GOVERNMENT OF INDIA

MINISTRY OF CIVIL AVIATION

(COMMISSION OF RAILWAY SAFETY)

RAILWAY ACCIDENT INVESTIGATION REPORT

ON

Derailment of 2301 Up Howrah - New Delhi Rajdhani Express train at km. 508/19-21 between Rafiganj and Deo Road stations on Gaya-Mughalsarai Grand Chord Double line Broad Gauge Electrified Section of Mughalsarai Division of Eastern Railway on 09-09-2002

सा रां श

1.	दिनांक	-	09.09.2002
2.	समय	-	22.39 बजे
3.	रेलवे	-	पूर्व
4.	गेज	-	ब्राड गेज
5.	स्थान	-	मुगलसराय मण्डल **के गया – मुगलसराय** ग्रैण्ड कॉर्ड दोहरी बड़ी लाइन विद्युतिकृत खण्ड के रफ़ीगंज और देव रोड स्टेशनों के **बीच कि. मी.** 508/19 - 21 पर।
6.	दुर्घटना का प्रकार	-	अवपथन
7.	प्रभावित गाड़ी	-	2301 **अप हावड़ा– नई दिल्ली राजधानी एक्सप्रेस**
8.	दुर्घटना के समय गति	-	लगभग 126 कि.मी. प्रति घण्टा
9.	कार्य प्रणाली	-	पूर्ण ब्लाक पद्धति
10.	रेल पथों की संख्या	-	दोहरी
11.	ढाल	-	समतल
12.	सरेक्षण	-	सीधी
13.	मौसम	-	बादल
14.	दृश्यता	-	अच्छी
15.	नुकसान का मूल्य	-	रू .9,42,18,000/-
16.	हताहत	-	मृत - 107 गम्भीर रूप से घायल - 60 सामान्य रूप से घायल - 115
17.	राहत व्यवस्था और चिकित्सीय प्रबन्ध	-	और जाँच की आवश्यकता है ।
18.	कारण	-	तोड़-फोड़
19.	उत्तरदायी पाये गए	-	**मुख्य** - अज्ञात व्यक्ति (एक या ज्यादा) **गौण** - (क) कानून व्यवस्था करने वाले।

(ख) पूर्व रेल प्रशासन के सुरक्षा, इन्जिनीयारिंग एवं परिचालन विभाग व मुगलसराय मण्डल के **सुरक्षा एवं इन्जीनीयरिंग शाखा ।**

निन्दनीय -(क) सर्वश्री कुलदीप एवं गणपत, देव रोड को यूनिट संख्या 5 के गैंगमैन - पैट्रोलिंग में कार्यरत ।

(ख) श्री बी . नस्कर, अनुभाग अभियन्ता/ पी. वे, रफिगंज ।

(ग) श्री मुकेश गुप्ता, सहायक अभियन्ता, गया ।

(घ) श्री अभय कुमार, मण्डल अभियन्ता/ II/मुगलसराय ।

(ङ) मुगलसराय मण्डल का वित्त विभाग ।

(च) आर. डी. एस. ओ. का ट्रैक निदशालय।

20. संक्षिप्त में महत्वपूर्ण सिफ़ारिशें

1) तोड़-फोड़ की घटनाओं को कम करने के यत्न –

(क) सुरक्षा पैट्रोलिंग के विषय पर विस्तृत व स्पष्ट निर्देश जारी किये जायँ ।

(ख) रेलपथ की सुरक्षा के हित में, गया – देहरी आन सोन खण्ड में गाड़ियों की गति और कम करके 75 कि.मी. प्रति घण्टा करने की आवश्यकता है ।

(ग) तोड़-फोड़ की आशंका वाले क्षेत्रों में सुरक्षा पैट्रोलिंग की जाय ।

(घ) कांक्रीट स्लीपर का ऐसा डिजाइन बनाया जाय जिससे रेलपथ में तोड़-फोड़ न हो सके । ऐसे स्लीपर एक साल के अन्दर तोड़-फोड़ की आशंका वाले क्षेत्रों में लगा दिये जायँ ।

(ङ) फालतू/लाइन से निकाला गया/रख रखाव के लिये कोई भी रेलवे लाइन का सामान बिना चौकीदार के लाइन के किनारे न छोड़ा जाय । तोड़-फोड़ की घटना वाले क्षेत्र में इस सावधानी की खासकर आवश्यकता है ।

(च) 13 मीटर से छोटी लम्बाई की एक रेल या बफर रेलों को तोड़-फोड़ की आशंका वाले क्षेत्र जैसे कि ऊचे बैंक, विषम गोलाई, पुलों से पहले या पुलों के ऊपर से तुरन्त हटाया जाय ।

2) यात्री डिब्बों का डिजाइन –

(क) वातानुकूलित यात्री डिब्बों में हथोड़े रखें जायँ ताकि दुर्घटना व आपातकाल में यात्रीगण शीशे तोड़ कर बाहर आ सकें ।

(ख) आपातकाल के लिये रेल डिब्बों में इमरजेन्सी लाइट्स लगाईं जायें । दुर्घटना के समय यह अपने आप जलने लगेंगी ।

(ग) रेल डिब्बों में आग व दुर्घटना के समय बाहर निकलने के लिये आपातकालीन द्वार लगाये जायें । यद्यपि रेलवे बोर्ड ने इस विषय में दिशा निर्देश 1999 में जारी किये थे, लेकिन इनका पालन अभी भी नहीं हो रहा है ।

(घ) यात्री डिब्बों की आन्तरिक सज्जा में गोल किनारों वाली, ढल जाने लायक एवं शाक प्रूफ सामग्री का प्रयोग किया जाय । सीट/शय्या को ऐसा बनाया जाय कि दुर्घटना के समय यात्री उस पर से दूर न गिर जाय ।

(ङ) तीव्र गति की रेलगाड़ियों के डिब्बों की संरक्षा जाँच समय समय पर यन्त्र लगा कर की जाय ।

(च) राजधानी एक्सप्रेस के डिब्बे के डैश पाट तेल के तल की जाँच हर फेरे में की जाय । डैश पाट आयल सिस्टम की जगह फ्रिक्शन टाइप स्नब्बर या सीलड टाइप तेल के शॉक एब्जारबर लगाये जायें ।

(छ) नई रेलगाड़ी चलाने से पहले रेलवे बोर्ड द्वारा जारी आर० पी० सी० 4 के अनुसार सर्टीफिकेट बना कर रेल संरक्षा आयुक्त को भेजने का सुझाव दिया जाता है ।

3) **रेल इन्जिन** - रेल इन्जिन में मेमोटेल टाइप "गति" मापक यन्त्र को पढने के लिये ट्रिप शेड्रो में उचित यन्त्र लगाये जायँ ।

4) **वाणिज्य -**

(क) वातानुकूलित डिब्बों में यात्रा करने वालों के टिकट के पीछे यात्रा में पालन करने की सावधानियाँ छाप दी जायें ।

(ख) वर्तमान रेल बीमा के अलावा, बीमा कम्पनियों को रेल यात्रियों का अतिरिक्त बीमा करने की सहमति दी जाय । इन कम्पनियों को राजधानी व शताब्दी गाड़ियों के स्टेशनों पर आपने काउंटरस खोलने की अनुमति दी जाय ।

(ग) यात्रा करने वाले डाक्टरों को किराये में रियायत दी जाय जिसके बदले में यात्रियों का आपातकाल में उपचार करें ।

5) **रेल लाइन –**

(क) लोहे के गार्डर वाले पुलों पर ट्रैक स्ट्रकचर को मज़बूत बनाया जाय ।

(ख) पुलों पर, काटों व डायमण्ड क्रासिंग पर लगे लकड़ी के स्लीपरों को हटाते का कार्य शीघ्र अति शीघ्र पूरा किया जाय । तब तक आवश्यकता अनुसार ट्रेनों की गति कम की जाय ।

(ग) नई लाइनों के निर्माण में प्लेट गर्डर व अण्डर स्लंग गर्डरों का प्रयोग कम से कम किया जाय ।

6) अन्य सिफ़ारिशें -

(क) दुर्घटना के समय यात्रियों को टेलिफोन की सुविधा उपलब्ध कराने के लिये 6 से 10 तक उपग्रह संचार टेलिफोन एक केन्द्र पर रखे जायें जिन्हे आवश्यकता पड़ने पर तुरन्त दुर्घटना स्थल पर ले जाया जा सके ।

(ख) कम से कम दस कोफिन्स (दीमक से बचाव के बाद) हर दुर्घटना के समय चलने वाली हस्पताल गाड़ी में रखे जाँय और पचास कोफिन्स एक केन्द्र पर रखे जायँ । इन्हें आवश्यकता पड़ने पर तुरन्त ले जाया जा सकता है ।

(ग) जिस दुर्घटना की जाँच रेल संरक्षा आयुक्त को करनी है, उसका प्रथम दृष्टी कारण रेलवे अधिकारियों द्वारा न बताया जाय ।

(घ) रेलवे बोर्ड व क्षेत्रीय रेलों द्वारा जारी सभी तकनीकी परिपत्र, पत्र व दिशा निर्देश जिनका संरक्षा से सम्बन्ध है, रेल संरक्षा आयोग को उपलब्ध कराये जायँ ।

(ङ) रोमिंग सुविधा सहित मोबाइल टेलिफोन रेल प्रशासन द्वारा रेल संरक्षा आयोग के सभी तकनीकी अधिकारियों जैसे मुख्य रेल संरक्षा आयुक्त, सभी रेल संरक्षा आयुक्त व उप आयुक्त रेल संरक्षा को उपलब्ध कराये जायँ ।

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SUMMARY

1.	Date	-	09-09-2002.
2.	Time	-	22.39 hours.
3.	Railway	-	Eastern
4.	Gauge	-	Broad Gauge
5.	Location	-	Between Rafiganj & Deo Road Stations at Km.508/19-21 on Gaya – Mughalsarai Electrified Section of Mughalsarai Division.
6.	Nature of Accident	-	Derailment.
7.	Train involved	-	2301 Up Rajdhani Express.
8.	Speed	-	About 126 Km/h.
9.	System of operation	-	Absolute Block System.
10.	Number of Tracks	-	Two.
11.	Gradient	-	Level.
12.	Alignment	-	Straight.
13.	Weather	-	Cloudy.
14.	Visibility	-	Good under headlight.
15.	Cost of damage	-	Rs.9,42,18,000/-
16.	Casualty	-	Killed - 107 Grievous Injury - 60 Simple Injury - 115
17.	Relief Arrangements Medical Attention	- -	Further inquiry required.
18.	Cause	-	Sabotage.

19. Persons held responsible -

Primary – Unknown person(s).

Secondary - (1) Law & Order system.
(2) Security, Operating and Engineering Departments of Eastern Railway and Security & Engineering Branches of Mughalsarai Division.

Blameworthy –

(1) Sarvashri Kuldeep & Ganpat, Gangmen of Unit No. 5 working as Patrolmen.
(2) Shri B. Naskar, Section Engineer/P.Way/Rafiganj.
(3) Shri Mukesh Gupta, Assistant Engineer/Gaya.
(4) Shri Abhoy Kumar, Divisional Engineer/II/Mughalsarai.
(5) Finance Department of Mughalsarai Division.
(6) Track Directorate of RDSO.

20. Important Recommendations in brief -

1) **Anti-sabotage Measures**:-

(a) Detailed and clear cut instructions should be issued over Security Patrolling

(b) There is a need for further reduction of speed in Gaya – Dehri-on-Sone section to 75 Km/h at night as discussed in para 7.5.1 to 7.5.3 and 7.5.8.. Similar review should be made for other sections affected by miscreant activities.

(c) Security patrolling should be done in sabotage prone areas.

(d) In sabotage prone area anti-sabotage design of fittings on concrete sleepers should be evolved and put in place within one year.

(e) No track material - surplus/released/maintenance reserve be left unguarded near the track particularly in areas known for miscreant activities.

(f) Single cut rails and buffer rails at vulnerable locations like high embankment, sharp curves, bridge approaches and on major bridges should be eliminated.

2) **Design of Coaches** –

(a) Hammers should be provided in AC coaches so that passengers can break open the glasses in case of accidents/emergencies.

(b) Emergency lights at a number of places should be provided in coaches which shall automatically switch on in case of emergency.

(c) Emergency Exits should be provided in all coaches for escape of passengers in case of fire, accidents, etc. Although Railway Board issued instructions on this subject way back in 1999, the same are yet to be implemented.

(d) Mouldable and shock absorbing materials with round edges should be used in internal furnishing of coaches. The seats/berths to be made such that the passengers are not thrown out of their positions in case of an accident.

(e) Riding quality of coaches of high speed trains should be checked periodically by an objective system of evaluation by instrumentation.

(f) Dash pot oil should be checked after every trip for Rajdhani Express coaches. A friction type snubber or any better alternative should be used in place of the present system of dash pot oil arrangement to have maintenance free service.

(g) Compliance to R.P.C. No.4 be certified and sent to Commissioner of Railway Safety for information before introduction of new trains.

2) **Loco -**

Facility for retrieving data from Memotel type speedometer should be provided in Trip Sheds.

4) **Commercial –**

(a) Safety precautions for passengers travelling in coaches should be prominently displayed in coaches and on the back of tickets.

(b) Apart from existing insurance system available for rail passengers, they should be allowed to be additionally insured by insurance companies.

(c) Doctors travelling as passengers may be encouraged to disclose their identity by issuing them concessional tickets on the condition that those doctors will attend to passengers in case of emergencies/accidents.

5) **Track –**

(a) Track structure on bridges with open deck should be modified and strengthened.

(b) The renewal of bridge timbers and wooden layout under points & crossings and special layouts should be completed at the earliest. Till then speeds should be reduced wherever required.

(c) In new constructions, open deck plate girders and underslung girders should be discouraged.

6) **Other recommendations –**

(a) At least 6 to 10 satellite phones may be kept at a central place and moved to the site of accident whenever such emergencies arise.

(b) Some 10 coffins (after anti termite treatment) be kept in each Accident Relief Medical Equipment van and some more at a central place. These can be moved whenever required.

(c) Prima facie cause of accidents where Commissioner of Railway Safety is likely to conduct the inquiry should not be announced by Railway Authorities.

(d) All technical circulars, letters, policy guidelines pertaining to safety shall be made available to the Commission of Railway Safety by the Railway Board as well as Zonal Railways.

(e) Mobile telephones with roaming facilities should be made available by the Railway Administration to all the technical officers of the Commission i.e. Chief Commissioner of Railway Safety, Commissioners of Railway Safety and Deputy Commissioners of Railway Safety.

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(b) Emergency lights at a number of places should be provided in coaches which shall automatically switch on in case of emergency.

(c) Emergency Exits should be provided in all coaches for escape of passengers in case of fire, accidents, etc. Although Railway Board issued instructions on this subject way back in 1999, the same are yet to be implemented.

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(f) Dash pot oil should be checked after every trip for Rajdhani Express coaches. A friction type shubber or any better alternative should be used in place of the present system of dash pot oil arrangement to have maintenance free service.

(g) Compliance to R.P.C. No.4 be certified and sent to Commissioner of Railway Safety for information before introduction of new trains.

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(a) Track structure on bridges with open deck should be modified and strengthened.

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

From : The Commissioner of Railway Safety,
Eastern Circle,
14, Strand Road (12th Floor),
Kolkata – 700001.

To : The Chief Commissioner of Railway Safety,
Ashok Marg,
Lucknow – 226 001.

Sir,

Sub: Derailment of 2301 Up Howrah-New Delhi Rajdhani Express at Km. 508/19-21 on the approach of Dhawa Bridge between Rafiganj and Deo Road stations on Gaya-Mughalsarai Broad Gauge Double line Electrified section of Mughalsarai Division of Eastern Railway at about 22.39 hours on 09-09-2002.

In accordance with Rule 4 of the "Statutory Investigation into Railway Accidents Rules, 1998", published by the Ministry of Civil Aviation, I have the honour to submit the Report of my Statutory Inquiry into the above accident.

1.2 **Inspection and Inquiry** -

1.2.1 (i) Information was received from Chief Safety Officer, Eastern Railway, Kolkata at 23.45 hours of 09-09-2002 that 2301 Up Rajdhani Express had derailed between Rafiganj and Deo Road stations on Gaya – Mughalsarai section at about 22.42 hours. A special train from Howrah was ordered which left at 01.45 hours on 10-09-2002 and reached the site by 09.00 hours. The officers who proceeded by this train were, apart from the undersigned, the General Manager, Eastern Railway, Principal Chief Engineer, Chief Mechanical Engineer, Chief Electrical Engineer, Chief Signal & Telecom. Engineer, Chief Security Commissioner and Chief Medical Director. Divisional Railway Manager, Mughalsarai along with his officers had earlier left Mughalsarai by Accident Relief Medical Equipment train at 23.40 hours of 09-09-2002 and reached the site at 02.58 hours on 10-09-2002.

(ii) The Hon'ble Minister of Railways reached the site of accident at 06.20 hours of 10-09-2002. The site was later visited by Shri A. K. Murthy and Shri Bandaru Dattatreya, Hon'ble Ministers of State for Railways, Hon'ble Chief Minister of Bihar State, Members of Railway Board and Chief Commissioner of Railway Safety.

(iii) I reached the site from Rafiganj end and saw the ghastly scene. The coaches had fallen down the bridge and piled up one over the other. Jawans of Bihar Military Police, Army Personnel and Railway staff were busy in taking out the injured and dead from the derailed coaches. Two of the derailed coaches were infringing the Down line. Therefore both the lines were blocked.

1.2.2 I started my detailed investigations and stayed at the site up to 12.00 hours of 11-09-2002. Briefly my observations are as under:-

(i) **Track** - One running rail about 9 m long was lying outside the Up track (cess side) at Km.508/19-21 on the approach of Dhawa bridge No.445. This was one of the single rails provided on the approach of major bridges to isolate the LWR from the bridge. The Switch Expansion Joint at the end of LWR was intact. The rail was lying toppled approximately 57 cms away from its original position with its head towards the cess and foot towards the track. The gauge face side on the head of this rail had rubbing marks. Fishplates of both the joints (four fish plates in all) connecting this rail were also found lying by the side. A look at the fish plates showed that they had been removed freshly. They bore no signs of damage due to passage of derailed wheels. That they were in active use was further evident from the fact that their colour was different from those kept in the store. 4 fish bolts of the Howrah end joint and 3 of the Delhi end joint were also found lying there along with nuts. The fish bolts were found separated from the nuts. One fish bolt was in the fish plate itself at the Delhi end joint. None of the bolts had any snapping marks. The threads of bolts and nuts indicated no shearing marks showing that they were deliberately opened recently. The 'point of drop' (P.O.D.) was on the sleeper just next to the joint sleepers. The concrete sleepers located thereafter were found crushed. The next rail (on the cess side) had shifted longitudinally in the direction of traffic towards Delhi by about 2.27 m. The head of that rail (facing the direction of the train) was found severely battered and rounded. That rail was found tilted and had hitting marks at end on the web also. The right hand rail had also snapped/fractured. Structure bond of the said 9 m long (approx.) rail remained intact.

(ii) **Bridge -**

Bridge No.445 involved in the accident is a girder bridge of spans 3x18.30 m + 1x18.90 m + 1x12.20 m (all steel girders) on brick masonry piers/abutments. In spans No. 1 & 2, the plate girders got separated due to snapping of their bracings. In spans No.3, 4 & 5, the girders were found bent and twisted. There was also evidence of fresh damage to masonry of piers and abutments.

(iii) **Loco** – Both the wheels of the rear axle of its rear trolley had derailed towards cess side, breaking the elastic clips from the Delhi end of the bridge upto Km.509/7 where the loco had stopped. The loco had separated itself from the rest of the coaches. The Driver of the Rajdhani Express train told me that he felt a heavy jerk before he approached the bridge No.445.

(iv) **Coaches** –

First 4 coaches derailed and fell down the bank at the Delhi end of the bridge. The next 4 coaches remained piled up on one another in the river bed in span No.5. One coach was lying near P-4. 2 coaches were infringing the Down line. 3 coaches were lying in spans No.1 to 3. 15th coach capsized near Howrah end abutment. In the 16th coach leading trolley was derailed and its trailing trolley was on the rails. The 17th & 18th coaches were on the rails.

1.2.3 (i) Press Notification was issued in National and regional Dailies published in English, Hindi and Bengali from New Delhi, Patna, Varanasi and Kolkata inviting members of the public having knowledge relating to the accident to give their evidence before me or to send it to my office. District Magistrate and Superintendent of Police of Aurangabad District had been intimated over phone about the programme and venue of Inquiry.

(ii) The Statutory Inquiry was held on the following days :-

16th & 17th September, 2002 at Gaya.
20th September, 2002 at Kolkata.
23rd & 24th September, 2002 at Mughalsarai.

(iii) The Inquiry was attended by the following officers from Eastern Railway headquarter and Mughalsarai Division of Eastern Railway:-

1) Shri A. K. Goyal, Chief Safety Officer, Eastern Railway, Kolkata.
2) Shri K. Gangopadhyay, Chief Track Engineer, Eastern Railway, Kolkata.

3) Shri K. K. Saxena, Divisional Railway Manager, Eastern Railway, Mughalsarai.
4) Shri Satwant Singh, Chief Electric Loco Engineer, Eastern Railway, Kolkata.
5) Shri Ramesh Chandra, Chief Motive Power Engineer (Diesel), Eastern Railway, Kolkata.
6) Shri G. C. Biswas, Chief Communication Engineer, Eastern Railway, Kolkata.
7) Shri T. C. Nagley, Chief Commercial Officer (Claims), Eastern Railway, Kolkata.
8) Shri S. R. Choudhury, Principal Chief Engineer, Eastern Railway, Kolkata (attended on 24th September only).
9) Shri S. Jha, Deputy Superintendent of Railway Police, Gaya (attended on 23rd September only).

(iv) Besides the Statutory Inquiry, a meeting was held with the following Bihar State Government Officers at Gaya on 17-09-2002:-

1) Shri N. C. Dhoundial, Deputy Inspector General of Police, Magadh Range, Gaya.
2) Shri S. Siddharth, District Magistrate, Aurangabad.
3) Shri S. K. Jha, Superintendent of Police, Aurangabad.
4) Shri S. Jha, Deputy Superintendent of Railway Police, Gaya.

In the evening of the same day, I met Shri Hem Chand Sirohi, Commissioner of Magadh Range, Government of Bihar at Gaya.

Evidence of 122 witnesses was recorded in 5 days mentioned in para 1.2.3 (ii). On 01-11-2002, evidence of another 21 railway officers/staff who were travelling on the derailed train was recorded.

1.2.4 During the course of my inquiry, I visited the site later again on 15-09-2002 and 25-09-2002 to gather more information. On 15-09-2002, I inspected the track by push trolley from Rafiganj to the Dhawa bridge on Up line to examine the general state of maintenance of track. I conducted a detailed inspection of Dhawa bridge No.445 on the Down line, adjacent to the accident involved bridge No.445 Up. Bridge No.493 (Up & Dn) at Km.534/7-9 was also inspected. These bridges were inspected because they too had similar materials of construction and were of the same vintage.

1.3 **The Accident** –

1.3.1 2301 Up Rajdhani Express left Gaya at 22.16 hours on 09-09-2002 and passed through the following stations at the timings indicated against each:-

Station	Arrival	Departure Time
Guraru	Passed	22.32 hours
Ismailpur	Passed	22.36 hours
Rafiganj	Passed	22.40 hours

The timings indicated as above are those given by station staff and Control. However, as per the crew in the loco cab and the speedometer graph, the train passed through Rafiganj at 22.37 ½ hours. There appears to be a difference of 2 minutes in the watches of station staff and loco crew.

1.3.2 It had an uneventful run till it passed Rafiganj. However as the loco of the train was approaching bridge No.445, enroute to Deo Road, the next station, the driver felt a heavy jerk. Within no time 14 coaches of the train derailed and capsized.

1.3.3 There was light rain up to Rafiganj, thereafter there was no rain till the train met with the accident, but there remained clear visibility under headlight.

1.4 Casualties -

I regret to report that a number of casualties took place in this accident. The numbers, as reported in the preliminary report, has since been revised by the Chief Medical Director/Eastern Railway/Kolkata vide his letter No.MD.2/6 dated 22-10-2002. The details are as under:-

Details	As given on 30-09-2002	Revised figures as given on 22-10-2002
Number of persons killed	116	107 *
Number of persons who suffered grievous injuries	51	60 @
Number of persons who suffered simple injuries	103	115 @

* (i) Six names had been entered twice in the list.
(ii) Three names had been wrongly entered.

@ The number of grievously injured persons and persons with simple injuries increased due to the following reasons:-

(i) Many trivial injury cases were later reclassified as simple and grievous after thorough investigations.

(ii) A few injured passengers who got their treatment on their own and later approached for ex-gratia were included in the list.

(iii) Injured passengers treated over Northern Railway are also included.

II. RELIEF MEASURES

2.1 **Intimation –**

First information was received from Station Master, Rafiganj who spoke to the Control Room at Mughalsarai at 22.54 hours. Thereafter all concerned were alerted immediately.

2.2 **Medical Attention –**

2.2.1 Following Accident Relief Medical Equipment Vans reached site:

Accident Relief Medical Equipment Van	Train called for	Departure time & date (Hours)	Arrival at site (Hours)	Distance travelled to site
Medical Van/Gaya	23.00 hrs.	00.00 hours of 10-09-2002	01.40 hours of 10-09-2002	38 Kms.
Medical Van/Mughalsarai	22.55 hrs.	23.40 hours of 09-09-2002	03.00 hours of 10-09-2002	164 Kms.
Medical Van/ Danapur	00.14 hrs.	01.10 hours of 10-09-2002	06.40 hours	140 Kms.
Medical Van/Dhanbad	23.45 hrs.	0.30 hours of 10-09-2002	08.25 hours	237 Kms.
Medical Van/Varanasi	-	Returned from Mughalsarai at 07.05 hours of 10-09-2002	-	-
Medical Van/Allahabad	-	Returned from Mughalsarai at 05.25 hours of 10-09-2002	-	-

Besides the above, a number of doctors including the Chief Medical Director, Eastern Railway reached by the special train along with the General Manager and other Principal Heads of Departments at 09.00 hours of 10-09-2002. Some doctors were arranged by the Bihar State Government as well.

2.2.2 The injured were sent to the following hospitals:

1. Primary Health Centre, Rafiganj
2. Railway Hospital, Gaya

3. Medical College Hospital Gaya
4. Army Command Hospital, Gaya
5. District Hospital, Sasaram
6. District Hospital, Aurangabad
7. Railway Hospital, Mughalsarai
8. various hospitals at Varanasi

2.2.3 Special relief trains were run for carrying the stranded passengers as well as the injured and dead to New Delhi and Howrah as per following details:-

Date	Train No.	From	To	Departure (Hours)
10-09-02	Passenger Special/ 3628	Gaya	Howrah	15.45
10-09-02	Relative Spl./22027	Mughalsarai	Aurangabad	22.45
10-09-02	Relative Spl./3973	Rafiganj	Howrah	09.22
10-09-02	E/Coaching/ 22288	Rafiganj	Gaya	13.55
11-09-02	Relative Sl/3266	Mughalsarai	Aurangabad	01.00
11-09-02	Dn. Special	Site/ Rafi-ganj	Howrah	14.40
11-09-02	Dn. Special	Gaya	Howrah	06.40
11-09-02	E/Coaching/ 1246	Mughalsarai	Dehri-on-Sone	02.25
11/12-09-02	Dn. Pass. Spl/053	Gaya	Howrah	23.55
12-09-02	Relative Spl./3635	Gaya	Howrah	02.50
12-09-02	Dn. Pass. Spl.	Gaya	Howrah	12.50

Up Relatives Special –

Date	Train No.	From	To	Departure (Hours)
10-09-02	Relative Spl. 21346	Dehri-On-Sone	Mughalsarai	13.46
10-09-02	Relative Spl. 14128	Howrah/ Gaya	Rafiganj	NA *
10-09-02	E/Coaching/ 22288	Gaya	Rafiganj	10.50

10-09-02	Pass. Spl./ 16266	Aurangabad	Mughalsarai	10.30
11-09-02	Relative Spl/22027	Aurangabad	Mughalsarai	06.10
11-09-02	Relative Spl./3266	Aurangabad	Mughalsarai	07.50
11-09-02	Relative Spl.	Dhanbad	Gaya	NA *
11-09-02	Passenger Spl.	Deo Rd.	Mughalsarai	19.50
13-09-02	Relative Spl/3275	Mughalsarai	Gurap	06.38

NA * information not available.

2.2.4 I visited the following hospitals to see the injured passengers:-

1. 12-09-2002 - Eastern Railway Orthopaedic Hospital at Howrah.
2. 15-09-2002 - Army Command Hospital at Gaya.
3. 19-09-2002 - Eastern Railway Orthopaedic Hospital at Howrah.
4. 21-09-2002 - Eastern Railway B.R.Singh Hospital at Sealdah.

3 **Preservation of clues –**

2.3 Still & Video photography of the site was done. Detailed measurements of the track were taken. Measurements of loco were recorded at Mughalsarai in the presence of Deputy Commissioner of Railway Safety/Electrical and Deputy Commissioner of Railway Safety/Mechanical from Lucknow. Measurements of underailed coaches were taken at Rafiganj and Liluah Workshop at Howrah by the two Deputy Commissioners. RDSO was also asked to make a detailed examination of the damaged bridge No.445. The removed fish plates, fish bolts and elastic rail clips were asked to be kept in safe custody by the Railway officials, duly sealed. The Mughalsarai Division, Eastern Railway was asked to keep and guard all the released rails, sleepers/timber and the girders at site till the Inquiry was over. Some of the items were taken over by the local police who were also conducting parallel investigations.

2.4 The carrying capacity of the train was 709 passengers and 91 staff. At the time of derailment, the train was stated to be carrying 497 passengers and 91 staff.

III. COMPOSITION OF THE TRAIN AND DAMAGE

3.1 **Composition and Marshalling –**

3.1.1 **Locomotive** – The train was hauled by a WAP5 Class electric locomotive No.30002. The locomotive is based at Ghaziabad shed of Northern Railway. The locomotive manufactured by M/s. ABB, Switzerland was commissioned on 13-09-1996 and had undergone its last IOH in June, 2001. Its trip inspection was done last on 08-09-2002 at Howrah and kilometres earned after last IOH was 342631 Kms. No schedule of inspection of the loco was reported to be overdue.

