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GOVERNMENT OF INDIA
MINISTRY OF CIVIL AVIATION
(COMMISSION OF RAILWAY SAFETY)

RAILWAY ACCIDENT INVESTIGATION REPORT

ON THE

**Collision Between 978 Down Goods Train And 4SL
Passenger Train At Bandhua Kalan Station
On Lucknow-Sultanpur Section
Of Northern Railway
On 28-6-1982**

Collision of 978 Down goods train with the rear of 4 SL Passenger train at Bandhua Kalan station on Lucknow-Sultanpur section of Northern Railway:

SUMMARY

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|--------------------------------|--|
| 1. Date | 28-6-1982 |
| 2. Time | 03.05 hrs. |
| 3. Railway | Northern |
| 4. Gauge | Broad Gauge (1676 mm) |
| 5. Location | Km. 923/16 to 924/2 of Bandhua Kalan station yard. |
| 6. Nature of accident | Collision. |
| 7. Trains involved | 978 Down goods train and 4 SL passenger train. |
| 8. Speed | 978 Down goods train—over 45 kmph. 4 SL Passenger—Nominal. |
| 9. System of operation | Absolute Block System. |
| 10. Number of tracks | Two lines in the yard.
Single line section. |
| 11. Gradient | Level. |
| 12. Alignment | Straight |
| 13. Weather | Windy with slight rain. |
| 14. Visibility | Slightly restricted due to poor focussing of headlight of the locomotive. |
| 15. Casualties | Killed—2
Injured—25 (Grievous 2).
(Simple 23) |
| 16. Cause | Disregard of signals |
| 17. Persons held responsible | Driver and Asstt. Driver of 978 Down goods train. |
| 18. Summary of recommendations | (i) Train examination procedures should be strictly complied with.
(ii) Provision of 'One-Slot-One-Train' and 'One-Slot-One-Startar' on the section may be considered. If not considered justified at all sections, it may be provided at stations where visibility of signals is restricted due to local features.
(iii) A suitable permanent speed restriction to be imposed beyond the down Distant signal of Bandhua Kalan due to the visibility of the Home signal being restricted due to curve. |

(i)

- (iv) Irregularities in transactions of private numbers by train passing staff should be checked by the inspecting officials.
- (v) Lifting barriers operated from the West cabin should be provided at level crossing no. 83-C
- (vi) Traffic census should be taken at unmanned level crossing nos. 80 and 81 to consider the need for manning.

ABBREVIATIONS USED IN THE REPORT.

S.S.	Station Superintendent.
S.M.	Station Master.
A.S.M.	Assistant Station Master.
T.X.R.	Train Examiner.
G.R.	General Rule.

GOVERNMENT OF INDIA
MINISTRY OF CIVIL AVIATION
(Commission of Rly. Safety)

From :

Suresh Chandra,
Commissioner of Rly. Safety,
Northern Circle,
Lucknow.

To :

The Secretary,
Ministry of Civil Aviation,
Government of India,
New Delhi.

Through : *The Chief Commissioner of Railway Safety, Lucknow.*

Sir,

In accordance with 4 of the 'Statutory Investigation into Railway Accident Rules, 1973' issued by the Ministry of Tourism & Civil Aviation vide Notification No. RS.13-T(8)/71 dated 19-4-1973, I have the honour to submit herewith the Report of my inquiry into the Collision of 978 Down goods train with the rear of 4 SL Passenger train which was just starting from the main line of Bandhua Kalan station on Lucknow-Sultanpur section of Lucknow Division on Northern Railway at about 03.05 hrs. on 28-6-1982.

1.2 *Inspection and Inquiry*

1.2.1 The site of accident was inspected by me on 30-6-1982 in the company of Shri N. P. Varma, Chief Traffic Safety Superintendent, Shri S. K. Kashyap, Chief Signal & Telecommunication Engineer (Signal), Shri H. S. Chatta, Divisional Railway Manager, Lucknow and other railway officers. The affected rolling stock was also inspected.

1.2.2 A Press notification was issued inviting any member of the public having knowledge relating to the accident to give evidence at the inquiry or to communicate with me by post.

1.2.3 The Civil authorities were advised by the Railway about the inquiry which was held me at Sultanpur on 30th June, 1st and 2nd July 1982.

1.2.4 The following officers were present at the inquiry :—

- (i) Shri N. P. Varma, Chief Traffic Safety Superintendent, Northern Railway, New Delhi.
- (ii) Shri S. K. Kashyap, Chief Signal & Telecommunication Engineer (Signal), Northern Railway, New Delhi.
- (iii) Shri H. S. Chatta, Divisional Railway Manager, Lucknow.

1.2.5 The evidence of 24 witnesses was recorded.

1.2.6 *In this report—*

- (i) The terms 'right/left', 'front/rear' and 'leading/trailing' wherever used are with reference to the direction of travel of 4 SL passenger and 978 Down goods train i.e. from Lucknow towards Sultanpur.
- (ii) The expression '4 SL' wherever used is with reference to 4 SL Passenger train which left Lucknow for Sultanpur at about 17.10 hrs. on 27-8-1982 and was just starting from the main line of Bandhua Kalan station at about 03.05 hrs. on 28-6-1982 when the accident occurred.

1.3 The Accident

1.3.1 4 SL Passenger train was received on the main line of Bandhua Kalan at 02.26 hrs. on 28-6-1982 as a goods train (Down Super Goods Train) was standing on the loop line. The Down Goods train left for Sultanpur at 02.35 hrs. After it cleared the section, Bandhua Kalan obtained line clear from Sultanpur for despatching 4 SL for which the down main line Starter signal was taken off and the token delivered to the driver. Just when 4 SL had started moving, 9/8 Down goods train entered the main line and collided with the rear of 4 SL. As a result of the collision, the rear end of the last coach of 4 SL was badly damaged and its rear trolley got entangled with the diesel engine of the goods train. Following the collision, the two trains came to a stop with a gap of about 33.70 metres separating them.

1.3.2 The weather was windy and there had been a slight rain prior to the accident, but the visibility was reasonably clear under the head-lights of the engine at the time of the accident. The head-light of the locomotive of 978 Down was in working order but it was not properly focussed resulting in the range of visibility being somewhat restricted.

1.4 Casualties

As a result of the accident, 2 persons died (one on the spot and one soon after admission in the hospital); 2 persons suffered grievous injuries and 23 others received simple injuries. The casualties were all amongst those travelling by 4 SL.

1.5 Passenger occupation

It was estimated that 4 SL passenger was carrying about 140 passengers against a seating capacity of 320 when the accident occurred.

2.0 Relief Measures

2.1 *Intimation* : The first information about the accident was conveyed by Shri V. K. Bhatnagar, A.S.M., Bandhua Kalan at about 03.10 hrs. on the control phone to Lucknow Control immediately after the accident. The civil authorities were advised about the accident on phone by the Station Supdt., Sultanpur.

2.2 Medical Attention and Relief

2.2.1 The injured were given first-aid by a Dispenser of the Railway Health Unit of Sultanpur who reached Bandhua Kalan at about 04.55 hrs. alongwith. Station Supdt., Sultanpur by a light engine. Doctors from the Civil Hospital, Sultanpur also reached the site of accident by road at 05.30 hrs. and arranged to shift the injured to the Civil Hospital, Sultanpur which was completed by about 11.30 hrs.

2.2.2 On 28-6-1982, two persons with grievous injuries (apart from one who died soon after admission in the hospital) and 23 persons with simple injuries were admitted in the Civil Hospital, Sultanpur. One of the passengers with simple injuries was shifted to the Northern Railway Hospital at Lucknow on 29-6-1982.

2.2.3. I visited the Civil Hospital at Sultanpur on 30-6-1982 where 10 patients (2 with grievous injuries and 8 with simple injuries) were still under treatment. They were receiving due care and attention.

2.2.4 The Railway authorities arranged to make ex-gratia payment to the next of kin of the deceased and to those who suffered grievous or simple injuries.

2.3 Restoration

As a result of the accident, two pairs of trains were partially cancelled and two trains were diverted via alternative routes. Traffic on the section was restored via the loop line of the station at 08.38 hrs. on 28-6-1982 and normal traffic was restored at 21.50 hrs. the same day.

3.0 Composition of Trains and Damages

3.1 4 SL Passenger train was hauled by a steam locomotive No. 24424 HPS/2 and had a load of 5 coaches.

3.1.1 Engine No. 24424 HPS/2 was commissioned in 1950. It had under one POH on 8-1-1982 after which it had covered 31075 kilometres. It had its last Schedule-C inspection on 1-6-1982 at Lucknow. The engine and tender were provided with vacuum brakes.

3.1.2 The composition of 4 SL in marshalling order behind the locomotive was as under :—

Position behind Engine	Coach number	Type of coach	Year built	Return date
1.	ER 4336 GS	ICF Steel body (Laminated spring)	Not known	6/83
2.	ER 5336 SLR	IRS (Steel body)	1961	12/82
3.	NR 4482 GSY	ICF Steel body (Laminated spring)	1959	11/83
4.	NR 5597 SLR	BEML (Steel body)	1966	5/83
5.	NR 9031 GSY	BEML (Steel body)	1963	4/83

Note—All coaches were anti-telescopic.

