

SUMMARY

1. Date	15-02-1991	
2. Time	08.55 hours	
3. Railway	Northern Railway	
4. Gauge	Broad Gauge	
5. Location	At Karchana Station	
6. Nature of accident	Derailment	
7. Train involved	2311 Up Howrah-Katka Mail	
8. System of operation	Absolute Block System	
9. Speed	106 KMPH	
10. Number of tracks	Double Line	
11. Gradient	Level	
12. Alignment	Curve	
13. Weather	Fair	
14. Visibility	Clear	
15. Casualty	Killed	15
	injury : Grievous—	28
	Simple	48
16. Cost of damage	Rs. 60,50,000/-	
17. Cause	Locomotive taking 'No Road' at the first facing point which was not set and locked.	
18. Responsibility	<ol style="list-style-type: none"> 1. Shri Nageshwar Prasad, ESM, Karchana. 2. Shri Indramani Kushwaha, ESM's Khalasi, Karchana. 3. Shri Asha Ram Shukla, ASM, Karchana. 4. Shri Ramji, Switchman, Karchana (East Cabin). 	
19. Important	<ol style="list-style-type: none"> 1. Forceful implementations of instructions to prevent unauthorised interference with interlocking. 2. Improvement in quality of signalling and interlocking systems and their interfaces with track to bring down the rate of failure. Norms for acceptable level of failures may be considered. 3. Review of Mechanical interlocking systems to make vulnerable connections proof against facile delinking. 	

(i)

सारांश

1. दिनांक	15-02-1991
2. समय	08-55 बजे
3. रेलवे	उत्तर रेलवे
4. भामान	बड़ी लाइन
5. स्थान	करछना स्टेशन
6. घुर्घटगा का प्रकार	अवपथन
7. प्रभावित गाड़ी	2311 अप हावड़ा-कासगा मेल
8. कार्यप्रणाली	पूर्ण ब्लॉक पद्धति
9. गति	108 कि० मी० प्रति घंटा
10. रेल पथों की संख्या	दोहरी लाइन
11. ढाल	समतल
12. संरक्षण	घुमावदार
13. मीसम	साफ (स्वच्छ)
14. दृश्यता	स्पष्ट
15. हुताहत	मृतक-15 घायल : (गम्भीर-28 साधारण-48
16. नुकसान का मूल्यांकन	₹ 60,50,000/-
17. कारण	कृपया संलग्नक "अ" देखें।
18. उत्तरदायित्व	1. श्री नागेश्वर प्रसाद, विद्युत सिग्नल मेंटेनर, करछना । 2. श्री इन्द्रानि कुशावाहा, सलासी (विद्युत सिग्नल मेंटेनर) करछना । 3. श्री आशा राम शुक्ल, सहायक स्टेशन मास्टर, करछना । 4. श्री रामजी, स्विचमैन (पूर्व केबिन), करछना ।
19. महत्वपूर्ण संस्तुतियाँ	कृपया संलग्नक "ब" देखें।

संलग्नक "अ"

Locomotive taking 'No Road' at the first facing point which was not set and locked.

संलग्नक "ब"

1. Forceful implementations of instructions to prevent unauthorized interference with interlocking.
2. Improvement in quality of signalling and interlocking systems and their interfaces with track to bring down the rate of failure. Norms for acceptable level of failures may be considered.
3. Review of Mechanical interlocking systems to make vulnerable connections proof against facile delinking.

Government of India
Ministry of Civil Aviation
Commission of Railway Safety
Northern Circle

To,

The Chief Commissioner of Railway Safety,
LUCKNOW.

Sir,

Sub. : Deraiment of 2311 Up Kalka Mail at Karchana Station on 15-02-1991.

In accordance with Rule 4 of the Statutory Investigations into Railway Accidents Rules, 1973 (issued under Ministry's Notification No. RS-13-T(8)/71 of 19-04-1973), I forward, my Report on the derailment of 2311 Up Kalka Mail at Karchana Station on the Mughalsarai Allahabad Broad Gauge Main (double) Line Section on the Allahabad Division of the Northern Railway at about 08.55 hours on 15-02-1991.

1.2 Inspection and Inquiry :

1. Being informed of the accident at Lucknow by the Senior Divisional Safety Officer of the Lucknow Division at about 10.30 hours, I left Lucknow by a special train at 12.30, reaching Allahabad at 15.45 and the site at about 17.00 when I had a preliminary inspection of the location of derailment and the derailed rolling stock in the company of the Chief Engineer (East), the Chief Engineer, the Chief Signal & Telecommunication Engineer and the Chief Motive Power Engineer (R&L). I had another, more detailed, inspection the next day in daylight when I issued instructions for preservation of clues and joint observations and tests by a team of Railway Officers from different departments and by the Deputy Commissioners, (Mech.) and (Signalling) in the Technical Wing of the Commission. I also visited the injured passengers undergoing treatment in the Swaroop Rani Nehru Medical College and in the Railway Hospital at Allahabad the same evening.

2. Notifications were issued in newspapers circulating in the area advertising the Statutory Enquiry, advising those interested to give evidence either during the Enquiry or by written statements sent to my office address. The following Officers were present during the Enquiry which I commenced at Allahabad on the 19th and continued there on the 20th and 21st.

- (i) Shri K.K. Gupta, Chief Safety Superintendent.
- (ii) Shri Kanwarjit Singh, Chief Engineer (East).
- (iii) Shri B.R. Sachdev, Chief Signal Engineer.
- (iv) Shri P.D. Narula, Chief Motive Power Engineer (R&L).
- (v) Shri V.K. Agarwal, Chief Electrical Engineer (Loco) (on the 21st).
- (vi) Shri K.N. Jain, Chief Signal & Telecom. Engineer (Const.) (on the 21st).
- (vii) Shri P.K. Wahi, Divisional Railway Manager, Allahabad.

3. Divisional Officers were called in as required. The Railway Administration had reportedly advised the District Magistrate, and the Superintendent of Police, Allahabad about my Enquiry by telephone.

1.3 The Accident

On 15-02-1991, while 2311 Up Kalka Mail was on its run, in fair weather with clear visibility, from Mughalsarai to Allahabad, the locomotive and 12 coaches derailed at Karchana Station six coaches capsizing. Nine coaches remained on rails. The Up Main and Up Loop lines were badly damaged, the locomotive coming to rest between these lines short of the East cabin of the Station while the capsized coaches were flung beyond the Up Loop line, one of them striking a tree with a resultant severe bend in its body.

1.4 Casualties

I regret to report that, as a result of this accident 15 people died and 76 were injured, 28 grievously, these casualties were mostly among the passengers in the coach which struck the tree and among the workmen engaged by a contractor on deep screening and sleeper renewal on the Up Loop line.

II. RELIEF MEASURES

2.1 Intimation

First information was conveyed at 09.00 hours to Control at Allahabad by the Switchman at Block Hut 'A', the Station in advance of Karchana. The Accident Relief Medical van and Accident Relief train were ordered and all concerned informed by Control by 09.10 hours; the Indian Telephone Industries unit at Naini was requested for vehicles to transport injured persons.

2.2 Medical Attention

The Railway's Accident Relief Medical Van was despatched from Allahabad at 09.45 and arrived Karchana at 10.10. At 09.20, the Railway's ambulance based at Allahabad left for Karchana and more medical staff followed by road vehicles, reaching the site at 09.50. The Accident Relief Medical Equipment reached the site at 10.10 and left for Allahabad at 11.00, carrying 28 seriously injured persons. 26 of these were admitted in the Railway Hospital at Allahabad where the ARME arrived back at 11.45. (Two of the injured expired on the way). Other injured passengers were taken by road (after First Aid at the site) to the S.R.N. Hospital, Allahabad where one of these expired during the night of the 15th.

2.3 Restoration

1. The main lines were cleared at about 15.10 on the 16th, 816 Down being the first train to pass at 15.50. The Up loop was cleared later.
2. As a result of this accident, 32 trains were cancelled on different sections up to the 17th Feb., and 28 trains were diverted via Varanasi.

III. THE TRAIN

3.1 The train was hauled by a WAM4(P) class (COCO) Locomotive No. 20680 manufactured at Chittaranjan in 1978. It was fitted with air brakes, a Hasler speedometer in working order and a Vacuum braking system for the trailing load.

3.2 The trailing load consisted of 21 coaches, all of ICF make, as indicated in Annexure-I. The coach immediately following the locomotive and the 20th coach were Second class -cum- Luggage-cum Rake van (SLR), while the last vehicle was a slip coach.

3.3 Disposition after the Accident

1. The locomotive came to rest, after derailling by all wheels, between the Up Main and Loop line short of the East Cabin, about 250 m. from the facing point.

2. The first coach (7900 SLR) was derailed by all wheels, The next coach (9270 GS) derailed and capsized to the south of the Up Loop, both bogies being dislocated. The third coach (9280 GS) also was flung beyond the Up Loop, its body striking a big tree and getting badly bent and broken as a result. The fourth coach (1229 WCB) came to rest square to the loop, the bogies getting badly damaged. The fifth coach (8565 WGSCW) derailed by all wheels and turned, blocking the Up Main and Loop. The sixth coach (8584 WGS CNY) derailed by all wheels and was flung south of the Up Loop. The seventh, eighth and ninth coaches, 7676 WGSCN, 7632 WGSCN, 7648 WGSCNY respectively were derailed by all wheels and came to rest to the south of the Up Loop, but did not capsize. The tenth coach (1877 WFC) derailed by all wheels to the South of the Main Line (between the Main and the Up loop). The eleventh and twelfth coaches (1139 WGACCW and 1148 WGACCW) also derailed; the first by all wheels on the Main line and the second by all wheels of the Delhi and bogie on the same line.

3.4 Damage

a. Locomotive

On the locomotive, the equaliser No. 13 (on the right side of the leading bogie) had fallen off and was found about 40m. behind the locomotive when it came to rest. The battery box and batteries were damaged. Gear cases 1, 3, 4, and 6 had ruptured. The front cattle guard and the rear pantograph were also damaged whereas the brake hanger and brake block of wheel no. 5 had fallen down. There were hit marks on the left wheels of the two leading wheel sets. Cost of damage has been assessed at Rs. 5,51,000/-.

b. Trailing Load

On the first coach (7900 SLR) the end panels were ruptured, the Delhi end draw bar and one buffer plunger broke and the head-stock got bent. On the second coach, (9270 GS) the body had bulged and under-gear fittings were smashed. On the third coach (9280 GS), the body had struck a tree and was bent, leading to casualties. On this coach one draft link was broken but the draw bar hook was intact, holding the screw coupling. The draft gear assembly with bracket was pulled out and the head stock was bent. The south side buffer was uprooted and draw bar broken. On the fourth coach (1229 WCB), the Delhi end panel was smashed and draw bar assembly uprooted. The Howrah end draw bar hook with screw coupling worked out. On the fifth coach, (8565 WGSCN) the body panel was smashed, head stock got bent and the end panel collapsed. The draw bar hook of Howrah end had broken and remained (with shank intact), hanging with the sixth coach (Delhi end). The draw bar assembly at Delhi end was intact. On the sixth coach (8584 WGSCNY) also the body had bulged out. The draw assemblies of both ends were intact. On the next three derailed coaches, bogies had worked out and under-gear damaged, where on the remaining three derailed coaches there was no serious damage, total cost of of damages, having been assessed at Rs. 45,00,000/-.

3.5 Other Damage

1. Permanent Way was damaged to the extent of one set of sleepers for 1 in 12 turn-out, one tongue rail, 150 (60 Kg) PRC sleepers, 200 m. 60 Kg. rail and 200 m. 52 Kg. rail on CST 9 sleepers. Cost of damage has been assessed at Rs. 9,50,000/-.

2. Two masts supporting the overhead electrification were brought down and four cantilevers damaged. Cost of damage has been assessed at Rs. 47,000/-. Damage to signalling installations was minor and confined to the 'clearing' bar and derailing switch on the Up Loop and some rod run. Cost has been assessed at Rs. 2,000/-.

