri before he started with his train. I, therefore, hold that the driver of No. 528 Down was not alert on the morning in question, that in view of the circumstances mentioned, he failed to control his train properly, that he thus ran past the down Outer Signal when this was at danger; and that thereafter he failed to control his train so as to avoid the actual collision. There is no doubt, therefore, that he is primarily responsible for the accident.

15. In regard to the possibility of the driver of No. 191 Up avoiding the actual collision under item (d) of para. 11, it will be seen from what is yet to be stated, that if he was more alert he might have stopped his train before he reached the down main line. On the other hand he had his authority to proceed and his signals were correctly lowered for him. From the layout of the yard it will be seen that he proceeded to take the turnout to the cross-over 300 feet from his starter signal where he had previously stopped. From this point, if he was alert, he should have seen the down goods train coming in. He then travelled 400 feet before he reached the crossing on the down main line and about  $4\frac{1}{2}$  bogie lengths beyond—that is some further 350 feet—when the actual collision took place. When examining this driver and the driver of No. 528 Down in an endeavour to arrive at the actual relative positions of Nos. 191 Up and 528 Down when they observed each other's train they became uncertain and vague—a point in their favour here was that it was before sunrise and neither driver had head lights on. He stated he first saw the Goods Train when he was some 300 feet beyond the commencement of the turnout just mentioned—that is some 600 feet beyond his starter. He would then still be about 100 feet short of the crossing mentioned. At this point his speed was stated to be 15/20 miles per hour at which he could have stopped within a length of 180 feet with an emergency application of his brakes (which were in very good order with the vacuum showing 20"). This was, however, too late to avoid the collision. In these circumstances, and correctly so, he thought it wiser to speed up and try and get across before the Down Goods Train could collide. On the other hand if he was alert and had spotted the Down Goods Train when he began to take the turnout from No. 3 line, as mentioned above, he had ample time and space to stop his train short of and clear of the down main line, for his speed would then have been about 10/12 miles per hour. Though by distances the problem as here stated seems simple and straightforward enough, when reduced to time it becomes a matter of 8 to 10 seconds. In view of the fact that the circumstances were unexpected, that his signals were lowered, the morning light uncertain coupled with the fact that headlights on his and the Down Goods Train were extinguished at the time, I am prepared to exonerate him from blame in not stopping his train in time.

16. **Conclusions.**—I therefore hold shunter passed driver, Allah Divayo of No. 528 Down Goods primarily responsible for the accident. There are the mitigating circumstances of unlit signals which, perhaps, resulted in his being unable to see the down Outer Signal sufficiently far away for him to control his train and bring it to a stop short of this signal. On the other hand he showed error of judgment in putting out his headlight when this might have been of help to him. As already stated, the A. S. M., Mr. Shesha Singh, is at fault for not keeping his signals lit till after sunrise.

17. **Recommendations.**—In considering recommendations to prevent possible recurrences of accidents of the nature under consideration two main relevant questions arise:—

- (i) The correct lighting of signals and engine lights.
- (ii) Braking power of Goods Trains and
- (iii) The position of Outer Signals arising from (ii) and the unusual layout for Khairpur Mirs station in regard to normal Double Line Working.

18. Taking the question of the proper lighting of Signals, I have recently had to take up a few cases with the North Western Railway where, to me, the relevant Rules contained in General Rule 45 do not appear to be strictly observed, and where, in the quest for economy, instructions are issued to station masters to extinguish signal lights in certain circumstances. In this particular case no instructions had apparently been issued to station master, Khairpur Mirs to put out signal lights before sunrise, but the fact that these are apparently so put out, as in this case,

makes the matter one of sufficient importance, I think, to consider the desirability of uniformity of practice in this connection.