3.1.3. The length and weight of the train, excluding the engine, were 110.02 metres and 194.2 tonnes respectively. The train was equipped with vacuum brakes with all cylinders active as per vacuum brake certificate no. 110836 dated 27-6-1982 issued at Lucknow.

3.2 978 Down goods train was hauled by Diesel locomotive no. 17926 WDM2 and had a load of 43 box wagons and one brake-van.

3.2.1 Diesel Locomotive no. 17926 WDM2 was manufactured by Diesel Locomotive Works, Varanasi and commissioned in May 1980. The locomotive was not yet due for POH and it had run 197985 kilometers after commissioning. It had its last monthly schedule on 21-6-1982 at Patratu. The locomotive was provided with vacuum brakes, dynamic brakes and independent air brakes. It was provided with head-lights and speedometer in working order and was running short-hood leading when the accident occurred.

3.2.2. 978 Down goods train had a load of 43 box wagons and one brakevan. The length and weight of the train, excluding the engine, were 634.51 metres and 1119.50 tonnes respectively. The train was provided with vacuum brakes. The joint examination carried out after the accident indicated that there were 65 active and 16 inoperative cylinders out of a total of 81 cylinders on the 41 wagons which had not derailed. The effective brake power, after excluding the three derailed box wagons, was 806.

3.3 Damage

3.3.1 4 SL Passenger. The rear portion of the last coach no. NR 9031 GSY of the train was badly smashed. The rear trolley of this coach got entangled with the diesel engine of 978 Down goods train and got separated from the body of the coach. No damage was caused to the locomotive and the other coaches of 4 SL.

3.3.2. 978 Down goods train—The diesel locomotive and the 3 box wagons behind it had derailed. The remaining 40 box wagons and the brakevan of the train were unaffected. The front portion of the diesel locomotive was damaged but no damage was caused to the derailed box wagons.

3.3.3 The cost of damage to railway assets was roughly assessed as under :—

Permanent way	Rs. 20,500.00
Diesel Locomotive	Rs. 60,000.00
Passenger coach	Rs. 1,50,000.00
S & T gear	Rs. 600.00

Total Rs. 2,31,100.00

4.0 Local Features

4.1 Bandhua Kalan station is a 'B' class station on the Utraitia-Sultanpur-Zafrabad single line section of Lucknow division. The station has only two running lines viz. one main line and one loop line. Since clear working with the adjoining stations on either side is through Neale's block instruments provided in the ASM's office. The signals are worked by double-wire lever frames from cabins at either end of the yard. The standard of interlocking is Standard-III.

4.2 Multiple Aspect Upper Quadrant signals are provided at the station. The reception signals consists of (i) Distant signal with three aspects viz. Yellow, Double Yellow and Green, and (ii) Bracketted Home signal with three aspects for the main line (Red, Yellow and Green) and two aspects for the loop line (Red and Yellow). For departure of trains, Starter signals interlocked with the block instruments have been provided for each of the two lines. The Starter signals have only two aspects viz. Red and Green. For shunting, two aspect shunt signals have been provided below the starter signals. No Advanced starters have been provided. Shunting limit boards have been provided at either end of the yard.

4.3 Station Master's control over the reception and departure signals has been provided through a slide frame in his office. Station Master's control on the facing points has also been provided through the Hepper's Key Transmitter whereby after the key has been transmitted to the ASM by the receiving end cabin after setting and locking the points for the nominated route, their position cannot be altered from the cabin unless the key is transmitted back to the cabin by the ASM.

4.4 The Home signals are slotted by the ASM and the Cabin at the other end. For releasing the control to take off the reception signals, the ASM must pull the relevant slide in the S.M.'s slide frame, and the Leverman in the cabin at the other and must pull the relevant slot lever. Any of these agencies can put back the reception signal already taken off to 'ON' position by withdrawing his control.

4.5 The Starter signals for despatching a train are slotted by the ASM and the 'Train going to' contact on the relevant block instrument. The Starter signals can therefore be taken off only after line clear for a train has been obtained from the station in advance and the block instrument duly operated to the 'Train going to' position and after the relevant slide in the S.M.'s slide frame has been pulled.

4.6 As no track circuiting has been provided, the reception/departure signals do not automatically go back to 'ON' with the passage of trains.

4.7 For reception of trains, on receipt of line clear inquiry from the station in rear, the ASM Bandhua Kalan advises the Leverman of the cabin at the receiving end giving him the particulars of the train to be received. The Leverman, after satisfying himself that the line is clear upto an adequate distance beyond the Home signal, confirms this to the ASM supported by his private number.

4.7.1. After having granted 'permission to approach' for the train, the ASM decides the line on which the train is to be received and informs the same to the Leverman in the cabin at either end with his private number. The Leverman of the cabin at the receiving end sets and locks the points of the route leading to the nominated line and satisfies himself that the line is clear and free from obstruction for receiving the train. He also ensures that the level crossings at his end as indicated in the Station Working Rules are closed and locked against road traffic. He then confirms the position to the ASM duly supported by his private number. He also takes out the key from the key lock provided on the lock lever of the facing points and transmits the same to the ASM in the Hepper's Key Transmitter who extracts the key from the Transmitter at his end and inserts the same in the S.M.'s slide frame.

4.7.2. Similarly, the Leverman of the cabin at the trailing end ensures that the line is clear upto an adequate distance beyond the Starter signals for a stopping train. He also sets and locks the points at the trailing end for the line on which the train is to be received and ensures that the level crossing gates at his end of the yard have been closed and locked against road traffic. He then confirms the position to the ASM duly supported by his private number.

4.7.3. After ensuring that the allotted line is clear and free from obstruction, the ASM pulls the relevant slide in the S.M.'s slide frame to release the control over the receiving end Home signal. The ASM also authorises the Leverman of the cabin at the trailing end to release the

slot for taking off the Home signal for the nominated line. In case the train is required to run through the station, the ASM shall also obtain line-clear from the station in advance and pull the slide for the relevant Starter signal to be taken off by the trailing end cabin. The ASM shall also assure himself by personal observation that the correct reception signals have been taken off.

4.7.4. For trains running through, the ASM is also required to check the tail lamp or its authorised substitute on the last vehicle of the train. The Leverman of the cabin at the receiving end is also required to check the complete arrival of the train before putting back the Home signal levers. He also confirms the 'complete arrival' of the train to the A.S.M. supported by his private number after putting back the reception signals.

4.7.5. Although not specifically indicated in the Station working Rules, the Leverman of the departing end cabin also confirms the 'complete departure' of a train to the ASM duly supported by his private number which is recorded in the log registers of the cabin and the station.

4.8. The accident occurred in Bandhua Kalan station yard and the railway alignment runs from west to east and is straight end level at the site of accident. At the Lucknow end of the yard, the alignment has a one degree curve between the Down Distant and Home Signals. As such, the driver of an approaching down train cannot sight the aspect of the Home signal until he has covered some distance beyond the Distant signal i.e. from a distance of about 413 metres in rear of the Home signal.

4.9. The permanent way consists of 90 RBS short welded rails of 1962-63, laid on CST-9 sleepers of 1962-63 with sleeper density of M+4. The main line is stone ballasted with a cushion of 200 mm. The height of the bank at the site of accident is about 2.2 metres.

4.10. The kilometrages of the stations referred to in the report as reckoned from Howrah are as under :—

	Kms.
Lucknow	1073.18
Utratia	1042.87
Shivnagar	937.19
Bandhua Kalan	924.03
Site of Accident	923/16-924/2
<hr/>	
Sultanpur	915.42
Zafrabad	823.25

4.11. Lucknow-Sultanpur is a controlled section with the control office as also the divisional headquarters being located at Lucknow. The maximum permissible speed of trains on the section is 100 kmph. The booked speed of 4 SL is 60 kmph.

5.0. Summary of Evidence

5.1 *Shri P. L. Yadav, Driver of 978 Down* (Witness no. 1) stated from Lucknow after availing full rest. After stopping at the Lucknow East Central cabin for about 47 minutes, his train got a through run thereafter prior to the accident. When he saw the down Distant signal of Bandhua Kalan at 45 degrees i.e. displaying yellow, he closed the throttle and proceeded further. After covering some distance on the approach curve between the Distant and Home signals, he saw the down Home signal at 45 degrees (yellow) although it was dimly lit. Soon after, he observed the Starter signal showing green and he picked up speed. As soon as he observed some train standing on the main line of Bandhua Kalan he applied the emergency brakes but could not avert the collision.

Answering questions, he stated that :—

- (i) He had been working on the Lucknow-Sultanpur section for about 18 years.
- (ii) The normal indication for the down Distant signal when it is at 45 degrees should be double yellow lights but one light was extinguished.
- (iii) The Starter signal of the main line was observed by him showing green and the down main line Home signal was at 45 degrees and showing yellow light.