3. Total damage thus works out to Rs. 60,50,000/-.

IV. LOCAL FEATURES

4.1 The Site

The derailment occurred on the facing point of the Up Loop at Km. 806/23 at Karchana Station which is 134.8 Km. from Mughalsarai and 18.2 Km. from Allahabad. Track at the location of derailment is on a compound curve, curvature varying from 0.56 degree to 0.875 degree on an embankment about one metre high, made up of alluvial soil. Track consists of 60 Kg. rails on pre-stressed concrete sleepers in the yard and of 52 Kg. rails on pre-stressed concrete sleepers towards Mirzapur. Sleepers have a density of 1660 per Km. under 60 Kg. rails and 1540 per km. under 52 Kg. rails. The turnout is of 52 Kg. rails with straight fixed wheel switches, laid in 1975, with steel trough sleepers. All track is ballasted with stone cushions varying from 200 to 300 mm.

4.2 The Section

1. The Mughalsarai-Allahabad section runs generally East to West and is part of the Rajdhani route from New Delhi to Howrah, worked as (orthodox) Double Line traction being (overhead) electric at 25 KV AC.

2. The Divisional Railway Manager and other Divisional Officers and the Traffic and Traction Power Controls are located at Allahabad. The Assistant Engineer is headquartered at Mirzapur. There is one P. Way Inspector at Meja Road and another P. Way Inspector in a Junior Grade is headquartered at Karchana where the Permanent Way gang is also headquartered. There is an Electrical Signal Maintainer posted at Karchana whereas the Mechanical Signal Maintainer is at Meja Rod, 20.2 kms. away. The Signalling Inspectors and Officers are at Allahabad.

4.3 System of Working and Interlocking

Karchana is a Double Line Station of the B Class, interlocked to Standard III and equipped with Multiple Aspect Colour Light signals consisting of an Outer, Distant, Inner Distant, Home, Starter and Advanced Starter for each direction (Up and Down). The Up direction has an additional Home signal. Points and lock bar, are operated by rodding from two Cabines, one at each end. The Main Lines are track-circuited and track between Starters and Advanced Starters are provided with axle counters in both directions. The section is worked on the Absolute Block System using Double Line Lock and Block instruments operated by Switchmen in the end Cabins, which have inter-cabin slotting along with Station Master's control.

V. SUMMARY OF EVIDENCE

Evidence relevant to the accident is summarised below:

5.1 Aohyuta Nand Dwivedi, resident of Kapchhua, stated in a written communication, that on 15-02-91 he was going to Naini with his friend. When he was near the east cabin of Karchana, he saw the occurrence of the accident where P. Way gang was working. He saw some of them running with tools like "Sabbal" and "Gainta". In the opinion of the witness, the accident had occurred due to SABBAL left on the track by the workmen because some people were seen searching for the broken part of Sabbal.

5.2 Ram Pyaro Singh, resident of Karcha, stated that he was standing on Up Line platform of Karchana Station (10 metres away from the mast No. 807/7), to board the passenger train for Allahabad. Kohli, PWI passed him with his two men between the two Lines. Witness wished him; he can recognise the two men but did not know their names; when Kohli reached near mast No. 807/5, the train derailed.

5.3. Krishna Kumar Dubey, Supervisor employed by the Contractor, first sent a written communication and was subsequently examined at New Delhi on 21-03-91 and at site on 11-04-91. He changed his version of the location where work was in progress at the time of derailment. According to his last statement after verifying the location at the site, his labour was working not beyond four metres to the west of the derailing switch near mast No. 806/1001. Witness lives at Allahabad and went to work by the morning Passenger. On the 15th (Feb.), he reached at 08.30 and went to the work site to distribute work. The PWI was near the Cabin; some of his labour had started opening the track on Up Loop. The work allotted was deep screening and sleeper renewal. At about 08.50, the engine of Kalka mail derailed with a loud noise at the facing point and started coming towards the Loop. Witness fell down while trying to run from the approaching locomotive and was injured. He stated that he saw an employee of the signal department at the detector box, but was not able to identify any one when shown the following (Signal Staff), Shambhu Nath/ESM-I, Shripal/Blacksmith, Omprakash/Patel/Khalasi, Rameshwar/Thakur/Khalasi, Valmiki/Vishwakarma/Khalasi, Rajaram/Hammerman, Janakraj/Khalasi Indramani Kushavaha, Khalasi, Rajman/MSM and Nageshwar/ESM.

5.4. Raziul Rahman, Driver of 231 P Up stated that he took over at Mughalsarai all equipment was in order. The train left Mughalsarai at 06.58. At Mirzapur the Assistant Engineer and PWI came into the cab. Approaching Karchana, the Distant Inner Distant and Home signals were showing Green. Witness passed the routing Home also showing green and was preparing to exchange signals with the cabin, when the engine jumped at the facing point with a jerk. Witness applied emergency brakes. When the locomotive came to rest he sent the Assistant Driver to the ASM's office to arrange for protection of other tracks as flasher light was not working due to damage to battery box. Proceeding to the East Cabin, witness found the switchman absent. The telephone was not working. Then witness went to the Station where the ASM told him that he had informed Control. Fearing violence from the crowd which had collected at the station, witness hid in a field until Railway officials came. PWI Karchana was seen talking on the Portable Control Phone. Witness also then talked to TLC at 10.25. Answering questions, witness stated that a P. Way Gang was working on the Up Loop. Witness did not tell Control that he had seen a 'gape' at the facing point. Witness later submitted a sworn affidavit, generally confirming these facts.

5.5. Rajendra Singh, Assistant Driver of 231 H Up corroborated the evidence of the Driver adding that, approaching the facing point the speed was 106 KMPH and that the Routing Home Signal was showing Green with Route Indicator unlit. When witness reached the ASM's office, he heard the PWI asking why the train was allowed to run through when he was called to check the point. There was no one working on the turn-out; one gang was working on the Loop about 1 mast away from the point.

5.6. Mewala, Driver of 5114 Up left Mughalsarai at 04.30 on 15-02-91 and passed Block Hut 'B' at 07.08. He waited 07.11 to 07.16 at Karchana Home due to Red aspect of signal and passed at 07.19 but did not get any jerk; reached Allahabad at 07.55 hours.

5.7. Bajrang Kumar, Driver of DBSI/975 left Mughalsarai at 02.45 on 15-02-91 and passed Block Hut 'B' at 08.28. He got Karchana Home Signal 'Green', late and passed through at 08.34. He did not get any jerk and reached Allahabad at 09.35 hours.

5.8. S. L. Sonker, Guard of 2311 Up stated that the train stopped at 08.57, with a jerk, his SLR being in the middle of the three coaches outside the facing point. Though injured, witness took his First Aid box and went to the ASM's office to send information to all concerned. The ASM's telephone was not working. Witness came to the cabin; the

Switchman was absent. He noted the lever positions in the Cabin Log at 09.05. Levers 9, 11 and 12 were found pulled though witness wrongly wrote 9,10 and 11 in the cabin log. He did not notice whether the relay room was open and did not see any point indication in the cabin.

5.9 Asha Ram Shukla, Assistant Station Master, Karchana, stated that he was on duty from 00.30 to 09.00. Up Badarpur was received on Up Loop. East Cabin took permission for Line Clear for 5114 Up. Witness asked West cabin to lock the Gate and run the train through. At 07.12. East cabin informed that the normal indication of the facing point was not lit. The ESM came to the Station at this time to get his 'movement' and was told about the failure. He quickly took the relay room key and went away. East Cabin was also informed accordingly. East cabin then informed witness that the indication had come and that all points and locks were set and signals were lowered. Area Control was also told about this, because the PWI's gang was working near East cabin. 5114 Up passed at 07.22 then 4083 and DBSI at 08.32. At 08.41. East Cabin informed him about 2311 Up. Witness asked West cabin to run the train through. All signals were taken off for through run. The derailment occurred at 08.56 near East Cabin. Witness informed Control through the West Cabin and Block Hut A as Control and TPC phones were not working. The Station Master came at 09.00 and sealed records. All employees on duty and otherwise were running to the site. At this time, the ESM was seen at the Station; he gave the relay room key and went running towards the site.

Answering questions, witness stated that normally relay room keys are not given without entering the register, but that day a mistake was made. It was not correct to run the train through when the relay room key was out, but witness thought that points were set and locked properly as the East cabin Switchman had informed him. Witness did not see the PWI or any of his staff when the ESM brought the key back. All employees had left for the site. Witness again confirmed that the ESM handed over the key of relay room after the accident. There was no signal failure during his duty at night and no signalling staff of Meja Road was seen by him at night. Daya Shanker was ASM on duty before him. Information about failures of Axle Counter and Gates at night is sent to ASM/Meja Road through Control. The ESM/MSM, Meja Road are given memo and when they came to the Station memos are served. After rectifying the failure, entries are made in the Signal Failure Register. Gate No. 30 B is a busy Gate; people and road vehicles like cycle, rickshaw, scooter and Tempo cross the road lifting the barriers causing accidents. OPT-373 for Starter and OPT-60 for the passage between Starter and Advanced Starter are being used at the time of axle counter failures.

5.10. Krishna Chandra Mishra, Relieving Assistant Station Master, Allahabad, stated that he had been sent for relief work on 15-02-91 at Karchana and reached at 10.25. On 16-03-91 or 17-03-91 Mitthu, Gangman of Gang No. 18 told him that crow bar which collided with the engine of 2311 Up was kept with Mithai Lal. Witness informed Mr. B. D. Shukla, Station Master, Karchana. On 20-03-91 at about 19.00 hours, GRP and RPF, Allahabad collected the crow bar from the quarter of Mithai Lal. On 06-04-91 Mitthu told the witness that on 15-02-91, fish plate of Main Line was opened for doing some work by four men (S/Shri Latta, Keyman S/o Sri Sadho, Paras Nath S/o Sri Ram Karan, Ram Dhani S/o Sri Ram Deo and Hira S/o Sri Purushottam) and 2311 Up came and derailed when work was going on. Witness informed Sr. Divisional Safety Officer, Allahabad.

5.11. Ramji, Switchman, was on duty in the East Cabin. From 01.00, he passed 13 trains without any problem. When he did not get indication for 5114 Up, he informed the ASM but ASM did not exchange Private Number. Shri Asharam Shukla was the ASM on duty, who sent Nageshwar Prasad, ESM to the Cabin. ESM went into the relay room. Some time later, the indication came and then there was no problem in

lowering signals. He passed three trains i.e. 5114, 4083 and DBSI. He was standing with handflag for waving to 2311 U₃ when he saw the train passing the point and derailling. U₃ to this time, ESM was present in the relay room. He left after the accident following witness when he was running towards the Station seeing the mob (of passengers). Witness informed the Assistant Station master.

Answering questions, witness stated that Private Numbers are normally exchanged with the ASM for failures as on 5114 U₃ and until the ESM comes and rectifies after opening the relay room, trains are run on OPT-373. The ESM took three or four minutes to come to the relay room from the time of his complaint to ASM and indication came when ESM was in the relay room. After receiving U₃ Budhaur on U₃ L₃, he set point No. 8 for Main Line and pulled lever No. 9 (Lock bar lever) but did not get indication for Main Line. Then he informed Shri Asha Ram, ASM who said he is sending the ESM, but did not give a Private Number. Witness went to the point by cycle; the point was set and locked. When he returned witness saw ESM in the relay room doing something and told him to not do any-thing but ESM said he had the authority of the ASM. Witness telephoned the ASM who told him to allow the ESM to work. When he went back to the cabin, indication for Main Line was available and he pulled lever Nos. 11 and 12 and passed 5114 U₃ which was waiting outside. For 4083, DBSI and 2311 U₃, witness had kept lever No. 8 in the normal position. Lever No. 9 was out back to release the Block Instrument and pulled for every train. Levers 11 and 12 are put back after every train and pulled for the next train. For 11, slot is given by ASM and West Cabin, and for 12 by Gateman. 4083 and DBSI passed his cabin at full speed. He did not exactly know the number of disconnection memos issued. He again confirmed that the ESM was present in the relay room at the time of accident. When witness was running away after the accident, he saw the relay room door open. In the experience of the witness, Signal Staff never came to the Cabin to set the lever midway to adjust points. He had nothing further to say about the accident.

