



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

RAILWAY ACCIDENT INVESTIGATION REPORT

ON

**Derailment of No. 98 Down 'Venkatadri Express' train at Km. 49/14-50/1 between
Malakavemala & Kalasamudram Stations
on Dharmavaram-Pakala Metre Gauge Single line section of Guntakal Division
of South Central Railway
on 22nd April 1981**

SUMMARY

CONFIDENTIAL

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SUMMARY

1. Date 22-4-1981
2. Time 04-45 hrs.
3. Railway South Central
4. Gauge Metre
5. Location At Km. 49/14—50/1 between Malakavemala and Kalasamudram stations.
6. Nature of Accident Derailment
7. Train involved No. 98 Down 'Venkatadri Express'
8. Consisting of Ten coaches hauled by YDM-4 Diesel locomotive No. 6297
9. Estimated speed at derailment 60 Km/h .
10. System of Operation Absolute Block System
11. Number of tracks Single
12. Gradient 1 in 100
13. Alignment Curve (873 m. radius)
14. Weather Clear
15. Visibility Good under the headlight of the locomotive.
16. Casualties Killed—Nil
Injured—6 (3 Grievous, 3 Minor)
17. Cost of Damage Rs. 6,27,060/-
18. Cause Tampering with track by persons unknown.
19. Responsibility No Railway staff held responsible.
20. Important Recommendations in brief:
 1. In view of frequent attempts at tampering with track on this section, the Law enforcing Authority may be requested to view such attempts seriously and bring the culprits to book. Railway Administration should also take up the issue at the highest level to put an end to this.
 2. The Railway Administration may consider anti-sabotage measures such as burring of fish bolts and welding of rails in vulnerable locations.

GOVERNMENT OF INDIA
MINISTRY OF TOURISM AND CIVIL AVIATION
(Commission of Railway Safety)

From: The Commissioner of Railway Safety,
Southern Circle,
Bangalore.

To The Secretary to the Government of India,
Ministry of Tourism and Civil Aviation,
Sardar Patel Bhavan,
New Delhi.

Through: The Chief Commissioner of Railway Safety, Lucknow.

Sir,

In accordance with Rule 4 of the Statutory Investigation into Railway Accident Rules, 1973 (published by the Ministry of Tourism and Civil Aviation under their Notification No. RS. 13-T (8)/71 dated 19th April 1973), I have the honour to report the results of my Inquiry into the derailment of No. 98 Down 'Venkatadri Express' train at Km. 49/14-50/1 between Malakavemala and Kalasamudram stations on Dharmavaram-Pakala Metre Gauge single line section of Guntakal Division of South Central Railway at about 04-45 hours on 22-4-1981.

1.2 Inspection and Inquiry

1.2.1. Having been telephonically informed of the occurrence at about 07-30 hours, I proceeded by the first available train to Dharmavaram and reached the site of accident by road at about 17-00 hours. In company with the Divisional Railway Manager, Guntakal, I made quick inspection of the track at the site of occurrence and the vehicles involved in the derailment before restoration work commenced. On the morning of the 23rd I made a detailed inspection of the site of accident again in company with the Chief Traffic Safety Superintendent, Chief Workshops Engineer, Chief Track Engineer, all from South Central Railway Headquarters, Secunderabad and the Divisional Railway Manager, Guntakal. On the afternoon of the 23rd I visited the District Headquarters Hospital, Anantapur, where three grievously injured passengers were receiving medical attention and talked to them.

1.2.2. A Press Notification was issued on the 23rd inviting the members of the public having knowledge of the accident to give evidence at the inquiry to be commenced by me at Dharmavaram on the 24th or to communicate with me by post.

1.2.3. The District Magistrate and the police authorities of Anantapur District of Andhra Pradesh and the Government Railway Police at Guntakal were advised about the inquiry.

1.2.4. The inquiry was conducted at Dharmavaram on the 24th and 25th of April 1981. The Senior Administrative Officers of the Railway present at the inquiry were:

- (i) Shri J. Rajagopalachari Chief Traffic Safety Superintendent.
- (ii) Shri S.H.R. Krishna Rao Chief Track Engineer
- (iii) Shri M. Raja Rao Divisional Railway Manager.
- (iv) Shri R. Ribeiro Addl. Chief Mechanical Engineer/R&L.

None from the State Government or Railway police was present at the inquiry.

1.2.5. In all, evidence of 25 witnesses, including three persons who travelled by the train and a member of the public was recorded and relevant exhibits filed.

1.3. The Accident

1.3.1. No 98 Down 'Venkatadri Express' comprising ten coaches and hauled by a YDM-4 locomotive, while running between Malakavemala and Kelasamudram stations on the Dharmavaram-Pakala metre gauge single line section of South Central Railway, became derailed of the locomotive and the following six coaches between Km. 49/14 and 50/1. Of these, the locomotive and the two coaches behind it capsized: two derailed coaches—3rd and 4th from the engine—came to rest in their upright but slightly canted position making an angle of 45° with the track alignment and the remaining two derailed coaches—5th and 6th from the locomotive—were off the rails but were standing on the bank. The last four coaches of the train were on rails, partly on bank and partly on a major girder bridge.

1.3.2. The speed of the train just before the occurrence was about 60 Km./h. The accident took place in clear weather in the early morning hours on a moon-lit night.

1.4 Casualties

Six persons were reported to have been injured in the accident—three of them having received grievous injuries and the other three, simple injuries. All the three grievously injured persons were passengers on the train and of the three persons who received minor injuries, one was a passenger and the other two were Railway Officials, on duty. Besides, several others received trivial injuries.

1.5 Passenger Occupation

The carrying capacity of the train was 542 and 264 passengers were estimated to be travelling at the time of the accident.

II. RELIEF MEASURES

2.1 Intimation

The coach in which the train Guard was travelling having come to rest on a high girder bridge, he could not come out for some time but managed to carefully drop his portable telephone down the bridge. The instrument was picked up and arranged to be fixed to the control wires by a Signal Inspector of the Railway, who was travelling by the train. He established contact with the Section Controller, Guntakal at about 05-20 hours and informed him about the accident. The Divisional Control in turn advised the concerned Railway Officials. Telephonic messages were sent to the Civil and Police authorities as also to Doctors at Kadiri and other towns near about the accident site.

2.2. Medical Attention and Relief

Limited first aid was rendered by the train Guard who managed to come out of his coach after day break. At about 07-30 hours Doctors of the Civil Hospital, Kadiri, a Taluk town, arrived and after rendering first aid to the injured, shifted them to the hospital. Thereafter all the three grievously injured persons were shifted to the District Headquarters Hospital, Anantapur, where they are at present receiving treatment as in-patients.

Railway Doctors from Dharmavaram and Guntakal reached the site of the accident after 09-00 hours, by which time the injured had already been shifted to the hospital.

2.3 Restoration

2.3.1. Break-down trains were ordered from Guntakal and Pakala stations and reached the site at about 12-00 hours. Relief operations at Pakala end commenced after 18-00 hours while relief operations from Guntakal end were delayed till the next morning for clearance by the Government Railway Police who had requisitioned 'Police Dogs' for investigation of the case they registered. The infringing coaches were removed and the track was restored by about 14-30 hours on the 23rd of April.

2.3.2. As a result of the accident, rail traffic remained fully suspended on Dharmavaram-Pakala section for about 34 hours. Important trains cancelled were the Up and Down Venkatadri Expresses between Dharmavaram and Tirupati on the 22nd.