- (iv) After passing the down Distant signal, he had reduced the speed of his train to about 10—15 kmph as he was not sure whether his train would be received on the main or the loop line.
- (v) He could make out the train standing on the main line of Bandhua Kalan only after passing the Home signal and the turn out points when he was only about 150 metres from the train. He did not notice the tail lamp of the train.
- (vi) From a speed of 10—15 kmph, his train could be stopped within a distance of about 100 metres but since he observed the Starter signal showing green and the down Home signal showing yellow, he started picking up speed and could not stop his train short of the obstruction.
- (vii) The hand signal lamp displayed from the West Cabin showed a white light but he noticed that the Leverman was trying to change the position of the light. He could not say whether the Leverman was wanting to turn the light to green or red.
- (viii) The head lights of his engine were in working order but the range of the light was not too good as it was not properly focussed.
- (ix) 978 Down had started from Khanalampura on 27-6-1982 from where Brake Power Certificate no. 323145 was issued by the TXR, indicating a vacuum level of 45 cms in the engine and 35 cms. in the rear brakevan. The same brake Power Certificate was handed over to the successive driver who worked the train during the course of its onward journey. No fresh brake power certificate was issued to him at Lucknow nor is it the practice to do so. The brakes of his train were, however, in good working order and he had no difficulty in controlling the train anywhere on the run.
- (x) He did not see the token porter of Bandhua Kalan for delivering the token for his train. The weather was windy and there was a slight rain before he reached Bandhua Kalan, but there was no dust in the air.

5.2 *Shri Prem Prakash* (1) Diesel Assistant of 978 Down (witness no. 2) generally corroborated what the driver of the train had stated.

Answering questions he stated that :—

- (i) The down Distant signal of Bandhua Kalan was at 45 degrees for his train but since one light was extinguished, the signal was displaying only a single yellow light. He saw the down main Home signal showing yellow and the down main line Starter signal showing green.
- (ii) There was a slight drizzle and the weather was windy but there was no dust in the air and the visibility was reasonably clear.
- (iii) *Shri P. L. Yadav*, Driver, with whom he had been working for about six months, does not take any alcoholic drinks. He himself had been working on the section for about 4-5 years.

5.3. *Shri A. Chakravarty*, Guard of 978 Down (witness no. 3) stated that his train got a through run after a stoppage of about 45 minutes near the Lucknow East Cabin. As his train approached Bandhua Kalan, he observed the down Distant signal showing yellow. Since the Home signal was dimly lit and the weather was not very clear, he could observe the Home signal only when he was very close to the Home signal and noticed that it was showing red. The collision occurred soon after. He also saw the main line Starter signal showing green.

Answering questions, he stated that:—

- (i) He saw the down Home signals, both for the main and loop lines, showing red.
- (ii) The brakevan of his train stopped mid-way between the Home signal and the West cabin after the accident. He did not see the Leverman of the West cabin.
- (iii) After passing the down Distant signal, the speed of his train had been reduced slightly and may have been about 40—45 kmph. A little later, the train picked up speed. He did not notice any significant drop in the vacuum before the collision.
- (iv) 978 Down goods train had originated from Khanalampura. Since the train vehicle summary had been handed over by him to Station Master, Bandhua Kalan for being handed over to the Guard who worked the load further to Mughalsarai, he could not

say if there was any change in the composition of the train enroute. The load from Lucknow consisted of 43 empty box wagons and one brakevan.

5.4 *Shri Makhodar, Driver of 4 SL* left Lucknow at 17.10 hrs. on 27-6-1982 and reached Bandhua Kalan at 02.20 hrs. on 28-6-82 where he was received on the main line as a goods train was already standing on the loop line. The goods train left for Sultanpur ahead of his train for which the loop line Starter signal was taken off. The Starter signal for his departure for Sultanpur was taken off at 03.03 hrs. and the token was delivered to him at 03.04 hrs. As soon as he started moving after exchanging signals with the Guard, the collision occurred.

He stated that for his reception at Bandhua Kalan, the down Distant signal was at 45 degrees displaying double yellow, the down main Home signal was at 45 degrees displaying single yellow and the down main line Starter was at ON showing red. He had exchanged alright signals with the Leverman of the West cabin when his train passed the cabin.

5.5 *Shri O. P. Awasthi, First Fireman of 4 SL and Shri Vinod Kumar, Second Fireman of 4 SL* (witness nos. 5 & 6) generally corroborated what the driver of their train had stated.

5.6 *Shri Khedoo Prasad, Guard of 4 SL* (witness no. 7) corroborated what the driver of his train had stated with regard to the movement of the train upto Bandhua Kalan. He had advised the control about the occurrence of the accident on telephone from the ASM's office.

Answering questions, he stated that :—

- (i) His train was running abnormally late due to frequent disconnection of the hose pipes by the travelling public.
- (ii) He had fixed the tail lamp to his train and had checked it during the halt at Bandhua Kalan.
- (iii) When his train was received on the main line at Bandhua Kalan, a Down goods train was already standing on the loop line which was despatched ahead of his train.
- (iv) He did not notice the oncoming 978 Down since his attention was towards the Starter signal which had already been taken off for the departure of his train.
- (v) He had exchanged alright signals with the Leverman of the West cabin of Bandhua Kalan.
- (vi) He had observed that the down Home signals had been put back to ON after the arrival of his train at Bandhua Kalan.

5.7 *Shri V. K. Bhatnagar, Assistant Station Master, Bandhua Kalan* (witness no. 8) was on duty from 22.00 hrs. onwards on 27-6-1982. Prior to the accident there were several down trains following each other in quick succession. 842 Down goods train was passed via the main line (line no. 2) followed by Down Food Grain Vishakapattam goods train which was received and stopped on the main line as the previous train had not cleared the section. The Down Super Goods train which was closely following, was, therefore, received on the loop line (line no. 1). As soon as 842 Down goods train cleared the block section, Down Food Grain Vishakapattam goods train was despatched. While the Down Super Goods train was still waiting on the loop line, 4 SL passenger was received on the main line. When the section ahead was cleared, Down Super Goods train was despatched while 4 SL passenger continued to wait on the main line. Soon after that, he granted line clear to Shiv Nagar for despatching 978 Down goods train. After the Down Super Goods train cleared the block section, line clear was obtained by him from Sultanpur for despatching 4 SL. Just when 4 SL was starting from the main line, 978 Down goods train entered the occupied main line and collided with the rear of 4 SL passenger. After the departure of Down Super Goods train, he had transmitted the key to the West cabin to set the route for the loop line. According to him, 978 Down entered the main line against reception signals. Since he observed the passengers in a threatening mood, he left the station after advising the control about the occurrence of the accident and after arranging to put back the main line starter signals under exchange of private numbers with the East cabin.

Answering questions, he stated that :—

- (i) He admitted his mistake in giving private numbers 66 and 44 to the Gateman of Level crossing no. 79 and the East cabin respectively for the movement of Down Super Goods, although these numbers did not exist in his private number book. His plea was that he probably mistook private numbers 77 and 24 appearing in the book as 66 and 44 respectively;
- (ii) He also admitted his mistake in not scoring out private numbers 77 and 24 which he had given for paper line clear working to Sultanpur and for granting line clear for 978 Down to the West cabin, respectively.
- (iii) When asked to explain his action in having given the 'Train entering section signal' for 4 SL even before the train had left his station, he stated that he did so on hearing the starting whistle of the train. This was the usual procedure followed by him;
- (iv) According to him, the East cabin did not give him any private number for the 'complete departure' of 4 SL. After the accident, when he asked the East cabin to put back the Starter signal which had been taken 'off' for 4 SL to the ON position, he was given private number 28 by the East cabin. For this transaction, he did not give any private number to the East cabin since a big crowd had reached the station by that time;
- (v) When asked to explain why he did not himself put back the Starter signal which had been taken 'off' for 4 SL by putting back the slide instead of advising the East cabin, he stated that he was very much confused at that time. Moreover, there had been occasion in the past when the signal did not go back to on even after the slide had been put back. He, however, did not record any such failure in the Signal Failure Register but had verbally mentioned about it to the signalling officials about six months earlier. During the preceding 6 months, no such failure had taken place during his duty hours;
- (vi) He had not nominated any line for receiving 978 Down and had not advised the same to the East and West cabins;
- (vii) On pointing out that according to his Train Signal Register, he had nominated the main line for receiving 978 Down, he stated that he had intended to receive the train on the main line after the departure of 4 SL, since he had been advised by the control to detain 978 Down outside the signals and to receive it on the main line after the departure of 4 SL;
- (viii) He did not receive any confirmation from the West cabin for the routes being set and locked for receiving 978 Down since he had not arranged for the reception of 978 Down and had not advised the East or West cabins nominating any line for its reception;
- (ix) After the arrival of 4 SL, he had confirmed from the back lights that the down home signal had been put back to ON. He had also put back slide no. 11 which he had pulled earlier for taking off the main line Home signal for receiving 4 SL;
- (x) He had issued OPT-373 for despatching Down Super Goods train on paper line clear to avoid detention to the train. He stated that since the token issued to the Down Food Grain Special which preceded Down Super Goods had been lost, the block instrument could not be normalised and the Starter signal could not be taken off. After having sent the paper line clear and OPT-373 to the Driver of Down Super Goods, he observed that the loop line Starter signal for the train had also come off;
- (xi) He normally gave the 'Train entering section signal' on hearing the starting whistle of the train although, according to rules, this signal is to be given after the train clears the trailing points and enters the block section. If, for any reason, the train is unable to enter the block section, the control as also the station in advance are advised accordingly. In such a case, the token is called back and the block instruments are normalised giving appropriate remarks in the Train Signal Register for cancelling the line clear;
- (xii) The 'complete departure' report for a down train is conveyed to him by the East cabin supported by a private number after the train enters the block section i.e. after it crosses the shunting limit board,

5.8 *Shri Kamla Prasad, Station Master, Bandhua Kalan* (witness no. 9) was at Sultanpur availing his weekly rest when the accident occurred. He was advised of the accident at about 03.50 hrs. on 28-6-1982, and reached Bandhua Kalan at 04.30 hrs. He was advised by the control that Station Superintendent, Sultanpur and some other staff were reaching the station by a light engine and that he should make arrangements to receive the same. On reaching the station he had observed that the facing point lock keys of both ends were in their respective locks and slide no. 8 (in S.M.'s slide framed) was in the pulled position.