19. To consider one aspect of this case I would mention that on certain sections, where trains do not normally run after a certain time at night, the Administration issues instructions for extinguishing signal lights when the last train has passed. In this connection the Administration takes its stand on the "Special Instructions" it is authorised to issue under G. R. 45 (d) for putting out Signal Lights, and the fact that G. R. 45 (c) provides a sufficient safeguard for lights to be properly lit again if a train or light engine has to run thereafter in an emergency. As happened at Khairpur Mirs on this occasion, in the case of an accident arising from these conditions when visibility is open to doubt and when engine headlights have failed or have been extinguished, evidence of a conflicting nature makes it difficult to arrive at definite conclusions. To me, if G. R. 45 (a) is read directly with G. R. 45 (d), the position would appear to be that where any train runs in the hours of darkness signals must invariably be lit at sunset and not be put out until after sunrise. In the former case, if weather or other conditions make it necessary, the signals should be lit earlier than at sunset and, in the latter, not be put out till well after sunrise—if at all—but certainly not before sunrise in any circumstances. This appears to be somewhat confirmed by the fact that General Rule 5 lays down night signals for use by day in certain circumstances. If it is accepted that the main object of the General Rules is to ensure safety, I do not think the Administration is correct in interpreting these (for the sake of dubious—certainly not financially material—economy in oil) in a way that makes them ineffective from the 'safety' point of view in the circumstances under consideration. I feel I am supported in this view of the case by what is stated in the first rule of Chapter II of the "General Rules" on Signals—viz., General Rule 3, which lays down in regard to the general use of signals that no exceptions are permitted except under "Approved Special Instructions". In view of this, it seems inconceivable that the "Special Instructions" stated in General Rules 45 (a) and (b) envisage a permissible departure from an *absolutely* safe practice as interpreted above. The situation thus explained indicates some considerable doubt in regard to a practice, which in some cases, is of long standing. In one respect, I think it is dangerously misleading as it would appear to place a premium on what can amount to a certain laxity in habits: for station staff on such sections acquire the habit of economising in oil which is considered creditable: but which, elsewhere, may result in serious consequences and thus become a serious fault. I am, therefore, of opinion that under modern conditions where much more frequent transfer and interchange of staff obtains, the comparatively small economy arising from this practice is not worth the risks that arise therefrom.

20. In the matter of suitable braking power for goods trains, I have had some difficulty in obtaining data of the performance of vacuum braked Goods Trains for varying degrees of vacuum for varying speeds and other conditions in regard to stopping distances. The nearest relevant information I have been able to obtain on this is that contained in Technical Paper No. 254 "Trials with vacuum brakes on long goods trains" compiled by R. C. Case in 1926. In this it was found that a goods train with a load of 70 to 88, with initial engine vacuum showing 19", with all engine brakes and the vacuum brakes of all the wagons and brake van on the train in good working order, and with a speed of 20/24 miles per hour, the stopping distance required appears to have been not less than 7/8th of a mile for a drop in vacuum of 10". In the case of No. 528 Down its load was 51, its speed was 20/22 miles per hour, its initial engine vacuum 10", its available brake power on the train uncertain, it was on a falling grade of 1 in 500 approaching the down Outer Signal and it had almost stopped when the collision took place—that is within about 1400' of the Outer Signal. To conform, roughly, with the data mentioned, the driver, Allah

Divayo should have applied brakes more than 3000' outside the down Outer Signal. These are "safe" assumptions. For an initial 10" engine vacuum and uncertain conditions of brake power available on the train, as was the actual case, a much longer stopping distance seems indicated. The Divisional Authorities, however, maintain that goods trains have been worked safely for some time now with a vacuum of only 10" on the engine. The North Western Railway Operating Manual lays down 14" for such a load, and under safer conditions. There is, therefore, a considerable element of doubt on this question; but I feel that a 10" vacuum is definitely unsafe. I would, therefore, recommend various braking tests being carried out for goods trains in order to determine what should definitely be laid down as the minimum for this purpose, what other precautions are necessary and for executive arrangements being made to ensure that these are being carried out in practice by drivers, guards and train examiners.