3.1.2 **Coaches** – The train consisted of 18 coaches as per details given below:-

Sl. No. from loco	Coach No.	Owning Railway	Type	Year Built	Type of body	Type of bogie	Last POH	Return date
1	6696A	ER	WLRRM	1992	ICF	ICF all coiled	06-11-01	06/03
2	92802 A	ER	WCBAC	1992	ICF	"	20-05-02	12/03
3	01102 A	ER	WACCN	2001	ICF	"	-	04/03
4	94108 A	ER	WACCN	1994	ICF	"	26-12-01	08/03
5	92071 A	ER	WACCW	1992	ICF	"	14-12-01	07/03
6	89075 A	ER	WACCN	1989	ICF	"	23-11-01	06/03
7	93053 A	ER	WACCN	1993	ICF	"	17-01-02	08/03
8	95052 A	ER	WACCN	1995	ICF	"	24-01-02	08/03
9	92072 A	ER	WACCN	1992	ICF	"	16-08-02	03/04
10	99132 A	ER	WACCN	1999	ICF	"	17-07-02	02/04
11	00105 A	ER	WACCN	2000	ICF	"	18-03-02	10/03
12	94112 A	ER	WACCN	1994	ICF	"	28-06-02	02/04

13	94115 A	ER	WACCN	1994	ICF	"	23-01-02	08/03
14	94128 A	ER	WACCN	1994	ICF	"	03-10-01	05/03
15	82803 A	ER	WCBAC	1982	ICF	"	28-01-02	04/03
16	99002 A	ER	WFAC	1999	ICF	"	31-07-01	03/03
17	90016 A	ER	WFAC	1990	ICF	"	29-11-01	07/03
18	00856 A	ER	WLRRM	2000	ICF	"	24-04-01	04/03

3.1.3 Coaches had undergone schedules/overhaul as per following details:-

Coach No.	Built Date	Schedule 'A' date	Schedule 'B' date	Date of last IOH	Date of last POH
6696A	1992	09-09-2002	12-08-2002	Overdue	06-11-2001
92802A	1992	23-07-2002	25-08-2002	Not due	20-05-2002
01102A	2001	31-08-2002	24-06-2002	Not due	01-09-2001
94108A	1994	02-08-2002	03-07-2002	01-09-2002	26-12-2001
92071A	1992	15-07-2002	14-06-2002	26-08-2002	14-12-2001
89075A	1989	Not due	Not due	03-09-2002	23-11-2001
93053A	1993	16-08-2002	17-07-2002	Not due	17-01-2002
95052A	1995	17-07-2002	20-08-2002	24-01-2002	24-01-2002
92072A	1992	Not due	Not due	Not due	16-08-2002
99132A	1999	22-08-2002	Not due	Not due	17-07-2002
00105A	2000	22-08-2002	17-06-2002	Not due	18-03-2002
94112A	1994	28-08-2002	Not due	Not due	28-06-2002
94115A	1994	09-09-2002	19-04-2002	Not due	21-01-2002
94128A	1994	05-09-2002	Not due	09-08-2002	03-10-2001
82803A	1982	Not due	Not due	Not due	29-08-2002
99002A	1999	31-08-2002	30-06-2002	27-03-2002	31-07-2001
90016A	1990	01-08-2002	26-05-2002	28-08-2002	29-11-2001
00856A	2000	14-08-2002	17-07-2002	Not due	24-04-2001

Above statement shows that coach No.6696A was running overdue IOH.

3.2 **Damages –**

3.2.1 **Locomotive** – Following parts of the loco were found damaged:-

Pantograph, Wheels, CBC, Axle guide, Wheel Flange Lubricator, Dampers.

3.2.2 **Coaches** -

No.1 to 14 coaches from train engine suffered severe damages. Coach No.15 also was badly damaged. Its sole bar and Delhi end head stock was also bent. Other coaches were not damaged.

3.2.3 **Permanent Way** –

Bridge No.445 – 5 plate girders (3x60' + 1x62' + 1x40') were totally damaged. 2 piers and Delhi end abutment were partially damaged.

P.Way : Rail = 1444 m, PSC sleepers = 770 Nos. with all fittings, 60 Kg SEJ – 1 set, Bridge timbers – 155 Nos. were damaged.

3.2.4 **OHE** –

03 OHE masts at locations Km. 508/23, 25 & 27 along with cantilevers, contact and catenary wires on Up line and 2 cantilevers on Down line were damaged.

3.2.5 **S&T** –

No damage to the permanent assets of S&T equipment was suffered.

3.2.6 **Cost of damage** – The cost of damage to Railway assets is estimated as under:-

Locomotive	-	Rs. 10,00,000
Coaches	-	Rs. 7,50,00,000
Permanent Way	-	Rs. 1,80,00,000
Overhead equipment	-	Rs. 2,18,000
Total	-	**Rs.9,42,18,000**

IV. LOCAL CONDITIONS

4.1 **The Section and the Site** –

4.1.1 The accident occurred on double line electrified Broad Gauge section between Rafiganj and Deo Road stations of Aurangabad district of Bihar State.

4.1.2 The alignment at the point of derailment is on a straight track on both approaches of bridge No.445 on River Dhawa. The track on Howrah end of the bridge and on the bridge is level up to Km.509/0, thereafter it is rising 1 in 400 towards Delhi. The height of bank on approaches is 3.05 m

(approx.) and the soil of the formation is black cotton type. The alignment of the Up track runs east to west in the direction of the train.

The permanent way on the bridge consists of 60 Kg 90 UTS single rails on wooden sleepers. Guard rails (duly notched) had been provided between the running rails.

The track of both approaches is laid with 60 Kg 90 UTS rails on concrete sleepers. Stone ballast up to 300 mm cushion (nominal) has been provided.

4.1.3 The kilometerage of various points as reckoned from Howrah is as under:-

Station	Kilometerage from Howrah
Gaya	469.64
Kastha	478.08
Paraiya	485.22
Guraru	491.17
Ismailpur	498.06
Rafiganj	507.12
ACCIDENT SITE	**508/19-21**
Deo Road	515.06
Mughalsarai	672.65

4.2 Headquarters:-

4.2.1 The track at the site of accident falls in the jurisdiction of following officials:-

Designation	Headquarters
Junior Engineer II/P.Way	Rafiganj
Section Engineer/P.Way	Rafiganj
Assistant Engineer	Gaya
Divisional Engineer/II	Mughalsarai

4.2.2 The headquarters of signalling staff having jurisdiction at the site of accident are as under:-

Designation	Headquarters
Junior Engineer/Signal	Gaya
Senior Section Engineer/ Signal	Gaya
Assistant Signal & Telecom. Engineer	Gaya
Senior Divisional Signal & Telecom. Engineer	Mughalsarai

4.3 **Signalling and System of train working :-**

Trains on Rafiganj-Deo Road section are worked on absolute block system. Rafiganj has end panels and Deo Road, a central panel. Both stations have multiple aspect colour light signalling (MACLS) system and standard III interlocking.

The control is at Mughalsarai and one Controller is in charge of Manpur-Gaya-Mughalsarai section.

4.4 **Loco and coaches:**

Gaziabad Electric Loco Shed of Northern Railway is responsible for primary maintenance of the locomotive involved in the accident. The shed is headed by Senior Divisional Electrical Engineer.

Coaches are based at Coaching Depot, Howrah where primary maintenance is done. This coaching depot is headed by a Coaching Depot Officer who reports to Senior Divisional Mechanical Engineer/ Carriage & Wagon/Howrah. POH and IOH of these coaches is done in Liluah Workshop of Eastern Railway at Liluah near Howrah.

4.5 **Permanent and temporary speed restrictions**:-

4.5.1 The maximum permissible speed on the Howrah-Gaya-Mughalsarai section for Rajdhani Express train is 130 Km/h and the corresponding booked speed is 120 Km/h. There was no temporary or permanent speed restrictions at the site of derailment or its vicinity on the day of accident.

V. SUMMARY OF EVIDENCE

5.0 In all evidence of 143 witnesses was recorded. Those who tendered their evidence consisted of 50 public witnesses, 82 Railway staff/officers and 11 injured passengers. Summary of the evidence of witnesses who threw light on the cause of accident or relief measures is as below:-

5.1 **Public witnesses:**

5.1.1 **Shri Vinay Kumar Singh, Rafiganj** reached the site after 2 hours of the accident. **He claimed that he had seen with his eyes that fish plates were open before the Dhawa river bridge**. On cross-examination he stated that his profession is farming. He had gone to the railway station when he heard siren continuously blowing (it may be clarified here that the siren of Civil Defence was blowing for waking up people to go and help the injured passengers in the ill-fated train). He learnt from 2-3 persons going on motor cycle that the Rajdhani Express train had derailed

on the Dhawa river. After returning home he learnt that local M.L.A. had also telephoned his house. He proceeded to the railway station where he met Shri J. K. Singh (in the Station Master's room) and proceeded to the site with him. He further stated that he saw fish plates and nuts lying there about 10 – 20 feet short of the Dhawa bridge. He could not proceed further and then went round by the road and reached the other side of the bridge. He saw there that the local M.L.A. along with Superintendent of Police/Aurangabad were there. The time was around 00.45 hours. He inquired from the officer commanding at site who told him (Officer in-charge) had reached the site one hour before. **He further told that in the year 2000 when Shri Raj Kumar Tewari was In-charge of Rafiganj Police Station there was an encounter at the same spot and police had recovered equipment for opening fish plates and some shoes and chappals from the site. In this connection Case No.44/2000 was lodged in the Rafiganj Police Station.**

5.1.1 **Shri Kedar Singh, Rafiganj** was to go to Patna by Palamau Express. Around 11 P.M. he came to know that Rajdhani Express had derailed on the Dhawa river bridge. **He immediately went to site and saw the opened fish plates. He further stated that in the year 2000 when Shri Tiwari was Officer In-charge of the Rafiganj Police Station there was an encounter with police party regarding opening of fish plates.** According to him there was a conspiracy to derail Rajdhani Express for a long time. FIR No.44/2000 was lodged in this connection in Rafiganj Police Station. On cross-examination he told that a bomb was caught on this bridge in 1962 also when war with China was on. In 1973 when India Pakistan war was going on, a bomb was found on this bridge.

5.1.2 **Shri Rana Singh, village Adalpur, Rafiganj.**

He stated that he is a native of village Adalpur and heard a bang of derailment of Rajdhani Express at 10.45 P.M. on 09-09-2002. He collected around 50 villagers and proceeded to the accident site. On reaching there he found that all bogies of Rajdhani Express had fallen down the river and only 2 bogies were on the bank of the river. When he went round the accident site **he found that the accident had taken place due to opening of fish plates because nuts, bolts and fish plates were lying on the railway line.** On cross examination he told that he reached site of accident at 2 A.M. of 10-09-2002. He again confirmed that the bang of accident could be heard in his village although the same is 3 Km. away from the site of accident. When questioned as to who told him at accident site about opened fish plate, he replied that he is the nominated Chairman of the village and after deploying the fellow villagers in the relief work he started inspection of the site. During this inspection he saw that the fish plates and nuts were lying opened. Fish plates were lying at 50 to 100

yards from the bridge. These were 2 numbers and nuts were 5 to 6 numbers.

5.1.4 **Shri Shiv Shankar Kumar Singh, Maharajganj, Rafiganj and six others** – They stated that they are native of Rafiganj town. On 09-09-2002 at 10.45 P.M. news of derailment of Rajdhani Express spread in the town. After this information they proceeded to the site when they saw that villagers from nearby area were also proceeding to the site with torch and lanterns. When they heard the cries of the injured passengers they started breaking the glasses of AC coaches with stones, axes, sticks and crow-bars and took out the injured passengers. Around 2.30 hours the Superintendent of Police along with his force and local M.L.A. Shri Sushil Kumar also reached the site. With their help injured persons were sent to local hospital. According to him this derailment is handy work of some terrorists and they were working on this plan for a long time. In this connection FIR No.44/2000 was also lodged in Rafiganj Police Station. During investigation, he found that the fish plates were lying open along with nuts and bolts. He had seen those at site. When questioned about the distance from the bridge where it was lying he told that the fish plates were lying by the side of the track and he did not measure the distance. He further told that it was one fish plate and 3 bolts which were lying opened.

5.1.5 **Shri Ashok Kumar Singh, Mohalla Babuganj, Rafiganj** – He stays about one kilometer away from Rafiganj Railway station towards the Dhawa bridge. After arrival at site he saw that fish plates, nuts and bolts were lying opened at two joints of track, and a rail was hanging in the bridge along with a coach. He had heard of the plot of miscreants trying to derail Rajdhani Express sometime back when there was encounter of the miscreants with the police. On cross examination he told that he reached the site of accident around 11.15 P.M. as his house is 400 m from the accident site. **He confirmed that he had seen the opened fish plates, fish bolts and the rail piece lying outside the track but he could not tell the number of fish plates, nuts and bolts lying opened. In reply to another question he told that the fish plates were lying about 100 ft. from the bridge.**

5.1.6 **Shri Akhilesh Kumar, Maharajganj, New Area, Rafiganj** – He had reached the accident spot between 2 and 2.30 A.M. of 10-09-2002. He saw the opened fish plates near the bridge and felt that **it was looking as if the fish plates were opened.** On cross examination he told that there were 2 fish plates and 6 nuts and bolts lying over there.

5.1.7 **Shri Pintoo Kumar, Devisthan Gali, Maharajganj, Rafiganj** – He joined the rescue work along with other villagers and claimed to have taken out 12 dead bodies and 3 injured passengers from the coaches. He told that

gas cutters had come to site by 06.00 hours of 10-09-2002. Before that he had broken the glasses and took out 9-10 persons. In his presence army personnel had broken the glasses of AS-6 and took out an injured Colonel from the coach.

5.1.8 **Shri Bal Mukund Prasad Singh, Upa Pramukh, Guraru – He confirmed seeing the opened fish plates at about 100 steps from the bridge. The fish plates were 2 in numbers and he did not count the bolts lying over there.**

5.1.9 **Shri Ram Deo Singh, Golbagicha, Kapraghar, Gaya & Shri Rabindra Prasad, New Area Bihar Talao, Gaya** – They had gone together to the site around 10.00 hours of 10-09-2002 and seen the opened fish plates, nuts, etc. **They narrated the incident of the year 2000 at the same spot and how the then Police Station Incharge took action against the miscreants.**

5.1.10 **Shri Sailendra Kumar & Shri Anil Kumar and others of Gaya** - They stated that the area is infested with miscreants who keep on commiting these crimes to loot the trains. There was a similar incident in the year 2000 when there was an encounter between the police and miscreants. During the relief work the villagers showed him the opened fish plates which caused the derailment and he further stated that this derailment is also caused by the miscreants.

5.1.11 **Shri Ragho Singh, Khadwa - According to him the derailment is due to weakness of the bridge and is not connected with terrorist activities.** During cross examination he noticed slackness in the relief operations by State Government as well as Railway.

5.1.12 **Shri Ajoy Kumar Singh, Khadwa** - He reached the site at 9 A.M. of 10-09-2002. He had seen fish plates/bolts opened and lying there but could not count the fish plates and bolts as he was not allowed to go near the site by the police.

5.1.13 **Shri Baldeo Prasad, Buniadganj, Gaya** - He stated that the derailment was much talked about and awaited desire of terrorists. **He had gone to the site and seen the fish plates opened which was the cause of the derailment.**

5.1.14 **Shri Bharat Prasad Singh, Rai Kashinath Mod, Gaya City – He had gone to site and seen the opened fish plates lying over there. He had read a few days back in newspapers that Rajdhani Express is on the hit list of M.C.C.**

5.1.15 **Shri Gupteswar Singh, Kendui, Gaya** – He reached the site at 08.30 hours of 10-09-2002. He could not search his relative for 4 days when Deputy Inspector General of Police showed him some photographs through which he could recognise the body. He had no complaint against Railway or State Govt.

5.1.16 **Shri Ram Prasad Singh, Wadopur, Rafiganj, Aurangabad** – He had seen the opened fish plates which were kept by the side of railway line – approximately 3 steps from the bridge. He did not count the number of fish plates.

5.1.17 **Shri Ramadhar Singh, Village Bour, Jakhim** – He saw opened fish plate. He reached the site of accident at 7 hours of 10-09-2002. One fish plate was lying at 3 ft. away from the line in the south side. He did not see nut bolts lying there.

5.1.18 **Dr. Rajiv Ranjan, Social Worker, Jheelganj, New Godam, Gaya** – He is a social worker and helped the passengers and their relatives in the relief work. **He narrated number of incidents of tampering with track etc. committed by miscreants in the past.**

5.1.19 **Shri Awadhesh Kumar, Ashoknagar, Gaya** – He reached accident site at about 10.00 hours of 10-09-2002 and found the 2-3 fish plates opened and lying at 10 steps away from the bridge.

5.1.20 **Shri Ravi Kumar Sharma, LIG 110, Chanakyapuri, Gaya** – He reached the accident site at about 11.00 hours of 10-09-2002 and found 10-11 fish plates lying over there. He also saw 10-12 nut bolts also at 20 m away from the bridge.

5.1.21 **Shri Rabindra Kumar Singh, Vill. Panchhara, Dist. Aurangabad** – He reached the site at 5.00 hours of 10-09-2002 and saw that local people, police and Railway employees were busy in relief/rescue. He submitted a copy of FIR No.44/2000 lodged at Rafiganj station on 22-05-2000 regarding encounter of police with miscreants who wanted to tamper with the track on the approach of Dhawa bridge.

5.1.22 **Shri Nagendra Kumar, Photographer, Rafiganj** – He was called from his home around 12 mid-night of 09-09-2002 through a son of a staff who told him that Rajdhani Express had derailed. He had been called by Shri Y. N. Singh to take the photographs. He proceeded to the station with a camera and from there to accident site with staff. He took 5 to 10 photographs and thereafter in the day time he had taken number of photographs on the recommendations of the railway officers. He clarified that he did not see anybody working at the accident site when he had gone there. He had taken the photographs around 1.00 hour of

10-09-2002. He got around Rs.3,000/- for those photographs. He further clarified that he made 200 to 250 copies.

5.1.23 **Shri Arvind Yadav, Member, Zilla Parishad, Aurangabad** – He reached the site of accident at 00.25 hours of 10-09-2002. After engaging the people in relief work he went to see the railway line and found that the railway line material was lying here and there. Only fish plates and nut bolts were kept there. According to him nothing had happened to the train which passed earlier and railway officers were talking of opening of fish plates to shield their faults. Had the fish plates been opened, nut and bolts should not have been secured and kept there. According to him fish plates were kept by the railway officers after the derailment.

5.2 **Railway witnesses.**

5.2.1 **Sarvashri Ramdeo Shaw, Driver/Dhanbad, A. K. Sinha, Co-driver/Dhanbad and Umesh Singh, Loco Inspector/Gaya** were working on 2301 Up Rajdhani Express on 09-09-2002. The Driver and Co-driver took over charge at Dhanbad and the Loco Inspector joined at Gaya. In their identical statements they stated that the train left Gaya at 22.14 hours and Rafiganj at 22.37 ½ hours. They exchanged alright signals with the station staff and got arrival and departure signals as green. At Km.508/21 they got a jerk, when brake pipe pressure started falling. They applied A-9 emergency brakes when the train engine stopped at Km.509/7. The driver had put on flasher light on the engine and went to inspect the train behind. They found that the train had derailed and both the wheels of last axle of their loco had also derailed. The driver gave information of this derailment to on duty Assistant Station Master at Rafiganj and Control room, Mughalsarai at 22.45 hours. On cross examination Shri Shaw stated that he got the jerk before the bridge as if the engine had hit something and jumped. After that the engine was shaking like a boat. **He further clarified that in his journey from Dhanbad to site he did not feel any abnormal running in the loco or track.** When questioned as to whether he noticed any abnormality in the track before the bridge he said he did not notice anything as he was looking for signal or any obstruction on track ahead. The speedometer was showing the speed as126/127 Km/h. The weather was drizzling.

Shri A. K. Sinha, Co-driver told that he felt jerk before the bridge between Km.508/21-23. When questioned about the type of jerk he said first he experienced several vertical jerks and the loco started rocking as if it had derailed. He confirmed that in his journey from Dhanbad to site he did not feel any abnormal running in the loco or track. When questioned as to whether he noticed any abnormality in the track before the bridge he replied in negative clarifying that during the night it is not possible to see the track clearly. He told that the speed of his train was 126/127 Km/h.

According to him the weather was dense cloudy. He confirmed that Chief Medical Superintendent/Mughalsarai had done breathalyser test on him and the driver.

Shri Umesh Singh, Loco Inspector also confirmed that he got the jerk before the bridge. It was a heavy vertical jerk and the loco started shaking badly. He did not feel any abnormality in the loco or track during his journey from Gaya to site. The speed of his train was 125 Km/h and it was drizzling. He has been working as Loco Inspector since January, 1998 and had 8 years experience as Goods Driver and 3 years as Assistant Driver. When asked to state as to what he checked from Gaya to accident site, the Loco Inspector stated that during his check he found that the Driver and Co-driver were alert and they were exchanging signals properly. The driver also maintained the caution between Kastha and Paraiya.

5.2.2 **Shri D. N. Singh Yadav, Guard/Mughalsarai** – He was working as Guard of 2301 Up on 09-09-2002. After passing Rafiganj station at 22.38 hours the train stopped at Km.508/21 at 22.39 hours. Due to derailment of the train he got many heavy jerks. He got down from his brake van and noticed that coaches after 2 from the rear were derailed and after the derailed coaches Dhawa bridge was seen collapsed on which 5th & 6th coaches were seen hanging and suspended over the bridge and the rest coaches were on the other side of the bridge seeing completely derailed and capsized. He immediately took safety measures to protect adjacent line and in rear. Thereafter he informed about the accident to Rafiganj station and Control. Then he returned to the site and engaged himself for helping and guiding and giving first aid to passengers. **He personally saw fish plate of left rail was open, kept beside the track with its nuts and bolts. One rail piece was found removed from its original position and kept off the left side sleepers.** When asked to clarify about the type of jerk he felt, he said that he got 10-12 jerks in the forward and backward direction within 10-15 seconds. He found that his box had moved near the door and all the things kept in the box had gone into the vestibule. Torch had fallen down. With this he could sense that there was a serious accident as he had an experience of one accident in the year 1979. He opened the gate on the North side of his coach and tried to speak to the driver. There was no response from the driver for first 2-3 minutes. Therefore he had put on a flare signal on the down line. In the meantime the voice of the driver came on to his walkie-talkie and he instructed the driver to put on the flasher light and protect the track in front. The Driver told him that he had already started this work. Then he saw how many bogies had derailed and proceeded for protection in the rear. While going back he spoke to Rafiganj station on walkie-talkie and told them about the derailment. When questioned about the timings he told the train derailed at 22.39 hours and he could speak to Rafiganj station at 22.55 hours.

When questioned whether he saw anybody near the track or running away he replied in negative. When asked whether there was anybody else in his brake van, he replied in negative. **When questioned about the time at which he saw the fish plate open, he replied that time was approximately 23.50 hours. When questioned as to who had arrived by the time he replied that there were some villagers, passengers of the train and some RPF constables in civil dress. When further questioned, whether he saw Permanent Way Inspector or his staff near the track he replied in negative. He was further questioned as to how many fish plates were in the open condition he replied that on Howrah side joint both fish plates and nut bolts were lying by the side of the track and the piece of rail was lying outside the track in a tilted condition.**

5.2.3 **Shri Arjun Yadav/Driver and Shri N. K. Singh, Assistant Driver** were working on train No.BOXNE/7500 ex. Mughalsarai to Gaya. They passed through Deo Road at 22.14 hours and arrived Rafiganj at 22.22 hours. On cross examination they told that they did not see anybody near the track or bridge when they were passing the Dhawa bridge. They were further questioned as to whether they had heard of any sabotage activity in Gaya – Aurangabad section, they replied in negative.

5.2.4 **Shri Baldeo Mahato, Driver & Shri H. K. Pramanik, Assistant Driver -** They were working on train No.3010 Down Doon Express ex. Mughalsarai on 09-09-2002. The train passed Deo Road at 22.30 hours and was received on the Loop line of Rafiganj at 22.38 hours. On cross examination they told that they did not see anybody near the Dhawa bridge or on the approaches of the bridge. When questioned whether they heard of any sabotage activity in Gaya-Mughalsarai section they replied in negative.

5.2.5 **Shri J. K. Singh, Station Master, Rafiganj** – He was on duty when 2301 Up Rajdhani Express passed on Up Main line at 22.40 hours and 3010 Down Express was received in the Loop line at 22.42 hours. Immediately after that traction power went off and he informed the Traction Power Controller of that. In the meantime Driver of 2301 Up told him on the VHF set that the rear wheels of his engine had derailed and he was standing at Km.509/01. He passed on this information to Controller on duty at Mughalsarai. Thereafter the Guard of 2301 Up told him that he (Guard) is standing at Km.508/19 and 4/5 bogies of Rajdhani Express were hanging in the bridge. He immediately told Controller on duty about it and informed Station Manager Shri Paras Thakur, Permanent Way Inspector, Chief Traffic Inspector, Railway Protection Force In-charge, Medical Officer In-charge and Government Railway Police Station In-charge. Doctors in the nearby area were also informed. In the meantime Shri Mitra and other officers who were travelling in 2301 Up came to the station and talked to

Control and Assistant Operations Manager. Accident Relief Train and Accident Relief Medical Equipment van from Gaya reached his station at 01.21 hours and left for site at 01.36 hours. On cross examination he told that when Rajdhani Express was passing, he exchanged alright signal with the Driver and Guard. He did not notice any abnormality in the train when it was passing through his station. He was informed of the accident by the Driver of 2301 at 22.54 hours and Guard at 22.56 hours and relayed the same to Control at 22.57 hours. He informed Station Master and Permanent Way Inspector at about 23.00 hours. When questioned as to why he detained the Accident Relief Medical Equipment and Accident Relief Train/Gaya for 15 minutes at his station, he told that he had gone to inform the local doctors etc. and Station Superintendent was working in his absence for despatch of trains.

5.2.6 **Shri Md. M. Siddique, Assistant Station Master, Rafiganj East Cabin & Shri H. Rehman, Assistant Station Master, Rafiganj West Cabin** – Both were on duty in their respective cabins when 2301 Up Rajdhani Express passed Rafiganj. Both exchanged alright signals with the Driver and Guard of 2301 Up. Both confirmed that the traction power went off at 22.41 hours. Both came to know of the derailment from Shri J. K. Singh, Platform Station Master at 22.56 hours. Shri H. Rehman on duty at West Cabin immediately made the commutator to "Train On Line".

5.2.7 **Shri Shakil Ahmed, Station Master, Guraru and Shri Ram Briksh Yadav, Assistant Station Master, East Cabin, Guraru** – Both were on duty when 2301 Up Rajdhani Express passed their station at 22.31 hours. Both exchanged alright signal with Guard and Driver and did not notice any abnormality while the train was passing through their respective positions.

5.2.8 **Shri Gulam Sah, Driver and Shri Birbal Kumar Sinha, Assistant Driver of BCNE/7303 Goods** - Both were working train No.BCNE/7303 from Gaya to Mughalsarai. They passed Rafiganj at 21.55 hours and did not get any jerk while passing Dhawa bridge No.445. They did not see any abnormality in the track on Up or Down line while passing this bridge. When questioned whether they noticed nobody near the track while passing over the bridge they replied in negative. They again confirmed that they did not notice any abnormality while passing Dhawa bridge.

5.2.9 **Shri Y. N. Singh, Junior Engineer/P.Way** – He was looking after the work of Junior Engineer/P.Way, Rafiganj in addition to his work. As the regular Junior Engineer/P.Way had gone on a few days leave. Around 23.00 hours on 09-09-2002 he got message through Shri Lakhan, Porter of Rafiganj to reach the station. On reaching the station he learnt that Rajdhani Express had derailed near Dhawa bridge. From there he along

with Shri B. Naskar, Permanent Way Inspector in-charge, went to office to collect the staff through Chowkidar. Shri Maheswar, who stays inside the office premises was readily available and was instructed by him to inform the maximum number of staff about this mishappening and to rush to the site. Thereafter Sarvashri Y. N. Singh, Naskar and Maheswar rushed to the site and reached around 23.30 hours. **When they were proceeding towards the bridge they found that one rail on the Up line beyond the SEJ near OHE mast No.508/21 was lying in opened condition on the toe of concrete sleepers. They also saw 2 fish plates and 4 bolts of Howrah end joint of opened rail and 2 fish plates and 4 bolts at Delhi end joint lying outside the track. They also saw some of the pandrol clips lying inside and outside the track. This rail (lying outside) was also having the connection to OHE mast at Km.508/21 through bond wire with one end connected to the rail and the other end connected to the OHE mast.** Then he rushed to the West Cabin of Rafiganj and spoke to Ballast Train Supervisor, Mughalsarai through Signal Control phone. He went to site again to have another detailed inspection seeing the gravity of the situation and came back to Rafiganj station and called a photographer. He, along with photographer of M/s. Parvati Studio and staff of other departments rushed to site. Photographs of the site were taken in the presence of Shri Naskar and Shri Maheswar. Thereafter they tried to go to Mughalsarai end of the bridge but could not go as the Down line bridge was blocked by coaches. On cross examination he told that there was no caution order on the bridge or its approach. He confirmed that he is not the sectional Permanent Way Inspector of the section. **He said that his staff did not disturb the 9.01 m rail outside the track. He had seen the fish plates lying outside which were looking as if opened recently. Similarly he saw the fish bolts which had no marks of snapping and the bolts had marks of fresh opening. He was the first Permanent Way Inspector to reach the site along with Shri Naskar, Permanent Way Inspector In-charge. According to his assessment the rail piece was thrown out by lateral thrust of loco. There were grazing marks on the gauge face side head of this rail piece. Another clue of the derailment was the end of the next rail. Howrah end of the next rail got battered by 30 mm and 1.40 mm hogged.** According to him, on Mughalsarai end of the bridge, on 57 sleepers MCI inserts were damaged, on 30 sleepers left rail outside and right rail inside were completely damaged. 890 pandrols of left rail outside and right rail inside up to Km.509/7 were broken. About 45 m length of rail was badly damaged. He did not remember the condition of damaged bridge timbers which were broken.