Answering questions, he stated that :—

- (i) On reaching the station, he did not check up if any of the two keys in the transmitter could be extracted;
- (ii) For the reception of the light engine from Sultanpur, he did not get any response on phone from the East cabin. He, therefore, sent a Porter to check up and advise him whether the points were set for the main or the loop line. A little later, when he again rang up the East cabin, Shri Shambhoo Nath, Leverman responded and advised him that he had set the points at the east end for the loop line. He then extracted the key after getting it transmitted from the East cabin but before he could prepare the caution order, the light engine arrived at the station;
- (iii) He did not get any response on telephone from the West cabin. On reaching the cabin, he found it locked and did not find the Leverman.
- (iv) The down Home and Starter signals for the main line were found to be in the ON position when he reached the station;
- (v) To fill up a leave vacancy of Leverman at the station, he had placed a demand on the T. I. Sultanpur who had deputed Shri Panna Lal, Leave Reserve Porter to work as Leverman in the West cabin at his station. He did not, however, receive any formal posting orders. Whenever staff is deputed to work in short-term temporary vacancies, the competency certificate continues to remain record at the station of regular posting. It was not the practice to seek confirmation in writing regarding the competency of the staff deputed except to check up verbally from the person.

5.9 *Shri Shambhoo Nath, Leverman, East cabin* (witness no. 10) was on duty from 20.00 hrs. onwards on 27-6-1982. He had taken off the main line Starter signal for despatching the Down Food Grain Special after exchanging private numbers with the ASM on duty. Thereafter, he had released the slot for the reception of 4 SL on the main line. He had subsequently taken off the loop line Starter signal for despatching the Down Super Goods. After the Down Super goods cleared the block section, he had set the route and taken off the Starter signal for the departure of 4 SL from the main line. When he heard a loud bang, he learnt from the ASM on phone that an accident had occurred due to which 4 SL could not be despatched. After exchanging private numbers with the ASM, he put back the Starter signal to ON, but in view of the shock, he forgot to record the private number given to him by the ASM for cancelling the movement of 4 SL. He left the cabin and returned some time later when he heard the sound of the light engine coming from Sultanpur side. He set the route at his end for receiving the light engine on the loop line. As there was no response from the ASM, he displayed hand signals to the engine to slow down to explain the position.

Answering questions, he stated that :—

- (i) He had not given any 'complete departure' report for 4 SL to the ASM and the private number '28' recorded by him in his log register as having been given by him to the ASM was in token of the advice from the ASM to put back the down main line Starter signal to ON for cancelling the movement of the train. However, in a hurry, he did not record this private number at the appropriate place in the log register and also forgot to record the private number given to him by the ASM.
- (ii) When asked to explain the private number '40' recorded in his log register with the remarks 'slot' for reception of some train on line no. 2, he stated that these entries had been recorded by him by mistake as no advice had been received by him for any train movement from the ASM.
- (iii) The loop line Starter signal had come off for the departure of Down Super Goods train.

(iv) As the weather was windy and rainy, he had closed the windows of the cabin. He could not, therefore, notice when 4 SL started nor did he hear the whistle of the train.

5.10 *Shri Panna Lal (Porter) working at Leverman, West cabin* (witness no. 11) was on duty from 20.00 hrs. onwards on 21-6-1982. He stated that after the departure of Down Super goods train from the loop line, the ASM advised him regarding line clear required for 978 Down goods train. He gave clearance for the same supported by his private number. After some time he contacted the ASM to ascertain the line on which 978 Down was to be received but he was asked to wait. When 978 Down was approaching the Home signal, he again rang up the ASM but did not get any reply. He displayed danger signal to stop 978 Down but the train passed the down Home signal at danger and entered the occupied main line and collided with the rear of 4 SL passenger. He saw the main line Starter signal taken off for despatching 4 SL. Since the ASM had not transmitted the key back to him after the reception of 4 SL on the main line, the points at his end were still set and locked for the main line.

Answering questions, he stated that :—

- (i) The key had not been transmitted back to him after the departure of Down Super Goods train from the loop line as contended by the ASM. He could not, therefore set the points at his end for the loop line.
- (ii) He did not receive the slot for taking off the reception signal for 978 Down.
- (iii) He saw the tail lamp of 4 SL passenger train burning brightly.
- (iv) He had recorded private number '78' as having been given to him by the ASM for receiving Down Super Goods incorrectly whereas the number actually given was '79'. Similarly, for reception of Down Food Grain Special, the private number recorded by him in his log register was erroneously recorded as 57 instead of 75.
- (v) For granting line clear for 978 Down, he had given private number 39 to the ASM which he had also scored out in the Private Number Book, but he forgot to record the same in his log register.

5.11 *Shri J. R. Meena, Station Superintendent, Sultanpur* (witness no. 13) reached Bandhua Kalan at 04.55 hrs. alongwith some other senior subordinates. He arranged to seize the relevant train passing records in the presence of Station Master, Bandhua Kalan. As per observations made by him, the block instrument for Shivnagar side was in the 'Train coming from' position and that for Sultanpur side was in the 'Train going to' position. Slide no. 8 in the Station Master's Slide Control frame (for the down starter) was in the pulled position and key no. 3 (which locks the down facing points), was in the key transmitter, but it was possible for the key to be extracted from the transmitter. Token no. 28 for Sultanpur side was in the possession of the driver of 4 SL. The West cabin was found locked, but on opening it, it was observed that lever no. 23 (detector lever for points leading to main line no. 2) and lever no. 16 (for locking the facing points) were in the pulled position. All other levers were in the normal position. The position of levers in the East cabin at the time of the accident could not be checked, as they had already been operated for receiving the light engine by which he came from Sultanpur.

Answering questions, he stated that :—

- (i) Only slide no. 8 in the SM's slide control frame for the down Starter signal was in the pulled position. All other slides were in the normal position;
- (ii) He did not observe the slot indication in the West cabin;
- (iii) He did not meet the Driver/Assistant Driver of 978 Down, the ASM on duty or the Levermen of East West cabins of the station as none of them were available.

5.12 *Shri H. H. P. Pandey, Section Controller, Lucknow* (witness no. 14) had directed the ASM Bandhua Kalan to despatch 4 SL to Sultanpur before arranging reception of 978 Down at the station. He was advised by the ASM Bandhua Kalan at about 03.13 hrs. that the driver of 978 Down had overshot the reception signals and collided with the rear of 4 SL. From ASM/Sultanpur, he learnt that line clear had been granted by him for 4 SL.

Answering questions, he stated that :—

- (i) ASM, Sultanpur did not tell him that he had also received the 'Train entering section signal' for 4 SL from Bandhua Kalan.

(ii) He did not remember if ASM, Bandhua Kalan gave him the out report for 4 SL.

5.13 *Shri Ram Deen, Gateman of Level Crossing no. 83-C* (witness no. 16) was on duty at level crossing no. 83-C situated between the down Distant and Home signals at the west end of Bandhua Kalan.

Answering questions, he stated that :—

- (i) He had observed that the main line Home signal had been taken off for receiving 4 SL, but he did not notice the aspect of the Home signal for the reception of 978 Down as it was windy and rainy;
- (ii) He could not say if the Home signal had been put back to ON after receiving 4 SL, since he went inside the gate lodge due to rain.

5.14 *Shri Ali Hussain, Driver of Down Super Goods* (witness no. 18) stated that his movement from Bandhua Kalan to Sultanpur was on paper line clear no. 165007 and that he was issued OPT, 373 to pass the loop line starter signal at ON. Hand signals were also displayed to him from the foot of the starter signal. He could not say if the starter signal subsequently came off after he had passed the signal. For his reception on the loop line of Bandhua Kalan, the down Distant signal and Home signals were both showing yellow and the signal arm of the Home signal was at 45 degrees. He had exchanged alright signals with the Leverman of West cabin.

5.15 *Shri J. N. Misra, Assistant Station Master, Sultanpur* (witness no. 24) stated that Down Super Goods train moved from Bandhua Kalan to Sultanpur on paper line clear as the token given to the previous goods train had been lost. The token was subsequently found at about 02.55 hrs. and deposited in the block instrument to restore normal working. He had granted line clear for 4 SL and on receipt of 'Train entering section signal' from Bandhua Kalan, he had arranged to take off the reception signals for the train. Later, when the Section Controller enquired if any accident had taken place at Bandhua Kalan, he tried to contact the ASM Bandhua Kalan several times but there was no response.