III. THE TRAIN

3.1 Composition

No 98 Down Venkatadri Express consisted of ten coaches, hauled by YDM-4 locomotive No 6297 with its shorthood leading. The coaches were in the following marshalling order :

| Sl. No | Coach No. | Built in | Type | P.O.H. | Return Date |
|--------|----------------|----------|----------|---------|-------------|
| 1. | SC WGSCNW 1084 | 1967 | ICF (AT) | 10-4-80 | 4/81 |
| 2. | SR SYLR 7660 | 1969 | Do | 9-1-81 | 1/82 |
| 3. | SC GSY 855 | .. | IRS | 24-2-81 | 8/82 |
| 4. | SC WFC 1211 | 1967 | ICF (AT) | 14-8-80 | 8/81 |
| 5. | SC WGSCN 1365 | 1979 | Do | 8-5-80 | 5/81 |
| 6. | SC WGSCN 1363 | 1979 | Do | 4-8-80 | 8/81 |
| 7. | SC GS 1184 | 1975 | Do. | 28-7-80 | 7/81 |
| 8. | SC GS 782 | 1968 | Do. | 28-8-80 | 8/81 |
| 9. | SC SLR 1478 | 1980 | Do. | 9-4-80 | 4/81 |
| 10. | SC GSCNW 1079 | 1961 | Do. | 5-9-80 | 9/81 |

3.2 The train was fully vacuum braked and as per the Brake power Certificate issued to the locomotive Driver before the train left Dharmavaram, all vacuum cylinders were stated to be in working order.

3.3 Damage

3.3.1 Diesel locomotive YDM-4 No. 6297 which hauled the train capsized and fell on its side to the left of the bank 2.5 to 3.3 metres away from the track. This led to damage to its cattle guard on both sides, two traction motor armatures, complete set of batteries and to the super-structure. The buffer on the long-hood side was wrenched off the locomotive. The approximate cost of damage to the locomotive is estimated to be Rs. 5,46,650/-.

3.3.2 Coaches

- (i) Coach No. SCWGSCNW 1084—immediately behind the locomotive—capsized on its left and came to rest on the left side of the track, down the bank 7.4 to 12.5 metres away from the track. The rear pair of wheels in the trailing bogie got disconnected and were lying on the ground. One battery box and top end body of the coach in the rear was damaged.
- (ii) Coach No. SRSYLR 7660—Second from the engine—capsized and came to rest on its left side away from the bank on the left side of the track and 12.5 to 25.0 metres from it. The coupler between this coach and the first coach was still holding. The front end body of the coach at top, two battery boxes and the yoke end draw bar were damaged. Two pairs of wheels—front pair in the leading bogie and the rear pair in the trailing bogie—got separated and were lying on the ground.
- (iii) Coach No. SC GSY 855—third from the engine—derailed of all wheels and came to rest at an angle of about 45° to the track with its farthest end 23.7 metres away from it on the left side. The bogies of this coach were partly buried in the earth.
- (iv) Coach No. SCWFC 1211—fourth from the engine—derailed of all wheels and came to rest with its front end about 10.75 metres away from the track and its rear end lying on the embankment and making an angle of about 45° to the track on the left side. The rear end body of the coach was found dented at the top, dynamo broken and yoke end bogie right hand leading axle box springs displaced.
- (v) Coach No. SC WGSCN 1365—fifth from the engine had— all its wheels derailed and the coach was lying canted parallel to the track on the left side over the embankment with bogies partly buried in ballast. The hook-end draw bar of the coach was found to have been bent.

(vi) Coach No. SC WGSCN 1363—sixth from the engine—had its front two pairs of wheels derailed, the rear left two wheels on rails and right two wheels floating from the track standing on the embankment. There was no visible damage to the coach.

The remaining four coaches, seventh to tenth from the engine, were on rails and suffered no damage. The total cost of damage to the coaching stock has been estimated to be Rs. 70,500/-.

3-3-3 Permanent Way

The track for a length of about 120 metres was found completely damaged. One of the left hand side rails was found to have been displaced and was lying near the toe of the bank on the left side. Two more left side rails with the fish plated joint in tact in between, were found to have been pushed forward by the derailed vehicles by about 45 metres, and were lying at the toe of the bank with the forward end bent into a 'U' shape. Almost all the CST-9 plates in the damaged portion were completely broken. The cost of damage to permanent way is estimated to be Rs. 10,000/-.

3-3-4 There was no damage to any other Railway asset.

3-3-5 The total approximate cost of damage to Railway assets aggregates to Rs. 6,27,060/-.

IV. LOCAL FEATURES

4-1 Description of the Site

4-1-1 The accident took place in Anantapur District of Andhra Pradesh. The railway track in this reach runs in an undulating country which is dry-cultivated. At the accident spot the direction of the track is from north to south. Leaving Malakavemala, the alignment generally rises, the difference in level between the station and the accident site being about six metres. Just before the accident spot there is a girder bridge of six spans of 18-19 m. across the river Maddileru. This portion is on level and after leaving the bridge the alignment is on a high bank of about nine metres which gets reduced to three metres in the next 150-200 metres. A right handed curve of 873 m. radius takes off immediately after leaving the bridge and the alignment rises in 1 in 100 gradient. The nature of the soil in the vicinity is moorum, of which the bank is made.

4-1-2 The permanent way consists of 50 R rails, 11-90 metres long, laid on CST-9 sleepers to M+3 density with wooden sleepers at joints over stone ballast. The track was laid in 1958-59 and the rails are jointed by fish plates with four bolts at each joint. While CST-9 plates with reverse jaws were seen in the first five rail lengths after the abutment of the major girder bridge, at the rate of one per rail length, no reverse jaw type sleepers existed in the track thereafter upto Kalasamudram. The wooden sleepers at joints are of hard-wood and rails are fixed to these on canted bearing plates. The fish plates are 40-6 cm. long with four 20 mm. dia. holes and the bolts are 92 mm. long, 18 mm. in dia. The CST-9 sleepers have two-way keys, one on each plate and the wooden sleepers at joints have two dog spikes, one inside and one outside. This complement of fittings continues on the 2nd curve beyond the point of derailment also.

4-1-3 The accident took place between Km. 49/14 and 50/1 and the kilometrage of the stations at either end of the Block section and other important stations is as under :

| | | |
|-------------------------|---|-------------------|
| Dharmavaram | : | 00-00 |
| Mudigubba | : | 34-77 |
| Malakavemala | : | 45-89 |
| <i>Site of Accident</i> | : | <i>49/14—50/1</i> |
| Kalasamudram | : | 53-73 |
| Kadiri | : | 67-25 |
| Pakala | : | 227-42 |

There are approximately 15 to 16 telegraph posts per kilometre in the vicinity of the accident.

4-1-4 The maximum permissible speed of passenger carrying trains in the section is 65 Km./h. There were no temporary speed restrictions in the region covered by the accident on the day of the occurrence.

4.1.5 The Engineering Officials having jurisdiction of the track at the site are stationed as under :

| | |
|-----------------------------------|--------------|
| Permanent Way Inspector/Grade III | at Mudigubba |
| Permanent Way Inspector/Grade II | at Kadiri |
| Assistant Engineer | at Guntakal |

4.1.6 The section is controlled and the Control Office is located at Guntakal which is also the Headquarter's of the Division where the Divisional Railway Manager and other Divisional Officers are stationed.

4.2 System of Working

Trains are worked in the section under the Absolute Block System of train working with Neale's ball type token instruments. The stations are provided with Lower Quadrant Semaphore Signalling, interlocked to Standard-I. The signals are worked from a central Cabin opposite the station, and points are operated locally with plunger type 'E' type locks.

V. SUMMARY OF EVIDENCE

5.1.1 **Shri K. Gopal, Driver**, who worked the Diesel locomotive hauling the Express train, said that the train ran through Malakavemala at 04-40 hours and while passing through Km 49/15 at 04-45 hours at a speed of around 60 Km./h., he felt an unusual jerk with ballast flying. He immediately applied brakes, but in the meantime the locomotive was thrown out of track and he became unconscious for a while. After he regained consciousness, he came out of the locomotive and made a quick survey of the situation.