5.2.10 **Shri B. Naskar, Section Engineer (P.Way)/Rafiganj** – He was informed of the accident by Ballast Train Supervisor at around 23.00 hours of 09-09-2002. Thereafter he immediately reached the station and found that Shri Y. N. Singh, Junior Engineer/II/P.Way was already there. Both went

to the office to collect staff through the Chowkidar who was instructed to collect maximum number of staff and rushed to the site. Sarvashri Naskar, Y. N. Singh and Maheswar (Gangman who stays in the office premises) rushed to the site. They reached around 23.30 hours. On reaching there they found that the Rajdhani Express standing on the bridge. They planned to cross the bridge via Down line but were cautioned by the passengers of the train that OHE wires were hanging there. Then they came to the rear of Rajdhani Express and proceeded towards the bridge via cess of Up line. They saw that one rail of Up line beyond the SEJ near OHE mast No.508/21 was lying in open condition on the toe of the concrete sleepers. **They saw that 2 fish plates and 4 bolts of Howrah end joint of opened rail and 2 fish plates and 4 bolts of Delhi end joint of the same rail were lying outside the track. They also saw that some of the pandrol clips were lying inside and outside the rail. This rail was having connection with the OHE mast 508/21 through bond wires.** Then Shri Y. N. Singh went to the West Cabin, Rafiganj for passing on this information to Ballast Train Supervisor. After sometime Shri Y. N. Singh came to site with the photographer of M/s Parvati Studio. They then arranged photography of opened track and the adjoining area. This was witnessed by a number of staff and the passengers of the derailed train. Accident Relief Train/Gaya reached the site at around 01.45 hours. Thereafter they tried to go to Deo Road side via Down line but saw that some of the coaches were blocking the Down line in the bridge portion. Medical Van from Mughalsarai with officers reached site somewhere between 03.00 and 04.00 hours. On cross-examination, Shri Naskar could not produce any record which could prove the condition of track on the bridge. He confirmed that there was no speed restriction on the track on Up line between Rafiganj and Deo Road on the day of accident. He had last footplated the section by 3151 Up on 23-08-2002 and did not notice any abnormal running on the bridge or its approaches. The section was last inspected by him by push trolley on 09-09-2002 and did not notice any abnormality. **He confirmed that the opened fish plates and the fish bolts had marks of fresh opening. Other fish plate was also opened, only one bolt was attached to it without nut. Some pandrol clips were also lying there. The fish plate with one bolt was found lying along the rail which had turned and lying outside the track. Traction bond was found connected at both the ends – traction mast and rail piece. Hit marks were seen on the Howrah end of rail, badly battered and rounded.** According to him an outsider (one man) can open the said fittings in 30 minutes and 2 men working simultaneously could open in 15 minutes. According to him 4 persons could take only 12-13 minutes. On Mughalsarai end he saw both rails of the Up track on 40-50 m length were bent. 50 to 60 sleepers were crushed. SKV welding and flash butt welding were broken. Outside of the left rail had dent marks upto Km.509/7. Inside of the right hand rail had also dent marks up to the point engine travelled. Some pandrol clips were also broken. He was incharge Permanent Way

Inspector of the section for the last 5 years. During this period the bridge had not given any trouble. He told that through renewal of bridge timbers was done in 1990. Thereafter casual renewal had been done whenever any sleeper/timber became unserviceable. He had kept 9 m rail piece on bridge approach to avoid joint on the bridge abutment or in its close vicinity. He denied any fish plate or fish bolt brought from the store to the accident site. **When questioned whether there was any possibility he could open the fish plate and bolt and remove pandrol from the track and removed the rail to make it appear that it was a case of sabotage, he denied that it was not possible physically for him to do that since the leading trolley of the coach No.H1 and the trailing trolley of Pantry Car 2 were there in derailed condition on the rail seat of 9.01 m rail. Besides this there were lot of passengers who would have witnessed and immediately objected to such a move from his part.**

5.2.11 **Shri A. K. Vatshyan, Junior Engineer/P.Way, Rafiganj** – He is sectional Junior Engineer/II/P.Way, Rafiganj and his jurisdiction is from Km.498/0 to 516/0 (Ismailpur to Jakhim). He was on headquarter leave for 3 days from 08-09-2002 to 10-09-2002 and gone to Motihari. He came to know of the accident through newspapers on 10-09-2002 and reached Gaya around 03.00 hours on 11-09-2002. He reported his arrival to the Ballast Train Supervisor and collected details of site. The Ballast Train Supervisor advised him to stay at Gaya and organise the movement of various materials from track depot and material coming from other Divisions. On cross examination he told that he had last inspected the track on 27-08-2002 by trolley from Rafiganj to Deo Road. He last foot plated the section on 14-08-2002 by 2381 Up and did not get any jerk. On 05-09-2002 one rail was renewed on Down line of the Delhi end of the bridge. On Up line fish bolts and hook bolts on the bridge were tightened on the same day. He told that the timbers were renewed between 1992 and 2002 as and when required but he could not confirm as to how many timbers were renewed.

5.2.12 **Shri Zafar Ahmed, Driver and B. K. Pandey, Assistant Driver of 3151 Up** – They worked on 3151 Up Express on 09-09-2002 from Gomoh to Mughalsarai. They took over charge at Gomoh. They arrived Rafiganj at 21.43 hours and departed at 21.48 hours, passed Deo Road at 21.53 hours. They received no jerk while passing Dhawa bridge. They did not see any person/persons roaming around there when they were passing over the Dhawa bridge.

5.2.13 **Shri Devi Dayal S/O. Shri Ram Dhani and 18 other Gangmen of Gang No.6** – They complained that Section Engineer (P.Way) books them on patrolling duty from 22.00 hours of the same day after working 07.00 to 17.00 hours in the gang. Earlier Section Engineer (P.Way) has fixed patrol

beats such that each beat was 5 Kms. Earlier two groups of Patrolmen used to start simultaneously from Rafiganj and Deo Road (10 Kms. length) and both used to exchange the books in mid-section come back to respective stations and again exchange their books in mid-section. Like this the section used to be covered 4 times. But the present Section Engineer (P.Way) has reduced it to one group only starting from Deo Road at 22.00 hours and reaching Rafiganj at 02.00 hours in the night and reaching back Deo Road at 06.00 hours in the morning. Thus the section is covered only two times in the night.

5.2.14 **Shri R. D. Mishra, Traffic Inspector (Movement), Dehri-on-Sone –** After learning about the accident he proceeded to site by Accident Relief Train/Mughalsarai and reached at 06.15 hours of 10-09-2002. He went to inspect the spot and found as under:-

Last 2 coaches were on the rail.
Wheels of 3rd & 4th coaches from the last were derailed.
5th & 6th coach from the end were hanging on the river from the bridge.
2 coaches were obstructing the Down line and balance other coache were lying in the river bed.

During inspection of track he found that one rail piece approx. 9 m long whose fish plates and fish bolts were opened was lying on the left hand side of railway line.

The engine of the train got detached from the load and was at Km.509/07. 2 wheels of Howrah end of the engine had derailed. According to him the accident occurred due to opening of fish plates.

5.2.15 **Shri A. K. Mondal, Senior Divisional Mechanical Engineer (Carriage & Wagon)/Howrah –** He told that the rake of 2301/2305 Up is maintained at Tikiapara Coaching Depot which comes under the category of Super Mega Coaching Depot. The infrastructural facilities confirm the requirement of Camtech Manual. In addition to Rajdhani and Shatabdi another 19 trains are given primary maintenance at this depot.

A computer based data recording system is in vogue for enlisting the damages, defects, secondary detachments enroute detention and passenger complaint to analyse the job patterns. Separate registers are maintained after checking all underslung items and safety items.

The particular rake involved in accident was checked on 08-09-2002 for damage detection. After attachements/detachments the final rake was given o.k. after primary attention on 09-09-2002.

On cross examination Shri Mondal told that Coaching Depot Officer checks the rake on sample analysis up to twice a month and he signs in the Safety Check Register for underslung items. In addition separate inspectors are nominated exclusively for Rajdhani rakes. The riding quality of the rake is checked by escorting Train Examiner who travels on Rajdhani Express in both Up and Down directions. These escorting Train Examiners submit reports to Senior Section Engineer/Rajdhani Express who in turn advise the concerned Train Examiners for necessary checks and rectification. Sometime mechanical oscillometer are kept in coaches to record the riding quality of the coach. He confirmed that he and his Coaching Depot Officer make test checks of the work of escorting Train Examiners. He further clarified that the work of escorting Train Examiner is not checked separately but when on board the check is carried out on all coaches of the rake.

5.2.16 **Shri B. B. Viswakarma, Senior Divisional Electrical Engineer (Traction Distribution)/Mughalsarai -** He reached the site of accident by Accident Relief Medical Equipment Van on 10-09-2002. **During assessment of the situation at site he observed that a rail near mast No.508/21 was lying outside the track with structure bond in tact. Many concrete sleepers under this rail were in broken condition**. He assessed the damage to OHE structures and started restoration work.

On cross examination he told that the rail was lying outside the track. Many pandrol clips were lying inside and outside the track. Fish plates of the rail joints were also kept near the track at one location. Nuts and bolts of the fish plates were also kept there.

5.2.17 **Shri R. Chaturvedi, Chief Controller, Mughalsarai** – He was working as Deputy Controller on 09-09-2002 in 17.00 to 01.00 hours shift. Rajdhani Express passed Rafiganj at 22.40 hours and the Switchman reported that OHE had tripped. He waited for 1-2 minutes but OHE did not resume. He rang Traction Power Controller who reported that both Up and Down OHE was not holding. He immediately advised Deputy Station Superintendent/ Rafiganj to look into it.

At 22.54 hours, Deputy Station Superintendent/Rafiganj informed that Driver of 2301 Up reported to him through VHF set that he felt severe jerk and had derailed by one wheel. At 22.55 hours he ordered Accident Relief Train/Crane/Medical Van of Mughalsarai and Gaya and thereafter he informed Divisional Safety Officer, Divisional Railway Manager, Senior Divisional Operations Manager, Assistant Operations Manager (Safety) and other officers.

On cross examination he told that Accident Relief Train/Gaya and Medical Van was ordered at 22.55 hours which was placed on line No.2 at 23.40

hours and out at 24.00 hours. Medical Van/Mughalsarai called at 22.55 hours, left at 23.40 hours. Crane + Accident Relief Train/Mughalsarai was called at 22.55 hours and left at 23.57 hours.

5.2.18 **Shri Lal Babu Singh, Accident Relief Train In-charge/Gaya** – Accident Relief Train and Medical Van called at 23.00 hours on 09-09-2002. It left Gaya at 24.00 hours, reached Rafiganj at 01.20 hours, left Rafiganj at 01.30 hours and reached site at 01.42 hours. **After reaching the site he found the fish plates of the left hand rail were opened short of the bridge on the Up line. He also noticed that the rail was also shifted forward by 6 inchesand then tilted on its side.** Thereafter he made lighting arrangements and got a ladder fixed on the bridge to provide communication from Rafiganj end to Jakhim end of the bridge as the coaches were blocking Down line on the bridge. Thereafter he started the relief work.

5.2.19 **Sri Abhay Kumar, Divisional Engineer(II), Mughalsarai** - He reached the accident site at 3.50 Hrs. of 10.9.2002 and immediately assessed the position of Mughalsarai end of the bridge, thereafter he went to Rafiganj end of the bridge and observed as under:-

1. The left hand side rail of Up Line was in position upto 12 Metre from SEJ. There was no sign of wheel mounting or riding mark over this rail.

2. Afterwards the position of left hand side rail of Up line was as under:-

One rail of about 9 Metre length was lying outside the track near toe of PSC Sleepers with traction bond wire of OHE mast at Km. 508/21 in tact. 4 number fish plates (2 of Howrah end and 2 of Delhi end joints) of this rail were found lying near the respective joints. 8 number bolts and nuts (4 near Howrah end fish plates and 4 near Delhi end fish plates) were also lying there. None of these bolts and nuts were sheared or broken. The fishing surface of these fish plates and the gauge face of the rail were having fresh shining mark. 22 number pandrol clips of this rail were also lying inside and out side of this rail. There were 14 PSC Sleepers in this rail, out of which, 4 sleepers were also having wheel dent mark on their rail seats. Their MCI inserts were in intact condition and remaining 10 sleepers, their rail seat were completely smashed. Their MCI inserts had also broken down. The gauge face of this rail was in upward condition. A grazing mark of about 2.5 Metre length was visible on the gauge face of this rail at a distance of about 4 Metre from Howrah end rail edge. The flange of this rail was also having wheel travel mark for about a length of 3 Metre. There were fresh marks of rubber pads on the bottom surface of this rail.

3. **After that there was no rail for about a length of 2.25 Metre.**

4. **Then, a rail of about 11 Metre, was lying inside the track with gauge face in down ward direction. This rail was battered and hogged on Howrah end due to impact of derailed wheels. The length of battered portion was about 25mm from Howrah end rail edge. The length of hogged portion of this rail was about 1.5 Metre from Howrah end rail edge. A deep dent mark was also visible in the web of Howrah end rail face. A cut mark was also visible on the outer race of this flange.**

5. Then there was no rail upto the abutment of bridge. This length was about 7 Metre.

6. The right hand side rail was in intact condition upto the broken SKV weld. This weld was at about a distance of 20 Metre from SEJ. This weld has broken from bottom as the flanges of the wheels had fallen on it. After that there was no rail up to the abutment of bridge. It seems to be a fresh breakage.

Condition of Bridge:

The abutment and piers of Up and Dn line have combined structure.

(1) Howrah end abutment of up line:- Its ballast wall for about 5 Metre length and 0.6 metre depth was damaged. Its bed block was also damaged at the edge.

(2) Howrah end abutment of Dn line: No damage.

(3) Piers: Nose of Pier No.1 & 2 towards up line was slightly damaged. The pier no. 3 & 4 towards the up line were severely damaged. These piers got broken towards up line and broken parts fallen into the river bed with bed block. On Dn line side, no damage had taken place on pier no. 4 and pier no. 3 was slightly damaged on top on Dn GC side

(4) Delhi end abutment of Up line:- Condition was not clear because of capsized coaches.

(5) Delhi End abutment of Dn line: No damage.

(6) Condition of Girders: All the girders(5 No.) of up line were completely damaged and Girder No.4 of Dn line was also damaged.

Condition of Track Over Bridge:

The track over the bridge was completely destroyed. Also on the Delhi end of Bridge track upto a length of about 20 Metres was completely destroyed. Also on Delhi end of bridge, around 60 sleepers, no. of MCI inserts and pandrol clips were broken. There was a dragging mark on outside of left hand rail and inside of Right hand rail up to Km. 509/7.

Position of Coaches:

The generator car and coach H2 were on the track, coach H1 and PC 2 were derailed of all wheels on Howrah end approach of bridge. AS 3 and AS 4 were infringing the Dn line. AS-1, A-2 Pc-1 and Generator Car were capsized on slope of Up line on Delhi end. The remaining coaches were also lying capsized in the bridge.

From the condition of the site, it is apparent that this derailment had taken place due to opening of fish plates and pendrol clips of 9 Metre rail on Howrah end and approach of the bridge.

He confirmed that there was no settlement of bridge. And further told that 63 out of 155 Bridge Timbers on Up line were replaced during the last 10 years. Out of these 63 sleepers, 61 sleepers have been renewed during the last 5 years. There is no speed restriction on this bridge on the day of accident. Also, no speed restriction had been imposed on this bridge from 1.4.2002 to 9.9.2002 .

On cross examination he told that he inspected the section by footplate on 11.8.2002 and last push trolleyed on 28.6.2002 and did not find anything wrong with the bridge or its approaches. He confirmed that the condition of Bridge Timber was good and the guard rails had notching, He had last inspected the bridge on 6.4.2002. His observations along with status of compliance are as under:-

Observation No. 1 - 11 Nos. unserviceable sleepers on Up GC to be changed – Not complied. However, those sleepers were shifted side ways and new grooves for rail screws were provided.

Observation No. 2 - Hook bolts missing 30, loose 11-Missing hook bolts were provided and loose bolts were tightened.

Observation No. 3 – Condition of painting in Span No. 5 was bad in patches. Repainting was to be done in those patches – Repainting done.

He confirmed that no bridge girder of 60 feet span manufactured in 1925 had given any trouble in this section. He was questioned whether there was any proposal to do eproxy grouting to fill up the cracks in the

masonry of bridge No.445 Up, he replied that since there were no cracks in this bridge, so question of epoxy grouting did not arise. He further clarified that through bridge timber renewal for 12 Nos. of bridges was sanctioned through Pink Book. Out of those 12 Nos. of bridges, only on 4 bridges (Bridge No. 462, 509, 510, 510A) speed restrictions due to unserviceable sleepers were imposed . He further, clarified that the procurement of bridge timbers had since been banned by the Hon'ble Supreme Court, bridge timbers were being replaced by channel sleepers as a matter of policy and therefore bridge no. 445 was also sanctioned for renewal of bridge timbers. He also told that during the last TRRC run on 25.8.2002 , the TGI value of Km 508 was 94 and no peak was recorded during the last OMS run conducted on the same day.

5.2.20 **Shri Mukesh Gupta, Assistant Engineer/Gaya** – He is the sectional Assistant Engineer. He was on paternity leave from 27.8.2002 to 10.9.2002 and was at Aligarh during that period. He read in the newspaper about the mis-happening of Rajdhani Express in his section. He immediately left Aligarh by 2312 DN (Kalka Mail) at 09.35 hrs. on the same day and reached Mughalsarai around 20.30 hrs. He proceeded to Anugraha Narayan Road station by the same train and reached there around 2.30 hrs. From Anugraha Narayan Road he left at 5.40 hrs. by road and reached accident site around 08.15 hrs. on 11.9.2002.

On cross-examination he told that he had last inspected Bridge No. 445 UP on 09.3.2002. During the inspection he found that 14 sleepers were unserviceable alongwith some other observations.

He told that guard rail notching and end binding was completed by 15-04-2002. 4 Nos. sleepers had been changed . He further told that last push trolley over the bridge was done on 14.9.2002 and he did not find anything wrong. He last foot plated this section on 11.8.2002 by 2801 UP and did not find anything wrong at the bridge. When questioned as to what anti sabotage measures were taken because of the number of reports of sabotage in his section in the past, he told that night patrolling was continuing.

5.2.21 **Shri Ramesh Kumar. Sr. Divisional Engineer(Co-ord), Mughalsarai** - He reached the site of accident by 3.50 hrs on 10.9.2002 by Accident Relief and Medical Equipment Van. He found that the loco of Rajdhani Express was standing on Up Line at Km 509/7 with two wheels of Howrah end Trolley derailed. These derailed wheels had damaged the track from Km 509/7 to Delhi end abutment of the Dhawa bridge. Thereafter he along with Divisional Railway Manager crossed the bridge. From the site conditions it was certain that derailment had taken place due to the opening of the fish plates and pandrol clips of 9metre rail on HWH end

approach of the bridge. Whatever he saw has already been recorded in the statement of Shri Abhay Kumar, Divisional Engineer(II), Mughalsarai.

On cross examination he told that the right end rail was broken due to the flange of the wheels having fallen on it. He examined this rail and has not found any old flaw .

He again confirmed that right hand rail has fractured with the falling of the flange of the wheel and then pulling the rail with the speeding wheels of the train. **At this stage, he was advised to locate the piece of the fractured rail and send it to M & C Directorate for Metallurgical test.**

5.2.22 **Shri Asit Kumar Banerjee, Senior Section Engineer/Bridge/ Mughalsarai -** He reached the site of accident at 13.30 hours of 10-09-2002. After reaching the site he assessed the damages to the bridge and found 5 girders had entangled with the derailed coaches and dislodged from their position. Both the abutments and 4 piers of the Up line were damaged due to the thrust of derailed coaches. The bracings and other structural members of the said girders were badly damaged because the wheels of the derailed coaches had travelled over them. On cross examination he told that steel work of the bridge was last inspected by Shri B. K. Nag, JE/P.Way/I on 12-10-99. He had also inspected the same along with Shri Nag. He had tested the rivets of girder and the results were as under:-

Span No.	No. of rivets tested	No. of rivets found loose
1	144	11
2	144	8
3	144	6
4	120	3
5	144	9

All the loose rivets were replaced by high tension friction grip bolts. The condition of steel work was good. Nowhere in his section 40/60 ft. span manufactured in 1925 have given trouble. Next inspection of the girder is due in October, 2004. The girders were last painted in November, 1998 and will be due painting in 2004. Greasing of centralised bearings was done in April, 2002. These centralised bearings were installed in 1925 itself and these are renewed only on the basis of condition. Since the bearings of these girders were in good condition there was no proposal for changing them. He further told that Bridge No.445 on Dhawa river was inspected by the then Commissioner of Railway Safety in the year 1998-99 and both he and the Permanent Way Inspector were awarded for good maintenance of girders and track.

5.2.23 **Shri M. A. Khan, Section Controller, Mughalsarai** – He was on duty from 18.00 to 00.00 hours shift on 09-09-2002. 2301 Up Rajdhani Express passed Rafiganj at 22.40 hours. Thereafter OHE went off for Up and Down lines. 1160 Down stopped at Deo Road for clearance of the section. Station master, Rafiganj reported to him that the Rajdhani Express derailed. Thereafter he informed immediately to Deputy Controller (General). All officers reached Control office within no time. All Up and Down trains were controlled for the passage of Accident Relief Train, Crane and Medical Van. On cross examination he told that none of the Station Masters from Gaya to Rafiganj gave him any adverse report about the running of 2301 Up. Before 2301 Up, BCN Empty had passed the section around 40 minutes earlier and 3151 Up Express had passed 15 minutes before the BCN Empty. He did not get any adverse report from the crew of 3151 Up or BCN Empty about any jerk in the section.

5.2.24 **Shri K. P. Sinha, Senior Loco Inspector/Gaya** - He reached the site of accident at 03.15 hours of 10-09-2002. During inspection of site he found that last 2 coaches were on the rails and 3rd & 4th from the last had derailed of all wheels. 5th & 6th coaches from the end were hanging in the river. 2 coaches were on the Down line and balance coaches had fallen down on the other end of the river on the left side. **During the inspection of track he found that a piece of rail 9.01 m long whose fish plates and nut bolts had been opened and separated was lying by the left side of the track. Like this 4 fish plates and 8 nut bolts were opened by some unknown person.** He saw the marks of the wheels on the girder. The engine of the train got detached from the load and was standing at Km.509/7. 2 wheels of Howrah end trolley of the loco found derailed. According to his assessment the train derailed due to opening of fish plates. On cross examination he told that he was at Gaya when the derailment occurred and he reached site by tower wagon. **He clarified that nobody told him about the opening of fish plates rather he noticed it when he was inspecting the site.** He had last foot-plated Rafiganj-Deo Road Up line by BCN Empty which left Gaya at 13.10 hours of 09-09-2002 and he did not get any jerk while passing this section.

5.2.25 **Shri Maheswar, Track Man/Rafiganj** – Sarvashri B. Naskar & Y.N. Singh came to the office and his house at 23.00 hours of 09-09-2002 and he accompanied them to the bridge site where they reached around 23.30 hours. **When they were going via cess on Up line they found that one rail of left hand side of Up line beyond the SEJ near OHE Mast No.508/21 was lying in opened condition on the toe of the concrete sleepers. They (all the three) saw 2 fish plates and 4 bolts of Howrah end joint of opened rail and 2 fish plates and 4 bolts of Delhi end joint were lying outside the track. They also noticed that some of the pandrol clips were lying inside and outside of the rail. Connection to this rail with OHE Mast No.508/21 was in tact.** In the meantime Shri Y.

N. Singh, Permanent Way Inspector brought a photo-grapher. He remained sitting near the opened track. On cross examination he told that he works in the Stores of Permanent Way Inspector and his quarter is situated within the Store compound.

5.2.26 **Shri Raja, Senior Track Man/Rafiganj** - He was working as Keyman on 09-09-2002. During his routine inspection from Km.507 to Km.510 he found that all fittings were in tact. He had checked the bolts and other fittings of SEJs on either end of Dhawa bridge. He had also checked the joints of the fish plates and tightened them wherever required. He had also tightened the loose hook bolts. When questioned he told that he had checked the pandrols on the approaches of Dhawa bridge on 08-09-2002. He started his patrol at 6.30 A.M. of 09-09-2002 and passed Down line of Dhawa bridge around 7.30 A.M. and Up line between 10 & 11 A.M.. In the afternoon he again crossed Up line between 5 & 6 P.M. and reached Rafiganj at 6.30 P.M. When questioned he said that he did not see anybody moving near the bridge and everything was found o.k. even in his second trip.

5.2.27 **Shri Asjad Yusuf, Station Master/Kastha and Shri Rajesh Kumar Sinha, Assistant Station Master/East Cabin Kastha & Shri Jagdish Prasad, Assistant Station Master/West Cabin Kastha** – All of them were on duty in their respective places in the afternoon shift of 09-09-2002. 2301 Up Rajdhani Express passed their station at 22.25 hours. They exchanged alright signals from their respective places and did not find any hanging part or any abnormality in the train.

5.2.28 **Shri Parameswar Prasad, Cabin Master/Paraiya and Shri B. Yadav, Assistant Station Master/Paraiya** - Both were on duty in their respective places in the afternoon shift of 09-09-2002. 2301 Up Rajdhani Express passed their station at 22.30 hours. Both exchanged alright signals from their respective places and did not find any hanging part or any abnormality in the train.

5.2.29 **Shri Dilip Kumar Sonkar, Section Engineer/Mughalsarai-**

He is incharge of Mughalsarai Accident Relief Train which left Mughalsarai at 23.55 Hrs. and reached site at 6.50 Hrs on 10.9.2002. He told that his train reached Jakhim Station at 2.42 Hrs. where it was detained further.

5.2.30 **Shri Kuldip and Ganpat, Gangman/Deo Road -**

Both were working as Patrolman on the section from Deo Road to Rafiganj on the night of 9/10th September, 2002. Both had reported at Deo Road at 22.00 Hrs. of 9.9.2002 and obtained signature of Station Master in the Patrol Book. When they proceeded towards Rafiganj they found a

light engine standing on up line. They met driver of the engine, the driver told that his train had derailed on the bridge and further told that two persons from the loco had gone towards the bridge. When they proceeded towards the bridge, they met both the persons returning from the bridge and told about the derailment. They proceeded further towards the road to cross the bridge and reach Rafiganj Station. They obtained signature of the Station Master there and came to Dhawa bridge, they stayed at Dhawa Bridge up to 5.00 a.m. and crossed the river by road and proceeded towards Deo Road and reached Deo Road at 8.00 Hrs. and obtained signature of the Station Master there.

Their Patrol Book was checked and it was found that they did not complete their duty on 08.9.2002. When they were questioned about this, they told that they came up to Dhawa bridge when it was raining heavily and the river had lot of water, therefore, they could not cross the bridge. He had only one Hand Signal Lamp which was lit by Kerosene, due to fear they could not cross the bridge and returned to Deo Road Station. When questioned " Why they did not obtain signature of Station Master of Deo Road" , they replied that the Station Master of Deo Road refused to sign their Book because they did not perform their duty upto Rafiganj

They were again separately cross-examined on 18.10.2002. When they were questioned as to why they returned from the bridge seeing too much water, they told that their Hand Signal Lamp was extinguished due to breeze blowing at that time and it was raining also. They had been supplied a Torch but it was not working. They further told that they walked in the dark up to the bridge and did not dare to cross the bridge in the dark. The torch was not working for last 4/5 days. They had reported for the same to their Mate who advised them to somehow manage.

5.2.31 **Shri Paras Thakur, Station Superintendent, Rafiganj -**

He got information about the derailment of Rajdhani Express at 23.05 Hrs. and reached station by 23.10 Hrs. He informed Doctors, Thana and Government Hospitals through porter, in the meantime Shri Mitra, Chief Electrical Engineer/Eastern Railway came to his station at 23.25 Hrs. and informed that the train had derailed and fallen in the river . The bridge of the river was also damaged, Shri Mitra advised him to make elaborate arrangements as the damage could be much more. Accordingly, he informed a Voluntary Organisation and sent patromax and torches to site at 23.50 Hrs. and got the STD booth in the nearby area opened. The guard of 2301 UP also gave a memo about the derailment. As soon as he was about to proceed to site Shri Mitra advised him to stay at the station and make arrangements. Medical Van from Gaya came at 1.20

Hrs. and was received in loop line, from there it was dispatched to site at 01.36 hours. When questioned why he received the Accident Relief and Medical Equipment Van in loop line he told that it was done as per the instructions of Control. When questioned as to why he dispatched the train at 1.36 hours, he kept on insisting that the train left at 1.30 Hrs. although entries in the Train Register showed that the train had left at 1.36 Hrs.

5.2.32 **Shri R P Paswan, Assistant Station Master on duty at Islampur**- 2301 Up left left his station at 22.35 Hrs. on 09-09-2002. He exchanged alright signal. He did not notice any hanging part or any other abnormality in the train when it was passing through his station.

5.2.33 **Shri Prahlad, Cabin Master/ Deo Road** - He was on duty at Deo Road in 16.00 to 24.00 hours shift of 09-09-2002. Line clear was granted for Rajdhani Express at 22.24 Hrs and he obtained line clear from Jakhim Station. Rafiganj (West) gave him" train on line" signal at 22.41 hours. 1182 Down was waiting at his station as 3010 Down had not cleared the section, after obtaining line clear for 1182 DN around 22.42 Hrs, he was about to lower the signal when power went off. Therefore line clear of 1182 DN was cancelled, he came to know about the derailment of 2301 Up Rajdhani Express at about 23.00 Hrs. through Control.