VI. TESTS AND OBSERVATIONS

6.1 To check the signalling installation at Bandhua Kalan, a down train was received on the loop line no. 1 of the station during my inspection on 30-6-1982. For receiving the train, the down loop Home signal was taken off to 45° after pulling Slide no. 9 in the S.M.'s Slide Frame and lever no. 3 in the East cabin for releasing the slot on the down loop Home signal. After the train had been received at the station, the following tests/observations were made :—

- (i) If the Slide no. 9 in the S.M.'s Slide Frame and lever no. 3 in the East cabin for releasing the slot remained in the pulled position, the down Home signal for the loop line could be put back and taken off again any number of times by pulling/putting back the relevant signal lever (no. 25) in the West cabin.
- (ii) After the down loop Home signal had been taken off to 45°, the S.M.'s slide no. 9 was put back. It was noted that the down loop Home signal went back to ON. Lever no. 25 of the West cabin was then put back and again pulled, but the down loop Home signal did not come off.
- (iii) S.M.'s slide no. 9 controlling the down loop Home signal was then again pulled and on pulling lever no. 25 of the West Cabin, the down loop Home signal came off.
- (iv) After the down loop Home signal had been taken off, lever no. 3 of East cabin was put back to cancel the slot released for taking off the signal. It was observed that the down loop Home signal went back to ON. Thereafter, lever no. 25 of West cabin for operating the down loop Home signal was put back and again pulled, but the signal did not come off.
- (v) After the slot on the down loop Home signal had been released from the East cabin by pulling lever no. 3, an attempt was made to pull signal lever no. 8 in the East cabin to take off the down loop Starter signal but it was not possible to do so.

6.2 The levers in both the cabins as also the slides in the SM's slide frame were then put back so that all signals were in the ON position. Line clear was then obtained from Sultanpur on the block instrument to despatch a down train from the loop line of Bandhua Kalan. Slide

no. 8 of the SM's slide frame and signal lever no. 8 of East cabin were then pulled to take off the loop line Starter signal. After the departure of the train, the following tests and observations were made :—

- (i) Signal lever no. 8 in the East cabin was put back which resulted in the loop line Starter signal going back to ON. When the lever was again pulled, the Starter signal came OFF. This operation could be repeated any number of time so long as slide no. 8 in the SM's slide frame remained in the pulled position.
- (ii) While the down loop Starter signal had been taken off, slide no. 8 in the SM's slide frame was put back but the Starter signal did not go back to ON as it should have done. The cause for this was investigated by the signalling staff and I was advised that two screws holding the armature of the signal reverser had become loose due to the threads having worn out, resulting in the armature of the signal reverser getting stuck. With a slight touch or tightening of the screws, the reverser worked and the signal arm went back to ON. The screws were replaced and on subsequent testing, the signal responded correctly to the operation of the slide.

6.3 The visibility of the signals while approaching from Shivanagar side was checked during the day-time from a motor trolley. It was observed that the down Distant signal could be easily sighted from a distance of about 750 m. On account of a one degree curve between the down Distant and Home signals, the latter could be sighted only after covering some distance beyond the Distant signal. The distance from which the down Home signal could be sighted was about 413 metres.

6.4 The visibility of signals was checked at night time from the foot-plate of a diesel locomotive travelling with short hood leading. It was observed that the down Distant signal could be sighted from a distance of about 530 metres. The down Home signal could, however, be sighted only after reaching a whistle board fixed between the down Distant and Home signals i.e. from a distance of about 413 metres from the latter. The down main line Starter signal could be sighted after travelling another 30 metres from the whistle board from where the distance of the Starter signal was about 1.5 kms.

6.5 To check the visibility of any load standing on the main line of Bandhua Kalan, a coach was stabled at the approximate location of the last coach of 4 SL. It was observed from the diesel locomotive with short-hood leading that the tail lamp of the stabled load could be observed from distance of about 309 metres but the general out-line of the standing load could be made out under the head-light of the engine from a distance of about 410 metres.

6.6 A copy of the joint observations recorded by the Senior Subordinates who reached Bandhua Kalan at about 04.55 hrs. is placed at Annexure-I. As noted by them, the block instrument at the station for Sultanpur side was in the 'Train Going To' position and that for Shivanagar side was in the 'Train coming from' position. Slide no. 8 in the SM's slide control frame (which controls the down direction starter signals) was in the pulled position and key no. 3 in the Hepper's Key Transmitter in the SM's room was in the transmitter but SS/Sultanpur clarified in his evidence that the key could be easily extracted, which indicated that its control was still with the ASM. The senior subordinates also found Lever nos. 23 and 16 in the West cabin in the pulled position indicating that the down facing points were set and locked for the main line. All the other levers in the West cabin were found to be in the normal position. There was also no indication of the slot having been released by the East cabin for taking off the Home signal for any down train.

6.7 The tail-lamp of 4 SL passenger was found in the debris of the last coach of the train in a damaged condition in the course of my inspection on 30-6-1982.

6.8 978 Down had started from Khanalampura station on 27-6-1982 after intensive train examination and was issued Vacuum Brake Certificate no. 323145 by the Train Examiner, Khanalampura. During the enquiry, it was learnt that 16 wagons were attached to the train at Iqbalpur station but no fresh train examination was carried out nor any fresh Brake Power Certificate issued. The train thus continued its journey upto the time of the accident on the authority of the Brake Power Certificate issued from Khanalampura. As per check carried out after the occurrence of the accident, the effective brake power (excluding the three derailed box wagon) was 80%.

VII. DISCUSSION

7.1 Time of Accident

According to the records of the control office, the collision occurred at 03.05 hrs. The Driver of 4 SL has stated that he received the token for the movement of his train at 03.04 hrs. and that he started shortly thereafter. This is also confirmed from the departure time of 4 SL as recorded in the train signal register of Bandhua Kalan. Since the collision took place just when the train started moving, the time of accident is taken as 03.05 hrs.

7.2 Speed of train

The speed of 4 SL was insignificant as it was just starting from the station. Regarding the speed of 978 Down, the Driver stated that the speed was about 10 to 15 kmph while running between the Distant and Home signals, but that it started picking up speed after he sighted the Home signal. The Assistant Driver of 978 Down has also stated that the speed of his train had been reduced to about 15 kmph and that it started picking up speed after sighting the Home signal. The Guard of 978 Down goods train has, however, stated that the speed of the train was about 40-45 kmph after passing the Distant signal and it started picking up speed thereafter. I am unable to accept the version of the Driver or Asstt. Driver of 978 Down since, if the speed had been about 15 kmph, it should have been easily possible for the goods train to be stopped before the collision. Considering the extent of damage caused to the rolling stock, I am inclined to accept the assessment of the Guard of 978 Down that the speed of 978 Down before the collision was above 45 kmph.

7.3 Cause of the accident

To determine the cause of the accident, the following possibilities have been considered :—

- (i) Inadequate brake power of 978 Down.
- (ii) Defect in signalling installations of the station.
- (iii) Signals being taken off for receiving 978 Down on the occupied main line.
- (iv) Movement of 978 Down against the signals.

7.3.1 Inadequate brake power of 978 Down

The Driver of 978 Down found the brake of his train working satisfactorily and he had no difficulty in controlling the train on the run. The check after the accident also did not indicate any serious deficiency. Inadequacy of brake power of 978 Down having caused the accident is, therefore, ruled out.

7.3.2 Defect in signalling installations of the station

None of the witnesses have made any complaint in respect of the signalling installation of the station. The railway official who reached the station after the accident also did not find anything amiss. The tests and observations carried out by me as detailed above, also give no reason to doubt the integrity of the signalling installations. Any defect in the signalling installations having caused or contributed to the accident is, therefore, ruled out.

7.3.3 Possibility of signals being taken off for receiving 978 Down on the main line.

The procedure for reception of trains at Bandhua Kalan as specified in the station working rules has been summarised under para 4.7 above. Some of the entries in the train passing records of the station and the East cabin raised a doubt as to whether the ASM and the Leverman/East cabin prematurely assumed that 4 SL had departed leading them to take action for taking off the Home signal for receiving 978 Down on the main line even though it was still occupied by 4 SL. The conditions which give rise to this possibility are as under :—

- (i) The ASM, Bandhua Kalan had given the 'Train entering section signal' for the departure of 4 SL from his station to Sultanpur at 03.06 hrs. which was duly recorded in the Train Signal Registers of both the stations. This action had been taken even though 4 SL had only just started moving and had not yet even passed the main line Starter Signal, leave alone entering the block section towards Sultanpur after passing the Shunting Limit Board. During cross-examination (Qr. No. 2 and 10), the ASM stated that he normally gave the 'Train entering section signal' on hearing the starting whistle of the departing train,