5.1.2 The brake power on the train was satisfactory and he was able to stop the train smoothly at Mudigubba, the previous halting station.

5.1.3 Answering a question, the witness said that he heard a noise similar to the clashing of steel on steel with an unusual jerk ; the ballast started flying and the locomotive began to oscillate sideways and travelled in that condition for a short distance before it fell on its side.

5.1.4 Answering further questions, the witness gave the following information : -

(i) Between Malakavemala and Kalasamudram somewhere in between the Up Outer and the first bridge he noticed four watchmen in two pairs within half-a-telegraph post distance from each other and one of them whistled as the train passed.

(ii) He did not notice any obstruction in the path of his train in the headlight of the locomotive as it approached the point of derailment.

(iii) At about 06-30 hours when he was checking from end to end, he noticed the fish plates of two left joints of a rail lying by the side of the track. One of the fish plates of the first joint was covered with ballast near the joint. Three bolts were lying inside the track and one outside. The rail was in its position. Nearabout the second joint of the rail he could see the fish plates but three bolts were lying inside and one outside. Beyond this rail, other rails towards Kalasamudram were all twisted and bent but those towards the bridge were intact. The right hand side rail opposite the location where the fish plates and bolts were seen was in position and its fittings were intact. He showed this position to the permanent Way Inspector, Kadiri, and permanent Way Inspector/Grade III, Mudigubba, after their arrival at the site, at about 07-00 hours. He had shown it to the Sr. Divisional Mechanical Engineer also when he arrived at about 09-00 hours.

5.2.1 **Shri R. Surya Babu, Diesel Assistant**, who worked the train along with the Driver Shri Gopal generally corroborated the evidence of the Driver as regards the manner in which the accident occurred.

5.2.2 Answering questions, he gave following further details :--

(i) Soon after the engine left the bridge he heard a 'Dhamal' sound and the ballast started flying. The sound was not an explosion but it was more intense than when a train passed a bridge.

(ii) After passing Malakavemala and the first bridge he saw two men in plain clothes and heard a whistle when the train passed. Subsequently, he found two more men when he passed the first bridge and he also heard a whistle. While approaching Maddileru bridge he did not see any man nor did he hear any whistle.

(iii) He remained near the locomotive only after he regained consciousness. When smoke started coming out of the traction motor and cables were burning, he assisted others in putting out the fire.

5-3-1 **Shri C.M. Balakrishnan, Guard**, who worked the Express train Ex. Dharmavaram, said that the train ran through Malakavemala at 4-40 hours and while passing over the bridge No. 1082 at Km. 49/12-14 at about 04-45 hours, he felt some heavy pull and push jerk and the train came to a sudden stop with his coach standing on the bridge. As it was not possible for him to get out of the coach, he could not go out till about 06-15 hours. He dropped the portable telephone set down the bridge and asked the Travelling Ticket Examiner of the last coach who caught it to fix it and convey the information to the Control. After he came out at about 06-15 hours, he assessed the damage and casualties and gave a detailed report to the Control. Using his First Aid box, he rendered First Aid to the injured passengers of the train.

5-3-2 Answering questions, the witness gave the following information :—

(i) After he conveyed the details of the accident to the Control, the Driver told him that he had noticed some fish plates having been removed and lying by the side of the track. He went out with him and noticed that at the first left joint of the rail beyond the bridge fish plates were lying removed by the side of the track and that bolts were lying inside the track. The fish plates and bolts did not have any marks on them. The rail was in its position. Beyond that rail, towards Kalasamudram no rails were seen and the track was in a disturbed condition. The Railway protection Force squad which was travelling by the train was asked to cordon off the area and prevent people from getting towards the location where the fish plates were found removed.

(ii) The vacuum gauge in his Van registered 52 cms. when he signed the Brake Power Certificate at Dharmavaram. The certificate indicated that the train had full brake power with all its cylinders active.

(iii) He heard the whistle of a Patrolman a minute before the train approached Maddileru bridge. Five or six minutes after the train had come to a stop with the Brakevan standing on the bridge, he could notice a white light from the rear. He presumed that the light was that of a Patrolman but when he shouted for him, there was no response.

5-4-1 **Shri K.S. Ithal, Signal Inspector, Dharmavaram**, who was a passenger on the train and was travelling in the First Class coach, fourth from the engine, said that the train had stopped with a jerk on sudden application of brakes after passing Maddileru bridge. Dust was entering through the windows and he presumed that there might have been a derailment. He came out of the compartment and surveyed the situation. When he proceeded towards the rear of the train, he found that the Guard's compartment was standing on the bridge and he could not reach it. He went down the bridge and using the portable telephone which the Guard had dropped he arranged to have it fixed. Communication was established with the Control at about 05-20 hours, and he gave particulars of the accident. At about 06-30 hours, the Driver of the train locomotive mentioned to him that he had seen fish plates and bolts lying by the side of the track. When he went to the spot along with the Driver, he noticed that two joints on the left side rail after the bridge were without fish plates and bolts. Both the fish plates of the first joint were lying beside the track with one of them lying buried under mud. At the other joint one fish plate was lying outside the track but he could not see the other fish plate. The rail was in position. The corresponding right side rail was also in position, and its fish plates, bolts and nuts were intact. Beyond these two joints the track towards Kalasamudram end was completely disturbed due to the accident. There was no indication on the fish plates which he saw that those were forced out. It appeared that they were removed and kept there.

5-4-2 Answering a specific question, the witness said that the train passengers were around and he would not consider it possible for any one to have removed the fish plates subsequent to the accident.

5-5-1 **Shri T.P. Narayana, Senior Rakshak, Railway Protection Force, Tirupati**, in charge of the Railway Protection Force Squad which accompanied from Guntakal, said that after the train left Malakavemala and passed the bridge, there was a sudden 'Dhan' sound and immediately the engine and the first coach in which he was travelling appeared to be moving on stone ballast oscillating sideways. As the engine came to a stop, he noticed that his coach had capsized on its side. All the time he had to balance himself holding on to the straps of the upper berth. He managed to come out and, with the help of other Rakshaks and passengers, arranged for all passengers to be taken out of the compartment one by one. Thereafter, the Rakshaks were asked to provide a cordon for the security of the passengers and their belongings. After day-break at about 06-00 hours he met the Guard and the injured were given First Aid. Thereafter, as he walked with another Rakshak alongside the track, he saw a rail bent and lying in front of the first two coaches, another rail was supporting a derailed coach. As he proceeded further towards the bridge he noticed fish plates of two joints of the left side rail removed and lying by the side. Corresponding joints of the right side rail were however, found intact. It appeared to him that the fish plates might have been removed by some one with a purpose and that might be the cause of the accident. He, therefore, made sure that the fish plates and other fittings found were not allowed to be disturbed. Many others saw the removed fish plates including the Tahsildar, who arrived sometime after 7 O' Clock and the District Collector and the Superintendent of Police who arrived later on.

5.5.2 Answering questions, the witness gave the following information :—

(i) After leaving Malakavemala and before approaching the bridge somewhere in between he happened to hear the whistle of a Patrolman. His impression was that he heard the whistle close to the bridge.

(ii) Sufficient care was taken by him and other Rakshaks to ensure that the belongings of the passengers were safe.

(iii) None from outside came to the site in the darkness. After 6.01 Clock outsiders arrived at the site.

5.6.1 Shri P. Srinivasan, Assistant Guard, who was travelling in the SYLR, second from the engine, said that immediately after passing the major bridge, he heard an unusual sound and felt a severe jerk. He remembered having caught hold of the vacuum gauge pipe to balance himself as the coach left the rail and started going down the ballast. Thereafter he lost consciousness and did not know what had happened for sometime. After regaining consciousness he managed to come out and contacted the Guard from under the bridge and as directed by him he remained near the telephone.