5.2.34 **Shri Rahul Banerjee, Train Superintendent, Rajdhani Express** - He was in Howrah end Pantry Car, when the accident occurred. During the run from Howrah to site of accident he did not feel any abnormal running but told that Shri T K Dutta, Wireless and Telecom Mechanic (who expired in the accident) rang him up at about 22.00 Hrs. and informed that Delhi end Pantry Car was shaking more than usual. After finishing his own job, he was proceeding to Delhi end Pantry Car in order to be sure as to what was happening, in the meantime derailment took place. He did not get any complaint from any other passenger about bad riding during the run from Howrah to accident site. He had not been given any training for giving first aid to injured passengers, Shri Banerjee suggested that ;-

(i) There should be a travelling doctor in the Rajdhani Express
(ii) The pantry car be maintained properly in respect of Electrical fittings and cleanliness.

5.2.35 **Shri Somra Kharia, Mate, Rafiganj** -

He is the Mate for Unit No. 5 having jurisdiction from Km. 504/0 to 510/0 and he has been working there for the last 12 years as Mate. He told his section is good and all the bridges are in good condition. His Permanent Way Inspector was awarded 3 years back for maintenance of this section. He confirmed that all fittings were in good condition. No incident of theft of P.Way material has been reported in his section, the condition of the

sleepers in track over Dhawa bridge was satisfactory. He had changed few sleepers on the bridge but did not remember the number.

5.2.36 **Shri Satyendra Prasad, Assistant Station Master/Guraru** – He was working in the afternoon shift at Guraru West Cabin on 09-09-2002. 2301 Up Rajdhani Express passed his cabin at 22.31 hours. He exchanged alright signals from his cabin and did not find any hanging part or any abnormality in the train.

5.2.37 **Shri P. C. Saha, Senior Section Engineer (Carriage & Wagon)/Howrah** - He explained the procedure and checks usually made in the rake of Rajdhani Express before giving it fit. On 09-09-2002 Rajdhani Express rake was given primary maintenance. After full satisfaction the coaches were made fit in all respects at 15.55 hours. On cross examination he agreed that the escorting Train Examiners were giving him report after they had come back from the trip. Although no frequency has been prescribed for his checks but he has been making the checks on the rake of Rajdhani Express. When asked about the frequency of inspection of the rake by Assistant Mechanical Engineer, he said that there is no such frequency stipulated for the Assistant Mechanical Engineer. He does not have any shortage of spares in his depot. Regarding his problems, he told that the washing pit line is on a curve and the illumination provided there need to be enhanced. There are 3 electric driven air compressors. They need one diesel air compressor and facilities for welding etc. Although the pits have no light, undergear examination of trains in the night are done with the help of Miner's lamp. In the rainy season water accumulates in the pit which is drained out with the help of pump. During the water-logging of pit, examination is carried out from outside and they go in the pit under water if required.

5.2.38 **Dr. N. Kumar, Dr. D. K. Sahay & Dr. J. K. Singh, Senior Divisional Medical Officers/Gaya** - They heard hooter at 23.02 hours, all the 5 doctors with para-medical staff reported at Gaya station at 23.15 hours. Accident Relief Medical Equipment Van left Gaya at 24.00 hours and reached site at 01.35 hours of 10-09-2002. They opened a First Aid Centre near the medical van and started attending to the injured. Accident Relief Medical Equipment Van from Mughalsarai reached site by 03.00 hours of 10-09-2002. In the meantime, civil authorities and local doctors started shifting the injured to Rafiganj Primary Health Centre. At 10.00 hours, Chief Medical Director/Kolkata instructed them to go and help the local doctors at Rafiganj hospital. Therefore, they took 4 seriously injured passengers in a tower wagon to Rafiganj and started assisting the local doctors there. Around 12.30 hours of 10-09-2002, Chief Medical Director again directed to shift the injured to Gaya. The State Government doctors were themselves sending seriously injured passengers to Magadh Medical College Hospital. However, as per instructions of Chief Medical Director,

transfer of injured to Gaya was commenced. 3 Railway doctors were attending the patients in the Special train at Rafiganj. The train left Rafiganj at 14.00 hours and reached Gaya at 15.15 hours.

5.2.39 **Sarvashri B. K. Datta/Safaiwala, B. Murmu/Khalasi Helper, S. P. Mandi/Khalasi Helper, Md. Z. Hussain/Khalasi Helper, R. K. Singh/Fitter Gr.II, Ajoy Kumar Routh/Khalasi Helper, Bhabatosh Roy/ Technician III of Howrah** – They were in Pantry Car No.2. They all confirmed that they did not feel any bad riding or problem on the running of 2301 Up Rajdhani Express from Howrah on the day of accident.

5.2.40 **Shri Sagar Singh, Chief Works Manager/Plant Depot/Eastern Railway Mughalsarai -** He was travelling from Dhanbad to Mughalsarai on duty in 1st AC compartment. After the jerks he got up, came out and heard of the accident. He became nervous, shocked and perplexed. He followed the people running here and there and later boarded a jeep and proceeded to Mughalsarai by road and started working there. On cross examination he stated that he did not consult any doctor at site nor at Mughalsarai. Since he was in a state of shock and perplexed, he could not find about the clue at site concerning the accident.

5.2.41 Shri R. Mitra, Chief Electrical Distribution Engineer/Eastern Railway – He was travelling in coach H-2 of the derailed train. Though he was injured, he walked to Rafiganj station and conveyed the information of accident to control and remained at site up to 13-09-2002. He was on sick leave with effect from 16-09-2002 to 25-10-2002. **He confirmed of seeing opened fish plates, fish bolts by the side of Up track (left side facing New Delhi) at about 02.30 hours of 10-09-2002.**

5.2.42 Shri S. Lal, Deputy Chief Electrical Services Engineer/S.E.Railway/ Garden Reach - He was travelling in coach H-2 of the derailed train. After the jerks he came out of the coach went to Rafiganj to give information about the accident and was at site up to 00.30 hours of 11-09-2002 taking part in relief and restoration measures. **He confirmed of seeing fish plates and bolts lying on the left side of Up line and also saw a small rail lying about 2 ft. away from track at around 02.30 hours.**

5.2.43 **Sarvashri Krishna Kumar Basak/Junior Electrical Engineer(I), Sanjoy Mahaldar/AC Coach Attendant, S. K. Sanyashi/Technician(I)/AC coach, T. Ghosh/Technician/Gr.I & Tulsi Ram/Oil Engine Driver III of Howrah** – They were all on duty in the last 4 coaches of the derailed train. After the accident they remained busy in their work or searching for their colleagues in the front portion of the train (other 14 capsized coaches). They could not give any evidence about the clue to the accident.

5.2.44 **Sarvashri Shri S. K. Biswas & U. K. Bhattacharjee** – They were working as Deputy Train Superintendent on the derailed train and were in Pantry Car 2 at the time of derailment. They took part in relief and rescue operation and both returned to Howrah by the Special train at 17.00 hours of 11-09-2002. **They had seen one rail on left side of the track lying in tilted condition. They further confirmed that no track staff worked on the track or brought any fish plate etc. from outside immediately after the accident.**

5.2.45 **Sarvashri Gopal Kumar & A. K. Ghosh/Coach Attendants of H-1 & H-2** – Their coaches were on the approach of Dhawa bridge and they took part in relief and rescue operation after the accident. **Both had seen the rail piece lying by the side of track. They further told that some fish plates and bolts were also lying there. They also confirmed that nobody worked under their coaches immediately after the accident nor they saw any body bringing fish plates from outside.**

5.2.46 **Sarvashri Maksud Alam, Kedar Modi, Shamim, Mahendra Prasad, Sovrati, Sukh Ram, Bhola Patro, R. P. Bhagat, Naresh Routh & Parimal Saha/Bearers** – They were on duty as bearers. **They had noticed along with railway staff and passengers that one rail on left hand side of Up track was lying by the side of track in opened condition alongwith some fish plates and bolts. They further told that they did not see any railway staff working under the coaches H-1 & H-2 or in rear of these coaches after the derailment.** They served approximately 450 bottles of mineral water to the injured/uninjured passengers after the derailment. Banana & biscuits available in the Pantry Car were also served to these passengers.

5.3 **Injured Passengers/Railway Employees -**

5.3.1 **Dr. Bhola Nath Banerjee, Passenger** – He was travelling on berth No.48 of coach AS-1. He was taken out of the coach at about 00.30 hours of 10-09-2002 by local people and was taken to Rafiganj Health Centre at 4.00 A.M. on 10-09-2002 by Police jeep. From there, he was taken to Railway Hospital/Gaya between 8.30 to 9.00 hours of 10-09-2002 by State Govt. doctors and got tremendous assistance at Gaya Hospital. On 11-09-2002, he reached Howrah by Special train and was admitted to Howrah Orthopaedic Hospital and was later transferred to B.R. Singh Hospital at Sealdah. He was satisfied with the treatment at B.R.Singh Hospital and Gaya Hospital. He was also satisfied with the treatment given to him by State Govt. Police, local people of Gaya who had given all kinds of help such as providing mobile phone and food etc.

He complained about the rescue operations by Railway employees & doctors as Railway Relief Van did not arrive in time. Even up to 4 A.M. of

10-09-2002 no railway employee or medical staff attended the site. He had not received his luggage up to 21-09-2002 when his statement was recorded.

5.3.2 **Shri B. K. Maiti, Bearer/Pantry Car** – He was travelling on berth No.4 in coach No.A-4. He was taken out of the coach between 7 & 8 hours of 10-09-2002 by his son and others. He was then taken to Civil Hospital and shifted to Gaya Hospital. From Gaya he was shifted to B.R.Singh Hospital on 12-09-2002. He gained consciousness in B.R.Singh Hospital only and was satisfied with the treatment there.

5.3.3 **Shri S. K. Chowdhury and Smt. Tapati Chowdhury, Passengers** – They were travelling on berth No.7 & 9 of coach A-5. Local villagers took him and his wife out at 00.15 hours of 10-09-2002. At 4 A.M. Deputy Inspector General of Police/State Govt. and his team provided them a vehicle and shifted them to Rafiganj Health Centre where the medical facilities were not adequate. They were shifted to Magadh Government Hospital at 14.30 hours and stayed there upto 10-09-2002. Up to that period they had not got any help, assistance from railway authorities. At Magadh Hospital local people, State Government, Police and some people of Human Rights organisation gave them food and other assistance. On 11-09-2002 a team of doctors headed by Dr. Shakil Ahmed attended them and advised that they could travel to Kolkata with proper care. At about 16.00 hours of 11-09-2002 railway doctors came and advised them to go to Kolkata. They started with a special train which left Gaya at 19.30 hours of 11-09-2002 and arrived Howrah at 09.30 hours of 12-09-2002 and they were admitted to B.R.Singh Railway Hospital where they got utmost care. They again asserted that cooperation from the railway doctors at Rafiganj was totally unsatisfactory. At B.R.Singh Hospital doctors diagnosed multiple fracture on the spine and right arm shoulder of Dr. S. K. Chowdhury.

5.3.4 **Shri Chittaranjan Halder, Assistant Manager, Fertilizer Corporation of India** – He was travelling with his wife in coach AS-5. He was taken out of the coach by the police at 02.30 hours on 10-09-2002 and shouted for gas cutter to save his wife. From site to Gaya he was shifted by a train at about 10.00 hours of 10-09-2002 and admitted to Magadh Hospital where no treatment was available except one unit saline. From Magadh Hospital he was shifted to Gaya Hospital on 11-09-2002. From Gaya he was further shifted to Howrah by a special train through a medical team to Orthopaedic Hospital, Howrah. At Rafiganj or Gaya no assistance was provided by State Government officials but local people helped them a lot. Treatment at the site and Rafiganj was not available. He complained of no rescue operation at site by railway although Railway Minister was at site. However, he was satisfied with the treatment at Orthopaedic Hospital, Howrah.

5.3.5 **Shri B. K. Bhattacharya/Businessman -** He was travelling on berth No.33 of coach No.AS-3 and taken out around 1.30 hours of 10-09-2002 and taken in Medical Van to Sasaram Hospital. At 9.30 hours of 11-09-2002, he was advised to shift to Mughalsarai Railway Hospital. Accordingly he was shifted to Mughalsarai Hospital at 12.30 hours on the same day. He left Mughalsarai by 2308 Down and reached Howrah on 12-09-2002 and was admitted to Orthopaedic Hospital, Howrah. He was critical about the State Government who provided him no assistance and was satisfied with the treatment given by the Railway. However, he compalined that rescue operation should have been started much earlier.

5.3.6 **Shri B. N. Ali/Bearer** – He was travelling in coach A-5 and had come out on his own at about 23.30 hours. Local people took him to Aurangabad Hospital where there was no arrangement for treatment. At 4.00 hours of 10-09-2002 he was referred to Gaya Railway Hospital and was brought by local people in their vehicle. He was sent to Orthopaedic Hospital, Howrah by a special train on 11-09-2002. He appreciated the work of State Government and local public who rescued him and other passengers.

5.3.7 **Shri S. Alam/Coach Attendant** – He was on duty in coach AS-1. He came out of the coach on his own after one hour of the accident. Bihar Police and local people came for their rescue and brought him to Aurangabad Hospital where he was given preliminary treatment. On 10-09-2002 he was brought to Rafiganj station by Military ambulance at about 10.00 hours. From Rafiganj he was sent to Gaya Hospital by Accident Relief Train where he received good treatment. He started from Gaya by a Special train on 11-09-2002 and arrived Howrah on 12-09-2002 where he was admitted to Orthopaedic Hospital, Howrah. He appreciated that State Government, local public helped him and other injured passengers. He was happy with the treatment at Orthopaedic Hospital, Howrah.

5.3.8 **Shri K. S. Alam/Railway School Teacher** – He was travelling on berth No.27 of coach AS-5. He was taken out at 3.45 hours of 10-09-2002 with the help of some railway employees and local people. He was taken to Gaya Hospital via Rafiganj at 13.45 hours of 10-09-2002. From Gaya he was shifted to Chittaranjan Locomotive Works Hospital and finally shifted to Orthopaedic Hospital, Howrah. He was happy with the help provided by the State Police, Military and local people available at site. No medical facility was provided at site. He was happy with the treatment at Orthopaedic Hospital, Howrah. He complained that rescue operation should have been started much earlier and there should have been some sort of emergency exit in the coaches.

5.3.9 **Shri Joydev/Khalasi Helper** – He was in generator car. He was rescued by local public and railway staff at 07.30 hours in the morning of 10-09-

2002 and taken to Aurangabad Military Hospital and from there he was directed to Rafiganj station where local people had given him food and medical services. He was sent to Gaya by train at 12.00 hours on the same day. From Gaya he left by a Special train and reached Howrah on 12-09-2002 and admitted to Orthopaedic Hospital, Howrah. He was happy with the treatment there. He commended the services rendered by the public along with the State Govt. and mililtary personnel.

5.3.10 **Shri Achintya Kumar Polley, Staff/EDP Centre/Kolkata** – He was travelling on berth No.10 of AS-3. He was taken out at 3.25 hours of 10-09-2002 by railway staff with the help of local people. He was taken to Rafiganj in Medical Van and thereafter shifted to Sasaram Hospital with the help of Lions Club, Bihar. From Sasaram Hospital he reached Patna with his relative and came to Howrah by 3232 Down on 12-09-2002. He complained that rescue operation was not up to the mark as he remained confined in the coach around 4 ½ hours after the accident.

5.4 **Others -**

5.4.1 As mentioned in para 1.2.3 (iii), I had a meeting at Gaya on 17-09-2002 with Shri Hem Chand Sirohi, Commissioner, Magadh Range, Govt. of Bihar. In this meeting, Railway officers mentioned at Serial No. 1 to 7 in the para 1.2.3 (iii) were also present.

The Commissioner mentioned following problems in connection with the relief work :-

(i) Shortage of coffins and slabs of ice for the dead bodies.
(ii) Shortage of railway's para-medical staff.
(iii) Shortage of life saving drugs in Accident Relief Medical Equipment vans.
(iv) There was lack of co-ordination between Railway and State Government doctors. According to him no one from Railway was co-ordinating with State Government officials.
(v) Shortage of staff to handle the dead bodies.
(vi) There was no site office at the site of accident.
(vii) The train for transporting dead and injured to Howrah was placed on line No.3 of Rafiganj station on 10-09-2002 whereas Chairman, Railway Board's train was stabled on line No.1. This caused lot of inconvenience in the transport of injured and dead to the train through foot-over-bridge.
(viii) There was acute shortage of cutters. He narrated how he arranged cutters from contractors working in the nearby area.
(ix) The crane in the relief train from Mughalsarai was giving frequent trouble causing delay in taking out the injured passengers from coaches.

(x) He also suggested that VIP movements should be kept to the bare minimum to avoid diversion of attention from relief.

5.4.2 Superintendent of Police, Aurangabad has also submitted a memorandum vide his letter No.1599/C dated 23rd September, 2002. He raised certain points which are summarised as under:-

(i) There were discrepancies in the map of site submitted to them. There were pre-existing cracks in the piers where girders are held back. The breakage of piers along the line of these cracks was visible. These cracks were not shown in the sketch given to them.

(ii) From the inspection of site it was found that next rail towards Delhi end had snapped and this snapped rail was 10.77 m long. This snapped rail was 6.81 m from the abutment of the bridge. All sleepers under this rail had been dragged in to the river. How this dragging could take place. This vital evidence not shown in the site sketch. This omission appears to be a part of larger conspiracy.

(iii) Relief Train left Gaya at 12 'O clock mid-night and reached accident site at 1.20 hours of 10-09-2002 by covering a distance of 39 Kms.

(iv) Station Superintendent/Rafiganj sent a memo to police station instead of informing by telephone.

(v) Four fish plates, 8 nut bolts and numerous pandrol clips found at the accident site rested in the store and were not part of the "derailed rail".

(vi) In the letter to police, Station Superintendent/Rafiganj mentioned that Dhawa bridge had collapsed.

(vii) Sarvashri Y. N. Singh, B. Naskar & Maheswar brought a photographer instead of attending to the cries of passengers.

(viii) Existing wooden sleepers used as bridge timbers in the bridge were worn out and spike killed etc.

(ix) Knee jerk reaction of managers of Indian Railways was that it was sabotage. The reaction is normal but time should have given way to reasoned deductions.

(x) Shri Kulshrestha (a retired railway officer)'s article asking as to whether monsoon patrolling was ordered. Whether speedometer of the loco was seized.

(xi) Members of American Society of Civil Engineers have blamed age factor for the collapse of the bridge.

5.2.3 **Shri S. K. Basu, New Delhi** – His wife Smt. Shubhra Basu was travelling in seat No. 33 of coach No.AS-2 and she died in this accident. Shri Basu reached Gaya on 10-09-2002 at 3 p.m.. Based on his experience he sent a fax to the Chairman Railway Board and copy to the undersigned. Some of the important observations/complaints made by him are summarised below:-

- They did not find a single person who was in-charge of the whole rescue operation.

- Nobody could tell them who were the people safe and sent back to Delhi and Calcutta. The reply from them (Railway officials) was – "they didn't make any list". There was no identification given to victims taken out from the compartments. After the accident those who could tell their names, the list was made, but who were unconscious and heavily injured, there was no way to trace them. Same thing must have happened to his wife, whom they could trace only on 11-09-2002 evening. Can Railways tell him where was she till that time?

- There was no coffin and ice arranged from 10th morning and other facilities were not available to preserve the bodies of the deceased. Many people had to purchase coffin on their own but of course some coffins were provided on 11-09-2002. Dead bodies were rotton and people had to carry fully decomposed bodies to their home.

- There was no helicopter service provided to airlift heavily injured passengers to place like Patna. This could have saved lot of lives.

- The complete list of passengers were not there on 10-09-2002. This should have come from Howrah Station/Mughalsarai by fax to Gaya by 10-09-2002 early morning.

- There was only one crane with 15.5 metre radius which was not able to fully lift the coaches. He told C.M.E. to get another crane on the 2nd line, so that coaches could be lifted properly and rescue operation could be faster. This was not done.

- Railway authorities were prioritizing to repair the railway line instead of salvaging people stuck up in various coaches where life may be there. Under his and other's influence, they stopped that on 10th night and concentrated on further rescue operation.

VI. **TESTS AND OBSERVATIONS.**

6.1 A copy of the sketch showing the plan of the accident site is placed at Annexure I. Index Plan and section of the track between Rafiganj and Deo Road stations is placed at Annexure – II.

6.1.1 Cross section of the river under the bridge showing water level as on 10-09-2002 is placed at Annexure – III. Joint note of Senior Supervisors is placed at Annexure – IV and track readings at Annexure – V. The

information from speedometer of loco No.WAG-5/30002 as down loaded in Electric loco shed at Ghaziabad is placed at Annexure – VI.

6.1.2 The observations made by me on reaching the site of accident (at 09.00 hours of 10-09-2002) and after seeing the damaged track, bridge, loco and coaches are recorded in para 1.2.2 of the report. I again inspected the site of accident on 15-09-2002 and 25-09-2002 to gather more information (refer para 1.2.4). Detailed observations of the track near the site of accident, bridge No.445, loco and coaches were made by me besides the following officers who assisted me in the investigations:-

(i) Executive Director (Bridge & Structure), Research Designs & Standards Organisation and his team for detailed examination of bridge No.445 on Dhawa river.

(ii) Deputy Commissioner of Railway Safety (Electric Traction)/ Lucknow & Deputy Commissioner of Railway Safety (Mechanical)/ Lucknow for detailed examination of coaches and loco of the derailed train.

(iii) Deputy Commissioner of Railway Safety (Signal & Telecommunication)/Kolkata for recording the statement of a few injured passengers in the hospitals at Kolkata.

6.2 As recorded in para 1.2.4, I inspected in detail bridge No. 493 at Km.534/7-9 on the Gaya – Mughalsarai section and bridge No.445 Down adjacent to the damaged bridge on 15-09-2002 to ascertain the standard of maintenance of bridges of same vintage on Gaya – Mughalsarai section.

6.2.1 Masonry of bridge No.493 is as old as that of bridge No.445 as both were built around the year 1900. The brick masonry (in both the bridges) in lime mortar is standing well except pointing required in patches. It may be mentioned here that cement attains its full strength after 28 days whereas lime mortar gains strength by natural process of chemical reaction with atmospheric carbon dioxide. This chemical reaction takes very long time and ultimate strength may take hundreds of years to achieve. Ultimately when all lime is converted to stone, it would be a complete cycle of nature. Therefore, any doubt that bridge was loosing strength because it was old is contrary to the scientific truth.

6.2.2 Condition of girders of bridge No.493 Up and Down (3 x 60 ft. G) was as under :-

Down line – girders were fabricated in 1897, last painted in October, 1998. Condition was good.

Up line – girders were fabricated in 1925, painted in October, 1998. Condition was good.

Cleaning of bearings/seat etc. of both lines done in December, 1999. Wooden sleepers were of the year 1998 and condition was O.K.

6.2.3 Condition of girders of bridge No.445 Down – (3 x 60 ft. + 1 x 62 ft, and 1 x 40 ft. Girders) was as under:-

(i) Spans No.1, 2 & 3 have girders fabricated in 1925.
(ii) Spans No. 4 & 5 have girders of 1958-59.

Condition of girders was good except a dent (caused during this accident) in span No.4 near P_3 for which speed restriction is in vogue.

Condition of wooden sleepers was also O.K.

6.2.4 The damaged bridge on Up line and the bridge on Down line was inspected again on 25-09-2002 along with Chief Bridge Engineer/Eastern Railway and Executive Director (Bridge & Structure)/RDSO and my observations are as under:-

(i) There were no old cracks in the masonry/piers/abutments as examined closely through a magnifying glass.

(ii) An examination of the broken surface of masonry showed that the quality of construction was very good as no voids in joints could be seen.

(iii) Quality of bricks used in construction was also very good.

(iv) The masonry in piers 3 and 4 fractured due to accident at the construction joint of isolated bed block of cement concrete and brick masonry of piers

6.2.5 The Bridge Register of Assistant Engineer/Gaya containing the reports of previous yearly inspections of Bridge No.445 was scrutinised. The entries showing defects etc. on Up line bridge are summarised as under:-

Date	Entries
11-03-94	(i) Pitching around piers No.2 to be repaired. (ii) 10 sleepers unserviceable on Up line.
18-01-95	(i) Peepul tree from pier No.3 (Howrah end face) to be removed. (ii) Sleeper renewal to be done.

11-03-96	(i) On Up side on pier No.4, vertical crack on top. (ii) Bed block Down side on pier No.3 horizontal crack to be repaired. (iii) Unserviceable sleepers – 20.
27-01-97	(i) LXN complied, not standing well. (ii) Unserviceable sleepers – 8
10-02-98	(i) All piers & abutments need flush pointing. At few locations masonry joints opened. (ii) Unserviceable bridge timbers – 'Nil'.
24-12-98	(i) Joints between bed block and masonry becoming loose in pier Nos. 3 & 4. (ii) In A_1 under Up G.C. bricks have become loose. It has to be fixed by cement mortar. (iii) Unserviceable bridge timbers – 15.
02-01-2000	(i) Hollow sound in bricks adjacent to the bed block of Up and Down G.C. in A_1. (ii) In pier No.3 Howrah end, cement pointing done in vertical crack in masonry not standing well. Epoxy grouting to be done. (iii) In pier No.4, Up side G.C. bed block and masonry adjacent to it are getting separated. Epoxy grouting needed. (iii) 30 sleepers (total Up/Down) to be renewed. Divisional Engineer/II/Mughalsarai recorded on 15-03-2000 that the work of epoxy grouting was in progress.
22-02-2001	(i) None of piers No.1, 2, 3 & 4 where holding down bolts have been fixed to be repaired. (ii) 21 sleepers on Up G.C. require changing.
09-03-2002	Unserviceable sleepers 14 on Up G.C. Divisional Engineer/I/Mughalsarai inspected on 22-05-2002 and recorded as under:- 11 Nos. sleeper unserviceable on Up G.C.

6.3 R.D.S.O. was assigned to undertake thorough investigations into the damage to sub-structure of Bridge No.445 on Dhawa river. Their report is placed in Annexure – VII.

6.3.1 RDSO team visited the site with following equipment:-

i) Rebound Hammer
ii) Ultrasonic Tester

iv) Acoustic Emission equipment
v) Ground Impulse Imaging System.
vi) Crack detection microscope
vii) Profometer
viii)Corrosion monitoring equipment.

6.3.2 Before starting field investigations with the help of NDT equipment, physical condition of the pier and abutments of bridge sub-structure was thoroughly examined. The damage to the various portions of the substructure, location of cracks, epoxy grouting done in the past etc were plotted on the sketches enclosed with the RDSO report at Annexure-VII to Annexure -VIII . The various observations noted during the examination are as under:-

6.3.2.1 **About strength of the mortar** – Each pier and abutment was thoroughly examined with the help of wire to assess whether there is any loss of strength in the mortar or not. Everywhere including that at broken portion of the piers, mortar was found in very sound condition. No leaching of mortar was observed in any of the piers and abutments.

6.3.2.2 **Condition of Bricks** – Bricks were found in excellent condition and no where any sign of efflorescence was noticed in any of the piers and abutments. Ringing sound was observed under impact of inspection hammer. Sample of bricks and masonry were collected for testing its strength in the laboratory.

6.3.2.3 **Condition of Sub-Structures** - No visible cracks were observed anywhere in the substructure of piers and abutments. At the broken portion of the pier, no loose mortar was found. At many places on existing as well as on broken piers, joints were raked using wires. The broken pieces of pier were in a chunk and loose bricks/mortar at joints were not found . From visual inspection, the condition of sub-structure appeared to be very sound. The sample of mortar, bricks and broken pieces of masonry had been collected for testing the compressive strength including composition of mortar.

6.3.2.4 **Waterway & Scouring** – High flood level marks on abutment A1 and Pier P1 reveal that the bridge had witnessed severe floods in 1916 and subsequently in 1926. There was no further flood of those intensities. Further more, during 1958-59, two more spans of 1X62' and 1x40' were added towards MGS end. The observation of site indicates that waterway presently available is adequate as bridge is not limited to constricted portion of flow and has sufficient opening.

6.3.2.5 **Settlement -** Thorough examination of the foundations revealed that there was no sign of settlement in any of the piers and abutments. To ensure whether any chances of gradual settlement had taken place in the past or not, levels of the bed blocks of all the piers and abutments were taken. It was found that there is no old crack in any of the piers and abutments. Further more, difference in level of bed block as taken by Assistant Engineer / Dehri-on-Sone under the supervision of RDSO found to be only of 5mm. It is worthwhile to point out that the least count of the measuring staff itself is of the order of 5 mm. Hence, it is concluded that there is hardly any level difference, ruling out the possibility of gradual settlement of piers and abutments in due course of time.

6.3.2.6 **Condition of Epoxy Grouting** – All the epoxy groutings were thoroughly examined. It was found that the groutings are in sound condition. Further more, nowhere development of any fresh crack beyond the grouted portion was found.

6.3.3 The RDSO team concluded as under:-

a) Nowhere presence of any efflorescence and leaching of mortar as well as nowhere any indication of loss of mortar indicates that although the bridge is old but still in very sound condition. Regarding this, it is clarified that strength of lime mortar increases with time due to more and more carbonation.

b) Nowhere, presence of any cracks in any of the piers and abutments reveals that bridge substructure is in sound condition. Uniformity in the levels of bed blocks reveals that even no gradual settlement took place in any of the piers and abutments.

c) No sign of any scouring was found anywhere.

d) Waterway was found adequate.

e) Results of rebound hammer on the bricks as well as mortar reveals that these are in sound condition. Bridge even being old, its strength is comparable with good quality of mass cement concrete. Further more, strength on the broken portion and on the intact portion was found to be of the same order.

f) Result of ultrasonic velocity reveals that there is no crack inside any of the piers and abutments. It also indicates fairly good strength. Further more, results on broken as well as intact portions are comparable.

g) Results of Acoustic Emission technique reveals that no cracks are there any where in any of the piers and abutments. If any cracks were there, then results might have been approximately 10 times more.

Furthermore, here also, results on broken portion as well as on intact portions are comparable.

h) Results of the GPR also indicates presence of no any cracks in any of the piers and abutments. Broken portion as well as intact portion were found to be of the same quality.

i) Laboratory testing of the bricks and masonry also reveals that the bridge substructure is having very good strength i.e. more than the required value.

j) If masonry were weak, these bricks might have been crumbled and not broken in big size mass. This failure mechanism reveals that pier no. 3 and 4 were partly broken due to excessively very high impact of derailment which might had been beyond the ultimate strength limit.

k) Comparison of various results with bridge inspection register reveals that bridge was not having any problem and it was in excellent condition.