21. The above facts in turn lead to several other points of a doubtful nature in regard to the siting of signals. On the North Western Railway on the plains sections, it is the common practice for Outers to be placed about 1400' short of the Home Signals on double line sections, and 1920' on the single line. In order to help drivers, a sighting mark (a white band 3' to 4' wide) is placed across the track half a mile outside all outer signals. For alert drivers, and for brake power strictly according to the rules laid down, these distances might suffice for proper control: for passenger and mail trains with present standards obtaining for these conditions, these are quite safe. In other cases, if by any chance such conditions do not obtain and the braking power is in doubt, it becomes a moot point whether a driver of a goods train can be held to blame for over running a signal at danger in an emergency like that under consideration. If, therefore, a lower amount of vacuum is to be accepted as normal practice for goods trains by the Operating Authorities, it seems advisable to insist on certain speed limits for such trains; or, alternatively, to suitably revise distances between Outer and Home Signals. This aspect should be given consideration when the tests recommended in para. 20 are being made. At any rate for stations on the double line sections with a layout corresponding with that at Khairpur Mirs, where normal double line conditions do not strictly obtain and which is described in para. 8 above, it is recommended that Outer Signals should be sited not less than 1920' from the Home Signals.

### 3. EAST INDIAN RAILWAY.

Collision between No. 144 Down Passenger and No. 418 Down Goods between Harangau and Firozabad on the 20th January 1941.

FROM MR. H. A. JOSCELYNE, SENIOR GOVERNMENT INSPECTOR OF RAILWAYS, CIRCLE No. 1, CALCUTTA, LETTER No. 389/XIII/41, DATED THE 5TH MARCH 1941.

(1460-T.T.)

1. **Description of Accident.**—On 20th January 1941 No. 418 Down goods train passed through Harangau station at 20-10 hours. The train consisted of 61 vehicles of which 2 were cattle vans loaded with horses and attached at the rear of the brake van. At 20-25 hours No. 144 Down passenger train arrived at Harangau punctually and was due to halt for 2 minutes. "Line clear" was not immediately available as the 'in-report' of No. 418 Down goods train had not been received. The delay was short and after a detention of about 1 minute only 'line clear' was received and the train left at 20-28 for Firozabad.

2. When the train had attained a speed of 25 miles an hour and travelled rather more than a mile the driver observed in the beam of his head light an obstruction on the track ahead of him. Realising it to be a vehicle he immediately brought his train to a standstill but not before he had actually collided with the obstruction. The obstruction was the last vehicle, one of the cattle wagons, of No. 418 Down goods train which had not cleared the section. Although the goods train was stationary the impact was not severe and the passenger train had practically stopped at the moment of collision. There was no derailment, the buffer beam of the passenger engine was slightly damaged and the whole of the goods train was moved forward a few feet.

3. Some of the persons in the passenger train received slight injuries in the nature of cuts and bruises.

4. As nearly as can be ascertained the time of the collision was 20-37 hours. The Guard of the goods train walked back to Harangau and reported the accident and information was given to the control office at Tundla. Certain Divisional Officers together with a Sub-Assistant Surgeon immediately proceeded to the site of the accident and arrived there at about 22-30 hours. The injured passengers received attention, neither the attendants nor the animals in the cattle wagons were injured.

5. The train staff examined their trains and certified them fit to move. The goods train was drawn forward into Firozabad and the passenger train was backed into Harangau. Single line working was introduced temporarily.

6. **Description of site of accident.**—The site of the accident was at mile 768/22 on the down track of the E. I. R. main line between Harangau (mile 770/9) and Firozabad (mile 765/8). These two stations are approximately five miles apart. The collision occurred about one and half miles from Harangau. The track is double line and is on a fairly low bank and is perfectly straight from Harangau. There is no gradient.

7. **Evidence and conclusions.**—From the evidence of witnesses the following is a fairly correct description of what happened:—

After No. 418 Down goods had passed through Harangau station and proceeded a mile or so the driver began to experience brake trouble. This became so severe that at 20-18 hours he eventually came to a stand with his engine at mile 768. The driver and guard walked along their train towards each

other and the driver found a defect in the vacuum connection at about the 26th wagon which he proceeded to repair. In the meantime the guard joined the driver and reported another leak in the vacuum about five wagons away. This the driver also attended to and instructed the guard to return to his brake van as it would be merely a matter of a few minutes before he would be able to start again. The guard returned to his brake van and before he arrived there some ten minutes must have elapsed since the train first stopped. The driver in the meantime having carried out temporary repairs had set out for his engine.