5.6.2 Answering questions, the witness gave the following information :

(i) The vacuum gauge in his Brakevan registered 58 cms. The Driver was able to control the train and stopped it smoothly at Mudigubba.

(ii) At about 4.5 telegraph posts before reaching the bridge where the accident had taken place, he heard a whistle of an Engineering Patrolman.

5.7.1 Shri S.V.V. Murthy Raju, Permanent Way Inspector, Kadiri, who reached the site at 07.45 hours, said that as he went round the accident spot, he noticed, among other things, the following :—

(i) Three hook bolts at the Pakala end of the bridge were found removed. One of them was lying in the bed of the river, one on the abutment and the third near joint No. 3 beyond the bridge.

(ii) The first joint after the bridge (Pakala end) was intact with fish plates and bolts on both left and right sides. In the second joint on the left side all the fish plates and bolts were found removed. Two fish plates were found buried in the ballast at the end of the joint sleepers. The fish bolts were lying inside and the nuts outside. One more fish plate was lying on the bank slope opposite to the left joint.

(iii) At joint No. 3 on the left side one hook bolt was found lying inside the track just at the joint wooden sleepers. A big sized boulder was lying outside the track. One fish plate was found lying on bank slope on the left side a little away from the joint. Four fish bolts and nuts were found lying at the joint. The corresponding right side joints 2 and 3 were intact with fish plates and bolts. The track beyond the third joint was in disturbed condition. Two rails identified as those between joints 3 and 5 were found to have been carried forward and were lying on the left side. The end of the rail towards joints 5 took a 'U' shape bend. The other end—at joint No. 3—had hit marks and the foot of the rail just under the second fish bolt hole had a hit mark indicating the flange having been bent up. At the end of the rail a portion of the bottom flange towards the centre of the track was found broken. Another rail identified as between joints 5 and 6 on the left side of the track was also lying down the bank on the left side.

5.7.2 Answering questions, the witness gave the following further particulars :—

(i) There was no point of mount or drop up to joint No. 3. Beyond that the track was completely disturbed and the rails were displaced.

(ii) The witness gave particulars of joint track measurements at Malakavemala end of the accident spot and expressed the view that the track was in a good condition.

(iii) From the hit marks on the rail end at joint No. 3 and the disposition of the dog bolt lying there in a bent condition as also the bent in the bearing plate on the joint sleeper of joint No. 3 the witness was of the opinion that after the fish plates had been removed, a portion of the rail between joints No. 3 and 4 might have been lifted and the dog bolt inserted between the rail and the sleeper. This might have caused the wheel to hit the projecting rail and get derailed. The rail end at joint No. 2 (the fish plates and bolts of which were also removed) was probably not raised and, therefore, the wheels of the first vehicle safely passed.

(iv) The witness was of the view the type of patrolling being done cannot prevent an accident, as the patrolmen had to walk four kilometres taking about 1½ hours.

(v) The reason for not patrolling the section between 01.30 hours and 04.00 hours was that the chart supplied to him by the Divisional Office did not provide for any patrolling during that period.

(vi) He would not suspect any of the Gangmen for tampering with the track. The men deputed were reliable.

(vii) Patrolling was introduced on the 18th of April 1981 when four pairs of fish plates and bolts were found removed at Km. 21/4-8.

5.8.1 Shri P. Srinivasa Murthy, Inspector Government Railway Police, Guntakal, who has registered a case and started investigation into the accident, expressed the view that there were no elements in the area where the accident had taken place who would like to cause sabotage. In his opinion, people connected with Railway work may, for their own reasons, be resorting to such acts. His Department suspected some Gangmen for removal of fish plates in an accident which took place in January 1980, but the matter could not be taken to court for want of adequate evidence. In that case, he did not have any evidence of outsiders' involvement.

The witness then gave particulars of the cases reported to his Department during the last ten years. Of the 26 cases reported, 19 were under Sections 126 and 128 of the Indian Railways Act: one was under Section 101 and the other six were under Section 309 of the Indian Penal Code. Most of the cases were closed as undetected.

In regard to the current accident, investigations so far made by him indicated that it was a case of suspected sabotage. The case has been registered under Section 126 of the Indian Railways Act.

5.9.1 Shri D. Venkatesu, Gangman of Gang No. 9, who patrolled the track on the night of 21/22-4-1981 for half the length between Kalasamudram and Malakavemala, said that in the third beat for the night (his second beat) he started from Kalasamudram at about 04-00 hours. According to schedule he was required to reach Km. 49/12 at 05-15 hours, exchange the book with the Patrolman coming from the other side and return to Kalasamudram at 07-00 hours. When he was at Km. 50/12 and was proceeding towards the bridge, he sighted the headlight of the Express coming from Malakavemala side. When he reached the bridge, he found that the train had derailed.

5.9.2 Answering questions, the witness gave the following information:—

(i) When he reached the bridge site in his first beat at 8-30 p.m. he found that everything was alright.

(ii) When he reached the bridge in his second beat he found that the train had derailed and the track was in disturbed condition.

5.10.1 Shri J. Muneppa, Gangman of Gang No. 8, who patrolled the track on the night of 21/22-4-1981 for half the length between Malakavemala and Kalasamudram said that in the third beat he left Malakavemala at 04-00 hours. While he was on his way to the bridge, the Express train passed when he was at Km. 49/2. He showed his light and whistled as the train passed. A little later he noticed that the train had stopped at the bridge. When he reached the bridge he found that the train had derailed and passengers were coming out of it.

5.10.2 Answering questions, the witness gave the following information:—

(i) When he went up to the bridge he did not have any conversation with the Guard. When he crossed over to the other side of the bridge, he found that the track was in a completely damaged condition. He did not notice anything else. While on his beat towards the bridge he was all alone and none was with him. He did not see anyone on his way.

5.11.1 Shri Akkulappa, Gangmate of Gang No. 9, confirmed having deputed two men from his Gang by name Venkatesu and Nagappa for patrolling the track from Kalasamudram end. In his view these persons were good workers and he would rely on them. The tool box of the Gang was located on the station platform of Kalasamudram. He locked the box on the evening of 21st after work and it was intact when he opened it on the morning of 22nd. All the tools were intact. He would not suspect any of his Gangmen for removal of fish plates. He could not also say if any outsiders had indulged in it.

5.12 Shri Narasimhulu, Gangmate of Gang No. 8, said that he had deputed Shri Subbanna and Shri Muneppa for patrolling the track between Malakavemala and Kalasamudram on the night of 21/22-4-1981. In his view Muneppa was a good worker and he was satisfied with his working. The tool box of his Gang was located within the station limits of Malakavemala. He locked it on the evening of 21st. It was found that the lock was intact when he opened it on the 22nd and all the tools were also intact. There were no mischievous elements in his Gang nor was there enmity between the Gangmen and the villagers. He would not suspect any of the Gangmen for removal of fish plates.

5.13 Shri M.S. Ravi, Assistant Station Master, Kalasamudram, confirmed that security patrolling was in force on the night of 21/22-4-1981 and that the Patrolmen reported to him at scheduled timings. In the third beat the Patrolman reported to him at 04-00 hours and left towards Malakavemala side after taking his signature in the Register.

He granted 'Line Clear' for No. 98 Express at 04-35 hours to Malakavemala and received out-report at 04-42 hours. When the train did not arrive by 05-15 hrs., he sent a search party and later learnt that the train was involved in an accident.