- (ii) In the Log Register of the station, in the line immediately after that pertaining to the movement of 4 SL, the ASM has recorded timings of 03.07 hrs. but all the other columns in the line which pertain to train no., line no., and private number have been left blank. As discussed later under para 7.3.3.1., the ASM had apparently made these entries in anticipation for the subsequent movement (i.e. to receive 978 Down) after the departure of 4 SL.
- (iii) Although not specified in the working rules, as per practice in vogue, the departing and cabin confirmed the complete departure of trains to the ASM supported by a private number which was recorded in the last column of the Log Register with the prefix 'C.D.' to signify complete departure. The private number thus received by the ASM was also recorded by him in his Log Register against the entries for that particular train. In this case also, the East cabin had recorded C.D. 28 against the entries for 4 SL, but subsequently the number 28 had been scored out in the cabin log register although it continued to be recorded in the station log register. The no. (28) had also been duly scored out in the private number book of the East cabin. This no. (28) also follows in the correct sequence in the book to have been given in support of the complete departure of 4 SL. As such there is no reason to doubt that the complete departure report for 4 SL had been duly given by the East cabin but, when the train could not depart due to the accident, the private number recorded in support thereof in his log register was scored out by the Leverman/East cabin.
- (iv) In the Log Register of the East cabin, in the line immediately after that pertaining to the movement of 4 SL, the Leverman has recorded line no. 2, private no. 40, and the remarks 'SLOT' but the other columns in this line meant to record the train no., time, and private numbers had been left blank. In the subsequent line also, private no. 89 had been recorded but all the other columns of the line had been left blank. These entries give the impression that slot had been released from the East cabin for receiving some train on line no. 2 but, as discussed later, the entries seem to have been made in anticipation of the departure of 4 SL for the subsequent requirement i.e. to release the slot for receiving the next train (978 Down) on line no. 2. Private no. 89, which was next in sequence in the book, may have just been noted for the next transaction.
- (v) According to the joint observations recorded after the accident (Annexure-I), key no. 3 of Hepper's Key Transmitter, which locks the down facing points, was in the transmitter in the S.M.'s office, but the key could be easily extracted from the transmitter as stated by the Station Supdt., Sultanpur in his evidence. The Signal Inspector (West), Ferozabad (witness no. 15) who had inspected the West cabin has also stated that the facing point lock control was in the locked position in the transmitter. The joint observations also recorded that the relevant levers in the West cabin for setting and locking the facing points for the main line were in the pulled position. These observations confirm that the route was set and locked for the main line with the control over the facing points being with the ASM, which is a condition pre-requisite to take off the Home signals for receiving a down train.

7.3.3.1 The entries made in the train passing records as referred to at items (i) to (iv) above, raise a doubts as to whether the ASM and the Leverman/East cabin prematurely assumed that 4 SL had departed leading them to arrange reception of 978 Down on the main line, even though the line was still occupied by 4 SL. The position of the down facing points and the key in the transmitter as indicated at item (v) above also permitted this. The following conditions, however rule out such a possibility :—

- (a) There are no entries in the Log Register of the West cabin of any transaction between the ASM and the West cabin as required prior to the Home signal for receiving 978 Down being taken off. The only entries in the Log Register of West cabin in respect of 978 Down are those which pertain to the transaction between the A.S.M and the Leverman before line clear was granted to Shivanagar for despatching the train. The Leverman has also denied having taken off the signals for receiving 978 Down and I see no reason to doubt his statement which is also supported by the records.
- (b) According to the joint observations made after the accident, only slide no. 8 in the S.M.'s slide frame was found to be in the pulled position. This slide controls the taking-off of the Starter signals of the main/loop lines for the down direction and would have had to be pulled for taking off the main line Starter signal for the

departure of 4 SL. Since all other slides in the S.M.'s slide frame were found to be in the normal position, the S.M.'s control over the down Home signal had not been released. The signal could not, therefore, have been taken off for the reception of 978 Down.

- (c) According to the evidence of the Guard of 978 Down, he had observed the Distant signal displaying yellow and the Home signal showing red for his train.
- (d) The entries recorded in the Log Registers of the station and the East cabin as referred to at items (i) to (iv) above are only one sided i.e. those which could be recorded by the concerned staff without any other agency coming into the picture. There were no entries for any private numbers received from any other agency nor did the private number books of the station or the cabin indicate any numbers having been scored out for any operation pertaining to the reception of 978 Down. This strongly supports the possibility of the entries having been made in advance in anticipation of the departure of 4 SL so that 978 Down could be received immediately thereafter.
- (e) As indicated at item (v) above, the position of the down facing points and the key in the Repper's Key Transmitter were such that the Home signal for receiving 978 Down could be taken off. The joint observations made in the West cabin after the accident indicates that the slot for taking off the down Home signal had not been released by the East cabin. This does not however, categorically rule out the possibility of the slot having been released earlier since the levers in the East cabin had been put back after the accident to receive the light engine from Sultanpur side. However, in view of the absence of co-related entries in the records of the station and the East cabin, I am inclined to believe that the slot for taking off the down Home signal had not been released by the East cabin.
- (f) Although the down facing points were set and locked for the main line and control over the transmitter key was with the ASM, it does not necessarily establish that this was done for taking off the down Home signal for receiving 978 Down. According to S.R. 3778 (extract at Annexure-11), after the reception of 4 SL on the main line, the points in rear should have been set towards the loop line which was occupied by a goods train only. It appears that either the supulation of S.R.3778 to set the points in the rear towards the loop line escaped notice or no effort was made to do so by the A.S.M. and the Leverman/West cabin. Although the ASM stated that he had transmitted the key to the West cabin for this purpose after the departure of Down Super goods from the loop line, his version is not supported by the joint observations recorded after the accident and has also been denied by the Leverman of West cabin. Even otherwise, the key should have been transmitted by the ASM immediately after the arrival of 4 SL without waiting for the departure of the goods train from the loop line.
- (g) As indicated at item (d) above, whatever entries were made in the log registers of the station and the East cabin, which could be presumed to have been made for receiving 978 Down, were only one-sided and did not include any entries regarding private numbers received from other agencies involved in the movement. As concluded at item (d) above, the entries were, therefore, apparently made in anticipation of the subsequent movement. Absence of entries for taking off the reception signals for receiving 978 Down in the records at all the three locations viz. West cabin, Station and the East cabin cannot be considered to be coincidental and leads to the conclusion that the transaction for taking off the reception signals for receiving 978 Down at the station had not actually taken place. It is, therefore, inconceivable that the reception signals for 978 Down would have been taken off.

7.3.3.2 In view of the above, the possibility of the reception signals having been taken off for 978 Down is ruled out. The entries made in the Log registers of the station and the East cabin as referred to at items (i) to (iv) above which give rise to this possibility have also been considered but, in view of the following observations, I feel convinced that these entries were made by the staff in advance in anticipation of the departure of 4 SL so that 978 Down could be received immediately thereafter :—

- (a) Regarding items (i) and (ii) under para 7.3.3 above, the ASM had not filled up any of the other columns in the log register i.e. Train no. Line no. and Private nos. Since the accident occurred prior to the timings recorded (3.06 and 3.07 hours), it

appears more likely that they were recorded in advance. Such a tendency on the part of the ASM is further borne out from the train signal register where, in the column for 'Train out of section signal received', he has recorded '3' against the entries for 4 SL although the train had not even left his station. Apparently, he had recorded the hour as '3', with the intention to write the minutes subsequently on receipt of advice from Sultanpur. Similarly, his practice was to give the 'Train entering section signal' on hearing the starting whistle of the train rather than on the entry of the train into the block section. These instances indicate the tendency of the ASM to take action in advance of the actual movement.

- (b) Regarding item (iii) under para 7.3.3. above, the Leverman of the East cabin has denied having given the complete departure report for 4 SL. He has stated that he had given private no. 28 to the ASM to acknowledge receipt of instructions for putting back the main line Starter signal to ON after the accident, and the ASM has supported this plea. In that case instead of scoring out the number, suitable remarks to indicate the purpose would have been recorded in the register. Moreover, in that case the ASM would also have given a Private Number to the East cabin but there is no evidence of the same in the station records or the private-number book. Since the words 'C.D.' signing complete departure have been clearly written against the scored out number, and the same no. (28) has been recorded in the log register of the ASM against the entries for 4 SL, it is not possible to accept the pleas of the Leverman/East cabin and the ASM. It is clearly established that the East cabin had given the complete departure report for 4 SL supported by his private no. 28 before the train departed. Subsequently, when the train got involved in the accident, the private number recorded for complete departure was scored out in the log register.
- (c) Regarding item (iv) under para 7.3.3. above, the Leverman of East cabin has recorded line no. 2, private no. 40 and the remarks 'SLO1' in the relevant columns of the log register in the line immediately after that pertaining to the departure of 4 SL. All the other columns in the line to indicate the train no., time and private number received have been left blank. In the next line also, private no. 89 has been written without recording any entries in the other columns. The former set of entries give the impression that they pertain to the release of slot for some train to be received on line no. 2 for which private no. 40 was given by the East cabin. It was noticed that private nos. 40 and 89, although next in sequence to no. 28, had not been scored out in the Private no. Book of the East cabin. Since there was neither any entry regarding train particulars or of any private number received from the ASM, nor was there any evidence of the same in the station records, these entries could only have been made in advance by the Leverman of the East cabin anticipating that his next operation would be to release the slot for the down train immediately after the departure of 4 SL.

7.3.3.3. In view of the above, I am convinced that the reception signals for receiving 978 Down had not been taken off and that some of the entries recorded in the log register of the station and the East cabin, which raise this possibility, were actually made in anticipation of the requirements.

7.3.4. Possibility of the movement of 978 Down against the signals

Having ruled out the other possibilities, the only other possibility could be of 978 Down moving against the signals, although the Driver has denied this. According to him the arms of the Distant and Home signals were at 45 degrees and both these signals were showing single yellow light, since one light of the Distant signal was extinguished. He also saw the main line Starter signal showing green.