8. The track here, as has already been stated, is perfectly straight and the lights of Harangau were visible in the rear. The guard of No. 418 Down goods train whilst walking back to his brake van noticed the electric head light of No. 144 Down passenger train arrive at Harangau and saw it switched off. To his surprise three or four minutes later he saw the head light switched on and realised that the train was approaching on his section and that a collision was imminent. He at once ran back towards the oncoming passenger train along the up track waving his red hand signal lamp.

The driver of the passenger train saw the obstruction just in time and was able to stop his train with a very light impact on the rear of No. 418 Down goods which was still stationary. The driver of that train having only got back to as far as one wagon length from his engine.

9. There was nothing irregular or out of order in the matter of the action of the staff of either of the trains in question. It is true that the guard of the goods train had not protected the rear of his train with detonators but this he is not required to do until he is aware of the nature of the detention to his train. The distance of the brake van from the point in the train where the driver had to execute repairs was about 300 yards. To walk this distance in the dark with the aid of a hand signal lamp and along loose ballast would occupy fully 5 minutes. Therefore over 10 minutes would have elapsed before the guard could have returned to his brake van, by which time it is certain that No. 144 Down passenger had left Harangau.

10. There is no question of speed or of timings, nor does the necessity for any such calculations arise. The timings given by the running staff and the records do not always tally within a minute or so but this is immaterial. There is only one question to decide, *viz.*, how is it that No. 144 Down passenger was allowed on to the section from Harangau to Firozabad before this section had been cleared of No. 418 Down goods? It is entirely a matter of signalling and operation.

11. A description of signalling and mode of operation is now necessary. Harangau is a double line station without either loop or passing sidings and is equipped with one signal cabin from which all signals are operated from a 12-lever frame. The block instruments are in the station building and operated by the station master. The signals are lowered from the cabin under orders of the station master. Log registers and private numbers are maintained. The signalling on the down line is 'A' class and consists of a fixed green warner, Home and Starter Signals. The Starter signal is situated about 600 yards in advance of the platform. There is a clear view of all signals from the track, station and cabin.

12. The system of working is 'A' class block working without lock, that is to say the block instruments are not locked with the signals on the section. There is, however, in this instance one element of lock which may be described as 'semi-lock'. The station master has complete control of the last stop signal, in this case the Down Starter. This control is in

the form of a slot and indicator in the cabin operated from the station master's office by a handle which has two positions only, 'locked' and 'free'. The cabin man can only lower the Starter signal when the station master has turned this handle to the 'free' position and the indicator in the cabin also has fallen. This indicator will not fall although the station master may place his handle to the 'free' position unless the station master has received 'line clear' from the next station in advance. Should the station master 'free' the indicator without receiving the line clear the indicator in the cabin would not drop but in such a case when the station master in advance signals 'train out of section' and gives 'line clear' it will transmit through the station master's office direct to the cabin and the indicator will then drop.

13. There being no complete block with lock the transmitting of 'train out of section' signal and giving of 'line clear' signal by the station in advance is entirely dependent on the action of that station master whose duty it is to see that the train has actually arrived complete before giving such signals. From the system as described it is clear therefore that for every lowering of the starter signal at Harangau there must be a separately acknowledged 'train out of section' signal and 'line clear' signal from the next station in advance, i.e., Firozabad.

14. In the present case it is known that the previous train had not cleared the section and yet a second train had entered into the section. Therefore one of the following four circumstances must have occurred:—

- (a) A defect in the lock in the starter signal and the slot indicator which enabled the cabin man to lower the signal when it should have been locked.
- (b) The starter signal may not have been returned to danger after passing of the 418 Down goods train thus enabling the following passenger train to be started on the same signal.
- (c) The 144 Down passenger was improperly started past the starter signal at danger.
- (d) Line clear was improperly given by Firozabad station without the station master there having satisfied himself that the previous train had arrived complete.