5.14 Shri Y. Satyanarayana Murthy, Assistant Station Master, Malakavemala, confirmed that security patrolling had been in force in Malakavemala-Kalasamudram section on the night of 21/22-4-1981 and that the Patrolmen had reported to him at the scheduled timings. The Patrolman in the third beat left his station at 04-00 hours with his signature in the Register. No. 98 Express was blocked by him at 04-35 hours and the train ran through his station at 04-42 hours. At 05-12 hours he sent a Pointsman to search for the train but subsequently learnt over the telephone that it had met with an accident.

5.15 Shri K.C. Dey, Section Controller, Guntakal, said that the train left Dharmavaram 60 minutes late and ran through Malakavemala at 04-41 hours. The running time between Malakavemala and Kalasamudram was 11 minutes and when the train was reported not having reached the other end till 05-10 hours, he asked the Assistant Station Masters concerned to send search parties. At about 05-30 hrs. he was told on the Control phone by someone who described himself as Signal Inspector. Dharmavaram from the accident spot that the train had met with an accident. He immediately informed the Deputy Controller and all concerned were soon advised. Relief trains and Medical Relief Vans were ordered from Pakala and Guntakal at 05-45 hours and 05-50 hrs. respectively. The Medical Relief Van from Guntakal left at 06-15 hours and arrived Malakavemala at 09-40 hours but was terminated there. The Breakdown Special from Guntakal reached Malakavemala at 11-50 hrs. and that from Pakala at 12-15 hours.

5.16 Dr. A. Venugopal, Dy. Civil Surgeon, Government Hospital, Kadiri, who was the first Doctor to reach the site, said that he was informed by the Railway Station Master at about 06-00 hours and rushed to the spot along with his staff at 06-45 hours. He examined three persons with grievous injuries, gave them first-aid and shifted them to Kadiri for further treatment. Later, these persons were shifted to the District Hospital, Anantapur.

5.17.1 Shri P. Atchuta Singh, Station Master, Kadiri, said that he was informed of the accident at 05-50 hours. He rushed to the station and sent intimation to the Permanent Way Inspector, Railway Police Sub-Inspector and also the local Doctors. He had also requisitioned buses from the Road Transport Corporation to transport the stranded passengers of the Express train. He left for site at 07-10 hours and reached at 07-40 hours, by which time the Government Doctor was already at site attending to the injured.

5.17.2 As he went round the place he noticed that two joints of the left hand side rail at Kalasamudram end of the bridge were without fish plates and bolts which were lying by the side. The corresponding joints on the right rail were intact. There was no indication of any damage on the fish plates and bolts and it looked as though they were removed by someone and placed there. There was also a bridge hook bolt in between the rails and a big size stone by the side of the left rail.

5.18 Shri A. Soundarapandian, Sr. Divisional Engineer/II Guntakal, who reached the accident spot at about 09-15 hours gave a detailed account of the condition of the permanent way he noticed on arrival. This corroborates with what the other witnesses who had reached the site earlier have said, in regard to the removal of fish plates and bolts from the left side joints of the track.

5.18.2 The witness who was associated with this section for the last four years in different capacities gave particulars of cases of sabotage and attempted sabotage which took place during the last several years. This included the derailment to the same Venkatadri Express train on two earlier occasions on 18-1-1977 and 13-1-1980 and six attempted cases of sabotage between 5-1-1980 and 18-4-1981.

5.18.3 Answering questions, the witness said that after the accident on 18-1-1977, hurring of fish bolts had been done as decided by the Chief Engineer, Southern Railway but as this had created problems of maintenance which got aggravated due to non-availability of bolts in sufficient numbers, it was decided to give up the practice and all the burred bolts were replaced by ordinary bolts. Questioned on the issue of close liaison with the State Government with a view to prevent sabotage cases or suspected sabotage cases, the witness said that at the Divisional level all cases were brought to the notice of the Assistant Security Officer and the Superintendent, Railway Police. The Divisional Railway Manager had also addressed a letter to the Chief Security Officer, Secunderabad about five months ago. Questioned on the efficacy

of the type of patrolling that was being done, the witness said that it was same as monsoon patrolling and was adequate in his opinion. Asked as to why the patrolling charts given to the Permanent Way Inspector excluded the period between 01-30 and 04-00 hours, the witness said that prior to November 1980 there was no train in the section during that period. The timings of Venkatadri Express were rescheduled in November 1980 Time Table which should have required introduction of patrolling between 01-30 and 04-00 hours also but was left out due to over-sight. Questioned about the likely motive of persons behind the earlier attempts of tampering with track, the witness said that looting the wrecked train might be the motive of the persons. To his knowledge there was no interference in the day to day working of his staff by outsiders. He had, however, narrated one occasion of an interference when some outsiders were reported to have beaten a patrolman on 5-11-1980 when he reported that some fish plates were found removed from the track. On that occasion, however, the Patrolman was able to stop the train with great difficulty.

5.19.1 Shri N.P. Gupta, Divisional Mechanical Engineer/Carriage and Wagen, Guntakal, who had the locomotive and coaches examined in detail on arrival at the site at 13-20 hours on the day of the accident gave particulars of the details of damage to the vehicles.

5.19.2 Answering questions, he stated that his inspection of the coaches did not reveal any defects which could have caused or contributed to the accident.

5.20.1 Shri K. Sigamani Assistant Security Officer, Guntakal who reached the site of accident at about 09-45 hours, said that on going round the site, he noticed, among other things, that both the fish plates, bolts and nuts were removed on one joint on the left side and kept aside. One fish plate was also found lying at some distance of that joint on the embankment. One dog bolt was found lying at one end of the bridge and another underneath the bridge. He had also noticed a stone weighing 7 Kgs. in front of the next joint on the left side rail. The fish plates and nuts of this joint were found removed. One of the fish plates was found in bent condition. In between the rails one dog bolt was also found in bent condition. Four bolts and two nuts were found near the rail joint.

5.20.2 Suspecting sabotage, the witness added, the Police had arranged for the Dog Squad from Kurnool and also for a Dog of the Railway Protection Force Department at Secunderabad. All the three dogs were set to smell independently at site at about 06-00 hours on the 23rd April. They smelt different articles and started running towards a nearby village—Nagireddipalli—and gave some clues. His information was that six persons were apprehended by Police and were taken into custody.

5.20.3 Answering questions, the witness said that there were four cases, of which two were registered as theft cases and the other two as attempted sabotage cases since November 1980. Investigation by the Government Railway Police into these cases was pending. His Department was not aware of any earlier cases.

VI. OBSERVATIONS AND TESTS

6.1 On 22-4-1981 I observed the condition of the track fittings which were found lying in or alongside the track at the site of the accident before restoration work commenced. The results are detailed elsewhere in the Report.

6.2 On 23-4-1981 I spent about three hours at the accident site to identify the various fittings and had a sketch made out. I had also inspected the unaffected track in the approach of the bridge.

6.3 At my instance trial was conducted on the adjoining 50 lbs. track to understand the possibility of lifting a rail (after removal of fish plates) and causing an obstruction sufficient to cause derailment of a train by 3 or 4 men using only spinners. It was possible for these men to lift the track at the joint and insert a hook bolt after creating a gap of 3 or 4 cms. between the rail and the sleeper seat. A similar trial was conducted at Dharmavaram on the 25th of April on 60 lb. track with similar results.

6.4 On 1-5-1981 I had a similar trial conducted on 52 Kg. track in Bangalore-Jolarpettai section of Southern Railway. It was found that the men were not able to lift the track substantially without the use of crow bars.

VII. DISCUSSIONS

7.1 Time of Accident

The Guard and Driver of the Express Train stated that it had run through Malakavemala at 04-40 hours and the accident took place at 04-45 hours

7.2 Speed of the Train

The Driver stated that his train was running at about 60 Km/h. just before he felt a jerk. This tallies with the speed recorded on the speed chart of the locomotive.