7.3.4.1 The trials carried out by me indicated that on account of a curve between the Distant and Home signals, the latter could be sighted only after covering some distance after passing the Distant signal. It was observed that the Home signal could be sighted from a distance of about 413 metres and after covering another 30 metres, the main line Starter signal could also be sighted. Since the weather was windy and rainy and the Home signal appears to have been dimly lit (as stated by the Driver and the Guard), it is quite possible that the Driver may have had difficulty in sighting the Home signal leading him to reduce the speed of the train after passing the Distant signal. Since the point from where the Home and Starter signals become visible are close to each other, there is every possibility of the Driver having seen the green aspect of the main line Starter signal (which had been taken off for the departure of 4 SL) even before he could see the

Home signal. He may then not have particularly bothered to look out for the Home signal and presuming the starter signal to have been taken off for his train, he picked up speed.

7.3.4.2. The following discrepancies in the statements of the Driver and the Assistant Driver of 978 Down raise further doubts regarding their credibility :—

- (i) In his statement, the Driver stated that the Distant signal was at 45 degree showing signal yellow. Since the normal aspect of the Distant signal at 45 degrees should have been double Yellow, during cross-examination, the Driver put forward the plea that one light of the Distant signal was extinguished. If this was so, he should normally have said so in his statement.
- (ii) The driving crew have stated that 4 SL was visible to them when their train was only about 150—200 metres from it whereas during the trials carried out by me, it could be sighted from a distance of about 410 metres.
- (iii) They have stated that the speed of the train had been reduced to about 15 kmph whereas according to the Guard, it was about 40—45 kmph. Had the speed been reduced to 15 kmph, it should have been easily possible to stop the train and avert the accident.
- (iv) The Driver has stated that he did not see any tail lamp on 4 SL whereas the Leverman of West cabin has confirmed seeing the tail lamp from the cabin i.e. from a distance of about 345 m. The damaged tail lamp was recovered from the damaged coach in my presence.
- (v) The Leverman of the West cabin has stated that he showed the danger signal when he saw 978 Down coming against signals. The Driver has however, stated that he saw the lamp showing white light and that the Leverman was trying to change the aspect of the lamp. It is not possible for the driver of a passing train at night time to observe such action on the part of Leverman in the cabin particularly when the cabin has no electric light. The statement of the driver appears to be intended to cover up his lapse for not exchanging signals with the cabin.

7.3.4.3 In view of the above, I am unable to rely on the statements of the Driver and the Assistant Driver of 978 Down that the reception signals had been taken off for their train. On the basis of the evidence as discussed above, I feel convinced that the train was driven past the signals at ON leading to the collision with 4 SL which was starting from the main line of the station.

7.4 Lapses of train passing staff.

In the course of the inquiry, serious lapses in the working of some of the staff came to notice as indicated below :—

7.4.1 Shri V. K. Bhatnagar, A.S.M., Bandhua Kalan

- (i) As observed from the train signal registers of Bandhua Kalan and Sultanpur, he had given the 'Train entering section signal' for the departure of 4 SL even before the train had left his station and entered the block section. He has admitted that he did so on hearing the starting whistle of the train which is not correct. In accordance with G.R. 335, the 'Train entering Section signal' should be given when the train leaves the block station i.e. when it enters the block section.
- (ii) For the movement of Down Super Goods, he had given private numbers 44 and 66 to the East cabin and level crossing no. 79 respectively, but these numbers did not exist in his private number book.
- (iii) For granting line clear to Down Foodgrain Special, he had given private no. 52 to the West cabin as recorded in both the log registers but the number actually scored out was 353.
- (iv) The purpose for which the numbers were utilised had not been indicated in the private number book.
- (v) As indicated at item (f) under para 7.3.3.1, he failed to transmit the key to the West cabin to enable the points in the rear of 4 SL being set towards the loop line as required vide S.R. 37/8.

- (vi) The ASM appears to be in the habit of recording entries in advance in the station records as discussed at item (a) of para 7.3.3.2 above.

7.4.2 Shri Shambhoo Nath, Leverman, East cabin :

- (i) As discussed at items (b) and (c) under para 7.3.3.2 above, he appears to have the tendency to make entries in advance in the log register and giving complete departure reports of trains even before their actual departure.
- (ii) The purpose for which the private numbers were given had not been indicated in the private number book.

7.4.3 Shri Panna Lal, Leverman/West cabin :

- (i) He had recorded private numbers incorrectly in his records. For reception of Down Foodgrain Special, he had recorded the number as 57 against 75 given to him by the ASM and for receiving Down Super goods, he had recorded the number as 78 against 79 given by the ASM.
- (ii) For granting line clear for 978 Down, he had given private number 39 to the ASM but the same was not recorded by him in his log register. He had also not recorded the other entries pertaining to this transaction.
- (iii) The purpose for which private numbers were given had not been indicated in the private number book.
- (iv) He did not make any effort on his own to have the key transmitted to him to enable him to set the points in the rear of 4 SL towards the loop line to comply with S.R. 37/8.

VIII. CONCLUSION

8.1. Cause of the accident

On careful consideration of the factual, material and circumstantial evidence, I have come to the conclusion that the collision of 978 Down goods train with the rear of 4 SL passenger at Bandhua Kalan station on 28-6-1982 was primarily cause by 978 Down having been driven past the signals without their being taken off for its reception. However, if the down facing points had been set and locked towards the loop line as required vide S.R. 37/8, the accident would have been averted.

8.2. Responsibility

(i)* Shri P. L. Yadav, Driver of 978 Down goods train is held responsible for the collision for his failure to observe signals and not keeping a good look-out as required vide General Rules 76 and 122 (extracts reproduced at Annexure-II).

(ii) *Shri Prem Prakash (I), Driver of 978 Down goods train is held responsible for not keeping a good look-out and assisting his Driver as required vide General Rule 122.

(iii) Although not primarily responsible for the accident, Shri V. K. Bhatnagar, ASM failed to transmit the key to the West cabin after the arrival of 4 SL to enable the points in rear being set towards the loop which could have averted the accident. He is also guilty of other lapses as indicated under para 7.4.1 above.

(iv) Although not directly responsible for the accident, S/Shri Shambhoo Nath, Leverman/ East cabin and Panna Lal, officiating Leverman/West cabin have shown serious negligence in performing their duties as indicated under para 7.4.2 and 7.4.3 above.

8.2.1 Shri P. L. Yadav, Driver was appointed as Clearner on 5-8-1947 and promoted as a 'C' grade Driver on 4-8-1973. He was put to work on diesel locomotives after completing his training on WDM-4 locos in March 1968 and on WDM-2 locos in March 1975. He had passed the refresher course in March 1978 and had last attended the safety camp in September 1972. During his service, he has been punished thrice, the last being in 1976 for disregarding signals while working on a goods train.

*Since acquitted by CJM/SLN.

†Since Convicted by CJM/SLN.

8.2.2 Shri Prem Prakash (I), Assistant Driver was appointed to railway service as a Cleaner on 15-2-1968 and promoted as a Fireman Grade 'B' on 8-11-1979. Although his substantive rank is still as Fireman Grade 'B', he has been working as an Assistant Driver on diesel engines in local arrangement after having been trained on WDM-4 locos in March 1981.

8.2.3 Shri V. K. Bhatnagar, ASM was appointed to railway service as a Clerk on 7-8-1963. He was promoted as an ASM on 31-8-1971 and has been working in this capacity at Bandhua Kalan since 16-7-1978. During his service he has been punished on six occasions, once for showing wrong timings and on another occasion for keeping the signals dimly lit.

8.2.4 Shri Shambhoo Nath, Leverman/East cabin was appointed to railway service as a Box Porter on 1-2-1959. He was promoted as Leverman on 3-8-1974 and has been working in this capacity at Bandhua Kalan since 5-1-1979. He passed the refresher course in October 1979 and attended Safety Camp in October 1980. During his service, he has been punished twice, for sleeping on duty and for unauthorised absence.

8.2.5 Shri Panna Lal, officiating Leverman/West cabin was appointed as a Leave Reserve Porter on 5-12-1978 and still holds the same position. He has been deputed to work as Leverman at various stations in short-term vacancies for which competency certificate No. 127 dated 26-3-1979 was issued to him by A.O.S. (General) which had expired on 28-2-1982. He had worked earlier also as Leverman at Bandhua Kalan for 3 days in September 1981 and 12 days in November/December 1981. On the date of the accident, he did not have a valid competency certificate to work as a Leverman.

8.3 Relief arrangements

I am satisfied that the relief arrangements and medical attention to the injured were satisfactory.

IX. REMARKS AND RECOMMENDATIONS

9.1 978 Down goods train started from Khanalampura on 27-6-1982 with a load of 34-67 and it was issued Vacuum Brake Certificate No. 323145 by TXR/Khanalampura after an intensive examination. Sixteen wagons were attached to the train at Iqbalpur station but neither any further train examination was carried out nor any revised brake power certificates issued even though the train had covered about 628 Kms. after leaving Iqbalpur. Since the composition of the train had been substantially altered, the load should have been offered for train examination again at the next examining point and issued a fresh brake power certificate.

9.2 The train was named as Down E/Box when it started from Khanalampura but on the Lucknow division, the nomenclature was changed to 978 Down goods (in some records it was indicated as 976 Down), although the train continued to run with the same load and on the authority of the same brake power certificate issued from Khanalampura. Such changes in nomenclatures of loads lead to confusion and in skipping train examinations as brought out in the inquiry report of the collision of 163 Up Sangam Express with a derailed wagon of 452 Down goods train on the Northern Railway on 30-10-1980 (refer paras 49 and 56 of the inquiry report).