Finally, above factual positions considered with presence of point of drop about 41 m in the rear of bridge reveals that damage to the bridge took place due to derailment of the trains moving at its full speed of about 126/127 kmph. Bridge is not the cause of derailment/accident.

6.3.4 In order to check the strength of existing bridge, Eastern Railway was requested to undertake detailed calculations to work out the stresses in sub-structure with present day loading. The calculated stresses vis-à-vis permissible stresses have been proof checked by RDSO and the correspondence between Eastern Railway and RDSO is placed at Annexure – VIII. Director (Bridge & Structure)/CBII, RDSO vide his letter No. CBS/MBE dated 24-10-2002 has certified that the calculations for checking existing pier P.3 of Bridge No.445 between Rafiganj and Deo Road on Gaya - Mughalsarai section, submitted by Eastern Railway have been perused and found safe for MBG loading – 1987.

It may be mentioned here that Eastern Railway has calculated stresses on pier No.3 as it supports 60 ft. and 62 ft. spans of the bridge No.445 and is the heaviest loaded pier.

Superstructure and bearings have been found safe as certified by RDSO vide para 4.0 of their letter No.CBS/MBE dated 30-10-2002 (Annexure – VIII).

6.4 **Track** on the bridge was last inspected by Assistant Engineer on 14-08-2002 and Permanent Way Inspector on 09-09-2002 at 18.00 hours and according to them, the track was found to be in order. In the last OMS 2000 (portable accelerometer) run carried out on 25-08-2002 at a speed of

76 Km/h, no peak greater than 0.15 g was recorded on the Up line track at Km.508. Similarly during the Track Recording cum Research Car (TRRC) run on the same day, TGI value of Km.508 Up line was recorded as 94. In layman's language this track can be classified as "very good". The bridge timbers on the Up line of the bridge were renewed through in 1990. As per the yearly detailed inspection of the bridge by Assistant Engineer/Gaya on 09-03-2002, 14 bridge timbers out of 152 were found unserviceable. Out of them 4 timbers had been renewed by 15-04-2002. Since my inspection revealed that the first Point of Drop was located in rear of the Howrah end abutment of this bridge, the condition of the bridge timber in any case did not play any role in the causation of derailment.

The track on bridge approaches on the Up line consisted of 60 Kg (1989 vintage) 90 UTS rails on prestressed concrete sleepers laid in 1984 at 65 cm apart. There are SEJs on either end of the bridge. Between the SEJ and the bridge, free rails were provided. The empty as well as loaded measurements of the track in rear as well as in advance of the affected portion did not indicate any irregularity which could contribute to the derailment. The fittings were found complete on Up line as noted during my push trolley inspection on 15-09-2002.

6.5 **Loco** –

6.5.1 The loco is homed at Ghaziabad electric loco shed of Northern Railway for schedules/overhaul. I inspected this shed on 04-10-2002 along with Shri R. P. Rehan, Chief Electric Loco Engineer/Northern Railway/New Delhi and Shri M. K. Gupta, Senior Divisional Electrical Engineer/Rolling Stock/ Mughalsarai. Shri R. K. Tiwari, Senior Divisional Electrical Engineer/Rolling Stock/Ghaziabad and Shri Mohit Sonakia, Divisional Electrical Engineer/Rolling Stock/Ghaziabad were present.

6.5.2 The loco shed maintains 135 locos out of which 13 are WAP5 type (10 were imported from M/S. ABB/Switzerland and the other 3 were manufactured in Chittaranjan Locomotive Works). Loco No. WAP5 30002 was an imported one. The Ghaziabad electric loco shed obtained ISO 9002 certification on 27th March, 2000 and has a number of innovations/awards to its credit. Other WAP5 locos maintained here, are hauling Rajdhani Express trains to Mumbai (up to Vadodara), Bhubaneswar (up to Kharagpur) and Chennai. Other trains being hauled are Shatabdi Express trains from New Delhi to Bhopal, Lucknow and Kalka.

6.5.3 The loco is fitted with modern gadgets with the state of art technology. Some of these are:-

Vigilance Control Device – A foot padel switch "vigilance" is provided at driver location in both the cabs. The driver is supposed to press this button every minute to show his alertness. If he fails to press this button and release, an alarm is sounded to the driver after the lapse of 60 seconds of the last operation done by him. If he fails to acknowledge the same within 8 seconds a penalty brake is applied. The driver is not supposed to press this button if he is controlling the train by throttle or brake controller as the loco software is aware that the driver is active. A similar push button switch is provided for the Assistant driver also.

Constant Speed control – The locomotive is provided with a feature of constant speed control for which the driver has to push BPCS button provided on the control panel when the loco reaches the desired speed. The loco software will maintain the speed of the locomotive at that value irrespective of the traction/braking requirements till the driver disturbs the throttle/brake controller.

Memotel type Speedometer – This locomotive is provided with a memotel type speedometer which can record the short term and long term speed-time and speed-distance observations. The data can be retrieved through a "data evaluation unit" and downloaded on a laptop computer. The speed - distance and speed - time graph and their values at any instant of time can be seen on the laptop and print out can also be taken.

6.5.4 However, it was learnt that there is no facility available at outstation/trip shed for retrieving the data from "Memotel" type speedometers.

Trip schedule for these locos working 2301 Up and 2302 Down Rajdhani Express is done at Electric Loco Shed/New Delhi and Bamangachi Shed (Howrah).

6.5.5 It was further learnt that the loco had undergone first intermediate overhaul (IOH) at Ghaziabad shed on 29-06-2001 after it was commissioned on 13-09-1996. So far it has earned 11.19 lakh Kms. after commissioning. The POH will be done after it has run for 20 lakh Kms. or completed 10 years of service after commissioning (whichever is earlier) . The loco had undergone following minor schedules at Ghaziabad shed after the last IOH:-

IA on 10-10-2001.
IB on 17-01-2002.
IA on 19-04-2002.
IB on 15-07-2002.

Next IA was due on 15-10-2002.

Senior Divisional Electrical Engineer/Traction Rolling Stock in-charge of the shed confirmed that no major abnormality was noticed on this loco during the schedules.

6.5.6 Electric Loco Trip Shed, Bamangachhi (near Howrah) was inspected by the two Deputy Commissioners of Railway Safety on 19-10-2002 (report at Annexure – XXIA). During the inspection of loco here following items are checked :–

i) Electrical items –

Horn operation, wiper/washer operation, water tank, main compressor, traction converter, main transformer, traction motor, air drier, BA voltage/CHBA voltage; Building up of MR pressure, BP pressure, FP pressure and condition of air flow indicators and working of brake cylinders etc.

ii) Mechanical items –

Internal door locks, centre buffer coupler, buffer, traction link and bar, gear case, hurth coupling, sand box, brake pad, scrubber brake actuator, brake cylinder actuator, bogie isolating cock, clearance between body and bogie frame, primary suspension and secondary suspension, etc.

On 09-09-2002 above items of loco No.30002 WAP5 were checked and all parameters were found within the prescribed limits.

The trip inspection is carried out by 3 teams of 2 staff each for electrical, mechanical and pneumatic sections respectively. Their observations are recorded in a register. This register was signed by Senior Section Engineer/Traction Rolling Stock/Bamangachhi. **However, it was detected that the officers do not carry out any intensive check of WAP5 loco although in the sanction for running Rajdhani Express at 130 Km/h it was stipulated by the then Commissioner of Railway Safety that intensive test check of the loco should be carried out by a junior scale officer at least once in 3 months**. It was also detected that there is no facility available at the running shed for retrieving data from the Memotel type speedometer installed in WAP5 locomotive, although in the Minutes of the meeting of Chief Electrical Loco Engineers and officials with Railway Board and RDSO on maintenance schedule of WAP5 locomotives circulated vide Director Standards Electrical/RDSO's letter No.EL/3.1.35/2 dated 11/12-07-2001, the facility to retrieve data from this speedometer was to be provided at the trip sheds.

6.6 **Coaches** – The coaches undergo POH at Liluah Workshop of Eastern Railway. Base depot for Primary maintenance is Coaching Depot/Howrah and Secondary maintenance is done at Coahing Depot/New Delhi.

6.6.1 First two derailed coaches (next to engine) were examined by Deputy Commissioner of Railway Safety (Electric Traction) and Deputy Commissioner of Railway Safety (Mechanical). Their detailed report is placed at Annexure - XXIB. Their observations are summarised below:-

a) **Coach No.6696A WLRRM (Power car) -**

i) The power car was lying on the left side of the Up line.
ii) Both the bogies were found to be attached with the coach.
iii) Only one axle with wheels out of four was attached to the bogie of the coach. The other three axles had been detached and were found lying at the site.
iv) Measurements of all the wheels were taken. The wheels were also checked using a tyre defect gauge and all the dimensions were found to be within permissible limits.

b) **Pantry Car No. 92802A –**

i) The coach was lying overturned and resting on its roof fully smashed.
ii) Both the trolleys had been detached and were thrown away.
iii) The wheels of this coach were lying scattered. These were traced and measurements were taken. As per measurement with the tyre defect gauge the dimensions were within limits.
IV) No hitting or rubbing marks were noticed.

6.6.2 Last 4 coaches of the derailed rake of the train were examined at Rafiganj by the two Deputy Commissioners of Railway Safety and their observations are as under:-

a) **WCBAC 82803A Pantry Car(15th from train engine) at Rafiganj Station**.

i) Right side body panels of the coach were found smashed due to handling with the chain of the crane. One under frame transformer was found missing . It was learnt that this was removed to facilitate lifting of the upturned coach by the crane.

ii) Some rubbing marks were noticed on the wheel disc.The measurement of all the wheels was taken and all the dimensions were found to be within limits.

b) **Coaches Nos.WFAC 99002A (16th from train engine) WFAC 90016A (17th from train engine) and WLRRM 00856A (18th from train engine).**

Observations were taken. No abnormalities were observed All the wheel dimensions were measured with tyre defect gauge and were found to be within limits.

These coaches were then taken to Liluah Workshop and examined in detail. Their observations are as under:-

i) Fresh breakage of one spring (No.-13) of WFAC 99002A was found. It was not surprising, considering the fact that this coach had derailed.

ii) All the wheel dimensions were within limits and no hitting marks were noticed.

iii) Groupings of axle and bolster springs of the four coaches were tested at Liluah workshop. It was found that a few axle springs and bolster springs fitted in bogies were not of the same groups. Details of these springs as follows:-

I. **Coach No. 99002 A WFAC (16th from train engine)**

		Axle Box (Spring)	Bolster Spring
Bogie no.1	(i)difference in Spg.No.	1&2 is 6 mm	(i) 1& 2 is 2 mm
	(ii) --do--	3 & 4 is 6 mm	(ii) 3& 4 is 8 mm
Bogie No.2	(I) --do--	11&12 is 3 mm	--
	(ii) -do-	15&16 is 5 mm	--

II. **Coach No. 82803A WCBAC (15th from train engine)**

		Axle Box (Spring)	Bolster Spring
Bogie No.1	(i) difference in Spg.No	1&2 is 6 mm	--
Bogie No.2	(i) - do-	13&14 is 6 mm	--

III **Coach No.00856A WLRRM (18th from train engine)**

		Axle Box (Spring)	Bolster Spring
Bogie No.1	(i) difference in Spg.No	3&4 is 10mm	--
	(ii) --do--	5&6 is 1 mm	--
Bogie No.2	(i) -do-	11&12 is 7 mm	--
	(ii) -do-	15&16 is 6 mm	--

IV **Coach no. 90016A WFAC (17th from train engine)**

	Axle Box (Spring)	Bolster Spring
Bogie No.1 (i) difference in Spg.No.	1&2 is 5mm	5 & 6 is 3mm
(ii) -do-.	5 & 6 is 5mm	--
Bogie No.2 (i) -do-.	13&14 is 7 mm	--
(ii) -do-	15 & 16 is 6mm	--

The difference in spring height will affect the magnitude of load coming on springs. It may cause breakage of springs.

The two officers concluded as under:-

i) **The observations made on the derailed coaches No.6696A WLRRM (first coach) and No.92802A WCBAC (second coach) at the accident site do not point to any deficiencies/defects in the above coaches which could have led to the derailment.**

ii) **No such deficiencies were observed on the coaches No.82803A WCBAC (15th coach) No. 99002A (16th coach), No.90016A WFAC (17th coach) and No.00865A WLRRM (18th coach) at Rafiganj and subsequently in Liluah Workshop, which could have led to the derailment. Further, we are of the opinion that if all the other coaches had also been maintained to the same standards as the above four coaches, they would not have initiated the derailment.**

6.6.3 **Tikiapara Coaching Depot** – Inspection of Tikiapara Primary Maintenance depot was done by Deputy Commissioner of Railway Safety (Mechanical) and Deputy Commissioner of Railway Safety (Electric Traction) on 17/18-09-2002. Their report is placed at Annexure – XXIC.

6.6.3.1 Following system of pre-inspection of coaches before placing on washing pit for maintenance is followed: –

i) Rolling-in-examination of rake is done at platform by train passing staff.

ii) Escorting Train Examiner submits his report in the office of Train Examiner train passing, as soon as he arrives at Howrah after completing the journey. This report comes to Senior Section Engineer/Rajdhani on same day.

iii) Escorting Train Examiner also informs on phone to Senior Section EngineerWashing pit of Rajdhani Express regarding works carried out during run and abnormality noticed.

iv) Sometime Escorting Train Examiner presents himself before Senior Divisional Mechanical Engineer if any serious abnormality is noticed during the run and Senior Divisional Mechanical Engineer then directs Senior Section Engineer/Washing pit/Rajdhani accordingly.

v) One washing pit gang also checks the rake at the entrance of washing pit complex regarding wheel defects i.e. wheel flat. They also check the rake for heavy repairs which needs detachment. The coaches are detached and attached in the night and placed in washing pit next morning for maintenance.

vi) Nine different gangs are deployed for undergear maintenance namely Air Brake testing, Howrah end adjusting, Delhi end adjusting, schedule special, undergear examination, special undergear examination, dash pot oiling, buffer/coupling oiling and trolley cleaning etc.

For upper gear maintenance separate gangs are deployed.

6.6.3.2 **Dash pot oil of coach number 99134A was checked on one wheel and no oil was noticed though last dash pot oiling was done only on 06-10-2002. This shows that the present practice of checking of dash pot oil at an interval of 15 days is insufficient. The dash pot oil in Rajdhani rake should be checked in every trip at Primary Maintenance depot.**

Piston stroke and slack adjuster 'A' dimension of coach numbers 92851A and 92803A were checked and found to be within the stipulated limit.

Ganges to check the wheel profile, slack adjuster 'A' dimension, piston stroke, axle box crown clearance and gap between bolster and trolley was checked and found to be o.k.

Supply of safety fittings, availability of staff for Rajdhani rakes and availability of coaches were reported to be adequate.

6.6.3.3 Following registers are maintained in coaching depot to keep the vital statistics of different coaches:-

(a) Daily damage and deficiency register – to note details of works carried out on washing pit on individual coach i.e. schedule, wheel, piston stroke, slack adjuster details are a few of them.

(b) Safety item – It is used for keeping records regarding availability of different safety brackets.

(c) Check of underslung items – In this register condition of fitment of all underslung items is recorded.

(d) History sheet – It indicates the periodicity of damage of coach along with its cause. It helps to know the repeatability of coach detachment.

(e) Coach kilometrage – To know the kilometrage earned by coach. This facilitates information for sending the coach for IOH & POH.

(f) Coach position – To check the integrity of rake.

(g) Escorting Train Examiner – Trip records – It gives information regarding unusual occurrence during run and bad riding behaviour of any coach.

6.6.3.4 The details of trip examination are recorded on a printed proforma called Daily damage and deficiency register.

6.6.3.5 Adequate equipment/facility for testing of Air pressure i.e. air compressor rake test rig and single coach testing rig is available.

6.6.4 **New Delhi Coaching Depot** – I visited New Delhi Coaching Depot on 03-10-2002 along with Shri S. Toppo, Deputy Chief Mechanical Engineer (Carriage & Wagon)/Eastern Railway/Kolkata and Shri D. Garg, Senior Divisional Mechanical Engineer/Coaching/Delhi Division. New Delhi Coaching Depot headed by a Senior Coaching Depot Officer undertakes testing of 2301/2302 Rajdhani Express rake on washing line No.7 between 12.30 and 16.30 hours. The tests conducted here are :-

(i) Air brake testing for continuity, leakage, sensitivity to alarm chain pulling and brake gear riggings.
(ii) Undergear examination including wheel profile, trolley and other under gear fittings to ensure safe running of train back to Howrah.
(iii) To attend to repairs pointed out by the Train Examiner accompanying the train.

6.6.4.1 Senior Coaching Depot Officer conducts surprise checks on an average once a month. Senior Coaching Depot Officer confirmed that adequate quantity of spares is available in the Depot. Record for checks for 3 days 01-09-2002, 04-09-2002, 07-09-2002 for secondary maintenance was checked and nothing abnormal was noticed.

6.6.4.2 It was also learnt that a work of "Provision of sick line shed, hardonate flooring, store shed and upgradation of existing washing line No.7 and 8 at New Delhi Coaching Depot" sanctioned through Works Programme 2000-01 is yet to be started. The execution should be expedited.

VII. **DISCUSSIONS**

7.1 **Time of Accident –** The train passed Rafiganj at 22.37 ½ hours according to Driver, Co-driver and Loco Inspector in the Driver's cab. The accident occurred at 22.39 hours according to them. Guard also has stated that the train came to a halt at 22.39 hours. The speed chart (Annexure VI) also shows a sudden drop of speed from 126 Km/h to 109 Km/h between 22:39.05 hours and 22:39.08 hours which indicates that the driver must have applied brakes a few seconds after the derailment. Hence it would be reasonably correct to assess the time of accident as 22.39 hours.

7.2 **Speed of the train –** According to the Driver and Co-driver the speed of the train was 126/127 Km/h just before the derailment, whereas according to Loco Inspector it was 125 Km/h. The speed chart at Annexure VI also shows that the speed of the train was 127/126 Km/h up to 22:39.05 hours. Therefore it can be inferred that the train was running at **126 Km/h at the time of derailment.**

7.3 **Circumstances and factors leading to the accident -**

A mid-section derailment of this nature could occur due to single or combination of following factors:-

- Convulsion of nature.
- Obstruction on track.
- Over-speeding/sudden braking/bad enginemanship.
- Defects in locomotive.
- Defects in coaching stock.
- Defects in S&T gear.
- Defects/deficiencies in permanent way.
- Defect in bridge.
- Sabotage/train-wrecking.

These are discussed one by one in the following paragraphs:

7.3.1 **Convulsion of nature** – There is no report of any natural calamity in the area prior to derailment. Although the weather was cloudy and drizzling, there was no report of any wash away or sinkage of track. The water at bridge No.445 was flowing 4.10 m below the danger level (refer cross section of the river at Annexure - III). No settlement of piers or any other problem with the bridge was reported as discussed in para 6.2 and 6.3 of the report.

7.3.2 **Obstruction on track** – No obstruction was reported on the track by the crew in the loco of Rajdhani Express. Train No.BCNE/7303 Goods train which left Rafiganj 42 ½ minutes earlier passed safely over the section. Nor did any of the down train crew report of having seen any obstruction on the Up track. An inspection of the Up line in rear of the site of derailment did not reveal any component of rolling stock of the Rajdhani Express train or any preceding train that had fallen down and which could have posed an obstruction to the movement of the Rajdhani Express causing it to derail. It was also noticed that there were no hit marks on the ballast or sleepers on the track in rear of the site of derailment which could leave a tell-tale sign of any hanging or fallen part of the rolling stock of the train which might have had any role in the cause of derailment. Thus it is concluded that any obstruction on the track as the cause of the derailment is ruled out.

7.3.3 **Overspeeding/sudden braking/bad enginemanship** – The booked speed of the train was 120 Km/h. Maximum permissible speed on the section was 130 Km/h whereas the train was moving at 126/127 Km/h which is within the maximum permissible limits. The Divisional Engineer stated that there was no permanent or temporary speed restriction either on the bridge or on its approaches. At the time of accident, there were Driver, Co-driver and a Loco Inspector in the loco cab. The Driver, Shri R. D. Shaw had been once censured in 1990 and Co-driver, Shri A. K. Sinha censured in 1994. Except this they have a good track record. They are working as mail/express drivers since September, 1997 and November, 2001 respectively. A perusal of the print out of the speed chart shows an uniform speed of the train, before the derailment. Therefore the question of bad enginemanship does not arise.

As regards sudden braking, all the three deposed before the Commission that the crew applied emergency brakes when they got a severe jerk on the approach of the bridge. The speed chart given by the speedometer also confirms this. Therefore brakes were applied only after the accident.

7.3.4 **Defects in locomotive –** It is inconceivable that the coaches derailed first and pulled the far heavier locomotive ahead of them and derailing it. Hence if one has to look for the first vehicle of the train to have derailed it is without doubt the locomotive of the train. In the instant case the last pair of the wheels of the locomotive was found in a derailed condition. An intensive examination of the undergear of the locomotive was undertaken to look for any possible defects/ deficiencies in the locmotive which might have a bearing on the derailment. No defect in the loco was reported by the crew in the cab. None of the Station Master/Assistant Station Masters on duty from Gaya to Rafiganj reported any hanging part or abnormality in the train which also rules out any defect in the loco/coach.

The undergear of the Locomotive No.WAP_5 30002 hauling the Rajdhani Express was checked in detail by Deputy Commissioner of Railway Safety (Electric Traction) and Deputy Commissioner of Railway Safety (Mechanical) and it was concluded by them (refer Annexure - XXIB) that there were no deficiencies/defects found in the loco which could have led to the derailment or contributed to the cause of derailment.

The locomotive had its last pair of wheels found in derailed condition at the place where the loco had come to a stop after the accident. As explained in later para 7.3.9.8 infra, a discontinuity was created on the left hand side rail by the removal of the fish bolts of the joints at either end of the rail and by removing the elastic rail clips holding the rail to the sleepers. As the wheels of the locomotive travelled over the left rail which had been made devoid of its fastenings, the heavy lateral forces exerted by the loco wheels in their normal course of travel displaced the left side rail forcing some of the wheels of the locomotive to travel over the concrete sleepers and the ballast Since the track was on a straight alignment and since the train was going at a steady speed, it was not surprising that it took only a fraction of a second for the loco wheels to cover the distance of about 9 m and still climb back on to the left side rail ahead; only the rearmost left wheel of the locomotive could not succeed in climbing back on to the left rail and hence continued to travel in derailed condition. All things considered, the defects/deficiencies in the locomotive if any are ruled out as the cause of the derailment.

7.3.5 **Defects in coaches -**

Except the first and 2nd coaches next to the locomotive as well as the 15th to 18th coaches, the remaining 12th coaches of the train had suffered extensive damage and had their components of undergear disintegrated and strewn over a wide area. Hence no useful purpose was to be served by going into a detailed examination of the components of the undergear of those coaches. In addition it was most unlikely that any of those

coaches had first derailed and caused the derailment of the coaches ahead of them as well as the locomotive.

Only the coaches first and 2nd next to the locomotive had their undergear in a reasonable condition for correlating the wheels with their respective coaches and for analysis. Lead profile was also taken of the wheels of those 2 coaches apart from checking through tyre defect gauge.The wheels of the undergear of the two coaches next to the locomotive were checked thoroughly by the two Deputy Commissioners of Railway Safety and they did not notice any deficiencies/defects which could have led to the derailment (refer Annexure - XXIB). Their inspection of the undergear of the coaches, 15th to 18th from loco which remained on the Howrah end approach of the bridge revealed that the general state of maintenance of the coaches of the Rajdhani Express was satisfactory. It was found that the train rake had its primary maintenance at Tikiapara and was given fit on 09-09-2002 after the required checks. Examination of the maintenance records of primary examination at Tikiapara as well as the reports of the rolling in examination of the Rajdhani rake when it had earlier arrived at Howrah revealed that there were no defects of any nature which might have, even remotely, any bearing on the cause of the derailment. The 4 coaches which had earlier arrived as a part of the rake of Rajdhani Express from New Delhi to Howrah on 08-09-2002 had been detached (one on root radius account and other due to axle box canting, other 2 required attention to internal furnishing and AC cooling coil) and in their place 4 other fit coaches were attached.

Primary maintenance depot at Tikiapara was inspected by the two Deputy Commissioners of Railway Safety and they were satisfied with the system and facilities there (Annexure – XXIC). I inspected personally the facilities for inspection as well as maintenance at the secondary depot at New Delhi and I was satisfied with the facilities and the system for their examination and maintenance of undergear.

7.3.6 **Defects in S&T gear -** Since the accident happened in the mid-section where there was no S&T gear, the role of S&T gear in the cause of the derailment was not even considered.

7.3.7 **Defects/deficiencies in permanent way** - The track on bridge approaches on the Up line consisted of 60 Kg (1989 vintage) 90 UTS rails on prestressed concrete sleepers laid in 1984 at 65 cm apart. There are SEJs on either end of the bridge. Between the SEJ and the Howrah end abutment of the bridge, free rails were provided. The floating as well as under load measurements of the track in rear as well as in advance of the affected portion did not indicate any irregularity which could contribute to derailment (refer Annexure - V).

The track fittings were found complete on the Up line as noted during my push trolley inspection on 15-09-2002. At the site of accident earlier on 10-09-2002, I inspected the track visually on the Up line in rear of where the last coach of the ill-fated train stood for a distance of 300 m and found that there was generally no deficiency in the fastenings between rails and sleepers in the LWR. It is significant to point out that on a straight track even minor imperfectness if any in the track geometry would have little effect in destabilising the train unlike on sharp curves. Here it is relevant to point out that the track on the approach of the site of derailment was on a straight alignment. Besides this, the crew of the train did not complain of any rough riding on the track.

All things considered, permanent way had no role to play in causing the derailment of the train.

7.3.8 **Defect if any in Bridge No.445 on Dhawa river on Up line** –

7.3.8.1 **Foundation** – The bridge No.445 is constructed of brick masonry and has common piers/abutments for Up and Down lines. Abutment A_1, and Piers P_1 & P_2 were constructed around the year 1900 on open foundation. Piers P_3, and P_4 and Abutment A_2 were later constructed in 1958 when two additional spans were provided to increase the waterway. The depth of water on the day of accident was about 2.875 m in spans 1 & 2. Water was flowing 4.10 m below the danger level marked on the bridge. Spans 3 & 4 had no water flowing through them. There was no apparent sinkage of piers/abutments as could be seen from the down line bridge where the rail traffic was resumed immediately after the restoration.

7.3.8.2 **Masonry of piers/abutment** –

(i) My visual inspection of the masonry of the bridge revealed that the masonry was quite sound. There were no old cracks. The bricks had undergone little or no weathering. The mortar in the masonry did not show signs of leaching. The broken masonry revealed that all cracks were fresh. Examination of the surface of the broken masonry further confirmed the soundness of materials as well as the good quality of construction in spite of passage of many years. Overall, the inspection revealed that there was no sign of deterioration/degeneration in the strength of the masonry of the sub-structure of the bridge due to age or weathering.

(ii) Theoretical calculation on the strength of the sub-structure of the bridge revealed that it was adequate to handle the live loads that the bridge was carrying (refer Annexure - VIII).

(iii) The masonry of piers/abutments was further checked by a team of experts from R.D.S.O./Lucknow after the derailment. The team was headed by the Executive Director (Bridge & Structures)/R.D.S.O. and consisted of Director/Testing and two Senior Research Assistants. As per their report (refer Annexure - VII), masonry of the piers/ abutment of the bridge failed due to the after effect of the derailment. Their report corroborated my observation as stated in the foregoing paragraph.

7.3.8.3 The **steel girders** of the bridge were inspected in detail by the Bridge Inspectors in October, 1999 as a part of their periodical check and they were found in sound condition. Next inspection is due in 2004. A visual inspection of the damaged girders did not reveal any signs of corrosion etc.

Calculations revealed that the girders of the bridge were strong enough to carry the live loads on the bridge (refer Annexure - VIII).

7.3.8.4 A scrutiny of the inspection reports for the last 9 years as recorded in the Bridge Register did not indicate any weakness of any structural member either in the super structure or the sub structure of the bridge.

7.3.8.5 **Track** on the bridge was last inspected by Assistant Engineer on 14-08-2002 and Permanent Way Inspector on 09-09-2002 at 18.00 hours and according to them, the track was found to be in order. In the last OMS 2000 (portable accelerometer) run carried out on 25-08-2002 at a speed of 76 Km/h, no peak greater than 0.15 g was recorded on the Up line track at Km.508. Similarly during the Track Recording cum Research Car (TRRC) run on the same day, TGI value of Km.508 Up line was recorded as 94. In layman's language this track can be classified as "very good". The bridge timbers on the Up line of the bridge were renewed through in 1990. As per the yearly detailed inspection of the bridge by Assistant Engineer/Gaya on 09-03-2002, 14 bridge timbers out of 155 were found unserviceable. Out of them 4 timbers had been renewed by 15-04-2002. **Since my inspection revealed that the first Point of Drop was located in rear of the Howrah end abutment of this bridge, the condition of the bridge timbers in any case did not play any role in the causation of derailment.**

7.3.8.6 All things considered, the bridge No.445 on the Up line over Dhawa river had no role to play in causing the derailment of the train.

7.3.9 **Sabotage/How the accident could have taken place?**

7.3.9.1 The first witness to reach the site was Shri D. N. Singh Yadav, Guard of the ill-fated train, who immediately came out of his coach after the accident and tried to assess the damages caused in the accident. He reported that the coaches 3rd & 4th from the rear were derailed and ahead of those coaches, Dhawa bridge was seen collapsed on which 5th & 6th coaches were seen hanging and suspended over the bridge. **He further told that he saw that fish plate of left rail was opened, kept beside the track with the nuts and bolts. One rail piece was found removed from its original position and kept on the left side sleepers.** On cross examination he stated that none of the permanent way inspectors or his staff was seen at site up to that time. He confirmed that both the fish plates along with nuts and bolts of Howrah side joint were lying by the left side of the track and the rail piece was lying tilted.