7.3 Site Evidence

I inspected the site at about 17-00 hours on the same day before restoration work commenced. What I saw at the site is detailed in paras 7.3.1 to 7.3.11 below:

7.3.1 At the Pakala end of the girder bridge No. 1082 (6 spans of 18.29 m. long girders) three hook bolts fixing the wooden sleepers (Nos. 197, 198 and 200 of the bridge) to the girder on the left side were found deficient. One of the bolts was found lying in the dry bed of the stream just under the last span where the deficiency was noticed. The second was found by the side of the track near the abutment and the third was lying near the track about 27 m. away from the abutment of the bridge. While the first two bolts had no marks on them, the third was found bent.

7.3.2 At my instance the rail joints commencing from Pakala end of the bridge were numbered L₁, R₁, L₂, R₂, L₃, R₃ etc. (indicating the 1st joint on the left side rail, 1st joint on the right side rail and so on) and the sleepers were serially numbered 1, 2, 3 etc. commencing from the abutment for identification purposes. Distances are reckoned from the abutment to various objects found in or along side the track. Symbols L₁, L₂ etc. in the following paragraphs refer to rail joints while symbols L₁-L₂, L₂-L₃ etc. refer to individual rails and L₁-R₁, L₂-R₂ etc. to track including rails sleepers and fittings.

7.3.3 The track was undisturbed between the bridge abutment and L₁-R₁. The rail joints L₁ & R₁ were intact with fish plates, bolts and nuts.

7.3.4 The track between L₁-R₁ and L₂-R₂ was also undisturbed except that at L₂ the fish plates and bolts were not found fixed to the rails. Near about the joint three fish plates were seen, two on the left side shoulder ballast and the third about 2.8 m. away from the centre of the track on the track on the left side cess. These fish plates bore no hit marks of any kind. Four fish bolts without nuts were found lying on the ballast inside the track near about the joint, one nut inside the track and three nuts outside on the left shoulder ballast. These bolts and nuts did not also have any hit marks on them.

7.3.5 The track between L₂-R₂ and L₃-R₃ was in original alignment and could be said to be in an undisturbed condition except that some of the keys were missing from the CST-9 plates but most of them were lying by the side of the track. At L₃, the joint fish plates and bolts were not found on the rail L₃-L₃ but on the corresponding right side joint R₃ the fish plates and bolts were intact. While the rail R₃-R₄ was in position, though slightly disturbed, the left side rail was not to be seen on the bank.

7.3.6 Four fish bolts with no damage marks were found lying on the ballast near about the joint L₃. A hook bolt of the bridge (referred to in 7.3. 1 above) was found lying between sleepers 41 and 42 (the sleepers at the joint L₃-R₃ are numbered 40 and 41) in a bent condition. From the nature of the bend it looked as if it had a vertical hit from above at about 1/3rd length from its head.

The left side canted bearing plate of the joint sleeper No. 41 had also a mark indicating a vertical hit from above. The wooden sleeper below was found crushed at the location of the bearing plate.

A boulder, about 100 cm. in circumference, was found lying on the left side shoulder ballast near about the joint.

7.3.7 There was no indication of 'point of mount' or 'point of drop' of derailed wheels of the vehicles any where on the track upto L₃-R₃. Thereafter the CST-9 sleepers on both sides were found broken, the breakage being more severe on the left side than on the right side. While the right side rails R₃-R₄, R₄-R₅, etc. upto R₁₂ were lying on the bank near about their original position (disturbed due to derailed wheels passing over broken sleeper plates) their joints were intact except at R₈ where the rail R₄-R₅ got separated from the joint, and the fish plates with one bolt intact were found fixed to the R₅ end of the rail R₅-R₆. The fish plates were in a bent condition indicating a violent separation of the rail R₄-R₅ from the joint after the breakage of both the fish bolts.

7.3.8 The rails L₃-L₄ and L₁-L₅ with the fish plated joint L₄ intact (complete with bolts and nuts) and undamaged were found lying down the left side bank nearly 47 metres longitudinally and 10 to 15 metres laterally. At the L₃ end of the rail there were marks of its having been battered and its bottom flange was found broken. A broken pipe 40 mm in dia. and 280 m. in length was found stuck up at the end of the rail in a 'L' shape. The L₅ end of the rail took a 'U' shape, the centre line of the 'U' being about 2 metres from the rail end.

7.3.9 The rail L5-L6 was found down the left bank at a distance of about 10 metres laterally and four metres longitudinally from its original position. While the L6 end of the rail was straight, its L5 end was in a bent condition with fish plates and two bolts intact. One of the fish plates was broken at the centre while the other was bent outwards.

7.3.10 From L6-R6 to L12-R12 the rails were generally in position except that they got damaged due to derailed wheels having passed over them. Most of the sleeper plates were, however, broken.

7.3.11 One reverse jaw type sleeper in each rail length was found in the track from L2-R2 to L5-R5.

7.3.12 A 2° (873m. radius) curve starts just beyond the abutment of the bridge and versine stations 0, 1, 2 etc. were found painted on the track web of the left side rails. The identity of the rails L3-L4, L4-L5 and L5-L6 could be determined with the help of the painted station numbers which were 10 metres apart.

7.4 Condition of the Approach Track :

The track on the girder bridge and at Malakavemala end of the bridge was in a good condition. The bridge alignment was good and the condition of the bridge timbers was satisfactory. Fittings were complete except for the three missing book bolts referred to in para 7.3.1. Gauge and cross levels on the bridge were satisfactory. The Gauge, cross levels and alignment of the track at Malakavemala end of the bridge were also satisfactory and ballast shoulder was adequate.

7.5 Condition of the Rolling Stock:

The condition of the locomotive and the first few coaches could not be inspected in detail due to their having got derailed and capsized. However, no visual defects which could have raised doubts about their acceptability came to notice. The Mechanical Engineers who had later inspected the vehicles in detail assured me of their track-worthiness.

7.6 Evidence of witnesses who were on the Train at the Time of Accident:

7.6.1 The locomotive Driver K. Gopal was among the first to have seen and told others about the condition of rail joints L2 and L3 a little after day break. Shri T.P. Narayana, Senior Rakshak, who was escorting the train had also seen the rail joints independently at about the same time and told others. Later the train Guard Shri C.M. Balakrishnan and Signal Inspector Sri K.S. Ithal, who was a passenger on the train saw them. Subsequently the Railway Officials and the Civil and Police Officials including the District Collector and the District Superintendent of police who visited the site at about 08-30 hours are reported to have seen the condition of the rail joints. Among them, witnesses who deposed before me described the position of the rails, fish plates and other fittings as per their observations and understanding. What they told me generally agrees with what I saw after about 12 hours of the occurrence. I am accordingly satisfied that what I saw represents the actual position as seen by the witnesses soon after the occurrence (from about 6 A.M. onwards). The accident occurred at 04-45 hours, an hour before day break, and it is likely that due to the insufficient light and their other preoccupations connected with the accident none might have noticed the condition of the track before day break.

7.6.2 A Clear Case of tampering with track:

From the evidence adduced above, I conclude that the occurrence was a clear case of tampering with track by some persons. The site chosen viz., a high bank of 8 to 9 metres, close to a bridge is also an ideal location for wrecking a train. There is a black-topped road about 100m. away from the track at the bridge but road traffic during the night was not such as would come in the way of the miscreants particularly when they acted in darkness.

7.6.3 The possible manner in which they might have acted appears to me to be as under:

(i) The last train to pass the spot prior to the ill-fated Venkatadri Express was a Goods train at about 20-30 hours. Security patrolling was in force in the section and as per the patrolling chart the spot (which incidentally was the meeting point of the Patrolmen from either end of the Block section) was covered last by the Patrolmen at 00-15 hours. Thus the persons indulging in tampering with the track had a clear 4½ hours to act. From the manner in which the track was tampered with, it appears that three to four men might have taken part in the act with the use of spanners to remove the fish plates and at least a short bar with clawed end to remove the dog spike(s) of the joint wooden sleeper(s).