9.3 Lucknow-Sultanpur-Zafrabad section carries mainly down direction traffic and it was noted that when the accident occurred, there was a continuous stream of down trains following one behind the other. As per Railway Board's letter No. 77/W3/SG/G/9 dated 23-5-1978, the provision of 'One-Slot-One-Train' and 'One-Slot-One-Starter' is desired to be provided at stations on the trunk routes and important main lines. Although Lucknow-Sultanpur-Zafrabad section does not fall in this category, it is recommended that the traffic pattern on this section be reviewed and, in case the movement of trains following each other in quick succession is frequent, the provision of 'One-Slot-One-Train' and 'One-Slot-One-Starter' at stations on this section should be considered. Even if this is not considered justified at all stations on the section, it is recommended that the same should be provided at Bandhua Kalan and other similar sections where the visibility of signals is restricted due to curves or other local features.

9.4 In view of the curve between the Down Distant and Home signals which restricts the visibility of the Home signals, it is recommended that a suitable permanent speed restriction should

be imposed from the Down Distant Signal upto the point from where the Home Signal can be clearly sighted.

9.5 It has been frequently observed that the staff do not indicate the particulars of transactions for which a private number is given and sometimes the numbers are either not scored out or scored out in a group at a time instead of doing so as and when they are conveyed. This should receive special attention of the inspecting officials and the defaulting staff pulled up.

9.6 Some of the other shortcomings which came to notice are indicated below for necessary action by the Railway administration :—

- (i) Level crossing No. 83-C within station limits of Bandhua Kalan had been shown as unmanned in the Rule Diagram whereas it was indicated as manned in the station working rules.
- (ii) In the 'Note' at page 22 of the station working rules, it was indicated that a magneto telephone was being arranged to be provided at Level crossing No. 83. In case the same has been provided, correction slip to the working rules should be issued incorporating the working procedures.
- (iii) Level crossing No. 83-C situated near the West cabin is provided with gate-leaves which are operated by the Leverman who come down from the cabin. It is recommended that lifting barriers operated by a winch from the cabin be provided to avoid the need for the Leverman to come down every time for opening/closing the gate.
- (iv) Unmanned level crossing Nos. 80 and 81 at the Sultanpur end of the station are provided with chains and the normal position of the gates is 'closed' to road traffic. For passing road traffic, the chains are opened by the Pointsman from the station. This arrangement is not considered satisfactory as there is every likelihood of the gates being left open. A traffic census should be taken to consider if manning of the level crossings is justified. Since the level crossings are not far from each other, it may be examined if only one of them be retained by constructing a connecting road.
- (v) A copy of the competency certificate should also remain with the staff so that it can be readily produced when staff are deputed to work at other stations in temporary arrangements.
- (vi) Even though 4 SL was a short distance passenger train, since the SLR had been provided, it should have been marshalled in the rear of the train instead of second from the rear to provide safety marshalling.

Sd/-

(SURESH CHANDRA)

Dated : February 8, 1983.

Commissioner of Rly. Safety
Northern Circle, Lucknow

(ANNEXURE-I)

COPY OF THE JOINT OBSERVATIONS RECORDED BY THE SENIOR SUBORDINATES
AFTER THE ACCIDENT

NORTHERN RAILWAY

BDKN

Dt. 28-6-1982

West cabin at BDKN was found locked. It was broken by C&W staff in presence of AEN/
SLN, SS/SLN and WRFO/SLN and checked the lever position as under :—

Pull lever

23 Detector lever main line No. (2).

16 Lock on points No. (14).

Slot—Normal position.

Rest found in normal position.

Mlock instruments (Stn.)

SHNG side :—Train coming from SHNG.

SLN side :—Train going to SLN.

Token No. 28 (SLN side) was personal possess in 4 SL P. Driver.

Slot—Pulled No. (8) for DN starter.

Key No. *(3) in transmitter (Down).

Sd/-

Sd/-

WRFO/SLN
28.6.82

SS/SLN
28.6.82

True copy.

Sd/-

Assistant Engineer
Northern Railway, Sultanpur

**EXTRACTS OF GENERAL RULES 76 AND 122 AND SUBSIDIARY RULE 37/8 OF THE
GENERAL AND SUBSIDIARY RULES, 1981" OF THE NORTHERN RAILWAY**

G.R. 76—Driver to obey signals and to be vigilant and cautious—

(a) The Driver shall pay immediate attention to and obey every signal whether the cause of the signal being shown is known to him or not.

(b) He shall not however, trust entirely to signals but always be vigilant and cautious.

G.R. 122—Driver and Fireman to keep a good look-out—

Every Driver shall keep a good look-out while the train is in motion, and every Fireman shall also do so when he is not necessarily otherwise engaged.

S.R. 122/1—

(a) The Driver and the first fireman of the Diesel Asstt. or Assistant Driver, as the case may be, shall identify each signal affecting the movement of the train as soon as it becomes visible. They shall call out the aspects of the signals to each other.

(b) The Diesel Asstt. or the Assistant Driver or the fireman shall, when not otherwise engaged assist the Driver in exchanging signals as required.

(c) Provisions of (a) & (b) above shall, in no way, absolve the Driver of his responsibility in respect of observance of and compliance with the signals.

S.R. 37/8—Setting of points against blocked line—

When a running line is blocked by stabled load, wagon, vehicle or by a train at the station, cross or give precedence to another train or immediately after the arrival of a train at the station, the points in rear on double line section and at either end on single line section should be immediately set against the block line except when shunting or any other movement is required to be done on that line.

If all the lines at a station happen to be blocked when line clear has been granted to a train the points should be set for the line occupied by a stabled load or a goods train in that order.

In case all the lines at a station are occupied by passenger trains, points should be set for a loop line. In such cases points should be preferably set for a loop line occupied by a train, whose engine is facing the direction of approach of the incoming train.

REVIEWS OF THE RAILWAY BOARD ON VARIOUS PARAS OF THE REPORT

2. Cause and responsibility :

2.1 The findings as to the cause of the accident and responsibility therefore as indicated in paras 8.1 and 8.2 of the report are *prima-facie* acceptable.

3. Remarks and recommendations :

3.1 Para 9.1 : Train Examination and Brake Power Certificate :

The recommendation made by CCRS is accepted. Instructions have been issued to the Railways to ensure that whenever any change in the composition of trains takes place at any station or in any section, the Guard and Driver should check the brake power of the train at the station where the train composition has changed. In addition, if the change in composition is 10 wagons or more, a fresh brake power certificate should be issued by the competent train examining staff at the next train examining station in the direction of the movement.

3.2 Para 9.2 : Nomenclature of a Goods train :

The recommendation made by CCRS in this regard is accepted. The Railway Administration have been asked to introduce a system of nomenclature to indicate type of C&W examination given to the train i.e. the number of the train should be prefixed by 'Y' when intensive examination has been given, 'S' when safe to run examination has been given etc.

3.3 Para 9.3 : Provision of One-Slot-One-Train and One-Slot-One-Starter at Bandhua Kalan :

Provision of One-Slot-One-Train and One-Slot-One Starter is linked more with quantum of traffic than with condition of visibility for which other remedial measures are available. Due to adverse ways and means position these are firstly being provided on trunk routes and important main lines where the density of traffic is very high.

Provision of these facilities on other sections will be considered only after the station on trunk routes and important main lines have been covered. For the present, therefore, provision of this facility at Bandhua Kalan which is on a branch line with comparatively less traffic is not being considered.

3.4 Para 9.4 : Permanent speed restriction from Down Distant Signal to the point from where the Home Signal can be clearly sighted at Bandhua Kalan :

The Railway Administration have explained that the visibility of the Home Signal at Bandhua Kalan is more than the minimum laid down. The imposition of permanent speed restriction is therefore not called for at this place.

3.5 Para 9.5 : Particulars of transactions for which private number is given :

Detailed instructions on the subject have already been issued by the Railway Administration. The inspecting officials are required to ensure strict adherence to the procedure laid down for writing details of train movements on the Train Signal Register and Log Books as well as scoring of private numbers after showing the specific movement against each private number. The Railway Administration has since been asked to ensure strict implementation of the instructions.

3.6 Para 9.6(i) to (v) : Level crossing gates over the section :

The Station Working Rule Diagram has been corrected indicating Bandhua Kalan as manned. This has been noted by CCRS. Telephonic communication has also since been provided at the level crossing No. 83. The work for lifting barriers at level crossing No. 82-C through a winch from the West Cabin has been proposed by the Railway Administration, who have been asked to expedite the work. A traffic census has been arranged at level crossings gate Nos. 80 & 81 and the question of manning these level crossings or closing one of the level crossings is under examination by the Railway Administration who have been asked to expedite. As desired, instructions have been issued by the Railway Administration for leave reserve and rest given staff to carry the competency certificates with them while they come on duty on a particular station.

3.6.1 (vi) : Marshalling of SLR :

Fresh instructions have been issued to the Railways that in case of short trains running with single SLR the SLR whether anti-telescopic steel bodied or not should be marshalled in the middle. If there are 2 anti-telescopic or steel bodied SLRs, one should be marshalled in the front and the other in the rear.

PRI-301
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