7.3.9.2 The Driver, Co-driver and Loco Inspector who were in the cab of the derailed train stated that **they got a severe jerk before they approached the bridge**. The Driver further clarified that he felt as if the wheel of the engine had hit something and the train jumped. The Co-driver told that he experienced severe vertical jerk and the loco started rocking. The Loco Inspector fell down immediately after the jerk.

7.3.9.3 Sarvashri Y. N. Singh, Junior Engineer/P.Way/Rafiganj, B. Naskar, Section Engineer/P.Way/Rafiganj and Maheswar, Trackman reached the site together within an hour of the accident, i.e. at 23.30 hours and found that **one rail of left hand side of Up line beyond the SEJ near the OHE Mast No.508/21 was lying in opened condition** on the toe of the concrete sleepers. Two fish plates and 4 bolts of Howrah end joint and 2 fish plates and 4 bolts of Delhi end joint were found lying outside the track. They also saw that some of the elastic rail clips were lying inside and outside the rail. Thereafter they decided to bring a photographer for taking photographs of this clue of derailment.

7.3.9.4 Photographer from Rafiganj, Shri Narendra Kumar stated that he reached the site along with Shri Y. N. Singh, Junior Engineer/P.Way/Rafiganj and other staff at around 00.30 hours of 10-09-2002 and took the photographs of the site as directed. Some of these photographs have been enclosed with the report (refer Annexure - XXIII). He also clarified that he did not see anybody working on the railway track when he reached there.

7.3.9.5 A large number of **public witnesses also stated (refer para 5.1) that the fish plates and rail were lying outside the track and confirmed that it is a terrorist infested area where such incidences have been reported in the past also.**

7.3.9.6 Divisional Engineer/II/Mughalsarai, Shri Abhay Kumar and Senior Divisional Engineer (Co-ordination)/Mughalsarai, Shri Ramesh Kumar reached the site at about 03.00 hours of 10-09-2002 from Mughalsarai end. After assessing the situation on Mughalsarai end of the bridge they came to Rafiganj end of the bridge and found that (refer para 5.2.19 and 5.2.21) **one rail of about 9 m length was lying outside the track** near the toe of the PSC sleepers with traction bond wire with OHE Mast No.508/21 intact. 2 fish plates, 4 nuts and bolts each of this rail were found lying near the respective joints. None of these bolts were sheared or broken. The fish plates had marks of fresh opening. 22 elastic rail clips of this rail were also lying there. There were 14 PSC sleepers in this rail out of which 4 sleepers were also having wheel dent marks on their rail seat and remaining 10 sleepers were completely smashed. The rail was lying tilted with gauge face in upward condition. A grazing mark of about 2.5 m length was visible on the gauge face of the rail. The flange of this rail was also having wheel travel marks for about 3 m length. The landing rail had shifted by about 2.25 m towards Delhi. **Howrah end of this landing rail was battered and hogged due to impact of derailed wheels.**

As recorded in para 1.2.2 (I) of this report, I had also seen on my arrival at site that fish plates of both ends of 9.01 m piece of rail (cess side) on the Up line on the approach of Dhawa bridge No.445 were removed. This rail was lying outside the Up track (cess side) at Km.508/19-21 on the approach of Dhawa bridge No.445. This was one of the single rails provided on the approach of major bridges to isolate the LWR from the bridge. The Switch Expansion Joint at the end of LWR was intact. The rail was lying toppled approximately 57 cms away from its original position with its head towards the cess and foot towards the track. The gauge face side head of this rail had rubbing marks. Fishplates of both the joints (four fish plates in all) connecting this rail were also found lying by the side. A look at the fish plates showed that they had been removed freshly. They bore no signs of damage due to passage of derailed wheels. That they were in active use was further evident from the fact that their colour was different from those kept in the store. 4 fish bolts of the Howrah end joint and 3 of the Delhi end joint were also found lying there along with nuts. The fish bolts were found separated from the nuts. One fish bolt was in the fish plate itself at the Delhi end joint. None of the bolts had any snapping

marks. The threads of bolts and nuts indicated no shearing marks showing that they were deliberately opened recently. The 'point of drop' (P.O.D.) was on the sleeper just next to the joint sleepers. The concrete sleepers located thereafter were found crushed. The next rail (on the cess side) had shifted longitudinally in the direction of traffic towards Delhi by about 2.27 m. The head of that rail (facing the direction of the train) was found severely battered and rounded. That rail was found tilted and had hitting marks at end on the web also. The right hand rail had also snapped/fractured. Structure bond of the said 9.01 m long rail remained intact.

The detailed observations made by me convinced me that **there was deliberate removal of fish plates and rail sleeper fastenings (elastic rail clips) of the 9.01 m long cess side rail on Up line, before the passage of the ill-fated train.**

7.3.9.7 Principal Chief Engineer/Eastern Railway who reached the site along with General Manager, myself and other senior officers at 09.00 hours of 10-09-2002 had given his observations separately as under:-

> The first fish plated joint after the SEJ was in opened condition. **The rail was about 9 m long and the fish plates of both the joints on the left hand side rail were in opened condition.** 2 pairs of fish plates and 4 bolts of each joint were lying by the side of the track. The connection of the rail (lying outside) with OHE Mast through bond wire was intact. There were shining marks on the rail top indicating that it was a running rail. Grazing marks on the rail head and the gauge face was indicating that something had grazed on the gauge face. Elastic Rail Clips for this left hand side rail were lying scattered on ballast. **It was also observed that first clear mark of wheel drop was on a few sleepers just after the fish plated joint of the left hand rail which gave an indication of the first drop of wheel immediately after the fish plated joint** with no rail existing approximately 30 m short of the bridge. **All the subsequent PSC sleepers were completely crushed with HTS strands exposed on the left hand side.**

7.3.9.8 **The track was straight on both the sides of the bridge.** In such a situation there could be either of the two possibilities leading to derailment:-

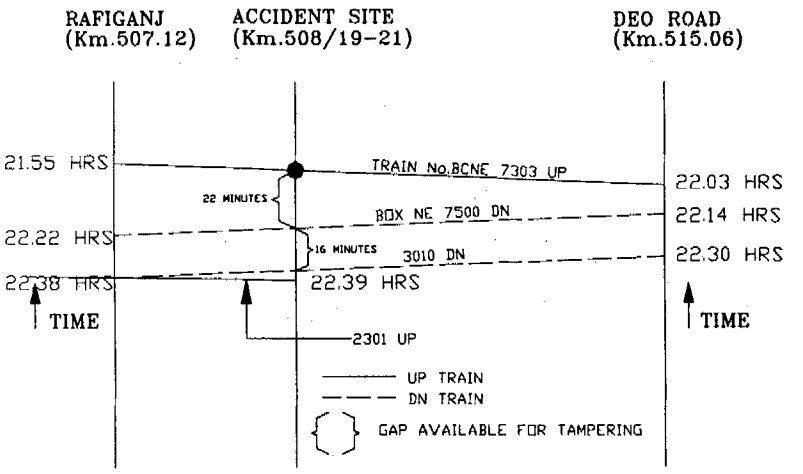
(i) The rail had been removed from its position by the miscreants before the arrival of the train. The front trolley of the engine

derailed and mounted over the landing rail but rear trolley rear wheels could not mount and derailed.

(ii) Rajdhani Express came, front trolley of the loco passed over this loose rail but rear trolley threw this loose rail out and rear wheels of this rear trolley also got derailed. This is the more likely scenario.

Subsequent coaches also derailed since no rail was in position. The left side wheels of the coaches jumped from rail and crushed the sleepers. Some wheels tried to mount on the Delhi end rail after derailing. This is confirmed by the battering of the facing end of Delhi end rail. A few coaches with partly derailed wheels could cross over the bridge fully or partly, but thereafter under the continuous impact of the passing derailed wheels, the wooden sleepers on girders could not bear the weight, got crushed and thereafter the wheels travelled over the girders, thereby snapping and separating the two parts of girders in spans 1 & 2. Simultaneously after application of brakes, the momentum of the derailed train got transferred to the piers and abutments resulting in damage to piers No.3 and 4 and abutment No.2. This also led to pulling the track from Howrah end of bridge towards Delhi and caused longitudinal shifting of cess side rail by 2.27 m towards Delhi.

7.3.9.9 **Time available for the miscreants :-**



7.3.9.10 The timings of the Up/Down trains which passed over the section Rafiganj to Deo Road just prior to the passage of the ill-fated train have been plotted in the above graph which shows that there were two gaps of approximately 22 and 16 minutes which were enough for tampering with the track. The PWI in his statement in para 5.2.10, stated that two rank outsiders (i.e. other than permanent way men) could open fish plates of both joints and all ERC clips of the 9.01 m rail in 15 minutes. I also feel that this tampering can be finished in less than 15 minutes - whereas the miscreants got two long gaps of 22 and 16 minutes. In addition to this, near the bridge there is an abandoned building on the cess side of Up line which might have provided a good cover for the miscreants to hide whenever a train must be approaching.

7.3.9.11 The area where the train derailed is known to be sabotage prone and a number of incidents of sabotage have been reported in the past as discussed in para 7.5 later. **Based on these foregoing observations, I am convinced that the above derailment took place due to tampering of track by miscreants.**

7.3.10 There was speculation in some quarters that the 9.01 m long rail on the cess side on the Up line was deliberately removed from its position after the accident by interested parties, to make it appear as if it is a case of tampering with the track. This can not be believed as the sleepers below this rail got badly crushed which is possible only when there is no rail. Moreover the 1st sleeper at Howrah end joint was not affected, showing clearly that the wheels jumped from top of the rail to 2nd sleeper onward.

7.3.11 Eminent Railway Track Engineer, Shri V. K. Agnihotri, who retired as Member Engineer/Railway Board holds similar views. Extracts of his letter dated 15-09-2002 are reproduced below:-

" As far as movement of engine on a portion of track where fish plates have been removed or rail has been disturbed is concerned the first thing to understand is the time taken to negotiate 13 meters length at a speed of 130 Km/h. This time is 1/3rd of a second which is even difficult to perceive. Further when a train is in motion at 130 Km/h it has lot of kinetic energy in forward direction and whatever disturbances will be imposed on this train due to discontinuity in the rail would take time to disturb the motion of the train. Further more the wheels of the train are rotating at a very high speed when it is travelling at 130 Km/h which generates a gyroscopic effect. In layman's language gyroscopic effect can be understood from the rotation of the top which children are playing with. A top continues to rotate in vertical direction as long as it has speed and as soon as speed comes

down it drops down. This very gyroscopic effect is used in the two wheeler vehicles whether it is scooter or cycle wherein the rotating motion in the wheel keeps the direction of the two wheeler and as soon as two wheeler comes to a stop it cannot stand vertical and it drops down. Therefore, when Rajdhani Express at 130 Km/h would have come against the discontunity in the rail it cannot suddenly change direction and in 1/3rd of a second the wheels will again find a proper support in the next rail. Even in the 13 meters gap where the rail may not be in a perfect condition there would be sleepers and ballast. Few wheels can easily pass over ballast and sleepers before the sleepers and ballast disintegrate. Therefore, after one or two vehicles pass in a situation where rail continuity is not there subsequent coaches starts plouging in into the ballast and formation thereby reducing the speed drastically and bogies from behind which are still travelling comparatively at a higher speed, mount on the vehicles in front. This is the classical method of derailment of a train finding discontinuity in rail. So there should be no misunderstanding that if engine and a bogie has passed there was no discontinuity in the rail."

7.3.12 There was yet another doubt in some quarters whether that rail and fish plates were brought from elsewhere and kept/placed at the position where it was found after the accident. It cannot be true, because the electrical structure bond connecting the nearby overhead electric structure to the rail was still found intact. Number of witnesses have confirmed (refer paras 5.2.21, 5.2.22 and paras 5.2.24 to 5.2.26) that no track staff worked at site immediately after the accident nor any fish plates etc. were brought from outside and kept there. Vide my observations in para 1.2.2 (I) I have clearly stated that a look at fish plates showed that they had been removed freshly. That they were in active use was further evident from the fact that their colour was different from those kept in store. If the rail had been removed after the derailment, the sleepers below would have not got crushed. Moreover, the rail cannot be removed when coaches are standing over it.

7.3.13 Had the derailment occurred due to a rail fracture on right side rail, the cess side end of sleepers under the 9.01 m long rail would not have crushed. This fracture on the right rail is on a thermit weld. When a derailed wheel travelled on the collar of thermit weld, the rail would have fractured through the foot and web. The balance portion of web and head must have fractured due to pulling of the rail towards Delhi end by the forward motion of the derailed wheels.

7.4 Condition of bridge timbers -

7.4.1 Although the bridge timbers did not play any role in the causation of the derailment, it is debatable whether they contributed to the damages caused in terms of more loss of lives and damage to bridge structure. Had the condition of bridge timbers been satisfactory the derailed train could have passed over the bridge; if not the full train, at least a few more coaches would have passed over the bridge. The renewal of bridge timbers was not undertaken, apparently due to a ban on procurement. The Division, therefore, got the renewal of bridge timbers with channel sleepers sanctioned for 12 bridges including the bridge No.445 on Dhawa river through FWP 2002-03 and framed detailed estimate No.3/TR/MGS of 2002-03 and sent to associate finance for vetting on 30-04-2002 with the following justification:-

" Existing wooden sleepers used as bridge timbers in bridges become worn out and spike killed and bunched at rail seat under bearing plate. Existing sleepers are very old. For the safety of traffic and maintainability these renewal is justified. Speed restrictions have also been continuing over the bridges due to unserviceable sleepers.

Sr. Divl. Engineer(III)/Mughalsarai"

The estimate was finally vetted on 16-09-2002 (after the accident). **Thus precious 4 ½ months were lost in vetting of estimate which could have been done within a week.** The Finance Branch of the Division had not accorded the required urgency to this work concerning safety of track on Rajdhani route.

Although the Mughalsarai Division was told to preserve all the damaged/released track material till finalisation of my report, very few timbers were preserved. Senior Divisional Engineer/ Coordination/Mughalsarai told that other timber pieces were stolen/taken away by the public. Thus an important clue was lost.

7.4.2 Moreover the Division could have considered imposing suitable speed restriction on Bridge No.445 Up due to the existence of some unserviceable sleepers. Such a measure could have perhaps reduced the severity of the impact of the derailment. Divisional Engineer, Assistant Engineer and Permanent Way Inspector (Incharge) have thus failed in their duties.

7.4.3 Principal Chief Engineer/Eastern Railway informed vide his letter No. W(4)512/4/6/Vol.III dated 21-09-2002 that **7000 out of a population of one lakh bridge timbers had been replaced. Sanction for replacement is available for renewal of 47000 bridge timbers**. The progress is too

slow considering the condition of bridge timbers on the system.The Railway should review the progress of renewal of bridge timbers, points & crossings and diamonds on wooden layouts and make a crash programme to complete this work of renewal in the next 3 years or so. Board are requested to review the progress and monitor the renewals. Till such renewals are completed, the Railway Administration should not hesitate to impose suitable speed restrictions consistent with safety.

7.5 Sabotage Prone Area and the Role of Railway Administration:

7.5.1 Principal Chief Engineer/Eastern Railway vide para 6 of his letter No.W(4)512/4/6/ Vol.III dated 21-09-2002 informed the Commission that Gaya-Mughalsarai section is noted for sabotage/miscreant activities. He had submitted along with his letter of 21-09-2002 a list of 13 cases of sabotage/miscreant activities in this section. The cases have been tabulated below according to the increasing kilometerage:-

Sl. No.	Location	Details of the cases
1	Km.468/15-17 North Outer Cabin/Gaya	On 02-03-2002, unloading of bundles of Jute bags from running train causing derailment of 2311 Up Kalka Mail
2	Km.479/20 between Kastha & Paraiya	On 20-06-1995, Train No.2312 Kalka Mail dashed with a rail piece kept on track.
3	Km.479/20 between Kastha & Paraiya	On 20-06-1996, Train No.2312 Kalka Mail detained due to PSC sleeper and rail piece kept on track.
4	Km.482/19 between Kastha & Paraiya	On 25-01-1994, boulders kept on Up line causing damage to air pressure brake pipe of coaches of 2381 Up Poorva Express.
5	Km.485.22 Paraiya Station	On 25-06-1993, about 100 persons squatted on tracks and blocked Up and Down lines by putting boulders.
6	Km.486/23-25 Between Paraiya & Guraru	On 13-03-1996, Train engine and 6 wagons derailed due to removal of SEJ rail by opening of fish plates and bearing plate bolts etc.
7	Km.498.06 Ismailpur station	On 18-05-1991, miscreants attacked RPF staff and burnt the station building.
8	-Do-	On 16-01-1992, 5-6 persons equipped with fire-arms entered West Cabin, stopped traffic, planted bombs on track etc.
9	Km.499/7-11 Ismailpur Station limits	On 08-05-2000, Train engine and 5 wagons derailed. Both end fish plates of rail behind CMS crossing were found opened.

10	Km.515.06 Deo Road station.	On 14-05-1994, 400-500 extremists equipped with deadly weapons surrounded the station building caused bleeding injury to on duty Switchman and set the station building on fire.
11	Km.541/5-7 between Anugrahanarayan Road and Chiraila	On 31-03-2000, PSC sleeper kept on track when 2301 Up Rajdhani Express was to pass.
12	Km.553/17-19 Dehri-on-Sone station limits	On 15-11-1997, Up Goods train derailed due to brake block of one wagon being taken out by miscreants. Meanwhile train started and brake block fallen on track and wheel mounted.
13	Km.614/3-5 between Pusauli & Muthani	On 20-02-1996, 2301 Up Rajdhani Express derailed due to opening of fish plates and pandrol clips of SEJ stock rail.

7.5.2 Besides the above, **an attempt to tamper with the track on the approach of the very Dhawa bridge at Km.508/21-25 had been earlier made on 22-05-2000** when 15-20 miscreants who had come to tamper with the track exchanged fire with a police party which had rushed to the bridge site on a tip provided to them by some unknown person. FIR No. 44/2000 was lodged in this connection at Rafiganj police station.

7.5.3 On 05-08-2001, "Hindustan", a Hindi daily from Patna published a report about a possible attack on Railway property in this area. Summary of this news item is as under:-

1. M.C.C. could attack Grand Chord railway line or a Railway station. The Railway line could be uprooted also.
2. Maximum chances of attack were on Deo Road and Jakhim stations.

7.5.4 On 02-09-2002, two reports of threat of subversive activities were reported from Danapur SIB (Refer Annexure - XIVA)and forwarded by Chief Security Commissioner, Railway Protection Force, Eastern Railway to General Manager, Additional General Manager, Chief Personnel Officer and Chief Operations Manager of the Railway and Director General/RPF/Railway Board/New Delhi and Joint Director/Intelligence/ RPF/ Railway Board New Delhi.

The relevant portion of the intelligence report is reproduced below:-

" (B) Activities of P.W.G.:- A sense of discontentment is prevailing amongst the activists of PWG due to arrest of their leader one Ajoy Kumar @ Ravi, area commander, by police. ***This discontentment may lead to***

greater agitational programme like damage and destruction of railway property, *Rail Chakka Jam agitation etc. over Jharkhand and Bihar portion of Eastern Railway. Situation is under watch."*

7.5.5 When clarifications were sought from General Manager/Additional General Manager/Chief Operations Manager, the Additional General Manager vide his letter No. Accident/ER/2002 dated 22-10-2002 (Annexure - XIII) replied with the approval of General Manager as under :-

"Daily Intelligence Reports are received from Chief Security Commissioner regularly. ***This is treated as information to the management for gearing up in case of any eventuality. Action on security matters like these is taken by the RPF Organisation which is headed by Chief Security Commissioner.*** *However, in cases where trains are likely to get dislocated due to public/staff agitations etc., it becomes necessary to take precautionary steps for regulation of trains as well as for ensuring attendance of staff, etc. It could also be necessary to open Emergency Cell in some cases like "bundhs" etc.*

When staff matters are involved, it may be necessary to have a dialogue with unions at appropriate level or any other action based on these reports.

For report (B) pertaining to Jharkhand and Bihar portion of the Eastern Railway, action has been taken by the Organisation of CSC/RPF."

Chief Operations Manager/Eastern Railway replied that vide his letter No. Accident/ER/2002 dated 24-10-2002 (Annexure – XV) as under :-

"Some of the DIRs are received by COM's office whenever such an information pertains to any eventuality which may result in dislocation of train services etc. Necessary arrangements in all such cases are made at Hqrs or the Divisional level as necessary. Assistance, if any, from the Headquarters operating branch is always extended to the Divisions for smooth train operations.

Since these reports were meant only for information, no specific orders were passed.

The responsibility for safeguarding the railway properties rests with the RPF organisation in co-ordination with the respective State Governments."

7.5.6 Chief Security Commissioner/Eastern Railway clarified vide his letter No. SC.47/TA/INT/2002/586 dated 21-10-2002 as under:-

"As regards the information under Sl. (ii) of the said letter the information was purely casual and not specific in respect of area of apprehension nor was it authenticated by the State and Central Intelligence Units. However, considering the activities PWG and apprehending that this arrest may lead to agitation which may have repercussion over Jharkhand and Bihar portion of Eastern Railway, it was incorporated in the Daily Intelligence Report and ***the same information was also passed on to both ADG/Rly.'s/Bihar and Jharkhand requesting them to instruct all concern to take necessary precautionary measures."***

7.5.7 **From the replies, given by the Railway Administration at para 7.5.5 and this para, one would believe that such intelligence reports are dealt with in a routine manner and are not dealt with any seriousness. There is a need to have a fresh look at the system of intelligence collection and guidelines should be issued on what concrete action should be taken by the concerned departments on such reports.**

7.5.8 (i) The incidents listed in paras 7.5.1 to 7.5.3 clearly prove that Railway Administration was aware of the fact that this area is sabotage prone and they kept on lodging FIRs and writing to State Government. But it probably never occurred to them that they should also take anti-sabotage measures on their own. Some of these measures could have been:-

1. Stretches of track on Eastern Railway affected by miscreant activities could be identified and speeds reduced appropriately.

2. Following anti-sabotage measures could have been taken in the affected areas:-

(a) Running of a pilot loco just ahead of Rajdhani Express and other superfast trains.
(b) Security patrolling of tracks and posting stationary watchman at vulnerable locations such as bridges.
(c) Burring the fish bolts.
(d) Jamming the elastic rail clips at vulnerable locations.

I consider that the Security, Operating and Civil Engineering Departments of Eastern Railway thus failed to maintain safety of railway traffic as they had failed to take above measures. Security & Civil Engineering Branches of Mughalsarai Division also failed to take the required anti-sabotage measures.

(ii) Authorities responsible for ensuring law and order also failed for not taking pre-emptive measures in the area where a series of miscreant activities were reported through FIRs lodged and a number of letters sent by the Railway Administration to the concerned authorities in the State Government at various levels.

(iii) Incidents at Serial No.2, 3 and 11 at para 7.5.1 also highlight the need that no released/surplus track material should be kept near the track in sabotage prone areas. Apparently no such lesson has been learnt as can be seen from the fact that released/surplus track material is lying unguarded along the track at many places even now.

7.5.9 It is unfortunate that adequate follow up action is not taken by the respective State Governments in cases of sabotage or tampering of track reported by the Railways. This has been brought out clearly by the Commissioner of Railway Safety/South Eastern Circle in his report on the derailment of 8690 Down Alleppey-Tata/Bokaro Express on 06-10-1999 on South Eastern Railway. The Commissioner of Railway Safety/South Eastern Circle had also sounded a note of caution by stating ***"Unless the guilty persons are brought to book, major disaster can not be ruled out in future due to such anti-social and nefarious activities".*** He had also recommended that the Railway Board should follow up the cases of sabotage with different State Governments and the Ministry of Home Affairs at the highest level. The instant accident has once again brought into focus the need for a serious and effective follow up action in bringing the culprits to book.

7.5.10 **Concrete sleepers with anti-sabotage features -**
Unlike CST-9 sleepers which had reverse jaw sleepers preventing lateral displacement of a rail in spite of removal of its fastenings, the PSC sleepers do not have any such anti-sabotage features.

7.5.10.1 While inquiring into the incident of derailment of 2301 Up Rajdhani Express in Eastern Railway on 20-02-1996, the then Commissioner of Railway Safety had recommended as under (vide para 9.4 of his report):-

"Anti-sabotage measures in LWR track

The old LWR Manual provides machined fish-plated joints between SEJ rails and LWR/CWR rails in cases where joints are to be used as block joints and when frequent destressing was necessary. This provision is not anti-sabotage and serious accidents could occur in

case of sabotage. Therefore, the above joints must be welded. The new LWR Manual of 1996 provides that the above joints should be welded. Therefore, on top most priority, all such joints should be welded as an anti-sabotage measure. ***The pandrol clips used on the SEJ rails do not have anti-sabotage characteristics. RDSO should be asked to design anti-sabotage pandrol clips for use on the SEJ rails."***

7.5.10.2 The recommendation for design of anti-sabotage elastic rail clips was sent to RDSO. Later, Board vide their letter No.96/Safety (A&R)/1/5 dated 31-05-1999 intimated as under:-

"Efforts have been made by RDSO to evolve a pilfer proof modified design of the ERC clip. The design was developed and one lakh clips were distributed for trials among the railways. The revised versions did not come to the expectations which was partly due to the general constraints in evolving a design which provides anti-sabotage features at the same time resulting in difficulty in driving out clips during maintenance operations. ***Due to discouraging results, the trials have been discontinued."***

7.5.10.3 The need for developing anti-sabotage measures on concrete sleepers was also brought out by the then Commissioner of Railway Safety, Central Circle in para 7.7.1 of his report on Derailment of 8033 Down Ahmedabad-Howrah Express at Km.714/20-22 between Dhamangaon and Talni stations on the Badnera-Wardha section of Nagpur Division of Central Railway on 09-07-1992.

The matter was discussed in a Track Standards Committee Meeting held in January, 1985 and a number of meetings thereafter. Vide para 9.3 of the above report the then Commissioner of Railway Safety had given following recommendations :-

" Since a large number of monoblock concrete sleepers have been laid on trunk and main line routes with ERC clips, it is imperative that RDSO should seriously revive their earlier research efforts to evolve an effective anti-sabotage device."

7.5.10.4 If anti-sabotage design for ERC was not possible, some other measures to make concrete sleeper useful for sabotage prone areas must have been thought of. RDSO thus failed to meet the Railway's requirement. Had RDSO developed a suitable anti-

sabotage design and had the same been used here, such derailments could have been averted.

7.5.10.5 Following is a suggested concept for achieving anti-sabotage property in the existing track laid with PSC sleepers –

It is suggested that the malleable cast iron insert of concrete sleepers, if modified like T443 CST-9 sleepers of the reverse jaw type, it can convert the present concrete sleepers to an anti-sabotage type. The concept is shown in the sketch at Annexure - XIX. As shown in the sketch, out of 20 sleepers used per rail length of 13 m, the 4th & 17th sleepers could be the modified type sleepers. The same modified type sleepers will be turned end to end and placed as the 5th and 16th sleepers. Thus only one type of modified sleeper can be used at four locations, out of the 20 sleepers. It will effectively prevent displacement of the rail laterally, even if all the elastic rail clips are knocked out by miscreants - just like the protection reverse jaw CST-9 sleepers used to give to a track laid with CST-9 sleepers. It will involve changing 4 out of every 20 sleepers in the existing concrete sleeper track. However the anti-sabotage features, it will bring in its wake, will far outweigh any difficulties involved in putting them in the place of the usual type of sleepers.

7.5.11 **All the above mentioned discussions lead one to believe that the accident which occurred on 09-09-2002 to the Rajdhani Express could have been averted or the consequences of the accident minimised, had timely action been taken by concerned authorities who were aware of miscreant activities in the area.**

7.6 **Role of Patrolman –**

7.6.1 Track between Deo Road and Rafiganj was being patrolled by a team of two gangmen starting at 22.00 hours from Deo Road, reporting to Rafiganj Station Master at 02.00 hours and returning to Deo Road reaching there at 06.00 hours in the next morning. A perusal of the patrol book showed that the Patrolmen Sarvashri Kuldeep & Ganpat reported at 22.00 hours of 08-09-2002 on duty at Deo Road **and thereafter there were no entries for their movements to Rafiganj and back**. On the other hand, they reported at Deo Road at 22.00 hours of 09-09-2002 and went to Rafiganj at 02.00 hours of 10-09-2002 and reported back to Deo Road at 08.00 hours of 10-09-2002.

When questioned about their absence from duty on 08-09-2002, both of them stated that their hand signal lamp was getting repeatedly extinguished due to rain and wind and that their torch was out of order.

One said that the torch switch was not working whereas the other said that the bulb was fused. Such excuses from patrolmen are never heard of, for not performing their duties. Had they performed their duty on the night of 08/09-09-2002 diligently, the miscreants could have got a message of alertness on the part of railwayman. Thus the patrolmen failed in their duties.

7.6.2 It was also noticed that two patrolmen in one group were covering a beat length of 10 Kms and their duty hours were such that important trains were not covered by their patrol as required in para 1004 of IRPWM. When the sectional Divisional Engineer was questioned about this shortcoming, he replied that the patrolling was done to detect rail or weld failures. Such patrolling is defined in para 1, Annexure X-B of the Manual for instructions on LWRs which is reproduced below:-

"Cold weather patrolling shall be carried out as follows:-

i) On single line or where only one road in a double section is having LWR/CWR – one patrolman for two kilometre.
ii) On double line section when LWR/CWR is on both road – one patrolman for one kilometre length on UP and DN road".

This proves beyond doubt that patrolling, if it was being done to detect rail/weld failures was grossly inadequate.

Also the patrolling which was being done, does not come under the definition of Security Patrolling as stipulated in para 1001 (5) (a) of the Indian Railways Permanent Way Manual.

7.7 **Design of coaches –**

7.7.1 A large number of passengers were taken out from the coaches by breaking the glasses of the windows as the doors were jammed/damaged during the accident. Had these glasses not been broken, the passengers would have died of suffocation. This highlights the need for :-

i) emergency light in the coaches.
ii) hammers to be kept in coaches at a prominent place for breaking the glasses, if required.
iii) Provision of emergency exits in the coaches.

The Railway Board vide their letter No.97/M (C)/137/12 dated 08th February, 1999 had given instructions to Integral Coach Factory, Rail Coach Factory and Bharat Earth Movers Ltd. to provide emergency openable windows on AC/Non-AC coaches. In this respect 01-04-1999 was stipulated as the cut off date.