(ii) The miscreants might have first removed the fish plates of joints L2 and L3 and the keys of some of the CST-9 sleepers of the rail L2-L3. When they found that they were not in a position to remove the rail from its position they tried to lift the rail at the joint(s) by keeping a solid steel object in between the rail and the sleeper. Removal of the book bolts

from the bridge sleepers was perhaps meant for this purpose. Possibly due to their not being careful, one of the bolts dropped down but they managed to get two bolts for use—one at each joint. They had, after lifting the L3 end of the rail L3—L4, managed to insert one of the hook bolts in between the rail and the sleeper. They had possibly intended to lift also the L2 end of rail L2—L3 but could not succeed for some reason. The possible reason for this might have been the difficulty in removing the dog spikes of the wooden joint sleepers. The hard wood joint sleepers were in a good condition and the dog spikes which were used with canted bearing plates had a good grip (as seen by me during a demonstration) making it difficult for their removal unless one used a long sized clawed bar. With some difficulty they had succeeded in removing one of the spikes of the joint sleeper No. 41 at joint L3. Despite the other spike having remained in position, they managed to shift the rail end from the spike (possibly they managed to lift that spike clear of the rail flange) and lifted it by 3 or 4 cms., enough to insert the hook bolt in between the sleeper and the rail. During a trial conducted at my instance on the 23rd April under similar track conditions, I found that it was possible for three men to lift the rail end along with the shoulder CST-9 sleepers and insert a hook bolt between the rail and sleeper. For this to be done, the rail was not required to be separated from the sleeper plates and the presence or absence of a Reverse Jaw type sleeper at the shoulder of the rail joint made no difference.

(iii) Lifting a rail by 3 or 4 cms. and supporting it solidly underneath in that position is a sure method of derailing a train without the Driver noticing anything about it even if he were alert. The reason for derailment not having taken place at joint L2 even though the fish plates had been removed there also can be explained by the fact that the dog spikes were in tact and the rails with fish plates removed had remained in alignment even at that speed.

(iv) The assumption that the method adopted for tampering involved lifting of the rail end at one rail joint only is borne out by the fact that the hook bolt found close to the joint L3 had a vertical hit on it, the bearing plate on which it was placed had a similar hit mark, the sleeper at the rail seat had crushing marks and the rail end itself had unmistakable marks of wheels hitting the rail end and leaving the rail table as they passed over it.

7.7 Course of the Accident:

7.7.1 With the fish plates of joints L2 and L3 removed and the rail L3-L4 vertically lifted by 3 or 4 centimeters creating a difference in level, in the rail table at joint L3 (the leading rail end being at normal rail level and the landing rail end being at a higher level) the course of the accident was probably as under;

7.7.2 As the wheels of the locomotive encountered obstruction in their path, they might have hit the rail end and derailed one after the other. As the derailed wheels travelled over the CST-9 plates, the latter were damaged, causing the gauge to spread. While the locomotive managed to keep to its path inspite of its wheels leaving the rails, the following coaches left the track alignment and began to deviate to the left. From the position of the derailed and capsized locomotive it appears that it did not deflect much to the left (its maximum lateral displacement after travelling for about 100 metres after its left side wheels left the outer rails of the 2° curve being 2.5 to 3.3 metres from the track in the capsized position) and continued to hold on to the coaches in the rear almost upto its coming to a stop.

7.7.3 The first two coaches behind the locomotive bore no visual marks of their wheels having ploughed through the earth before coming to rest several metres down the bank. They were held by the couplings in front and rear and it looked as though they were floating in the air before reaching the natural ground down the bank 12 to 24 metres away from the track. Due to the lateral oscillations caused by their simultaneous longitudinal motion and the lateral deviation caused by the third and fourth coaches (which had left the bank and ploughed through the natural ground before coming to a stop in a canted position) with couplings in tact almost till the end, the first two coaches had, in the last one or two seconds of their motion, overturned with consequent snapping of the coupling between the locomotive and the first coach and that between the 2nd and 3rd coaches. All other couplings were found held after the accident and when this observation is considered together with the manner in which the coaches came to rest, the above presumption gets strengthened.

7.7.4 The displacement of rails L3-L4, L4-L5 and L5-L6 away from their position may be explained as under:—

(i) As the sleeper plates got broken by the derailed wheels of the locomotive and the first two coaches, the rails L3-L4 and L4-L5 (with the fish plates at joint L3 having been removed earlier and with the fish plates at joint L4 being in tact) got displaced from its original alignment and one of the wheels of the rear vehicles (possibly of the third coach) hit it and pushed it longitudinally with joint L5 becoming its support at the other end. This resulted in the rail end L5 taking a 'U' shape; at some stage it got separated from the fish plates and moved forward with the coach down the bank.

(ii) A similar hit by one of the wheels of the rear vehicles resulted in the L5 end of rail L5-L6 being bent to 'U' shape, one of the fish plates bent and the other broken at the middle and then got dragged by the wheel which left it at some stage.

(iii) While there are clear indications that joints L4 and L5 had their fish plates and bolts in tact before the accident, it is possible that the joint L6 might have been without fish plates. No fish plates could, however, be seen at the site to substantiate this presumption.

7.8 Tampering with track — a frequent occurrence in the Section:

It appears from available information that the section Dharmavaram-Pakala has been the favourite ground of miscreants attempting to wreck trains for quite some time. As per details given by the Senior Divisional Engineer, Guntakal, there were two earlier attempts in April 1981, three attempts in 1980 (of which one resulted in the derailment of Venkatadri Express on 13-1-1980) and one each in 1976 and 1977 (the latter resulting in the derailment of Venkatadri Express). From the deposition of the Inspector of Police, it appears that there were as many as 19 cases registered under Section 126 (Maliciously wrecking or attempting to wreck a train) and Section 128 (endangering safety of persons travelling by Railway by willful act or omission) of the Indian Railways Act, during the last ten years. None of these cases resulted in prosecution and all ended as 'undetected' except the last few which were still under investigation.

7.9 What was the motive behind the tampering attempts?

7.9.1 The Police Officer who deposed before me was of the view that these were not acts of outsiders who would like to cause sabotage on Railway track. He was inclined to think that people connected with the Railway work may, for their own reasons, be resorting to such acts. This view has not however, been shared by the Railway Engineer who deposed before me. In his view looting the wrecked train may be the motive of the persons indulging in it.

7.9.2 It appears from the evidence of the passengers of the train and Railway Officials who were on the train at the time of the accident that there was no attempt by any outsiders to loot the passengers of their belongings. In fact there was no evidence of any outsider being near about the site of occurrence. Besides, the timing of the accident, an hour before dawn, would not suggest any possibility for looting. The train was running an hour late on the fateful day and even if the miscreants expected it to run on time there was not enough time for sustained train looting.

7.9.3 This was the third successive attempt of train wrecking as far as Venkatadri Express was concerned, the two earlier attempts being in January 1977 and January 1980. On the earlier occasions also the derailment took place just before day break and there was no report of attempts at looting passengers.

7.9.4 I have questioned the Permanent way Inspector and his staff and they do not seem to think that there were any dissatisfied elements among the staff who would like to wreck a train to settle scores with their colleagues or with the Railway Administration.