15. Considering each of these:

- (a) One of the Divisional Officers was at Tundla that night, a distance of 5 miles away only and he at once proceeded to Harangau station. He took possession of all records and in particular checked the control on the last stop signal and found that there was no defect. Nothing can possibly have been tampered with and no repairs or alterations have since been required.
- (b) and (c) are associated. If the starter signal had not been returned to danger after the passing of 418 Down goods then there would have been no detention of a minute or so to the passenger train waiting for it to be lowered. The evidence of witnesses in this respect is overwhelming. Having waited for the signal to be lowered it is inconceivable that the driver could have started his train and passed it at danger.
- (d) The station master on duty at Harangau states that he received 'line clear' from Firozabad. The station master on duty at Firozabad states that he gave no such—line clear for Harangau to No. 114 Down passenger.

16. The whole matter therefore depends on this last aspect. How was 'line clear' received at Harangau enabling the starter signal to be lowered if no 'line clear' was transmitted from Firozabad? The train signal

register of Harangau station shows the following entries in regard to the running of No. 114 Down passenger: ;

| Train arrived. | Train out of section sent. | Line clear asked. | Line clear received. | Train entering section sent. |
|----------------|----------------------------|-------------------|----------------------|------------------------------|
| 20-26          | 20-28                      | 20-26             | 20-26                | 20-28                        |

According to these entries the station master apparently received 'line clear' the moment that he asked for it and there is therefore no reason for the extra minute's delay. According to the train and cabin staff, however, there was this delay. The private number given to this 'line clear' is 62.

17. The train signal register at Firozabad station shows no entry whatever for the movement of No. 144 Down passenger train. The last entry in the register concerns No. 418 Down goods train against which the line clear number is 92, and the same number is correctly recorded in the Harangau register against that train. On checking the private number sheet at Firozabad station it is seen that No. 62 is not the next correct number. This figure does not occur until a number of others down the list. The statement of the assistant station master, Firozabad that he did not send line clear for the passenger train is therefore borne out.

18. There is so much obvious falsity in the statement made by the responsible staff of the two stations that it is difficult to determine exactly what transpired. From the evidence and manner of the assistant station master on duty at Harangau it is clear that he was seriously at fault somewhere. He states that the moment the passenger train had left he was informed that the line clear had been wrongly given and that he then lost his head and called for the station master. Neither the station master nor the assistant station master informed the Control that two trains were on the section at the same time. Why if neither of them were in any way responsible for a defective line clear they failed to do this is not apparent. It certainly appears as if they had hoped that the goods train in the lead would clear the section safely without being overtaken by the passenger train in which case everything might be passed off.

19. The assistant station master, Firozabad has another story to tell. His statement was taken down by the police and has been apparently learnt off by him by heart. At the enquiry he was almost word perfect and repeated the statement in parrot fashion, frequently after being halted for a moment, repeating the last few words of the previous sentence so as to start off correctly on his repetition. Briefly his statement is to the effect that he was absent from his office for the whole period from 20-18 to 20-29 hours being compelled to leave to answer a call of nature and consequently he knew nothing whatever as to what had happened. He imagined on his return that the situation was the same as when he had left seeing the block instrument needle at 'train on line' as he had left it. He did not then know that it has been moved by somebody to 'line closed', line clear and again to 'train on line' for the passenger train although the goods train was still on the section. He had the private No. sheet with him and therefore the correct private number could not have been given with the line clear.

20. It is possible that this assistant station master did transmit the defective line clear and realised his error before stating the correct private number. This would account for his story of being absent from his office, preferring to meet that charge rather than the one of culpable negligence in working. He is, however, protected by the fact that there is no record in his register and that the proper private number was not entered.

21. The original procedure arranged by control was that No. 418 Down goods was to pass through Firozabad and subsequently No. 114 Down passenger was to be admitted. According to the Controller, on learning by 20-30 hours that No. 144 Down had not passed Firozabad he

decided to alter the arrangement and instructed that station to halt No. 418 Down goods there and to give No. 114 Down passenger train precedence. He phoned Harangau to ascertain the whereabouts of No. 114 Down only to learn that the train was already on the Harangau-Firozabad section. Thus at 20.40 hours the Controller first knew that there were two trains in the same section. He then referred to Firozabad and the assistant station master there states that it was then that he first learnt of the irregularity. The assistant station master, Harangau, admits he knew that there was something wrong at 20.30 hours. How did he know it and why did he not advise Control at once if everything that he had done was in order?