5.12. Dhani Ram, Switchman, was on duty in the West Cabin from 08.00. He got information of the occurrence from the ASM and informed Block Hut A to inform all concerned as the ASM's phone was not working.

5.13. Shyam Krishna Malviya was on duty at West Cabin of Karchana Station on 14-02-91 from 16.00 to 24.00 hours shift. The handle of Gate winch in his Cabin had broken; he informed the ASM and MSM rectified it.

5.14. Bhagwat Giri, Section-Controller, Allahabad was on duty from 16.00 to 24.00 hours shift on 09-02-91. Witness stated that at 18.32 Home Signal of Karchana became RED itself for U₃ E/BTI and lowered at 18.36 after slotting. Then there was no any failure upto 24.00. The information of failure to the ESM is being given by the concerned SM/ASM through Memo and they also inform the Signal Inspector of Test Room and they make arrangement to convey it.

5.15. A. P. Chakrabarty, working as CTLC, came on duty at 09.15 and got busy arranging Relief Train. The Driver involved could not be contacted due to failure of telephone at Karchana; but talked to him at 10.25 on TPC Emergency circuit. The Driver told witness that all signals were green; the speed was 105/106 kmph; he experienced heavy jerk and the accident took place. The driver could not give the position of derailed coaches and OHE as he had not checked them and it was not safe for him to go there. The Driver further said that AEN and PWI, MZP were in the cab.

5.16. Nageshwar Prasad, Electrical Signal Maintainer, Karchana stated that he went to the office of ASM at 07.00, noted 'movement' and talked to Test Room, Allahabad. Asha Ram Shukla, ASM was asked about failures; witness saw SI-14; there was no failure. He then went to his quarter to take tea and returned at 08.45 to his tool room on the

west side of the Up Line platform. After some time, his Khalasi (Indramani Kushawaha) came to the tool room for duty. Shortly after, another Khalasi, Om Prakash Patel, came from Allahabad by 4008 Down. When he was marking attendance of his khalasies and was preparing to go to work, he heard the bell ring in ASM's office and some commotion. He went to the ASM's office and came to know of the derailment. When he was going to the site with his Khalasies from Up line platform, he saw a mob and returned back to the ASM's office to inform Test Room. No telephones were working except site phone. He saw Shumbhoo Nath, ESM and Ram Dhiraj, TCM, Karchana in the office. Shumbhoo Nath advised relaying of information through Block Huts A and B. He went to the site with Shri Nasir, Sectional Signal Inspector, Allahabad and his Khalasies later on and saw the locked East cabin. He saw point No. 8 set for Main Line, Lock No. 9 was completely set and a coach was standing on the point in the Main Line. The seal of EPD was alright and one fish-plate on first joint on Allahabad side from the toe was opened.

Answering questions, witness stated that he opened the seal of lever of point No. 11 for cleaning; he did not remember the date. He could not seal it due to lack of lead seals. He got seals on 06-02-91 but was busy with other works. He gave a list of works from the 6th to the 15th. Getting to know of a defect on points he goes to the point and checks for obstruction. He checks it from the cabin if there is no train and if the point is out of adjustment he tells ASM to call for MSM because he has no knowledge of mechanical adjustment. Witness sealed the detector box of point No. 8 on 09-02-91 and there was no obstruction when tested on that day. When asked about the fresh oil on the fusing point lock plunger and shining seal of detector box on 15-02-91 witness stated that oiling work is done by the MSM and he had nothing to say about the seal. On 11-04-91, witness stated that he was in his house preparing food (as his wife was away) before proceeding to his tool box at 08.40.

5.17. Indra Muni Kushawaha, Khalasi of ESM, Karchana came to the tools room, situated at Up Line platform, at 08.45 and met his ESM who was present there. After some time Om Prakash Patel also came. ESM told him to go to Down Advanced with his tools. After some time there was commotion in the Station and the bell started ringing. Going to the ASM's office they came to know about the accident. They started for the site, but fearing an angry mob coming from the other side, returned to the ASM's office where they stayed until the Signal Inspector came. When they went to the point No. 8 with SI and ESM, ESM told him to sit away from there and he did so. Witness did not remember anything after that: (Witness refused to say anything further in spite of utmost persuasion. He appeared terrified and had originally brought a statement obviously written by someone else which he consisted he had written. Apparently, an unreliable witness with something to hide).

5.18. Om Prakash Patel, Khalasi of ESM, Karchana, reached Karchana by 4008 Down from Allahabad at about 08.45 and went to the tool room and met with his ESM. After some time, he heard ringing of bell and knew about the accident, He went to the site when Mr. Nasir, SI came.

5.19. Rajman, Mechanical Signal Maintainer, Meja Road, stated that on 12-02-91 he worked on both Cabins of Karchana and checked both Gates (30 and 31). On 13-02-91 and 14-02-91 his duty was at other Stations. On 15-02-91, he was coming to Bhirpur by 1 CA Passenger from Meja Road, came to know about the accident of 2311 Up Kalka Mail when his train stopped at Block Hut 'C' and returned back with the same train reaching Karchana at 11.15 by the truck of PWI.

5.20. Ram Chander, ESM, Meja Road when asked about his presence at Karchana on 09-02-91 denied it, but when shown his T.A. Journal, he said it is his; further, he saw his

diary and accepted that on that day he was at Karchana. He went to Karchana by 4007 Up, reached at 21.20, went to Up side track circuit location with Nageshwar (ESM, Karchana) and rectified bond wire broken during sleeper changing, but did not make any entry in the register; that was a mistake by him. Nageshwar told him about the failure of track circuit at about 18.33 and 18.46 on 09-02-91; the cause of failure was not 4007 Up, reaching at 22.20. When asked (by witness) about the (reported) axle counter failure, the ASM replied that there was a failure which got rectified. He was in the ASM's office for some time and then went to the Platform in front of the office, spent the night without failures and returned back on the 15th morning by 3040 Down at 07.35.

5.21. Harbanah Singh, MSM (Night), Meja Road, stated that on 08-02-91 he was at Karchana and tightened up the loose nuts of Up Line lock-bar No.9 but did not make any entry in the register. On 12-02-91, he rectified the rod of West Cabin lock-bar No.9 of Karchana (by hammer) which was twisted. On 14-02-91 he maintained Gate No.31 C of Karchana (west Cabin) of which handle had broken but did not make any entry in the register. It was a minor defect and Gate was in closed position. When witness was asked about proof of his working mentioned above, he submitted only the memo for 12-02-91. He was not in a position to show any other record and said his diary had been lost.

5.22. A. K. Chakrabarty, Signal Inspector D-2 Allahabad received a message at 09.05 from Test Room. He talked to DSTE and started for Karchana with DSTE and SI Section at about 09.45 and reached at 10.30. He saw the point and found it properly set and locked. One fish plate was missing. At about 1300 hours, PWI,—MJA, TI, MZP AND CTRX ALD came for joint observation. PWI, MJA was creating obstruction for joint observation along with other PWI. After being warned by ADRM-II, joint observation was completed at 22.30 and joint note signed at about 23.30.

About the conductors for the indicator circuit seen without insulation in the East Cabin, witness stated that the VI wires have been eaten by insects, and since the wire is inside a wooden channel, it has not come to notice at the time of inspection.

5.23. Mohd. Nasiruddin, SI (Sec) I, Allahabad, stated that at about 09.10, he received information from Karchana through Test Room. Witness proceeded to the site with SI (D-II) and DSTE, reaching at about 10.30. He went to the East Cabin which was locked. Through the glass door, he found all levers in normal position except levers 9, 11 and 12 which were pulled. The Block Instrument position was not visible. Proceeding to the point, he found it correctly set and locked for main line and trap in open condition. There was no damage either to the switch or signal fittings connecting facing point 8 and lock No.9 for the Main Line, but at the trap point, P. Way and Signal fittings were damaged and broken. Heel block connecting switch and stock rail was missing. Outside fishplate was lying between 'stock' of main and loop line. Bolts of fishplate were not found at site except one. There was clear striking mark of wheel on lead rail—its position was staggered due to non-availability of fishplates. Electrical point detector and its fittings were not damaged. Detector cover was sealed; SI (D-II) instructed witness to make assessment of broken/damaged materials.

Answering questions, witness stated that on the way he collected VHF set from Test Room at 09.50 and went straight to near the East Cabin, because test room told him (on VHF while approaching the Yamuna Bridge) of the derailment near the point. DSTE and SI (D) went to the point and he went to the Cabin and saw the position of levers through the glass of the locked door and returned back to the point where DSTE was available. At 11.00, when he went to ASM's room he found Nageshwar Prasad and his two Khalasies there, Shambhoo, ESM who had come from Allahabad by 4008 Passenger (to locate the PILC cable) was on the Down Platform. Witness had not specially noticed

fresh oil on the facing point lock and did not remember about the seal on the EPD. Many times, minor problems on rod-operated points are solved throwing the lever; otherwise MSM has to be called if the Switchman, who has to go and check the point, does not see any obstruction which he can clear. There is no standard list of tools provided to the ESM but Pliers, nose pliers, box wrench, 3/8" wrench 1/2", screwdriver, obstruction piece, multimeter, shunt resistance and "Simit" are provided. ESMs do obstruction test alongwith MSM usually with 1/8" obstruction piece and if indication comes with obstruction, detection slides are to be adjusted. In the opinion of the witness, derailment occurred due to missing fishplate (outside was lying 1 m. away and inside was not there). He did not definitely know anything about the fish bolts but one bolt was lying there. The bolt of Delhi end lock-bar clip had fallen down; the nut must have become loose. The extended bracket was not moving fully after the accident due to obstruction by ballast on rodding. These are 12 to 14 cases per month of train detentions at Karchana as at Moja Road also. At Bhirpur failures are 5 to 6; differences are mainly due to axle counters (which fail more than track circuits) and to P. Way work. If block is required, disconnection momos are not accepted, but for checking for 10 to 15 minutes there was no problem. The strength of flying gang has to be increased (taking into account the traffic load) to rectify the wear and to renew worn-out gears.

5.24. Atul Kumar, ASTE, Allahabad, stated that he received information at 09.15 through Test Room. Proceeding to the site by the Relief Train, he reached at 10.50. Going to the East Cabin, he found the basement locked. He went to the site and found rescue work in progress. Point No.8 and lock 9E were correctly set and locked for Main Line and one AC coach was standing covering the point on Main Line. Witness observed that there was no damage or hit mark on switch or stock rail (which were properly housed upto five sleepers on Main Line) or on S&T fittings at toe of switch. The lock bar was in pulled condition and lock plunger was fully plunged. The detector was properly sealed. The left hand heel block was missing and its bolts broken. Fishplates connecting left hand switch rail and straight lead rail were missing. One well greased fishplate with no marks on its holes was lying 0.5m away. There was a wheel mark on left lead rail which was dislocated from its position. Tran point was open, with no point of mount on tongue rail. Two OHE masts between Up Main & Loop were damaged (before km. 807/1) by derailed coaches. PRC sleepers and rails of Main Line were badly damaged.

Answering questions, witness stated that he did not remember whether the ESM had told him that ballast was opened out under the point; he did not see track opened out.