7.10 Absence of serious concern by the Authorities:

7.10.1 Whether it was an act of Railway staff or outsiders, one thing appears certain and that is, the motive of the persons indulging in tampering with track was an attempt to wreck the train and thereby embarrass the Railway Administration. As far as its effects on innocent train passengers are concerned it makes no difference as to whether a train is wrecked by an outsider or an insider and what one is interested in is that the persons concerned are brought to book. It appears from available evidence that in this respect neither the law enforcing machinery of the State nor the Railway Administration has shown any serious concern so far.

7.10.2 The fact that in none of the 19 cases so far registered by the Police Department have they been able to prosecute any persons, much less to secure their conviction substantiates this observation of mine. There is no evidence of any high ranking Police or Civil Administrators of the State viewing the matter seriously in the earlier cases and from the evidence of the Inspector of Police, it is clear that they are not going to do much about the present case either.

7.10.3 From the side of the Railway Administration, there is no doubt expression of routine concern at the frequent attempts of tampering but that appears to be confined to the lower levels. There is, as yet, no evidence of the top Administration seriously viewing the matter. This may perhaps have been conditioned by the fact that none of the attempts which have so far been made (including the three derailments caused to Venkatadri Express) has resulted in serious casualties. Looking at the severity of the

current derailment, I feel that it could as well have resulted in heavy casualties but for divine mercy-- I do not see any other explanation for such light casualties when the locomotive and the following four coaches left the bank and went down by as much as 7 metres at its worst point before coming to rest. I would accordingly urge on the Authorities concerned to take a serious view of the situation and try to put an end to the attempts soon, since, one cannot be sure that luck will continue to favour for the fourth time in succession.

7.11 Ineffective Security Patrolling:

Twelve days prior to the accident, on the 10th of April there was a reported attempt of tampering with track in the adjoining block section, at a location 15 kilometres away from the site of the present occurrence, and as a result of that report night patrolling was introduced in the affected Block Section. Again on the 18th of April, another attempt in tampering with track was reported at a location 28 kilometres from the present site, and as a result security patrolling was introduced in the entire section of the permanent Way Inspector. Despite these two warnings and notwithstanding the Security Patrolling being in force the third attempt took place on the 22nd of April which resulted in the present accident. The fact that the security patrolling made no difference to the occurrence, would itself substantiate the ineffectiveness of the patrolling. It is surprising that when an important Express train was scheduled to run in the Block section Malakavemala-Kalasamudram between 03-30 hours and 04-00 hours in the morning, the chart used for patrolling did not include that period for the movement of the Patrolmen. The earlier beat of patrolling was scheduled, as per the chart, between 22-30 hours and 01-30 hours and the next beat was scheduled between 04-00 hours and 07-00 hours leaving precisely the period during which the Express train was scheduled to run in the Block section. This shows how serious the officials in charge of patrolling were in the matter. It is another matter that the present accident might not have possibly been averted even if the patrolling had been in force between 01-30 hours and 04-00 hours also, but that would not in any way justify the indifference with which patrolling was given effect to.

7.12 An effective anti-sabotage measure is the immediate need in the affected section:

7.12.1 Several anti-sabotage measures were tried in the past on Indian Railways but they were all given up except the use of reverse jaw type plates when CST-9 plate sleepers are used in the track. Even that practice appears to have been implemented in a half-hearted manner in this section when relaying was done twenty two years ago. I could only see one reverse jaw type sleeper per rail length in the stretch involved in the accident and I was told that even this provision did not exist in some adjoining stretches. On the efficacy of the practice, however, I have had to revise my earlier opinion. A practical demonstration made at my instance on 50 lb. and 60 lb. track indicated that even with a reverse jaw type sleeper at the shoulder, the track can be lifted after removing the fish plates and what is required for causing a derailment is only a vertical gap of 3 or 4 centimetres between two adjoining rails (the leading rail being lower and the landing rail being higher). This lifting can easily be achieved by three or four persons without use of any crow bars. In the case of 52 Kg. or 44.6 kg track lifting becomes very difficult due to heavy and comparatively inflexible track. During a demonstration made on such a track lifting was found possible only with the use of at least two crow bars.

7.12.2 It is evident, therefore, that ordering the provision of the full compliment of three reverse jaw type sleepers will not solve the problem in Dharmavaram-Pakala section. I was told during my inquiry that after the derailment of Venkatadri Express in January 1977, the Southern Railway Administration (which was then administering Guntakal Division) ordered burring of fish bolts but this was, however, reversed after South Central Railway took over the section when maintenance became difficult and replacement of damaged bolts became more difficult. While elimination of the cause (or causes) behind frequent attempts of tampering with track is the only long term solution to the problem in Dharmavaram-Pakala section, it appears to me that burring of fish bolts may be helpful although it will create problems of maintenance. The condition of rails as seen in the track of the affected stretch was not too bad and welding the rails (after cropping the ends if necessary) in vulnerable locations may be another method to frustrate the attempts of mischievous elements trying to tamper with the track.

VIII. CONCLUSIONS

8.1 Cause of the Accident:

Having carefully considered the factual, material and circumstantial evidence at my disposal I have come to the conclusion that the derailment of No. 98 Down 'Venkatadri Express' train at Km. 49/14-50/1 between Malakavemala and Kalasamudram Stations on Dharmavaram-Pakala Metre Gauge single line section of Guntakal Division of South Central Railway on 22-4-1981 was the result of tampering with track by persons unknown.

8.2 Responsibility:

I do not hold any Railway Official responsible for the occurrence.

8.3 Relief Arrangements:

I am satisfied with the relief arrangements. Thanks to the prompt action taken by the Railway Station Master, Kadiri, and others, Medical help reached the site as quickly as could be expected in the circumstances and all the three grievously injured persons were taken care of properly by the Doctors.

IX. REMARKS AND RECOMMENDATIONS

9.1 In view of the frequent attempts at tampering with track in Dharmavaram-Pakala section, the law enforcing Authority may be requested to view such attempts seriously and bring the culprits to book early. The Railway Administration should also take up the issue at the highest level with a view to put an end to it early.

9.2 The Railway Administration may consider taking antisabotage measures like burring of fish bolts and welding of rails in vulnerable sections with a view to eliminate the chances of tampering even at the cost of facing some maintenance problems later on.

Yours faithfully,

BANGALORE.

2-6-1981.

Sd.

(B.P. Sastry)

Commissioner of Railway Safety.

RAILWAY BOARDS COMMENTS ON VARIOUS PARAS OF THE REPORT:—

Para 9.1: The General Manager has taken up the issue with the Chief Secretary to the Government of Andhra Pradesh, expressing serious concern over the frequent attempts at tampering with the track on Dharmavaram-Pakala section and requesting him to take urgent remedial action in the matter. The Minister for Railways has also written a letter (copy enclosed) to the Chief Minister, Andhra Pradesh, indicating that some extremist elements were active in Khamman, Anantapur and Cuddapah districts of the State and that measures should be taken to foil their attempts so as to avoid any mishap to the trains in the area.

Para 9.2:

(i) Instructions have been issued to the Railways vide Board's wireless message No. 81/W6/PRA/10 dated 1-8-81, indicating that fish bolts may be burred, two in a joint, in vulnerable sections and that patrolling may be introduced on a selective basis, where thefts, removal of fittings and tampering with the track is rampant.

(ii) As explained by the Railway Administration, the section is laid with 50 lbs rails in the year 1957-58 and having a wear of 2 to 3 percent. Since welding of rails is not undertaken on sections laid with rails below 60 lbs on the metre gauge, the matter was referred by the Railway to RDSO, who did not recommend the welding of the rails on the consideration that the combined effect of high thermal stresses and dynamic loading may lead to very large magnitude of stresses beyond permissible values. The Railway has, however, been asked to have the suggestion re-examined in consultation with the RDSO expeditiously.

After further consultation with the RDSO, the welding of such rails to form SWP/LWR is not found technically feasible on account of stresses exceeding the permissible limits.

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