22. It is certain that the 'line clear' had been transmitted by the block instrument from Firozabad to Harangau, otherwise the starter signal could not have been lowered. Who had done this at Firozabad? The assistant station master on duty declares he was absent from his office and that he had instructed the waterman to advise him if the instrument bell rang. The waterman absolutely denies having been in the office or having received any such instructions from the assistant station master.

23. The station master who was in the next office states that he heard the assistant station master in his own office and thinks that he was there the whole time. He states that the assistant station master advised him of the irregularity and that he, the station master, then advised the Control; the assistant station master says that he only learnt of the irregularity from the Control. It is not possible to reconcile the statements of the assistant station master and the station master. It is only possible to adhere to the one point as to how the block instrument came to be operated, thus transmitting 'line clear' and yet no proper private number was issued.

24. At the time of the occurrence there were two fog porters outside the office. Both these men give the same evidence to the effect that the waterman was in the office, that the assistant station master was not there, that the waterman left when the bell rang, that the station master's son, who is not a railway servant, entered the office and operated the instrument and that later the assistant station master returned, asked some question about the goods train and then, after speaking on the telephone, called the station master. At the time of the enquiry the station master's son was not available. He is not a railway servant and is reported to be absent from his home.

25. The only conclusion is that some person unknown, possibly the assistant station master on duty but more probably some unauthorised person in the absence of the assistant station master, operated the instrument thus transmitting 'line clear' to Harangau for the Down passenger train whilst the goods train was still in the section.

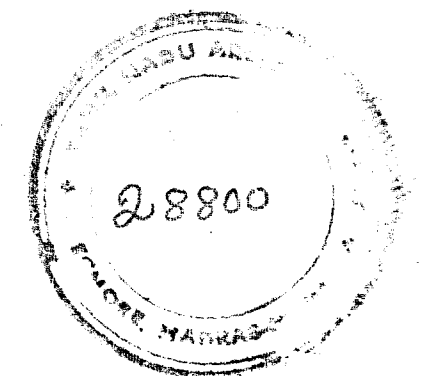
26. I am of the opinion that the following is what happened at Harangau though it is impossible to prove it. The assistant station master on duty being unable to obtain 'line clear' for the passenger train when he first asked for it, in order to save time advised the cabinman to lower the starter signal the moment the cabin indicator dropped. He then turned his slot handle to the 'free' position, thus relinquishing all control over the starter himself. Turning the slot handle could not lower the indicator in the cabin but the indicator would become linked through and dependent on the instrument at Firozabad. After a short interval some person unknown at Firozabad operated the instrument there and either not having a private number sheet or else realising that a mistake had been made could not or did not give a private number. Having operated the instrument at Firozabad the indicator in the cabin at Harangau at once fell, thus allowing the cabinman to lower the starter which he did, and the train immediately left the station without the assistant station master having any further say in the matter. The assistant station master was then in the position of having started a train without a complete 'line clear' in that it was not covered by a private number. At this stage he was

unable to obtain a private number from Firozabad and consequently he applied the No. 62 fictitiously.

27. The assistant station master on duty at Firozabad is responsible, if not for the accident itself, for having left his office without taking proper precautions. I also consider that the assistant station master on duty at Harangau was concerned in the irregularity and did not strictly observe the rules.

28. Recommendations.—The existing installation of signalling and interlocking is adequate provided the rules are observed. It is not absolutely fool proof and it is recommended that complete block with lock should be introduced as funds become available.

29. Another feature is dual control, the station master operating the 'line clear' and the cabinman operating the signals. It of course means a great expense in raising the class of the cabinman, but it is desirable that line clear instruments should, as far as possible, be in the cabin from which the signals are operated.



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