The Railway Board vide their letter of their even Number dated 24-07-2001 on the recommendations of Chief Commissioner of Railway Safety directed Zonal Railways to take immediate action to start retrofitment of emergency openable windows on the existing coaches in a planned manner and further directed that this will become NTXR monitored item with effect from 01-04-2002. However, Board vide their letter of even number dated 22-07-2002 clarified that non-provision of emergency windows would become rejectable deficiency with effect from 01-04-2003. **Thus it is noted that there was no strong desire and will on the part of the Railway Board to ensure compliance of their own directives on safety.**

None of the derailed coaches had been provided with emergency windows although coach No. 01102A WACCN was built in year 2001 and coach No.00105A WACCN was built in 2000, well after the cut off date fixed by Railway Board. This is a very serious negligence on the part of the concerned production units, which could have been allowed, only with the knowledge of the Railway Board.

In this connection, a Purchase Order has been placed by Eastern Railway for 3000 numbers for provision of windows on non-AC coaches. Another Purchase Order for 500 numbers of the same is presently under finance vetting. Likewise, for AC coaches, the tender is under finalization for procurement of emergency windows.

From the above, it appears that Eastern Railway may not be able to stick to the deadline of 01-04-2003 stipulated by the Railway Board unless some special efforts are made to comply with the target.

7.7.2 Majority of injuries to passengers are caused by the passengers hitting against sharp edges of seats and other fittings used for internal furnishings. Mouldable and shock absorbing materials with rounded edges, if used for internal furnishings can save life of passengers in coaches of accident affected trains. The seats should be made and fastenings so provided such that the passenger is not thrown out of his seat/berth in case of an accident.

7.8 **Other matters brought to light –**

7.8.1 Short-comings or deficiencies noticed during inspection of Tikiapara depot :-

(a) Following Infrastructural deficiencies were noted –

(1) Flooding of inspection pit during rain – continuous pumping out of water is required.

(2) No cat walks – There is very little space between two inspection pits which affects the movement of material trolley as well as staff.
(3) All inspection pit lines are curved (some as sharp as 8^0 – Due to it, a few buffers remain compressed and these can not be checked/attended at washing pit. Easing out of curve is essential.
(4) No pavement – Poor road approach to inspection pit which affects movement of material trolleys.
(5) No light in inspection pit – There is no lighting arrangement provided inside the inspection pit, this affects the maintenance even in day times especially in rainy season when it becomes dark in day time. Night maintenance is even more difficult.
(6) Dash pots were not quite capable of retaining oil and ensuring dampening properties.

(b) Staff – As per the statement of Coaching Depot Officer, there is a shortfall of 98 staff for maintenance of rakes other than Rajdhani.

(c) Coaches – As per the statement of Coaching Depot Officer, there is a shortage of non-AC coaches specially WGSCN coaches. Only 422 coaches are available against the requirement of 479 coaches.

7.8.2 Quality of coach maintenance has quite often been a source of doubt in accidents. In this case the Train Superintendent quoted a deceased person saying that Delhi end Pantry Car was shaking sometime before the accident [Refer para 5.2.34). I too had occasion to write to the Chief Mechanical Engineer/Eastern Railway vide my letter No.184/H dated 25-06-2002 stating that a 3-tier coach was giving bad riding on 20-06-2002 in 2313 Up Rajdhani Express and a report was called for. But no such report/ reply was received from Chief Mechanical Engineer/Eastern Railway in spite of a reminder dated 11-07-2002.

To depend on the escorting Train Examiner and his staff to evaluate the quality of riding of coaches is very subjective. **It is hence proposed that an objective system of periodical evaluation of the riding characteristics of the coaches through instrumentation by portable accelerometers or other suitable means should be implemented - on the lines of objective recording of the quality of track by Track Recording Car, Oscillograph Car, Portable Accelerometers etc.**

7.8.3 Major bridges and their high embankment approaches are vulnerable locations, in the sense that a derailment there can have major consequences in terms of loss of life and property. Hence efforts should be seriously undertaken to remove fish plated joints in the rails at such vulnerable locations by welding the joints. This will require a review from design point of view. Wherever even if one joint can be welded it shall help in elimination of a potential danger.

7.8.4 In any case, keeping cut rails i.e. rails of length less than 13 m at such vulnerable locations should not be permitted. In case of this accident the rail, whose fish plates were opened, was a cut rail. The derailment of the Rajdhani Express train on Northern Railway on 13-11-1979 was also caused due to the removal of a cut rail.

Buffer rails also suffer from the same vulnerability. Although instructions exist that buffer rails should be replaced by SEJs yet, even today buffer rails continue to exist!

7.8.5 In the instant case the driver had applied emergency brakes on the bridge which probably led to the full momentum of the train getting transferred to the girders. The bed blocks of these girders got uprooted and damaged the masonry of piers and girders. Therefore there is a need to have a second look on the loading prescribed by RDSO for longitudinal forces on bridges for air brake trains.

7.8.6 There is also a need to have a relook on the efficacy of track structure on bridges. This accident has proved that the present track structure (consisting of single rails, bridge timbers and guard rails etc.) is not safe enough for passing a derailed train fully. In fact the present track design/structure on bridges has remained the same for more than 100 years, although the track elsewhere has been strengthened and modernised by use of steel and concrete sleepers.

It is also seen that the bridge timbers move laterally on either side and the derailed wheel goes in between the bridge timbers and thereafter the whole of the track on the bridge gets uprooted. To avoid this, it is suggested that the clear spacing between two channel sleepers should be reduced further. The sleepers should be fabricated in a group of four or more and then placed on girders. The whole design should be such that individual sleepers do not shift under the movement of the derailed train.

7.8.7 Passengers travelling in Rajdhani and Shatabdi Express trains come from financially affordable background and the Railway is competing with airlines in this sector.

It is proposed that apart from the existing insurance, system for railway passengers, passengers should be allowed to be additionally insured by insurance companies through counters at important stations served by Rajdhani and Shatabdi trains. Such facilities already exist for air travel.

7.8.8 The derailment occurred on the approach of a bridge of spans 3 x 60 ft. + 1 x 62 ft. + 1 x 40 ft. plate girders. After the derailment the coaches had

fallen on to the river bed; a similar accident had occurred for the Rajdhani Express train on 13-11-1979 on Northern Railway on the approach of a bridge with ballasted deck. Not much loss of life was caused at that time. It is therefore recommended that in new constructions, open deck plate girder bridges and underslung girder bridges should be discouraged.

7.8.9 **It has been noticed that the Railway Board's letter No.95/MC/141/1 dated 29-10-01 regarding introduction of new train which stipulates as under is not being followed on Eastern Railway –**

"Before introduction of any new train, compliance with the RPC No.4 (Revised) will be be certified jointly by CPTM and CRSE of the originating Railway duly consulting the terminating Railway."

7.8.10 Coach No. 6696A in the derailed rake of 2301 Up was running overdue IOH. Railway should enquire into it and fix up responsibility for this unsafe practice. [Refer para 3.1.3]

7.8.11 Shri Sagar Singh, Chief Works Manager/Plant Depot/Mughalsarai who was travelling by the derailed train, left the site of accident without taking any part in relief to and rescue operation. [Refer para 5.2.40]

7.8.12 **Prima facie cause of the accident -**

It is noticed that an undue emphasis is laid in getting the prima facie cause of the accident from the senior most officer at the site of accident. In some accidents it is very difficult to arrive at the most probable cause of the accident, till such time an in-depth investigation is done. It is possible that the senior most officer who is under pressure to communicate the prima facie cause, might be tempted to declare a prima facie cause, which, on detailed investigation may prove to be incorrect. Besides, when a team of officers would in any case inquire into in detail, declaration of such a prima facie cause by the senior most officer at the site (who might be senior to all the members of inquiry committee) could inhibit the members of the inquiry committee from objectively undertaking the investigation.

Even more serious is the haste by the Railway Administration in declaring a prima facie cause into accidents which would require a Statutory Inquiry by the Commissioner of Railway Safety. In the instant case, in the media it was widely reported that the railway officials had given a particular factor as the prima facie cause of the accident, whereas there was yet another school of thought which disagreed entirely with the version given by the railway officials. Under such circumstances the Commissioner of Railway Safety is placed in a delicate position because as per the statute it is he who is required to conduct the inquiry and ascertain the cause. Matters

are further complicated by the misconception in the minds of some sections of public at large that a Commissioner of Railway Safety (because there is the word "Railway" in his designation) is an officer owing allegiance to the Ministry of Railways and hence would tend to be partial in his views while investigating into the cause of the accident. If later even if the Commissioner of Railway Safety arrives at the same conclusion as that earlier stated by the railway officials as the cause of the accident, suspicion will continue to linger in the mind of some section of public that 'Commissioner's agreeing with the views of the Railways was only to be expected!

Moreover, once a senior most officer arrives at a prima facie cause the entire concentration of the railway officials at site is focussed on strengthening or supporting that claim and in that process very vital clues for other possible causes are ignored set aside and consequently irretrievably/lost.

In view of what is stated in the foregoing paras, I consider that –

i) The existing undue emphasis laid in reporting the prima facie cause by the senior most officer at site should be removed.
ii) More particularly, in accidents into which Commission of Railway Safety is likely to inquire into the accident, Railway officials should refrain from declaring in public what in their opinion is a prima facie cause.

7.8.13 **Copies of important technical circulars and letters -**

During the course of the inquiry I came across a large number of letters and circulars produced by the Railway officials before me. I was very surprised to come across those circulars for the first time because till then I was completely in dark of the existence of such circulars and instructions. I would have been no wiser even if those circulars and instructions had not been produced by the Railway officers before me. This situation arose because copies of those circulars had not been sent to the Commission of Railway Safety by the Railway Board. Likewise there were many instructions issued by the Headquarter of Zonal Railways to the Divisions on technical matters affecting safety directly or otherwise, of which the Commissioner has no knowledge. It is a distressing fact that in spite of the existence of clear instructions within the Railway Board as well as the Zonal Railways, the Commission is not produced with copies of such circulars - though this matter had been taken up by the Commission of Railway Safety in the past with the Railway Board, the latest being the meeting it had with Railway Board on 08-11-2001 when it was agreed to by the Board that such circulars/letters would be provided to the Commissioners.

In the official language policy implementation drive in the Railways, there is a "pivot section" through which all outgoing letters are sent out and that cell ensures that unless Hindi version of such letters are simultaneously made available those letters will not go out of the Board's office. On similar lines in order to bring in discipline, the Railway Board and the Zonal Railways are requested to establish "pivot section" which should be vested with the responsibility that all such letters having even a remote bearing on safety in railway working are invariably copied to the Commission of Railway Safety.

7.8.14 **Mobile Telephones for Commissioners of Railway Safety and other officers of Commission** - Though I was aware of the occurrence of the accident as early as 23.45 hours on 09-09-2002, I had to immediately proceed to the site of accident in the Heads of Department's Special. Therefore it was not possible for me to contact the Chief Commissioner of Railway Safety who was at Chennai, in the absence of a mobile telephone with me. I requested Commissioner of Railway Safety, South Eastern Circle, Kolkata to inform Chief Commissioner of Railway Safety of the accident before I hurried to catch the Special train which was leaving for the site of accident. In turn the Chief Commissioner of Railway Safety was made aware of the accident only at around 06.30 hours on 10-09-2002 i.e. after a lapse of about 8 hours. The Chief Commissioner of Railway Safety, immediately after he learnt of the accident, decided to reach the site of accident by catching a flight from Chennai enroute to Patna considering the enormity of the loss of life and property.

Whenever accidents involving passenger trains occur, it is necessary for the Commissioners of Railway Safety to get in immediate touch with the Chief Commissioner of Railway Safety and post him with information as well as receive direction from him if necessary. The Chief Commissioner of Railway Safety in turn is required to keep the senior officials in the Government as well as the Hon'ble Ministers concerned apprised of the details of the accident, before they get information (which could be sometimes incorrect, inaccurate or distorted) indirectly through press and electronic media.

Recognising the need for equipping the officers of the Commission with mobile telephones, the then Chairman Railway Board in his meeting with Secretary, Ministry of Civil Aviation, on 28-11-2001 had agreed to provide mobile telephones to the officers of the Commission which would enable the officers of the Commission to contact one another as well as the Railway officials irrespective of the part of the country or city they happened to be. Provision of mobile telephones with roaming facilities is a genuinely felt need for the effective working of the Commission. Railway Board, in spite of the commitment by the then Chairman, has still not

provided mobile telephone with roaming facilities to the officers of Commission.

VIII. CONCLUSIONS

8.1 **Cause** - Having carefully considered the factual, material and circumstantial evidence at my disposal, I have come to the conclusion that the derailment of 2301 Up Howrah – New Delhi Rajdhani Express at Km.508/19 - 21 between Rafiganj and Deo Road stations on Gaya – Mughalsarai double line B. G. electrified section of Mughalsarai Division of Eastern Railway which occurred at 22.39 hours on 09-09-2002 was due to opening of fish plates and elastic rail clips of the cess side single rail in Howrah end approach of Bridge No.445 by miscreants. [Refer para 7.3.9]

Accordingly the accident falls under the category of "Sabotage".

8.2 **Responsibility** -

8.2.1 **Primary** – Primary responsibility lies with the unknown person(s) who wilfully tampered with the track with the intent of causing harm to the travelling public and damage to the Railway property attracting sections 150 and 151 of the "Railways Act, 1989". [Refer para 7.3.9]

8.2.2 **Secondary** –

(i) Auhtorities responsible for ensuring law and order are held responsible for not taking adequate pre-emptive measures in the area where a series of miscreant activities had been reported in the past.[Refer para 7.5.8 (ii) and 7.5.9]

(i) Railway Administration of Eastern Railway (Security, Operating and Engineering Departments) and Mughalsarai Division (Security & Engineering branches) are held responsible for not taking adequate safety measures in a sabotage prone area where a series of activities of tampering with the track by miscreants were reported and threats of tampering were received. [Refer para 7.5]

8.2.3 **Blameworthy** –

Following are blameworthy :-

(a) Sarvashri Kuldeep and Ganpat, Gangmen of Unit No.5/Deo Road working as Patrolmen. [Refer para 7.6.1]

(b) Shri B. Naskar, Section Engineer (P.Way)/Rafiganj. [Refer para 7.4.2]

(c) Shri Mukesh Gupta, Assistant Engineer/Gaya. [Refer para 7.4.2]]

(d) Shri Abhay Kumar, Divisional Engineer/II/Mughalsarai. [Refer para 7.4.2]

(e) Finance Branch of Mughalsarai Division. [Refer para 7.4.1]

(f) Track Directorate of Research Designs & Standards Organisation/ Lucknow. [Refer para 7.5.10]

8.3 **Relief Measures -**

8.3.1 Immediately after the acident there was severe criticism of the Railway Administration both in print and electronic media about the poor and inadequate relief measures at the site of accident. I tried to personally verify this by meeting a number of injured passengers. Broadly the complaints received from injured passengers can be summarised below:-

(i) Relief from Railway did not come up to 4 A.M. of 10-09-2002. Local villagers only saved them by breaking the glasses and taking them out. [Refer para 5.3]

(ii) Railway doctors did not see the injured in State Civil Hospitals at Rafiganj or Gaya up to 10-09-2002. [Refer para 5.3]

8.3.2 Besides these the Commissioner, Magadh Range, Government of Bihar also complained about shortcomings in Relief Measures. [Refer para 5.4.1]. On the other hand jawans of Bihar Military Police and a number of voluntary organisations/individuals did exemplary service to the injured and dead.

8.3.3 The injured persons were moved by trains to Howrah which took considerable time. Railway could have hired aeroplanes/helicopters to move them to Hospitals in Kolkata and other places where life saving hospital facilities are available. [Refer para 5.3]

8.3.4 There was considerable delay in the movement of Accident Relief Medical Equipment trains. [Refer para 2.2.1]

8.3.5 There was problem of communication in the morning of 10-09-2002 as only one satellite phone was working at the site of accident. Every injured passenger tried to talk to his relatives for help but it was a big commotion.

8.3.6 On the whole there is ample scope for improvement in this field. **Railway may, therefore, set up a high level committee to go into it and implement necessary remedial measures.**

IX. REMARKS & RECOMMENDATIONS.

9.0 I had made following Immediate Recommendations:-

"1. Stretches of track on Eastern Railway affected by miscreant activities may be identified and speeds reduced appropriately with immediate effect.

2. Following anti-sabotage measures may be considered in the affected areas:-

(i) Running of a pilot loco just ahead of Rajdhani Express and other superfast trains.

(ii) Security patrolling of tracks.

(iii) Burring the fish bolts and bolts in SEJs.

(iv) Jamming the elastic rail clips on every third sleeper with epoxy or any other suitable material.

(v) Railways may reconsider the safety involved in running of superfast trains at night in the affected areas.

3. Any other appropriate measures to eliminate accidents on account of tampering of track by miscreant activities and also to minimise consequences of such accidents may be taken by the Railways as they deem fit."

I am grateful to learn from the Chief Safety Officer, Eastern Railway, Kolkata that Railway Board vide their message No.511/DTP/ 2002 dated 11-10-2002 have given following instructions for Danapur, Mughalsarai & Dhanbad Divisions to East Central Railway and Eastern Railway :-

" With immediate effect and until further advice speed of all trains running in those divisions between 20.00 hours to 05.00 hours should be restricted to 100 Km/h. A Light Engine should run ahead of Rajdhani Express between 20.00 and 05.00 hours in those divisions as a Pilot."

Summing up, and taking into consideration my immediate recommendations, following final recommendations are made:-

9.1 **Anti-sabotage Measures -**

9.1.1 Detailed and clear cut instructions should be issued over Security Patrolling [refer para 7.5.7 and 7.5.8].

9.1.2 There is a need for further reduction of speed in Gaya – Dehri-on-Sone section to 75 Km/h at night as discussed in para 7.5.1 to 7.5.3 and 7.5.8.. Similar review should be made for other sections affected by miscreant activities.

9.1.3 Security patrolling should be done in sabotage prone areas. [Refer para 7.5.8]

9.1.4 In sabotage prone area anti-sabotage design of fittings on concrete sleepers should be evolved and put in place within one year. [Refer para 7.5.10]

9.1.5 No track material - surplus/released/maintenance reserve be left unguarded near the track particularly in areas known for miscreant activities. [Refer para 7.5.8 (iii)]

9.1.6 Single cut rails and buffer rails at vulnerable locations like high embankment, sharp curves, bridge approaches and on major bridges should be eliminated. [Refer para 7.8.4]

9.2 **Design of Coaches –**

9.2.1 Hammers should be provided in AC coaches so that passengers can break open the glasses in case of accidents/emergencies. [Refer para 7.7.1]

9.2.2 Emergency lights at a number of places should be provided in coaches which shall automatically switch on in case of emergency. [Refer para 7.7.1]

9.2.3 Emergency Exits should be provided in all coaches for escape of passengers in case of fire, accidents, etc. Although Railway Board issued instructions on this subject way back in 1999, the same are yet to be implemented. [Refer para 7.7.1]

9.2.4 Mouldable and shock absorbing materials with round edges should be used in internal furnishing of coaches. The seats/berths to be made such

that the passengers are not thrown out of their positions in case of an accident. [Refer para 7.7.2]

9.2.5 Riding quality of coaches of high speed trains should be checked periodically by an objective system of evaluation by instrumentation. [Refer para 7.8.2]

9.2.6 Dash pot oil should be checked after every trip for Rajdhani Express coaches. A friction type snubber or any better alternative should be used in place of the present system of dash pot oil arrangement to have maintenance free service. [Refer paras 6.6.3.2 and 7.8.1 (a) (6)]

9.2.7 Compliance to R.P.C. No.4 be certified and sent to Commissioner of Railway Safety for information before introduction of new trains. [Refer para 7.8.9]

9.3 **Loco -**

Facility for retrieving data from Memotel type speedometer should be provided in Trip Sheds. [Refer paras 6.5.4 and 6.5.6]

9.4 **Commercial –**

9.4.1 Safety precautions for passengers travelling in coaches should be prominently displayed in coaches and on the back of tickets.[Refer para 7.7.1]

9.4.2 Apart from existing insurance system available for rail passengers, they should be allowed to be additionally insured by insurance companies. .[Refer para 7.8.7.]

9.4.3 Doctors travelling as passengers may be encouraged to disclose their identity by issuing them concessional tickets on the condition that those doctors will attend to passengers in case of emergencies/accidents. [Refer para 5.2.34]

9.5 **Track –**

9.5.1 Track structure on bridges with open deck should be modified and strengthened. [Refer paras 7.8.5 and 7.8.6]

9.5.2 The renewal of bridge timbers and wooden layout under points & crossings and special layouts should be completed at the earliest. Till then speeds should be reduced wherever required. [Refer para 7.4.3]

9.5.3 In new constructions, open deck plate girders and underslung girders should be discouraged. [Refer para 7.8.8]

9.6 **Other recommendations -**

9.6.1 At least 6 to 10 satellite phones may be kept at a central place and moved to the site of accident whenever such emergencies arise. [Refer para 8.3.5]

9.6.2 Some 10 coffins (after anti termite treatment) be kept in each Accident Relief Medical Equipment van and some more at a central place. These can be moved whenever required. [Refer para 5.4.1 (i)]

9.6.3 Prima facie cause of accidents where Commissioner of Railway Safety is likely to conduct the inquiry should not be announced by Railway Authorities. [Refer para 7.8.12]

9.6.4 All technical circulars, letters, policy guidelines pertaining to safety shall be made available to the Commission of Railway Safety by the Railway Board as well as Zonal Railways. [Refer para 7.8.13]

9.6.5 Mobile telephones with roaming facilities should be made available by the Railway Administration to all the technical officers of the Commission i.e. Chief Commissioner of Railway Safety, Commissioners of Railway Safety and Deputy Commissioners of Railway Safety [Refer para 7.8.14].

Yours faithfully,

Sd/-
(MAHESH CHAND)
Commissioner of Railway Safety,
Eastern Circle, Kolkata.

Enclo: As above.

LIST OF ANNEXURES

I. Plan of the accident site.

II. Index Plan & Section.

III. Cross-section of the river under the bridge.

IV. Senior Supervisors Note.

V. Track Readings.

VI. Speedometer print out.

VII. RDSO Report on bridge.

VIII. RDSO's certificate on strength calculations of bridge.

IX. Technical appraisal report of Principal Chief Engineer.

X. Technical appraisal report of Chief Electrcal Engineer.

XI. Technical appraisal report of Chief Mechanical Engineer.

XII. Shri V. K. Agnihotri's letter dated 15-09-2002.

XIII. Letter of Additional General Manager.

XIV A Letter of Chief Security Commissioner dated 20-09-2002.

XIV B Letter of Chief Security Commissioner dated 21-10-2002.

XV. Letter of Chief Operations Manager.

XVI. Copy of FIR lodged in the year 2000.

XVII. Copy of Press Cuttings of "Hindustan" dated 5th August, 2001.

XVIII. Copy of FIRs lodged in connection with the accident on 09-09-2002.

XIX. Sketch of anti-sabotage concrete sleeper.

XX. Report from Commanding Officer/Bihar Military Police XVIII.

XXI A Report of Deputy Commissioner of Railway Safety for inspection of Bamangachi Electric Loco Shed.

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XXI C Report of Deputy Commissioner of Railway Safety for inspection of Tikiapara coaching depot.

XXII. Letter from Superintendent of Police/Aurangabad.

XXIII. Photographs.

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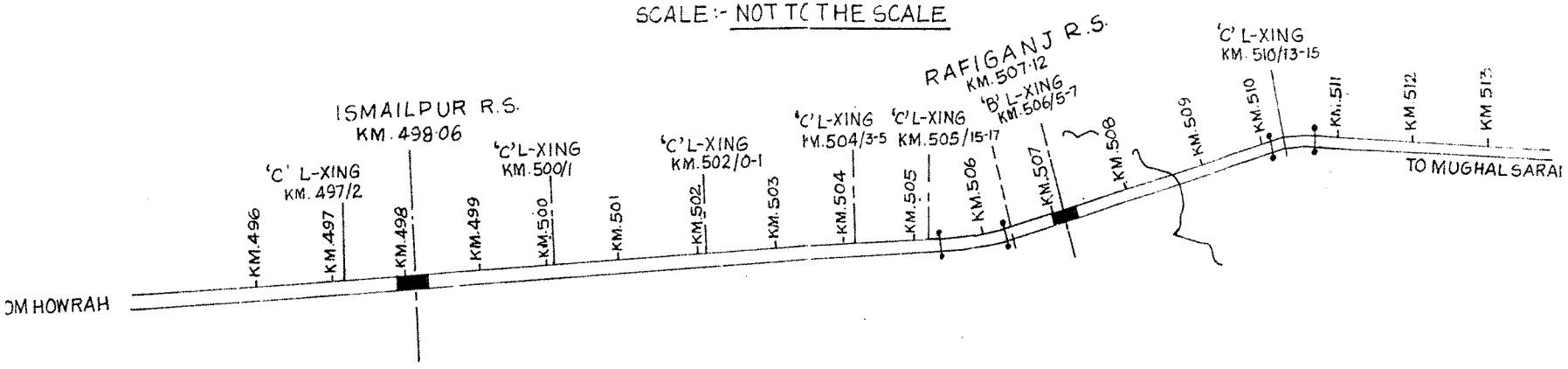
ANNEXURE - II/1

EAST CENTRAL RAILWAY
MUGHALSARA DIVISION

INDEX PLAN OF GAYA - MUGHALSARAI SECTION
FROM KM. 496/00 - 513/00

SCALE :- NOT TO THE SCALE



KILOMETREAGE FROM HOWRAH	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512	513
NO OF E.M'S PER KM.	31/32	29/30	27/28	27/28	27/28	27/28	27/28	27/28	29/30	29/30	31/32	29/30	27/28	31/32	27/28	31/32	27/28	

DRM/MUGHALSARAI

SR.DEN(CO-ORD)/ IGS

DEN(II)/MGHALSARAI

DRAWN BY

DRM/MUGHALSARAI PLAN NO.103-2002.

DRM/MGS. 19/10/02

SR.DEN/CO-ORD. MGS. 18.X.2002

DEN(II) MGS. 18/10/02

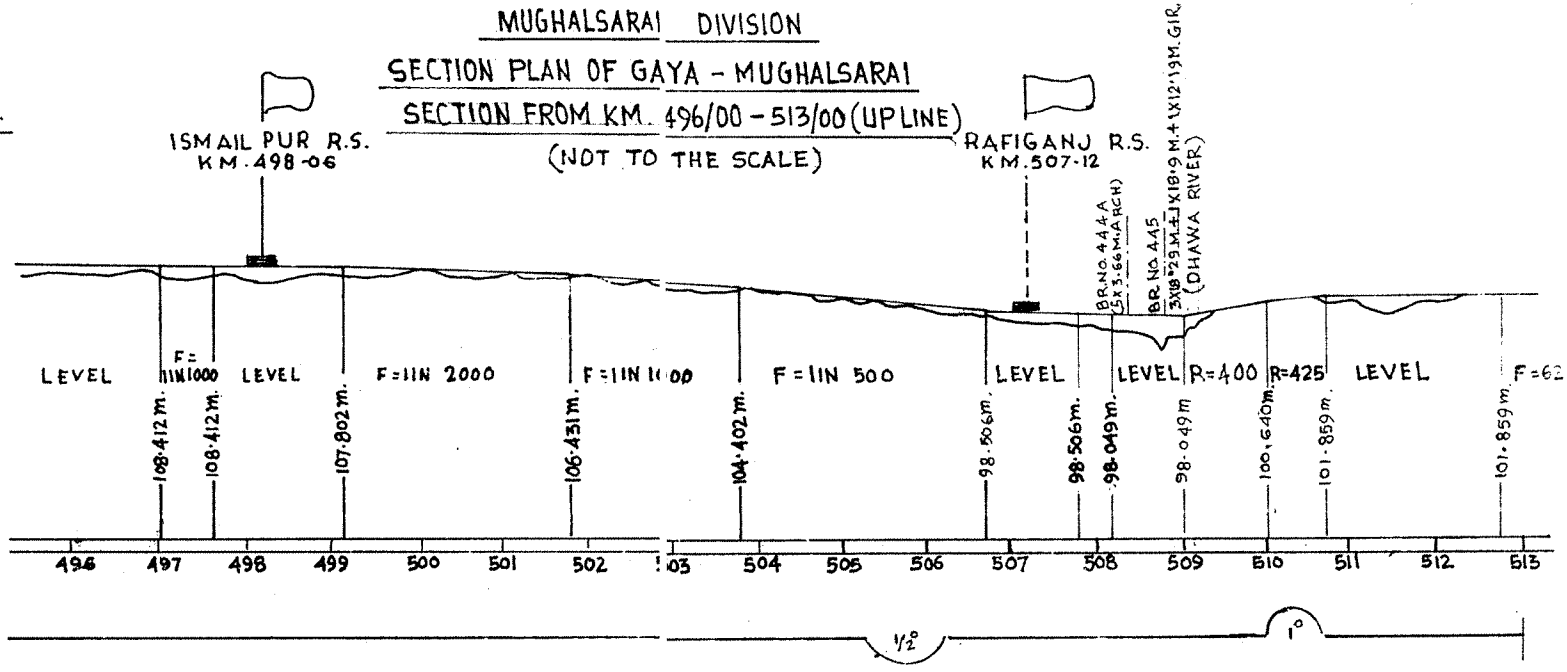
EAST CENTRAL RAILWAY

MUGHALSARAI DIVISION

SECTION PLAN OF GAYA - MUGHALSARAI

SECTION FROM KM. 496/00 - 513/00 (UP LINE)

(NOT TO THE SCALE)



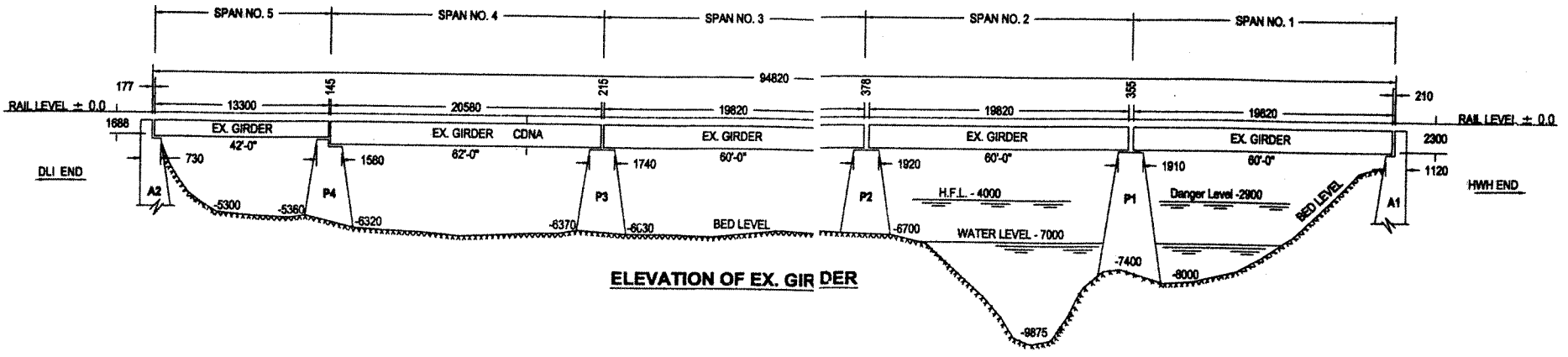
UP TRACK

	Km.496	Km.497	Km.498	Km.499	Km.500	Km.501	Km.502	Km.503	Km.504	Km.505	Km.506	Km.507	Km.508	Km.509	Km.510	Km.511	Km.512	Km.513
RAIL SECTION & LENGTH	← CWR 60K (72 UTS)											60(90)	60KG/M(90 UTS) CWR			60(90)	60(90)	→
YEAR LAID	SWP 84	87	SWP		89				87			SWP	96	SWP/SR		89		
RAIL MAKE & DATE																		
SLEEPER TYPE & DENSITY	← 60KG (PSC)							(M+7)						BR. TIMBER				→
YEAR LAID				87						84	87		84		87	91	90	
TYPE QUALITY & QUANTITY OF BALLAST CLEAN/CAKED (IN CM)	← 10/20	S		T	7·5/22·5		→		O	10/20		N		E	15/15			→
CREEP STOPPER TYPE & NO. PERRAIL	← ELASTIC FASTENING						→											
BEARING PLATS AT JOINTS ALSO ON CURVES	← N						→		I			L						→
STEEL KEYS NO. PERRAIL																		
FORMATION	← BANK 3·05 m. & BELOW						→		← BANK ABOVE 3·05					→ BANK 3·05 & BELOW				→

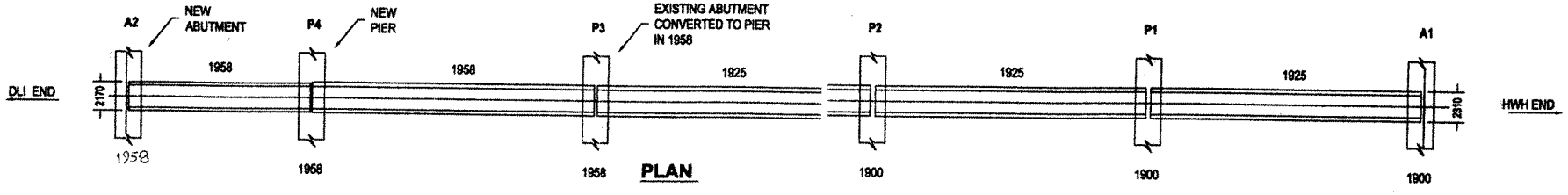
DRAWN BY - [illegible]

DRM/MGS. PLAN NO. 104-2002.