5.25 A. Pandey, AEN, Mirzapur, stated that he was in the cab of the locomotive. While approaching Karchana, witness was observing the work on the Up Loop. The loco derailed when it entered the facing point zone and started going towards the left of the Main Line, damaging the electric masts. When the loco stopped, witness got out with the Driver, Assistant Driver and PWI Mirzapur (who was also in the cab). The Driver stated, when asked how the loco derailed, that the point was not set properly and the train took two roads. The PWI also confirmed this. Witness saw eleven coaches derailed. Going into the East Cabin, witness found no Switchman there. Communications were out. Going to the ASM's office, he found Senior DOS, Howrah trying to inform Control. PWI Karchana told witness that he had heard ESM Karchana talking with his two Khalasies near the East Cabin that there was a gap in up facing point; according to the PWI, the relay room door was open and was closed (after the accident) by the ESM who went towards the ASM's office telling his Khalasies not to tell anyone about this matter. The Distant was showing double yellow but became through afterwards. The derailment took place at 0855; witness went to the cabin at 09.05, but did not note the position of the levers and indications.

5.26 V. K. Singh, PWI, Mirzapur, boarded the cab of the loco of 2311 Up with his Assistant Engineer. When his train was approaching the facing point at Karchana at 110 KMPH speed, he saw a gape between the left hand tongue rail and the stock rail. He was wondering how, with such gape, signals had lowered, when the derailment occurred. When the train came to rest, the Assistant Engineer asked the cause of derailment from the Driver and Driver R. Rahman told him about the gape in the point; witness went to the point at 10.15, after the Accident Relief Train reached. At the point, he saw left hand tongue rail in set position. The fish plates linking tongue rail and lead rail had separated. The inner side fish plate was there but the outer one was not. All bolts were broken. There were wheel marks on the distance blocks and some of them were lying below the cess. Witness did not note the position of facing point lock after the accident.

5.27 A. K. Kohli, PWI/- Karchana, stated that, while he came near the East Cabin by the Up Main Line from the Delhi end, inspecting the track, he saw the ESM, Nageshwar Prasad talking loudly with his Khalasis who were coming from point No. 8 and saying the point is not set properly and that there is a gap(c) in the point. Witness told them that the signals should not be lowered but the Switchman said they were lowered and train was coming. At that moment the train came—witness went to the Up loop and saw the train derailing on the Up Loop. While witness was rushing to inform SM and all concerned, he saw the relay room door being locked by ESM who got his key out with difficulty and rushed to the Station with his khalasis, telling them not to tell anybody. Witness went to the Station, arranged rescue work and while returning, saw AEN, Mirzapur and Sr. DOS—HWH and informed them of the facts. The Driver informed TLC from emergency tap at 807/27, in the presence of witness, that he saw gap in points, but could not stop in time. Witness learnt that there was trouble in the point since morning and they were attending to it. He sent Goma Lal, Keyman to km. 804/12 to call the P. Way gang.

Answering questions, witness stated that work on deep screening and sleeper renewal was in progress on the Up Loop from km. 807/1015 towards Howrah since 04-02-1991. On the 15th, work was at km. 806/29—31. The labour usually start at 09.00. A 'block' of 6 to 7 hours is obtained. The ESM's Khalasis were about 30m away from the East Cabin towards HWH. Witness did not check the position of levers and indications in the East Cabin, but rushed to the Station. No complaint was made to witness about the point involved. He went there about one hour after the accident and found the point set for Main Line with one coach on turnout. Switches were clear of wheels. Returning 15 minutes later, he found the point locked. The left hand switch rail was worn, but within the limits of lateral wear of 6 mm. His Trolleyman Hari Shankar had told witness that, from 40 Down in which he was sitting, he saw ESM going to East Cabin.

On 22-02-91, Inspector, RPF came and saw the muster sheet of Gang 18. According to witness, minor adjustments of points are done by ESM and Khalasis. Witness had learnt that ESM attended the point on the night of 14/15-2-91, coming by 4007 Up.

5.28 A. Chakravorty, PWI, Meja Road, stated that he got down from 1 CA passenger at Block Hut 'C' and rushed at 10.00 by road to the site, reaching at 11.00. When met his AEN & PWI Karchana, P. Way gang No. 18 was deputed to protect the evidence, and witness was thereafter asked to prepare sketch, track readings and joint note, of which witness submitted a copy of each. There were seven coaches standing behind the coach over the lock bar.

5.29 Chhote Lal, Trolleyman of PWI, Karchana stated that when he came to the East Cabin with his PWI and Dilraj, Trolleyman, counting rail joints from the West Cabin, he saw Block Fitter(ESM) standing without his Khalasis. Both upper and lower doors of the East Cabin were open. Later he saw both (ESM) khalasis running towards the Block Fitter from the east side, saying there is a "JHIRP" in the facing point. In between,

there was conversation between Block Fitter; Switchman and PWI. After he heard the rd "JHIRI", the Kalka Mail derailed. The AEN met him when he was running towards the station after the accident.

5.30 Hari Shanker, Trolleyman, stated that on 15-02-91 he was going to Meja Road by 3040 Down. When he boarded the train, he found the Block Fitter (ESM) running towards the East Cabin. At Meja Road he came to know of the accident to the Kalka Mail; he told his PWI that he had seen the Block Fitter running, probably because there was something wrong with the signal. Witness also saw Ram Chander, staff of Signalling Department posted at Meja Road, on the same train in which he was.

5.31 Lalta, Keyman saw the block Fitter (ESM) examining an open small box on the south side and waving his arms to the Cabinman when he was returning from Km. 806, checking his Down Line. Later on, he heard of the accident.

5.32 Goma Lal, Keyman, stated that Shri Jagdish, Mate met him at km. 805 when he was returning from his beat. Mittho Pasi was also in the gang. He did not see any gang working near the facing point at about 08.30. Lalta was making his meal in his quarter when he returned to his quarter.

5.33 Mithai Lal, Gangman of Gang No. 18 found a crowbar and three balast rakes buried near a Mango tree (Pole No. 806/29) on the south side of track on 17-02-91 while returning from his night duty. After 15 days, he told his mate about these things which were with him upto 20-03-91. Police arrested him with those materials and released him on 21-03-91, after taking his thumb impression but on a statement. He did not know what the policeman had written on the statement on which he gave his thumb impression. The crow-bar was not much damaged.

5.34 Dinesh Kumar, Permanent Way Mistry, Karchana stated that he was on rest from 13-02-91 to 14-02-91 and on 15-02-91 he came to Allahabad by Prayag Express and reached Karchana by Tompo at 10.00. When he was returning again for site from the residence of PWI, he met with Assistant Engineer, Mirjapur at the east end of platform and then worked according to his supervisor's instructions.

5.35 Paras Nath, Gangman, stated that on 15-02-91 he was told by the Mate to work with the Contractor's gang as Flagman. He went to the Contractor's tent at 08.30; some of the labour were eating whereas others had left for the site. Witness also collected his equipment and went to the site by the Up Loop. Near the East Cabin, he saw PWI Kohli and ESM talking to each other. He could not hear the conversation. The relay room door was open. The Switchman was sitting in the Cabin. Two trolley-men of the PWI were also there with the PWI. (Witness was shown Nageshwar Prasad, ESM and confirmed that he was the person talking to the PWI). When the train derailed, witness ran back home.

Answering questions, he stated that the work of deep screening was being done to the west of the derailing switch. When he was going back, he saw the SM and ASMs going towards the Cabin. Witness did not see any signal staff working on the point. The Contractor's man did not open any rail joint; they are not able to do so as they do not have wrenches. The permanent Gang was working far away.

5.36 Jagdish Bahadur, Mate of Gang No. 18, stated that he distributed overhauling work to his gang at km. 804/10-14 at about 8.30. At about 10.00 he came to know about the accident of Kalka Mail through Goma Lal and went to the site with his Gang, as per instruction given by his PWI through Goma Lal.

Answering questions, he stated that he did not see any-one working on the track; he went to his work site on a bicycle by road. He knows the Signal staff. Further, he stated that if there is minor signalling work, the staff of Karchana do it; otherwise staff from Meja Road do it. ESM, Karchana has also some tools for such work. The work of adjusting points is done by removing pins between stretcher bar and rodding and between lock bar and facing point lock.

5.37 Bharat Lal, Gangman working with the Contractor, stated that when he was going to the work site at 08.30 he saw Mr. Kohli talking with a man (in the presence of two trolley-men) on the north side of the Cabin. He could not hear their conversation. The doors of the cabin, both upper and lower were open and the Cabinman (Switchman) was standing in his Cabin.

5.38 Bajrangi Lal, Gangman working with the Contractor stated that he started work 60 metres before the facing point at 08.45. When he was coming to the site, he saw three men working near the point. At this stage, eleven persons were called in three groups witness recognised only Indra Mani, Khalasi of ESM as working near the point.

5.39 Ram Karan, Gateman, stated that he was on duty at Gate No. 30B from 08.00 hours. His Gate and signals were working properly. 2311 Up passed his Gate safely with full speed on Main Line.

5.40 Mitthu, Gangman of Gang No. 18 stated that, after getting tools from Jagdish Bahadur, Mate at 07.00 hours on 15-02-91 the Gang went to work at Km 804/12-14; while going to work, he saw Lalta, Keyman on the Line at about 07.00 hours. When they were doing over-hauling work at Km. 804/12-14, at about 10.30 Goma Lal came and asked them to go to site of accident. They reached at 11.30.

Answering questions, witness said that he is residing with Lalta in quarter No. 17, allotted to Lalta, Keyman. On 13-02-91-14-02-91 he worked in the night and in the day time of 14-02-91 was in the office of SSP, Allahabad. He entrained at Karchana at 08.30 and reached at 10.00; returned back to his village at 20.00 and took rest at night. On 15-02-91, in the daytime he was working with the Gang, where he reached by cycle from his village and in the night he worked as Chowkidar. Witness again confirmed that he saw Lalta Keyman at Km. 806, one pole east from his tool, box, returning from Down Line to the west.

5.41 Babu Lal Ojha, Inspector, GRP, Allahabad came to know about the accident at 09.20 through phone and reached site at 11.00. In his opinion, derailment occurred due to some obstruction on the point, left by Contractor's gang working near the point of Loop Line. The Contractor refused to divulge details of his employees who were killed or injured. Railway Officials are trying to establish sabotage. There was no red flag, detonator or Railway Supervisor when work was in progress on the loop line. It has been stated by passengers and others that the engine got a jerk at the point and came on the Loop Line. Witness enclosed a list of casualties.

5.42 S, N. Singh, Inspector, Railway Protection Force went to Karchana on 22-02-91, on the basis of an informer and met PWI, Kohli, who was asked about the accident to 2311 Up. Witness saw the Muster sheet of PWI's staff where he saw 'R' marked on the sheet against the name of Mitthu Passi, Gangman on 15-02-91. When he asked about his rest on 15-02-91 when he was seen on the day of the accident on spot. Mr. Kohli told witness that Mitthu was not on duty that day; he was on rest. When witness asked Mr. Kohli that Mitthu has given rest on muster sheet to hide something about the clue to the accident, after thinking for sometimes the PWI said no, it is not matter he was not on duty that day. Then witness told all things to his Assistant Security Commissioner and Divisional Security Commissioner.

On 20-03-91 when witness was shown the muster sheet he said this (photo copy) was not the sheet which was shown to him on 22-02-91. There was 'R' marked against Mitthu there but on the photocopy it is 'P'.

5.43. Dr. P. D. Srivastava, the Railway's Medical Superintendent, at Allahabad, stated that a message was received in Casualty at 09.10 from Chief Controller. Witness reported to the ASM at 09.20 and left by ARME VAN AT 09.45 reaching at 10.10. Another Medical team had reached by road at 09.50. After rendering First Aid, 28 injured were brought to the Van which left the site at 11.00 reaching Allahabad at 11.45. Two of the injured died on the way and the rest were admitted into the Railway Hospital at Allahabad. Counting the injured admitted into other Hospitals, there were 24 grievous injuries and 53 simple injuries out of which one died. 15 others also died.

VI. OBSERVATIONS AND TESTS

6.1 Inspecting the site on the evening of the 15th, I observed that the facing point lock had fresh oil on it and remarked about this to the DSTE who said it is the oiling done on regular maintenance. I also noticed that the seal on the Electrical Point detector was bright; the next day I confirmed that it bore the mark of the ESM Karchana, Nageshwar Prasad.

6.2 Travelling in the cab of a locomotive similar to the one involved, I found that, approaching Karchana on a left hand curve, there was no problem with visibility especially for Signals and did not notice any particular feature of relevance to the accident.

6.3 Trying to spread the gauge at the toe of the facing point switch by a jack to test the integrity of the assembly under lateral loads, I found that the gauge did not spread significantly and no gap was created between stock rail and toe of switch.

6.4 The condition of wooden sleepers and fastenings at the stock rail joint was not very good. On the approach track on prestressed concrete sleepers, there was no feature discernible which could have contributed to a derailment. The left hand switch rail had been chipped and had perceptible lateral wear.

6.5 Measurements and other observations of the track and signalling arrangements were made by three joint teams separately—one of the Senior Subordinate level another of the Junior Administrative Grade level (from the Division) and the third of the Senior Administrative Grade level (from Headquarters). The locomotive and rolling stock were also subjected to measurements and joint observations where profiles of the locomotive wheels were plotted and its springs tested for deflection and stiffness. Observations and tests were also made by the Deputy Commissioners in the Technical Wing of the Commission in charge of the Signal and Telecommunications, and the Mechanical Engineering disciplines.

6.6 These observations indicated the following :

1. On the approach track, gauge varied from +3 to -3 mm, maximum variation between stations 3 m. apart being 3 mm. Cross levels varied from 27 to 30 mm, maximum variation being 2 mm between stations. Versines on 10 mm chord varied from 15 to 19 mm, maximum variation being 4 mm between Stations (nominal versine is 18 mm and super elevation 30 mm on this curve).
2. On the turn-out itself, gauge varied from +6 mm to -4 mm except on sleeper No. 20 where gauge was + 10. Super-elevation varied from 78 to 32 mm, upto the 25th sleeper. Thereafter it varied from +25 to -20, being damaged.

3. Sleepers 1 to 4 were wooden (Sleeper 1 being the first one from the Stock Rail Joint of the involved turnout); the first and second sleepers had two spikes deficient each. Other sleepers were steel turnout sleepers. The point was found correctly set, housed properly upto five sleepers (sleeper No. 5) in normal position and properly locked. Edge of the lock-bar was 150 mm away from toe of switch. There was chipping of tongue rail over a length of 80 mm starting at a distance of 290 mm from toe, maximum depth of chipping being 10 mm. On the right hand tongue rail no marks were found towards stock rail. The opening (throw) of switch on the right side was 110 mm. There were hit marks on the left hand 'U' stopper between sleepers 10 to 11 on the full length of 'U'. There was no gap between the left hand tongue rail and stock rail from sleepers 3 to 8, it varied from 8 mm at sleeper No. 9 to 120 mm at the end of the tongue rail at the joint.

4. The Electric Point Detector was found intact and sealed. On the lock bar, one bolt of the first clip from the toe of switch was missing. The leading starter bar with all fittings and rodding was found intact with no hit marks. The first and second stretcher bars were also intact without any hit marks. The toe of the switch had no hit or riding mark. There was no riding mark from stock rail joint upto the heel block. There was a grazing mark after 4 sleepers on the south face of the left hand tongue rail (housing side). There was hit mark on the 'U' stopper between sleeper No. 12 and 13. All fittings upto sleeper No. 14 were complete and tight. The left hand heel block between sleepers 14 and 15 was missing. Two heel block bolts were found broken into two pieces, with a hit mark on one bolt. The heel block was found at km. 806 / 27-29, 13 m. way from the Up Loop on the south side, about 50 m. away along the direction of the train. Hit marks were found on the foot of the stock rail below the position of heel block on the south side. There was a hit mark on the 'Z' anchor (which was deformed), and another in between left hand stock rail and left hand tongue rail over sleeper No. 16. All fittings were complete on sleeper No. 15. On sleeper No. 16, the left hand outside spike was lifted up and bent outside. The loose jaw on the inside of the switch rail was freshly sheared. There was one hit mark on the sleeper outside the left hand stock rail, one hit mark on the leading edge between the tongue and stock rail and a grazing mark on the non-gauge face of the switch rail. The first distance block on the left hand side between sleepers 16 and 17 was not in place. There were grazing marks on the web of the switch rail on the non-gauge face. The left hand switch rail was pushed inside at the joint with the lead rail which was ruptured (there was a versine of 16 mm on a chord of 2.7m from the end of the switch rail). The outer fishplate was lying in between the lead rail and stock rail about 1 metre ahead; this fishplate had its upper edge scabbled for a length of about 190 mm at the leading end. The inner fishplate was not seen, but one fish plate was later recovered from under coach No. 7676 (which was seventh from the locomotive and had derailed and come to rest to the south of the Loop Line). One distance block was found about 5 m to the south west of sleeper No. 70. The landing end of the lead rail at the ruptured joint had a mark 10 mm wide and 2 mm deep, for a length of about 150 mm.

5. On sleeper No. 17 the outside loose jaw of the left hand stock rail was missing and the inside spike of left hand tongue rail was freshly sheared. On sleeper No. 18 and 19, on the left hand side, both loose jaws were sheared. The third distance block between sleepers 19 and 20 had the nut of its bolt sheared and was broken at the leading edge; there were two distinct lines (presumably of wheel tyre edge) visible on the right hand stock rail between sleepers 17 and 19. On sleeper No. 20, there were hit marks between the tongue and stock rails, the loose jaws were contact on the tongue rail but the pandrol clip had worked out and was lying between this sleeper and the next. One spherical washer, two nuts and one washer were found between the tongue and stock rails between sleepers 20 and 21. The fourth distance block on the left side had its nut broken, whereas on the right side the nut and bolts were intact but the block was broken. The fifth distance block between sleepers 22 and 23 on the left hand side was missing and on the right hand side it was found broken. (one distance block was found about 15 m south west of sleeper No. 70 which is just ahead of the crossing). Rail fastenings which consisted of loose jaws and either pandrol clips or keys were either missing and or damaged from sleeper No. 22 to sleeper No. 56.

6. Clear wheel marks were available on the sleeper numbers indicated below between the lead and stock rails on either side :

of one wheel set on 20, and from 27 to 30, two wheel sets from 31 to 37, one wheel set from 38 to 43, two wheel sets on 44, one wheel set on 45, three wheel sets from 46 to 56, one wheel set on 58 (which is at the throat of the crossing) two wheel sets on 59, two wheel set on 60 which is near the nose of the crossing, one wheel set on 61 and two wheel sets on 62, one mark being on the left wing rail. The next wheel mark is of one wheel set on sleeper 65, one wheel being inside the right rail of the Main Line and the other inside the right rail of the Loop, this pattern continuing on the sleeper 66, whereas on sleeper 67, the left wheel had jumped over the right rail of the Loop and made a mark between the left rail of the Main Line and the right on the loop.

7. The minimum clearance of the lock bar which was 12.6 m long, and had 11 clips, varied from 30 to 34 mm from the rail top. On the radial guide for the lock bar, the rubbing mark over the cam path was towards the lock side (west) over a length of about 10 cm whereas there were no marks on the east half.

8. On the trap point on the Up Loop, the rod connections, crank, and lock bar were all found disconnected/damaged.

9. In the East Cabin, lever No. 9 (for lock on facing point) was fully latched in reverse position. Lever No. 11 for Up Main Home was in reverse position for movement on Up Main Line. Lever No. 12 for Up Home was also in reverse position. There were no indications in the cabin as power is supplied from OHE which was disconnected at the time of observation. Testing of interlocking by attempting conflicting movements of levers did not result in any deficiencies. The Block Instruments showed Down Line in 'line closed' and Up Line in 'train on line' position. The commuters was in 'train on line' position and could not be normalised.

10. The basement (containing the relays also) was provided with a double lock. All levers except lever No. 6 had circuit controllers; there was no seal on the circuit controller of lever No. 11 (Home signal) and the seals of circuit controllers on levers No. 10 and 12 could be taken out without breaking the seal. In the relay room which had double locks 8 NKR was found picked up corresponding to the Up facing point in normal position and locked; the relay was sealed but its anti-tilting device was defective. Relay 8 RKR was found dropped. The relays for slots from the West cabin and from the Level Crossing Gate were found dropped whereas the track relays 10/11 were found picked up (a coach was standing on the track circuit). All other relays were found dropped. On relay 11; DR contact No. 5 and 6 armature and 5 and 6 back were connected armature to armature and back to back with a piece of wire. After the mains supply was restored the indication for point No. 8 was normal with all levers normal except the lock lever 9 which was reversed.

11. At the electrical detector of the facing point one check nut was loose and sealing wire was tight over the nut and checknut.

6.7 The Dy. CRS (S&T) tested the functioning of the Signalling and interlocking arrangements and found them in order.

6.8 On the locomotive No. 20680 WAM 4 P, inspected by and tested under the supervision of Dy. CRS (Mechanical), partly at Ghaziabad loco shed, the following observations were made :

1. Both the bogies sustained damage at horn gap locations. All parameters of the geometry of the bogies were within specified tolerances. There was no damage to the centre pivots. Wheel profiles were recorded and revealed nominal wear; there were two dent marks on the two leading wheels on the left side. Coil springs were tested for hardness and for rate of deflection and were found within acceptable limits. One equalising beam between wheels 11 and 9 (right leading beam) was found disengaged due to shearing of tie-pin. Side bearers were intact. The general mechanical fettle of the locomotive bogies was of good standard and no factor which could possibly contribute to a derailment came to notice.

6.9 The Dy. CRS(Mech.) also inspected all the derailed coaches which were in accordance with specifications for running at 110 KMPH.

6.10 A trial was conducted at a similarly equipped Station (Guldhar) to observe the situation when a locomotive wheel of the type involved derails between the switch and the stock rails. A wheel set of WAM4 locomotive was used. It was observed that with the facing point unlocked and the route set for the Loop, a wheel could be dropped between the left hand side switch and the stock rails only after the switch rail was moved inside. When the flange of the wheel rested on the switch stop and the wheel tread was between the switch and stock rails, there was a gap of 3 mm on the right hand switch at the nose. The gauge spread from +8 to +10.

6.11 It was observed that even though the plunger of the facing point lock does not home fully, the indication comes on in the cabin. There was no permanent damage to the switch assembly after this trial.

6.12 A trial was conducted (in the Varanasi yard) to see the effect of a non-functional clip on a lock bar, the radial guide bracket being kept in the position at which it was found at the accident site. It was observed that, in the absence of a clip, lock bar with a wheel on it near the missing clip could be operated both in the locked and unlocked positions, the lock bar flexing sufficiently.

6.13 RDSO conducted a metallurgical examination of a broken welded joint found at site and concluded that the failure was not due to any metallurgical deficiency but was due to sudden unusual impact.

6.14 A trial was conducted to see the position when a (fishplate) joint on a 52 kg. rail is fastened using only one fishplate and one bolt. It was found that, even with full tightening, there was a gap of 18 mm between the fishplate and rail head, when the head of the bolt is in contact with the web of the rail.

6.15 A joint observation by Officers of the Signalling and Engineering departments revealed that gap of about 35 mm between the switch and the stock rails at the toe of the switch is clearly visible from the cab of locomotive running at 80 KMPH, and approaching the site of derailment.

6.16 A trial was done to see whether, in the absence of the heel block and first distance block, a lateral load can move the switch rail with a wheel standing on it. The switch rail did not override on the stock and the wheel did not drop.

6.17 During trials it was observed that to remove the heel and distance blocks after removing the fish plates took about 10-15 minutes when bolts were greased and 30-45 minutes when bolts were rusty, when a 'Z' (switch) anchor was not present. When such an anchor is fitted, the heel block could be removed only after the keys on the sleepers are taken out, the two (stock and switch) rails moved apart by three persons using crow bars and the block rotated to bring its thin end up. If the anchor is removed, it took about 18 minutes to remove the blocks. Bolting rails without the blocks resulted in a mis-match of the gauge faces of tongue rail and lead rail, such bolting taking another 30 minutes.

VII. DISCUSSION

7.1 Time of the Accident

1. The Driver's timing of arrival at Karchana is 08.56, and the Guard's 08.57, whereas, according to the watch in the speed recorder it is 08.54. I estimate the time of the accident at 08.55.

7.2 Speed of the train at the time of accident

1. The Hailer recorder in the locomotive indicated a speed of 106 KMPH. I see no reason to doubt this recording and accordingly estimate the speed of the train at the time of the accident at 106 KMPH.

7.3 Cause of the Accident

1. According to the Driver, he was concentrating on the Signals and preparing to exchange signals with the Cabin when the locomotive jumped at the facing point and derailed. He did not notice any gaps at the point, not having looked particularly there. The AEN, who was in the cab, was looking at the work in progress on the Up Loop (deep screening and sleeper renewal) some labour being already present at this time of the morning. His PWI, Mirzapur who was also in the cab was, however, looking at the point as he had been told by the AB to experience the riding on the better-maintained turnouts of PWI, Meja Road. He was wondering how a turnout would have such a gaping point as he saw, when the derailment occurred.

2. The PWI, Karchana, was evidently coming towards the work site on the Up Loop. When near the East Cabin, he saw the ESM talking to his Khalasies who were coming running from the involved point shouting that there was a gap. While the PWI was remonstrating with the Switchman, the derailment occurred. The Switchman denies the talk with the PWI but testifies that the ESM was in the Relay Room when signals were taken off for the train which derailed. The PWI evidently saw the ESM locking the Relay Room and going towards the Station after the derailment. The ASM admits to the ESM having taken the Relay Room keys in the morning when there was a problem for receiving 5114 Up Janta Express and to having received the keys back only after the accident, just before the Station Master came and seized the keys and other records. A koyman of the Engineering department who was returning from his early morning beat evidently saw the ESM doing something near the point and detector box. A trolleyman of PWI Karchana, who boarded 3040 Down saw the ESM going in a hurry towards the East Cabin.

3. The ESM and his khalasies vehemently deny having gone towards the East end of the yard before the accident but they are not able to produce any witness who has seen them elsewhere during this period. In short, the Engineering and Operating Department staff, in their evidences, point to an open relay room prior to and during the accident whereas the Signalling Department staff deny it.

4. Evidence is that, after the accident, the facing point was found set and locked for the Main Line with the rear coaches of the train standing properly on the straight route. There was no damage to the switch assembly, but fastenings between the left hand switch rail and stock rail as also behind the heel block were damaged. Wheel marks beyond the fishplated joint of the left hand switch and lead rails clearly pointed to a "no road" derailment, the left wheels of the locomotive rupturing the right rail of the Loop Line behind the crossing and then travelling on the cess, causing the locomotive and coaches behind it to veer to the left in derailed condition damaging the track of the Up Loop and the OHE masts in between, before coming to rest.

5. All blocks and bolts on the turnout were found generally near the locations where they are normally fixed, except for one fishplate, the heel block and two distance blocks which were found 50 m or more away (in the direction of motion of the train) from their original locations. There were no significant marks on the heel blocks and distance blocks.

6. Technical assessments of the cause of the accident were given by Chief Signal Engineer, Chief Engineer (East), Senior Divisional Signal and Tele-communication Engineer and Senior Divisional Engineer.

7. Broadly, three theories have been propounded :

(1) that there was adequate gap between the left switch and stock rails for the locomotive wheel flange to enter it and thus lead to a "no road" derailment.

- (2) that the derailment occurred due to the absence of the heel block, distance block and one fishplate, allegedly removed by the Engineering gangs without proper block and
- (3) obstruction on the rails perhaps by some tool left by workmen. A crow bar subsequently recovered from a Gangman of P. Way Gang No.18 was suspected to be involved.

8. Considering the evidence of the loco crew and the Assistant Engineer and Permanent Way Inspector who were travelling in the loco cab, and the marks on the left leading wheels of the locomotive, there is no doubt that it was the locomotive which derailed first. There also is no doubt about the path taken by these wheels ahead of the first fishplated joint from the switch whether the left leading wheels derailed at or after this joint and if not, whether they travelled on the straight switch or on the left stock rail from the toe of the switch to lead rail joint, are Points to be determined.

9. Considering the time of the day and the generally good standard of track on which the Rajdhani Express runs at 130 KMPH, I consider that likely causes of derailment such as failure of formation, sabotage or defective track on the approach can be ruled out. There was no evidence of any component falling out from any train which could have caused such an accident; nor is there any evidence of rail fracture. There is also no evidence of any defect in rolling stock which could have led to such a derailment.

10. It was seen that there are hit marks, a bit very light, on the first switch stop in between sleeper 10 and 11. It is at this location that, when the right wheel is on the right (correct) stock rail for the straight route, the distance to the gauge face of the left stock rail is such that there is no supporting rail under the left wheel, which comes down, pushing the left switch rail toward the middle of the track. This can, conceivably, cause rupture of the heel and distance block bolts and dislodge these blocks (A non-standard switch anchor, made out of an old tie-bar, was seen deformed enabling a block to be passed over it). The left wheels would then damage the fishplate and fishbolts at the joint between the switch and lead rails, creating enough space between these two rails, damaging the fastening which hold the switch rail behind the heel block, as seen. The head of the lead rail will also be hit, as seen. Physical evidence, thus points to the possibility the left wheel having entered between the left switch and stock rails at the toe. Grazing marks on the non-gauge face of the left hand switch rail were also evident. This possibility is supported by the evidence of the Permanent Way Inspector, Mirzapur who testified to having seen a gap. It has also been established by trials that it is possible to see a gap at such a point from a speeding train.

11. During the trials carried out at Guldhar with a floating wheel set, the wheel did not derail but a wheel under the locomotive's load will presumably drop when the gauge is wide enough.

12. Having observed some lateral wear on the left switch rail, I have also considered whether there was a possibility of the wheel mounting the switch rail and dropping in the gap between the switch and stock rails. I am of the opinion that the possibility of such mounting can be ruled out in view of the profiles of the switch rail and the wheels of the locomotive.

13. There is also no evidence that an obstruction by an object like a crow bar caused the derailment. A Gangman who was picked up by the Police with a crow bar found in his possession, stated that he found it away from the track. It is likely that tools of the Contractor's workman on the Loop came under derailed vehicles and got damaged.

14. The Senior DSTE of the Division had brought to my notice many factors which he claims to have heard from others, all leading to the possibility of a fishplate and the heel/distance blocks being absent at the time of the derailment, at the lead rail joint. After long discussion with this Officer when he had the opportunity to talk to the

staff mentioned by him, in my presence, it was seen that there was no reliable evidence either way. His theory of derailment, as finally expressed by him was that "due to absence of one fishplate and three bolts at the joint of the switch and lead rails, all the left wheels of the leading bogie of the locomotive jumped and while the switch rail was thus relieved of load, it came back from the position to which it had been pressed and deformed to the edge due to the absence of heel block and first distance block; caused the breakage of heel block and distance block bolts and the failure of rail fastening on the inside of the switch rail from heel block to rail joint and moved further to the right, allowing the rear wheel of leading bogie to drop in between left hand side switch and stock rail". I have considered this possibility but am not able to imagine how all the wheels of the leading bogie of the locomotive could remain in the air at the same time, so as to enable the switch rail to oscillate as suggested.

15. As seen during trials, the switch rail could not be moved significantly towards the stock rail even after removing heel and distance blocks and three fish bolts. Trials also showed that it takes two to three men about 20 minutes to remove the blocks when an anchor is present and another 20 minutes to put the anchor and other bolts back. The previous train passed at 08.32 hours and there is no evidence or rationale for removal of a fishplate and heel/distance blocks.

16. It is thus reasonably clear that there was a "no road" derailment of the left wheels of the locomotive. This could not happen if the facing points were set and locked as required and it has to be inferred that these points were not set and locked.

17. If this was the case, how did the signals for the train come off and more importantly, how were the rear coaches standing on the correct route over the involved facing point which was found (after the accident) correctly set and locked and without any damage?

18. As soon during the trial at Guldhar, the switch assembly will escape damage if a wheel is forced between the stock and switch rails, the switch rail deflecting adequately by, provided that the rodding from the stretcher bar to the point lever is disconnected.

19. Evidence is that the point gave trouble at about 07.19 detaining the Janata Express. The following Up train also saw signals first yellow and then green. The AEN in the cab of the affected locomotive has also testified that signals changed to green when he was looking at them. The ASM had given keys of the relay room to the ESM, who, according to the Switchman, was working in the relay room up to the time of the accident. The PWI also saw the ESM at the Cabin just before the accident with ESM's Khalasies coming running from the points. Though there are some discrepancies in the evidence, I am of the opinion after correlating it that everything points to ESM and his Khalasies being present in the relay room of the East Cabin, and near point at the time of the accident, these employees having no witness to testify to having seen them anywhere else during the crucial period. The behaviour of the ESM's Khalasi, Kushwaha while appearing at the Enquiry also was indicative of shock, confusion, guilt.

20. I have considered whether it is at all feasible to disconnect and unlock point when the Cabin lever(s) of the point and the lock bar are set and locked for a certain route. I find that this can be easily done by removing the cotter pins and bolts at the connection between the lock bar and the facing point lock and between stretcher bar and driving crank. It is also possible to reconnect these linkages even when coaches are on the turnout, provided the switches are clear of wheels which was the case when the rear vehicles of the affected train stopped. It is an easy enough procedure to take Colour Light Signals off, even though the required logic is not met, if access to the concerned relays is available.

21. It has to be assumed that the point got set for the Main Line when the fish-plated joint ruptured, pushing the toe end of the switch rail home, following wheels taking to right road, but derailing at the ruptured track near the crossing. This feature apparently facilitated reconnection of the linkages after the accident.

22. Considering these factors, I am of the opinion that the preponderance of probability is that the point was disconnected and unlocked at the time the train came to the facing point on signals, which were all taken off for a through run, such a situation arising out of unauthorised procedures adopted by the signalling staff.

7.4 Responsibility for such a situation would devolve on the Signalling and Operating Staff. Consequent to accidents arising out of unauthorised interference with interlocking systems by Signalling Staff in collusion with Train Passing Staff, the Northern Railway Administration had issued a number of instructions. In a letter (No. 81T/93/1/Safety Pt. III) dated 06-10-88, it was ordered that when a signal failure is observed in the face of an approaching train, trains shall be dealt with only by piloting. On 01-02-90 a Joint Circular ordered that while ASM's key of the relay room is out, the ASM must be extremely vigilant and should take all possible precautions in the course of reception/despatch of trains to see that an accident does not occur, even if there is some malfunction from inside the Relay Room. In every unusual situation of points/signal failure, the points were to be clamped and pad locked.

7.5 In an appeal by the General Manager to all Signal maintainers and ASMs it was expressly stated, inter alia, that ASMs key must not be given in the face of an approaching train when a failure is noticed.

7.6 In the instant case, the ASM has admitted to the relay room keys being given to the ESO in the face of the 5114 Up Janata Express when the point indication in the Cabin failed to appear, thus violating the instructions and appeals, apparently in an effort to avoid detentions, this being not an uncommon practice.

7.7 The Signalling Staff also violated extant instruction contained in General Rules, the Signal Manual and the Railway's communications that no work which interferes with any point, signal etc. should be undertaken without properly executed "Disconnection Memos" which will force the Operating Staff to observe necessary precautions when passing trains.

VIII. CONCLUSION

8.1 Finding :

On consideration of the evidence available, I am of the opinion that the accident occurred due to the locomotive taking "No Road" at the first facing point which was not set and locked as required, signals being taken off through use of unauthorised procedures.

8.2 Responsibility :

1. I am of the opinion that Shri Nageshwar Prasad, ESM, Karchana and Shri Indramani Kushwaha, ESM's Khalasi, Karchana are primarily responsible for this accident. Shri Om Prakash Patel, ESM's Khalasi is also considered an accessory. He was appointed only about three weeks prior to this accident and I consider this an extenuating circumstance.

2. Shri Asha Ram Shukla, Assistant Station Master, Karchana and Shri Ramji, Switchman, Karchana (East Cabin) contributed to the derailment.

3. The ESM violated GR 3.51(3), paras 723 and 1416 of the Signal Engineering Manual (1984)—which, I understand, are still in force—and instructions contained in Northern Railway Headquarters letter No. 342-Sig/87/2/Monitoring Team dated 30/31-03-82. The A.S.M. violated GR 3.68(1), GR 3.69(1) and (3) and instructions contained, inter alia, in Safety Circular No. 1/1990, and Joint Circular No. 403-T/114/Pt.II (Rules) dated 15-03-90. The ESM's Khalasi violated GR. 2.11(2) and GR. 3.51(3). The Switchman violated GR 2.11 (2) (a) and SR 3.68/1 a (v).

4. Their Service record is at Annexure II.

8.3 Relief Measures :

These were adequate.

IX. REMARKS AND RECOMMENDATIONS

9.1 On the Northern Railway there have been reportedly at least seven proven cases of unauthorised interference by Signalling staff leading to accidents calling for joint Enquiries, during the period April '88 to December'90, a very serious accident having occurred at shambhu for this reason in December, 1987. The Railway Administration have issued many instructions to eradicate such practices. These need to be implemented forcefully.

9.2 Apparently, the Signalling and Interlocking systems are prone to a rate of failure which the current level of traffic cannot tolerate and operating and signal (maintenance) staff tend to adopt short cuts and/or unauthorised procedures to avoid detention to traffic and consequent criticism/punishment, a 'signal failure' usually coming on record only if a train suffers significant detention' due to such a failure. An all-out effort to upgrade the quality of signalling and interlocking systems and their interfaces with track is indicated, so as to reduce the incidence of failures under extant conditions. According to the quality of equipment and the standard of maintenance, some failures are bound to occur; the Railway Administration may consider whether it is possible to fix norms for such failures which can be tolerated without the signal maintenance staff attracting punishment. Such a situation may, conceivably, remove some of the motives behind short-cuts and unauthorised procedures.

9.3 Arrangements at present facilitate quick and easy delinking of mechanical interlocking systems which may be reviewed to make vulnerable connections proof against such facile delinking.

DA : Annexure I&II
Extract of Rules.

Yours faithfully,
Sd/-
(K.J.N. KUTTY),
(Commissioner)

MARSHALLING ORDER OF THE TRAIN

Serial No.	Coach No.	Body & Type	Year Built	Date of Last POH
1.	7900 SLR	ICF A/C AT	1988	19-11-90
2.	9270 GS	ICF A/C AT	1988	20-11-90
3.	9280 GS	ICF A/C AT	1988	13-01-91
4.	1229 WCB	ICF A/C AT	1977	08-12-90
5.	8565 WGSCW	ICF A/C AT	1989	13-01-91
6.	8584 WGSCNY	ICF A/C AT	1990	25-08-90
7.	7676 WGSCN	ICF A/C AT	1990	19-10-90
8.	7632 WGSCN	ICF A/C AT	1990	17-02-90
9.	7648 WGSCNY	ICF A/C AT	1990	26-04-90
10.	1877 WFC	ICF A/C AT	1990	17-08-90
11.	1139 WGACCW	ICF A/C AT	1984	31-08-90
12.	1148 WGACCW	ICF A/C AT	1985	29-01-90
13.	1085 WGFAC	ICF A/C AT	1974	31-12-90
14.	1861 WFC	ICF A/C AT	1990	12-03-90
15.	1870 WFC	ICF A/C AT	1990	06-08-90
16.	7672 WGSOCW	ICF A/C AT	1990	25-10-90
17.	7629 WGSCNY	ICF A/C AT	1990	08-02-90
18.	5777 PPS	ICF A/C AT	1984	10-08-90
19.	9278 WGS	ICF A/C AT	1988	30-07-90
20.	7922 SLR	ICF A/C AT	1989	30-11-89
21.	7280 WGSCNY	ICF A/C AT		20-08-90

SERVICE RECORDS

1. Shri Nageshwar Prasad, Electric Signal Maintainer, Karchana :

Born on 14-08-1941 Shri Nageshwar Prasad, was appointed as Electric Signal Maintainer Grade III on 29-07-66 in the scale of Rs. 110-180. He was promoted as E.S.M. Grade II on 29-07-77 and declared suitable for the post of E.S.M. Grade I on 03-03-79.

He has been punished four times from 25-03-82 to 29-02-88 as below:

- (i) Point No. 10 and Lock No. 9 of Karchana failed due to bad maintenance.
- (ii) Inefficient Maintenance.
- (iii) Low level of electrolyte.
- (iv) Spiral spring of Block Instrument not replaced in time.

2. Shri Indramani Kushwaha, Khalasi, Karchana :

Born on 01-08-1952, Shri Indramani Kushwaha, was appointed as a substitute Khalasi in the scale of Rs. 196-232 on 18-08-79 and confirmed as Khalasi on 01-01-90.

No punishment or award is indicated in his record.

3. Shri Asha Ram Shukla, Assistant Station Master, Karchana :

Born on 31-07-1936 Shri Asha Ram Shukla was appointed as Shuntman on 15-10-57 and promoted as Leverman from 23-03-63 as Switchman in Grade of 125-155 from 17-02-71 and as Assistant Station Master on 11-03-79.

No punishment or award is indicated in his record.

4. Shri Ranji, Switchman, Karchana :

Born on 05-09-1953, Shri Ranji was granted authorised scale as Khalasi in scale of 195-232 on 09-11-76 in the Engineering Department. He was transferred to the Operating Department as Shuntman in the Grade of Rs. 210-250 on 28-07-80, posted as Leverman II in November 82 and promoted as Switchman in Grade 330-360 on 20-07-84.

No punishment or award is indicated in his record.

EXTRACTS FROM RULES

1. General and Subsidiary Rules :

G.R. 2.11(2) : Every railway servant who observes—

- (a) that any signal is defective,
- (b) any obstruction, failure or threatened failure of any part of the way or works,
- (c) anything wrong with a train, or
- (d) any unusual circumstances likely to interfere with the safe running of trains, or the safety of the public

shall take immediate steps, such as the circumstances of the case may demand, to prevent an accident, and where necessary, advise the nearest Station Master by the quickest possible means :

Provided that in the case of a train having parted, he shall not show a stop hand signal but shall endeavour to attract the attention of the driver or Guard by shouting, gesticulating or other means.

G.R. 3.51(3) No railway servant shall interfere with any points, signals or their fittings, signal wires or any interlocking or block gear for the purpose of effecting repair, or for any other purpose, except with the previous permission of the Station Master.

G.R. 3.68(1) Duties of Station Master generally when a signal is defective :-

As soon as a Station Master becomes aware that a signal has become defective or has ceased to work properly, he shall—

- (a) immediately arrange to place the signal at 'on' if it is not already in that position.
- (b) depute competent railway servants with such hand signal and detonators as may be required to give signals at the foot of the defective signal until he is satisfied that such signal has been put into proper working order;
- (c) take action in accordance with Rules 3.69 and 3.70 as may be required for movement of trains past the defective signals, and
- (d) report the occurrence to the railway servant responsible for the upkeep of the signals, and if the section is controlled, the controller also.

G.R. 3.69(1 & 3) Duties of Station Master when an approach stop signal is defective :-

- (1) In the event of an Outer or a Home or a Routing signal becoming defective, the Station Master shall advise the station in rear and the nominated station in rear, save in a case where a signal post telephone or a Calling-on signal is provided on the defective signal, in order that the Drivers of approaching trains may be warned of the defective signal and issued a written authority to pass such signal on receipt of Proceed hand signal at the foot of the defective signal;
- (3) The Station Master of the station where the signal has become defective shall, before authorising a train to pass the defective signal, ensure that the conditions for taking 'off' that signal have been fulfilled. He shall then authorise the Driver to pass the defective signal at 'on'.....

S.R. 3.68/1(a) At an interlocked station provided with a cabin or cabins, should it be found even after due check that a signal governing the movement of a train cannot be taken 'Off' the Station Master on duty shall be informed. He shall arrange to have it checked by the Cabinman/Switchman concerned or, where there is a cabin A.S.M. by the latter, whether—

- (v) the relevant line is clear and free from obstruction. If after these checks, the concerned signals come 'Off' normal working shall be resumed, with the permission of the Station Master. If a signal still does not come 'OFF', the Cabinman/Switchman or Cabin A.S.M., as the case may be, shall then ascertain whether there is a gap in any of the points caused by ballast or any other obstruction and arrange to remove them. If, after this, the signal comes 'OFF' normal working shall be resumed with the permission of the Station Master. Should, however, the signal still fails to come 'OFF' the Cabinmen/Switchmen or the Cabin A.S.M., as the case may be, shall confirm to the Station Master on duty that the signal is defective and such advice shall be confirmed by an exchange of private numbers.

2. Signal Engineering Manual :

Para 723 : Advice of Disconnection :—When it is necessary to disconnect any switches, signals or locking or any other gear, the Station Master and/or cabinmen on duty must be advised in writing on form S&T/DN, Annexure 'B', para. 1416, and his/her signature obtained, before work is started and after it is completed.

Such Disconnection Notice may be written in English, Hindi, or the regional language.

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No punishment or award is indicated in his record.

3. Shri Asha Ram Shukla, Assistant Station Master, Karchana :

Born on 31-07-1936 Shri Asha Ram Shukla was appointed as Shuntman on 15-10-57 and promoted as Leverman on 21-03-53 as Switchman in Grade of 125-155 from 17-02-71 and as Assistant Station Master on 11-03-79.

No punishment or award is indicated in his record.

4. Shri Ramji, Switchman, Karchana :

Born on 05-09-1953, Shri Ramji was granted authorised scale as Khalasi in scale of 195-232 on 09-11-76 in the Engineering Department. He was transferred to the Operating Department as Shuntman in the Grade of Rs. 230-250 on 28-07-80, posted as Leverman II in November 82 and promoted as Switchman in Grade 330-560 on 20-07-84.

No punishment or award is indicated in his record.

EXTRACTS FROM RULES

1. General and Subsidiary Rules :

G.R. 2.11(2) : Every railway servant who observes—

- (a) that any signal is defective,
- (b) any obstruction, failure or threatened failure of any part of the way or works,
- (c) anything wrong with a train, or
- (d) any unusual circumstances likely to interfere with the safe running of trains, or the safety of the public

shall take immediate steps, such as the circumstances of the case may demand, to prevent an accident, and where necessary, advise the nearest Station Master by the quickest possible means :

Provided that in the case of a train having parted, he shall not show a stop hand signal but shall endeavour to attract the attention of the driver or Guard by shouting, gesticulating or other means.

G.R. 3.51(3) No railway servant shall interfere with any points, signals or their fittings, signal wires or any interlocking or block gear for the purpose of effecting repair, or for any other purpose, except with the previous permission of the Station Master.

G.R. 3.68(1) Duties of Station Master generally when a signal is defective :-

As soon as a Station Master becomes aware that any signal has become defective or has ceased to work properly, he shall—

- (a) immediately arrange to place the signal at 'on' if it is not already in that position.
- (b) depute competent railway servants with such hand signal and detonators as may be required to give signals at the foot of the defective signal until he is satisfied that such signal has been put into proper working order;
- (c) take action in accordance with Rules 3.69 and 3.70 as may be required for movement of trains past the defective signals, and
- (d) report the occurrence to the railway servant responsible for the upkeep of the signals, and if the section is controlled, the controller also.

G.R. 3.69(1 & 3) Duties of Station Master when an approach stop signal is defective :-

- (1) In the event of an Outer or a Home or a Routing signal becoming defective, the Station Master shall advise the station in rear and the nominated station in rear, save in a case where a signal post telephone or a Calling-on signal is provided on the defective signal, in order that the Drivers of approaching trains may be warned of the defective signal and issued a written authority to pass such signal on receipt of Proceed hand signal at the foot of the defective signal.
- (3) The Station Master of the station where the signal has become defective shall, before authorising a train to pass the defective signal, ensure that the conditions for taking 'off' that signal have been fulfilled. He shall then authorise the Driver to pass the defective signal at 'on'.....

S.R. 3.68/1(a) At an interlocked station provided with a cabin or cabins, should it be found even after due check that a signal governing the movement of a train cannot be taken 'Off' the Station Master on duty shall be informed. He shall arrange to have it checked by the Cabinman/Switchman concerned or, where there is a cabin A.S.M. by the latter, whether—

- (v) the relevant line is clear and free from obstruction. If after these checks, the concerned signals come 'Off' normal working shall be resumed, with the permission of the Station Master. If a signal still does not come 'OFF', the Cabinman/Switchman or Cabin A.S.M., as the case may be, shall then ascertain whether there is a gap in any of the points caused by ballast or any other obstruction and arrange to remove them. If, after this, the signal comes 'OFF' normal working shall be resumed with the permission of the Station Master. Should, however, the signal still fails to come 'OFF' the Cabinmen/Switchmen or the Cabin A.S.M., as the case may be, shall confirm to the Station Master on duty that the signal is defective and such advice shall be confirmed by an exchange of private numbers.

2. Signal Engineering Manual :

Para 723 : Advice of Disconnection :—When it is necessary to disconnect any switches, signals or locking or any other gear, the Station Master and/or cabinmen on duty must be advised in writing on form S&T/DN, Annexure 'B', para. 1416, and his/her signature obtained, before work is started and after it is completed.

Such Disconnection Notice may be written in English, Hindi, or the regional language.

Para 1416 : Disconnection of Apparatus —Maintainers in possession of a certificate of competency may undertake work necessitating interference with points, lock bars, detectors signals etc. independently. They must observe instructions, as laid down in para 723 and 724, whenever it becomes necessary to disconnect any gear for repair and adjustments. Each maintainer must have in his possession a book of Disconnection Notice form S&T/DN Annexure-B.

Copy of GM (S&T) NDLS letter No. 342-Sig./87/2/Monitoring Team dt. 30/31-3-82 addressed to DRMs is reproduced below.

Sub : Disconnection of Apparatus (Para 723 of Signal Engg. Manual and GR 52).

Ref : This Office D.O. No. 256-Sig./O/SG III dt. 21-1-82 addressed to all DRMs.

In the interest of safety it is essential that whenever any work is to be executed where it becomes necessary to interfere with any point signals or their fittings, signal wires, any inter locking gear, Switches locking of any other gear for the purpose of effecting repairs or for any other purpose or for making alteration in the circuitry the SM on duty must be advised in writing on Form S&T/DN Annexure 'B' para 1416 of Signal Engg. Manual (Correction Slip No. 68) of 1955 edition and No. 49 of 1st Reprint 1968 circulated under this office letter No. 340-Sig./O-VIII dt. 2-1-82 and his signature obtained before work is started and after it is completed.

2. Normally, the disconnection memo should be prepared and offered by the maintainer/inspector who is authorised to maintain the equipment under his control. In case of emergency to prevent a possible accident a disconnection memo may be issued by any staff authorised to issue disconnection memos, but the reconnection portion of the memo will be issued only by the staff authorised to maintain the equipment.

3. The situation where issue of disconnection Memo is called for can be judged by the Maintainers/Signal Inspectors keeping in view the nature of work involved. A few illustrative examples where disconnection memos should be issued and got accepted by the Operating Department before executing repair/renewals or interference of any signalling gear some of which are given below :

- (i) Repairs and replacement of facing point locks and SLM mechanism alongwith rod transmission & fittings including lock bars and connecting rods for points and locks.
- (ii) Repairs and replacement of detectors and their fittings both Mechanical and Electrical.
- (iii) Changing of signal/Point motors, reversers including their controls, cables etc.
- (iv) Alterations in the SMs slide control frames SM Key locking boxes.
- (v) Alteration in locking of lever frames of all types.
- (vi) Changing of signalling cable.
- (vii) Addition and alteration to wiring of signalling circuits
- (viii) Repairs to lever locks, circuit controllers HKTs and other Electro-mechanical apparatus.
- (ix) Change of Signal arms in Semaphore signalling territories.
- (x) Removal of any relay or control or any signal/point or any other signalling circuit.
- (xi) Alterations to axle counters.
- (xii) Replacement of any parts in the Block Instruments.
- (xiii) In case of route relay/panel interlocked installations conducting of various safety checks by simulating conditions should only be done under advice of disconnection memo to the operating staff.
- (xiv) Annual testing of signalling cables.
- (xv) Conducting of broken wire tests should be carried out under disconnection memo.

4. For carrying out normal maintenance check and testing of signal and interlocking equipment which does not involve any disconnection/interference/repair of signalling gear which does not involve any unsafe working for train operation issue of disconnection memo is not required.

5. Suitable speed restriction should be imposed by SM/ASM/Section controller over the point of its fittings are involved.

6. Pre-planned programme should be normally organised to avoid repercussion on train services due to issue of the disconnection memos where, however, issue of disconnection is essential in view of the safety of interlocking system these can be issued without waiting for prior programme. Non-issue of disconnection memos can result for serious accidents.

You are advised to issue necessary instructions to your staff in this regard. A copy of these instructions may be endorsed to this office for information. Cases of interference to signalling gears without observance of the rules regarding issue of disconnection memos should be severely taken-up.

Please acknowledge receipt of this letter.

NORTHERN RAILWAY

Safety Circular No. 1/1990

No 81-T/93/1/Safety/Pt. III

Headquarters Office
Baroda House, New Delhi.
January 31, 1990

DRMs, N. Ry. ALD LKO MBDLI FZR UMB BKN JU.

Sub: Observance of rules in train passing.

On 29-12-89, 12 coaches & T/Engine of 2391 Up Magadh Exp. derailed at Ekdil station on ALD Divn. involving casualties. The enquiry into this case revealed that this accident was caused because the Operating & S&T staff was by passing rules and including in unauthorised tampering of relays.

Certain important instructions in this regard were circulated vide this office letter of even No. dated 6-10-88 but it is felt that despite this, the tendency on the part of Traffic & Signal staff to resort to short-cut methods continues to exist and they continue to indulge in such practices.

In order to avoid such mishaps, it is once again reiterated that :-

- (i) Once certain S & T gear has been declared defective OPT-373 (authority for passing signal at danger) has been prepared for reception of a train, it must not be cancelled and train must be piled;
- (ii) In every unusual situation of point/signal failure, the points must be clamped & locked to assure their correct position and to prevent changing of route before the completion of the movement for which the route has been set;
- (iii) ASM's key to the relay room/cabin basement room is always kept under personal custody of the ASM on duty and handing over/taking over of such key is done in the Relief Diary. Besides, this key need not be given to S & T staff in the face of an approaching train, at the time of failure;
- (iv) ASM's relay room/cabin basement room key must be given only to the authorised S&T staff and acknowledgement on the relay room/cabin basement room register;
- (v) Short cut methods, such as temporary "looping" of relays or "giving feed" must not be followed in order to avoid registering of detentions to trains.

Divisions to note down these instructions very carefully and advice to this effect be sent to all traffic & S&T staff. The senior supervisors in Operating, Safety & Signal branches should also keep a note of these instructions and full cognisance to these instructions during the course of their inspections and surprise checks and any violation of these rules should be dealt with severely and the defaulting staff be taken up under major penalty charge-sheets.

A wide publicity should be given to these rules.

Sd/-
C.S.S.

c/- (i) All DRMs/Sr. DSOs/DSOs/Sr. DOSs/Sr. DSTE/DSTEs N. Ry. ALD LKO DLI MB P&R UMB BKN & JU.

c/- for information to : CPTS/I & II, CPTS/II & II, COPS, CSE, CSTE, CSTE(C)/N. Ry.

सुरक्षा पत्रिका नं० 1/1990 की प्रतिनिधि छापीली सूचना तथा आवश्यक कार्यवाही हेतु भेजी जाती है। इस संबंध में अनुदेशों का पालन करने के लिए आपसे अनुरोध है कि आप अपने मंडल में सम्बन्धित अधिकारियों तथा कर्मचारियों को इन आदेशों का कड़ाई से पालन करने के लिए अवश्य सूचना दे दें।

NORTHERN RAILWAY

JOINT CIRCULAR
No. 403-T/114/Pt. II(Rules)

Headquarters Office,
Baroda House,
New Delhi.

Dated: 15 March 1990.

LRMS/WR/ALL BKN DLI FZR, JU LKO MB & UMB.

C/- Sr. DSOs/DSOs N. Ry. ALL BKN DLI FZR JU LKO MB & UMB

Sr. DOSs, N. Ry., ALD, BKN, DLI, FZR, JU, LKO, MB & UMB.

Sr. DSTE's, N. Ry. ALD, DLI, FZR, LKO, MB & UMB & DSTE's, BKN & JU

Sub: Provision of double locks on the doors of cabin basements/relay rooms.

1. Board's instructions circulated vide joint Circular No. 236-Sig/O/SG/Corresp. III dated 8-8-79 by GM(OPTG) & GM(S&T) were modified vide joint circular No. 256-Sig/O/SG/Corresp/Pt. LW of 29-8-84 by the CSS & CSTE(Sig.) after taking into consideration certain day to day practical working problems of staff and it was not made obligatory to lock the cabin basement rooms if lever locks of relays or any such equipment were not provided inside such cabin basement areas

2. This issue has been once again considered and it has now been decided that main entrance door of every cabin basement should be provided with two locks, key of one should always be in the personal custody of the ASM on duty and key of other lock with ESM/MSM concerned at the station. Opening of cabin basement and the entry of the ESM/MSM inside the basement shall be permitted by the ASM only after obtaining signatures of ESM/MSM in the relevant register with the ASM.

3. It is also desired that SMs/ASMs must ensure that:

- (i) Cabin basements/relay rooms are properly locked with double locks;
- (ii) SM's keys handedover to the authorised S&T staff after taking their signatures in the cabin basement/relay room register;
- (iii) On return of the ASM/SM's key by S&T staff ASM/SM should ensure personally or through his responsible representative that rooms are properly locked. This fact should also be mentioned in the basement/relay room key register.

Divisions should arrange suitable accommodation for the stores of MSMs/ESMs adjacent to the station buildings so as to avoid the opening of relay rooms/cabin basements for keeping stores.

Please acknowledge receipt.

Sd/-
C.S.T.B.

Sd/-
C.S.S.

VIEWS OF THE RAILWAY BOARD**Cause of the accident and responsibility**

The cause of the accident and responsibility therefor, as established by the Commission, are, prima-facie, accepted.

Remarks and Recommendations**Para 9.1**

The action taken by the Railway pursuant to the recommendations made by the CRS has been appreciated by the Commission. A copy of the note is being endorsed to other Zonal Railways for information and guidance.

Para 9.2 :

There is constant endeavour to improve the reliability of even the mechanical signalling equipment. Meetings of CSTE's are conducted regularly to discuss issues relating to reliability, exchange views and ideas based on experience for improving reliability of the signalling equipment. Fixing norms for failures would depend on the quantification of reliability which entails the application of statistical techniques of reliability engineering. RDSO have been advised to make an attempt at this quantification.

Para 9.3 :

As has been rightly commented by CCRS, external gears do not lend themselves to sealing arrangements so as to be made secure against 'facile delinking'. It is as complex as making a stipulation that fish bolts and nut on the track should be sealed.

PRI. 32*

500-1777(L.6A-IV)