ANNEXURE - III



ELEVATION OF EX. GIR DER



PLAN

NOTES :

1) SPAN NO. 1, 2 & 3 - ALL 60'-0" GIRDERS OF 1925
2) SPAN NO. 4 - 62'-0" GIRDER OF 1958.
3) SPAN NO. 5 - 42'-0" GIRDER OF 1958.
4) ABUTMENT NO. 1 & PIER NOS. 1 & 2
   BRICK MASONRY **
   YEAR OF CONSTRUCTION - 1900
5) PIER NO. 3, 4 & ABUTMENT NO. 2
   BRICK MASONRY WITH CEMENT MORTAR (1:4)
   YEAR OF CONSTRUCTION - 1958
6) WATER LEVEL SHOWN ABOVE WAS NOTED AT 8.00 HRS. OF 10-09-2002.

** *AS PER HISTORY OF INDIAN RAILWAYS - ISSUED BY MINISTRY OF RAILWAYS*
CORRECTED UPTO 31st MARCH 1955.
LINE OPENED ON 01.03.1900
DOUBLE LINE OPENED ON 16.2.1927

10.9.2002

CHIEF TRACK ENGINEER
EASTERN RAILWAY / KKK

EASTERN RAILWAY

SKETCH SHOWING THE CROSS SECTION OF RIVER UNDER BRIDGE NO. 445 (UP LINE) AT KM 508.67 BETWEEN STATION3 RS J - JHN IN GYA - MGS SECTION OF MGS. DIVN.

ANNEXURE-IV

Position of coaches

From HWH End

1. The Generator Car and coach NO- H-2 are on the track before SEJ.
2. Coach NO- H-1 and PC-2 are in derailed condition by all wheels on Howrah end approach of the Bridge.
3. Delhi end of coach NO- AS-7 is on pier NO-1 where as its Howrah end is in hanging condition in the river bed.
4. Coach NO- AS-6 is in fallen condition in the river bed between pier NO-1 and 2.
5. Coach NO- AS-5 is lying in the river bed on the left hand side of up line track.
6. Coach NO- AS-4 is tilted horizontally and impinging the Down line through pier NO-3.
7. Coach NO. AS-3 is lying across up and Down line and impinging Down GC.
8. Coach NO A-1, A-2, A-3, A-4 and A-5 are overlapping each other and badly capsized between pier NO-3 and abutment of Delhi end.
9. Coach NO. A-2, AS-1, PC-1 and Generator car are lying outside on the left hand side of the track on the slope of the bank and ground.
10. Howrah end of Loco was at KM 509/7. The Delhi end Tally has not derailed. The leading wheel of Howrah end Tally has also not derailed, but its trailing wheels have derailed. The left wheel has derailed outside the track and the right wheel has derailed inside the track.

SE/P/RPH 15.9.02

SLI/TRS/GHY

ARO O/C/GHY

(N)

Condition of Bridge ANNEXURE-IV

Both the abutments and all four piers of up and DN SC are of combined stone line.

Up Side Abutment (up SC) :—

The ballast-cord for about a length of 3 m and 0.6 m depth is damaged for full thickness. The bed block is damaged on the edge.

Up Side Abutment (DN SC) :—

No damage is noticed.

Piers :— The nose of piers NO-1 and 2 of up SC is slightly damaged. The pier NO 3 and 4 of up SC is severely damaged and both of them have fallen in the river bed with the RCC bed blocks.

On DN SC side, no damage is noticed except the nose of pier NO 3, which is slightly damaged on the top.

Delhi end abutment :— The condition of abutment of up SC is not visible due to over capping of dilapidated and explained coaches. No damage is noticed on DN SC.

Condition of Girders :—

Span NO-1 (up SC) — This is badly damaged and lying in the river bed.

(DN SC) :— No damage is noticed.

Span NO-2 (up SC) — This is badly damaged and lying in the river bed.

(DN SC) :— No damage is noticed.

Span NO-3 (up SC) — This is badly damaged and lying in the river bed.

(DN SC) :— No damage is noticed.

Span NO-4 (up SC) :— This is badly damaged and lying in the river bed.

(DN SC) :— No damage is noticed.

Span NO-5 (up SC) — This is badly damaged and lying in the river bed.

(DN SC) :— No damage is noticed.

Observation — SE (P.Way) S.C. Rly
Recommended — Sr. DSO/SC
Approved — Addl. DRM/SC

ANNEXURE-IV

Track on the Bridge

(A) UP GC

1. About 15 M rail of left hand side has been found hanging in the Bridge portion in zig-zag way and the remaining rails have broken into pieces and fallen inside the river bed.

2. About 51 M rails of right hand side has been found in hanging position in zig zag position and the remaining rails have broken into pieces and fallen inside river bed.

All the bridge timbers with fittings have smashed and broken into pieces lying inside the river bed.

(B) DOWN GC

1. 12 Nos Bridge timbers have been found damaged between pier No-3 and 4. A new rail of 13m long has also been found lying between up and Down line tracks.

Chandan
SE/P/RFS
15.9.2002

Majhi
SI/I/TRS/ETA

[illegible]
ATM/HYB

[illegible]
ART-II/ETA

Delhi end of Bridge NO – 445 ANNEXURE-IV

1. Rail :- 10 M rail in both side from abutment is totally bent and damaged.
2. Sleepers :-
   a) 57 Nos Psc sleepers has been completely damaged.
   b) 30 Nos C.I. inserts on outside of left hand rail and inside of right hand rail has been damaged.
   c) To-bM 870 Nos Pandrol clips are broken in pieces inside and outside of track.
3. Dragging mark has been noticed on Psc sleepers outside of left hand rail and inside of right hand rail up to Km 509/07.
4. There is 1 flash butt welded joint broken in left hand side, in bottom flange and web. Four SKV welded joints also found broken 1 no in each side of rail.
5. All the flash butt and SKV welds in both side rail have got crest mark on bottom flange from abutment to Km 509/07.

SE/P/KTI
15.9.2004

SI/P/TRG/VA

T1(M)/G4A

ART I/C/G4A

ANNEXURE-IV (1)

Supplementary joint observations Redd. 28/9/2000

Howrah End of the Bridge No-445 on up Arr.

1. The left hand side rail was in position upto a distance of 12.29 M from the tip of the tongue rail of SEJ. This rail was not having any wheel marketing or riding mark.
2. Afterwards the position of left hand rail upto the abutment of Howrah end was as under:
   a) 9.01M — This rail was lying outside the track near the toe of the PSC sleepers with traction board wire of OHE mast of km 508/21 fixed with it at a distance of 1.33 M from Howrah end rail edge. The gauge face was in upward condition The gouging of 2.50M length was found on the gauge face at a distance of 3.80M from Howrah end rail edge. The flange of this rail was also having wheel board mark of 3.03M at a distance of 3.92 M from the Howrah end rail edge. This rail is also having tooth marks of metal cutter on the flange both outside and inside. The foot of the rail throughout its length is having tooth marks of rubber pads.
   b) 2.27M — No rail.
   c) 10.77M — This rail is not in position but lying inside the track with gauge face in downward condition and Howrah end rail edge battered and hogged due to the impact of derailed wheels. The length of the battered portion of the rail is 30 mm from the Howrah end rail edge. The length of the hogged portion of the rail is 1.10 M from the Howrah end rail edge. A deep chisel mark is also visible in the web of Howrah end rail face. A cut mark is also found on the outer face of the flange.
   d) 6.81m (upto abutment) — No rail.

Sharma SE/P/RTJ 15.9.2000 | Sinha SLI/TRS/GYA | TM(m) GYA | ARI/E/GYA

B

5. The right rail end is in intact position upto the broken rail end. This rail has broken from the bottom because the flange of the wheel has fallen on it. After wheels, there was no rail upto the adjacent insulated joint. It is a fresh breakage and there is no sign of any old flaw.

7. 9.01 M long rail is having 14 PSC sleepers. Out of these 14 sleepers first 4 sleepers are having direct elastic rail seat. Their MCI insulators are in intact condition and the remaining 10 sleepers are having rail seat which completely smashed. Their MCI inserts have fallen towards down. Beyond this 9.01 M long rail on PSC sleepers on any of their fittings could be seen except few pieces of broken polythene chips.

5. Both the fish Plates of Up main and joint of Delhi end joint of 9.01 M long rail have been found lying outside the track on the backfill near the respective joints. 4-1 bolts and nuts have also been found lying near these fish Plates in full length and also in open condition. The fishing surface of these fish Plates as well as rail are having fresh shining mark.

6. 22 Nos of Pandrol chips have been found lying inside and outside of the 9.01 M long rail.

Upadhyay SE/P.Rly 15.9.2002

SE/Track/Con

Tirmlapur

Addl DRM/Izatnagar

ANNEXURE-V

Track reading in undisturbed Portion between KM 508/21→17 in up UL ie in rear of Point of drop.

Location	Station No.	G	XL	Remarks.
	0	-3	4R	Point of drop 4.050m ahead of TP 508/21. at 1st Fish Plated Joints for Toe of SEJ
	1	-2	6R	12.29 M.
	2	-3	6R	
	3	-4	5R	
	4	-4	6R	The Stations are 1M apart.
DLI end	5	-4	4R	
↑	6	-2	0	
	7	-1	0	
	8	-3	3R	
	9	-4	3R	
↓	10	-5 -2	3R 0	Toe of SEJ
UWLL end.	11	-4	0	
	12	-3	2R	
	13	-3	4R	
	14	-4	5R	
	15	-4	3R	
	16	-4	0	
	17	-3	0	Stations are of 3m apart
	18	-4	3R	
	19	-4	4R	
	20	-3	6R	
	21	-2	4R	
	22	-3	5R	
	23	-3	5R	
	24	-3	4R	
508/19	25	-4	6R	
	26	-3	5R	6.400m.
	27	-4	6R	

Condition of fittings - ① All G.R. Pads, Metal Liners and Pandrol clips are complete and tight
② SEJ bolts are complete and tight.
③ Condition of wooden sleepers under SEJ are good.
④ 5 Nos metal liners were not fitted properly for adjustment of Gauge.

Sankar
SE/P/RMM
15-9-02

SE/TRS/GYA

TI/M/GYA

ARI II/C GYA

ANNEXURE-V

Trace reading of un-disturbed Patch from deraited wheel of Engine towards MGS.

Station No.	Distance apart	XL	G	Remarks.
0	1M	9R	-3	
1	"	8R	-3	
2	"	8R	-3	
3	"	7R	-2	
4	"	7R	-2	
5	"	6R	-3	
6	"	6R	-3	1M apart Stations upto this Patch. i.e 10m
7	"	7R	-1	
8	"	7R	-3	
9	"	7R	-3	
10	"	8R	-4	
11	3M	10R	-3	
12	"	10R	-2	
13	"	8R	-2	
14	"	10R	-3	
15	"	12R	-3	
16	"	13R	-3	3m apart Stations i.e 60m total distance.
17	"	14R	-3	
18	"	15R	-2	
19	"	10R	-2	
20	"	8R	-3	
21	"	6R	-3	
22	"	6R	-3	
23	"	8R	-4	
24	"	6R	-3	
25	"	8R	-2	
26	"	11R	-3	
27	"	13R	-2	
28	"	13R	-3	
29	"	11R	-1	
30	"	9R	-3	

SE/P/RBO
15.9.02

SI/TRS/E.I.A

Tilak/AVN

ARO I.C/GY/A

ANNEXURE-VI

Sécheron | Tabular Output | MEMOTEL-AS V 1.32

01/01/94 01:24:02 | Page 2

Customer Id: IR
Vehicle Type: WAP_5
Mod. WD (mm): 0

Vehicle Id: 30002
Equipment Id: 5.2301.014/01
Conf. WD (mm): ----------

Memory Type: Short Term

Flags	Time	Distance km	Speed km/h
09/09/02 22:38:47			
	22:38:47	962.949	123.0
	22:38:48	962.983	123.0
	22:38:49	963.017	123.0
	22:38:50	963.051	124.0
	22:38:51	963.086	124.0
	22:38:52	963.120	124.0
	22:38:53	963.155	124.0
	22:38:54	963.189	125.0
	22:38:55	963.224	125.0
	22:38:56	963.259	125.0
	22:38:57	963.294	125.0
	22:38:58	963.329	126.0
	22:38:59	963.364	126.0
	22:39:00	963.399	126.0
	22:39:01	963.434	126.0
	22:39:02	963.469	127.0
	22:39:03	963.504	127.0
	22:39:04	963.539	127.0
	22:39:05	963.574	126.0
	22:39:06	963.609	124.0
	22:39:07	963.643	120.0
	22:39:08	963.675	109.0
	22:39:09	963.704	104.0
09/09/02			
	22:39:10	963.733	100.0
	22:39:11	963.760	96.0
	22:39:12	963.786	93.0
	22:39:13	963.811	89.0
	22:39:14	963.836	86.0
	22:39:15	963.859	82.0
	22:39:16	963.881	78.0
	22:39:17	963.902	75.0
	22:39:18	963.923	71.0
	22:39:19	963.942	67.0
	22:39:20	963.960	64.0
	22:39:21	963.977	60.0
	22:39:22	963.993	56.0
	22:39:23	964.008	52.0
	22:39:23	964.008	52.0
	22:39:24	964.022	48.0
	22:39:25	964.035	44.0
	22:39:26	964.046	41.0
	22:39:27	964.057	36.0
	22:39:28	964.067	32.0
	22:39:29	964.075	28.0
	22:39:30	964.082	23.0
	22:39:31	964.088	19.0
	22:39:32	964.092	14.0
09/09/02			
	22:39:33	964.096	9.0
	22:39:34	964.098	5.0
	22:39:35	964.098	1.0

ANNEXURE-VI

01/01/91 01:24:03

Customer Id IR
Vehicle Type WAP 5
Mod. WID (mm): 0

Vehicle Id 30002
Equipment Id 5.2301.014/01
Conf. WID (mm): ----------

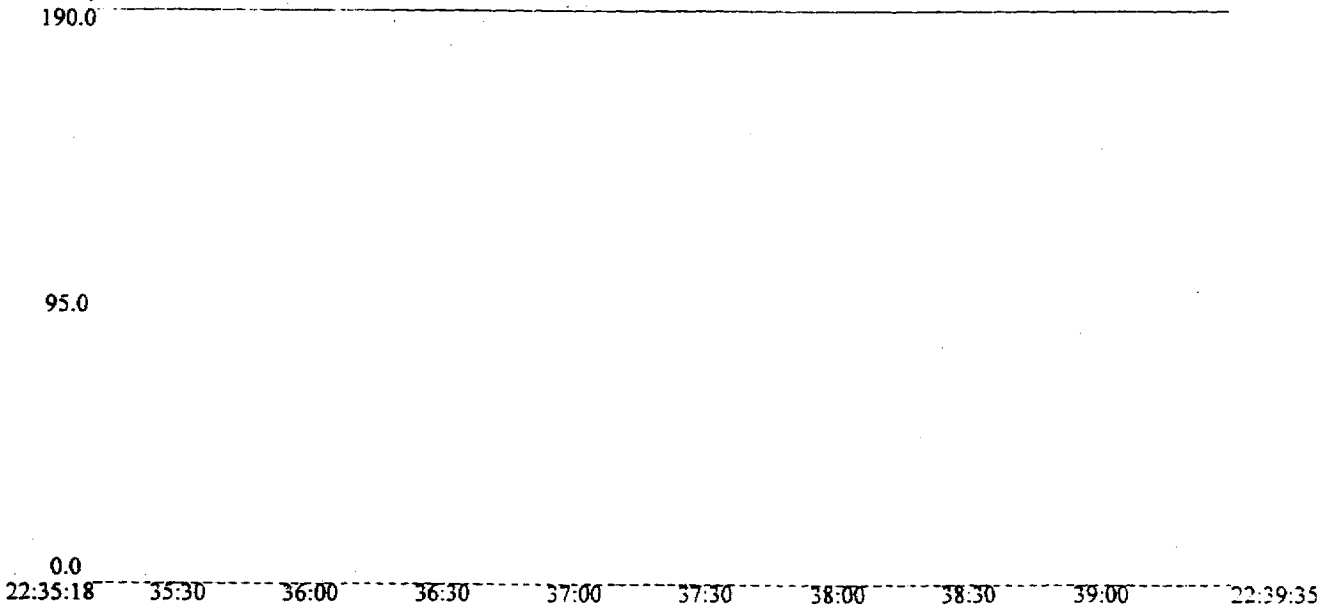
Memory Type Short Term

Flags	Time	Distance km	Speed km/h
	22:39:35	964.098	0.0

09/09/02 22:39:35

Short Term Data

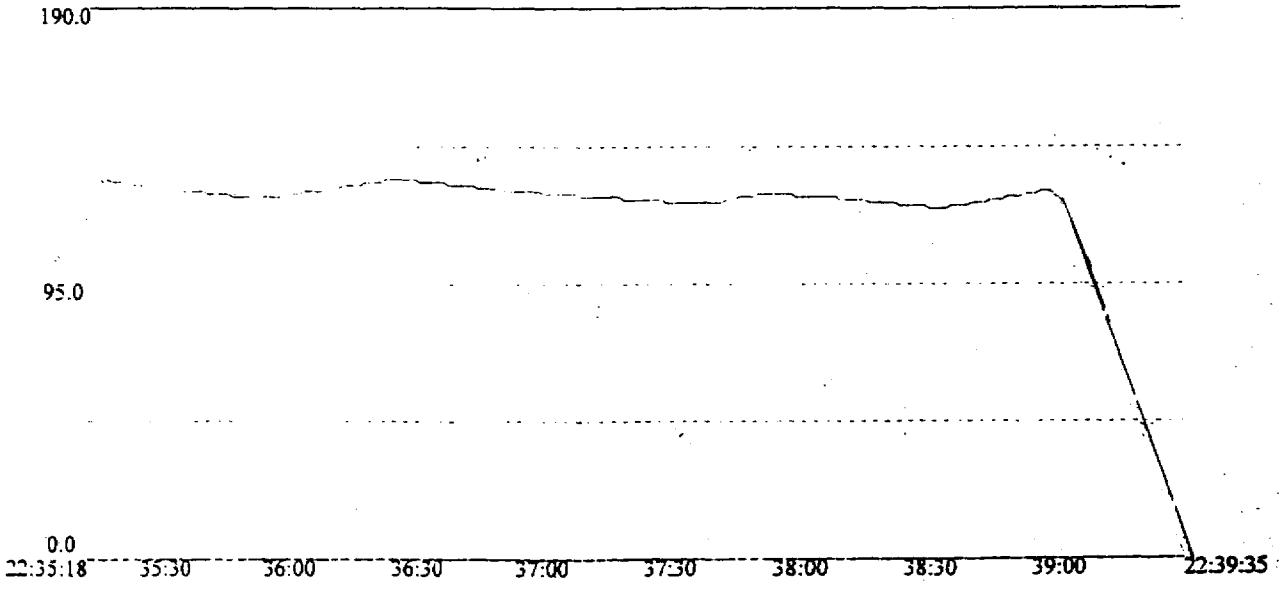
Customer Id	IR	Start	09/09/02	22:35:18	Mod. WD (mm):	----------
Vehicle Type	WAP 5	End	09/09/02	22:39:35	Conf. WD (mm):	1039
Vehicle Id	30002	Distance	955.631	964.098(km)		
Equipment Id	5.2301.014/01					



(15 Secs. Interval)

Short Term Data

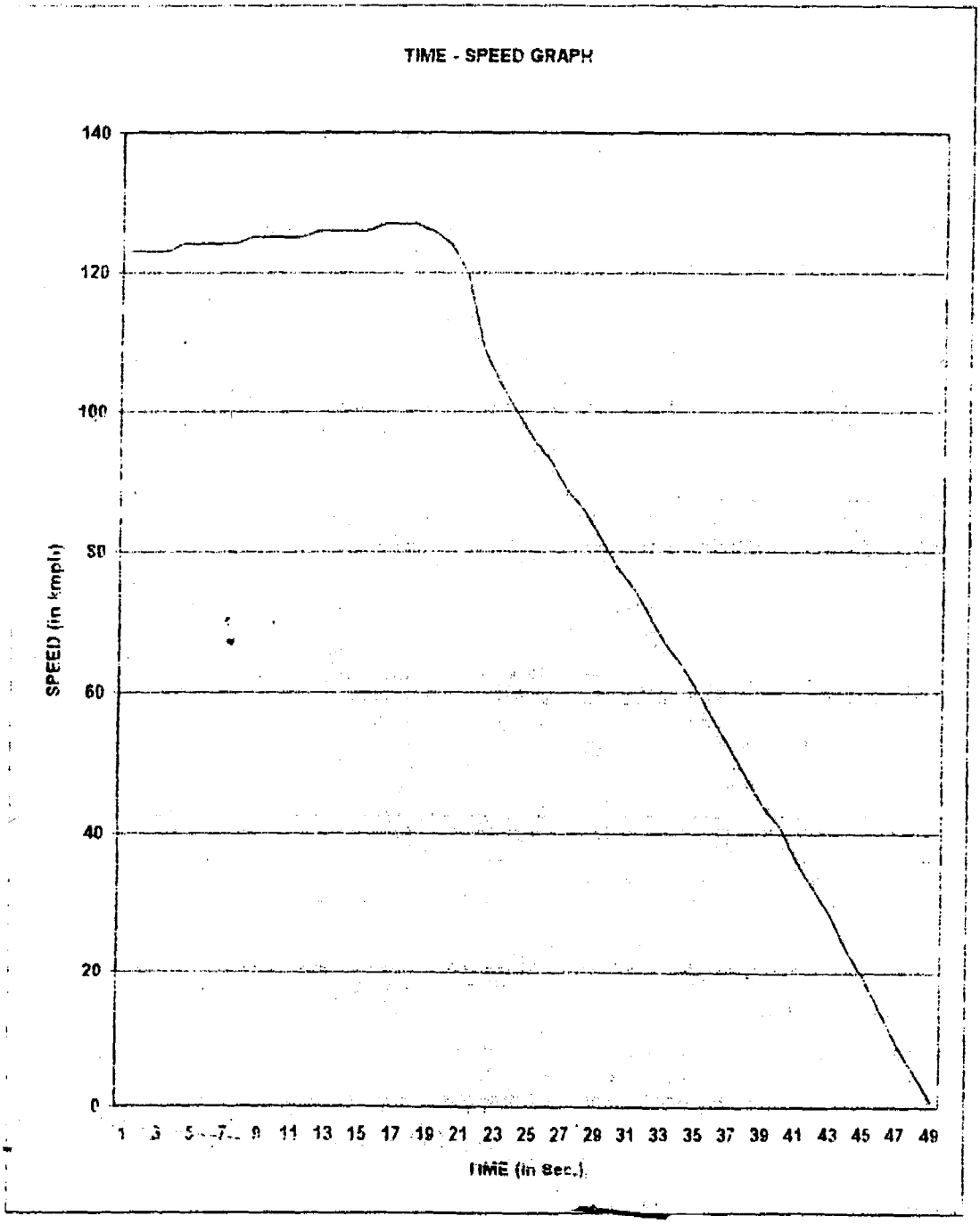
Customer Id	IR	Start	09/09/02	22:35:18	Mod. WD (mm):	———
Vehicle Type	WAP 5	End	09/09/02	22:39:35	Conf. WD (mm):	1039
Vehicle Id	30002	Distance	955.631	964.098(km)		
Equipment Id	5.2301.014/01					



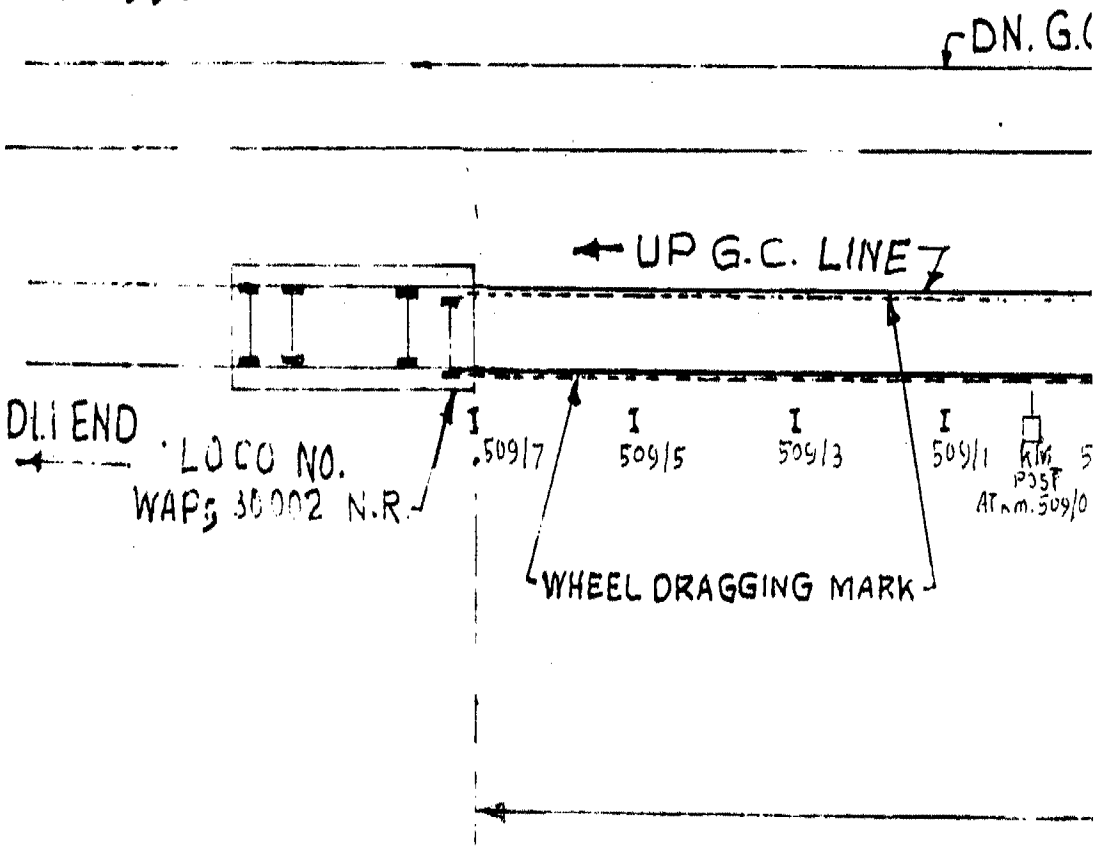
(15 Secs. Interval)

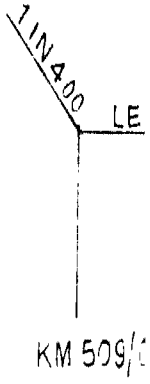
ANNEXURE-VI

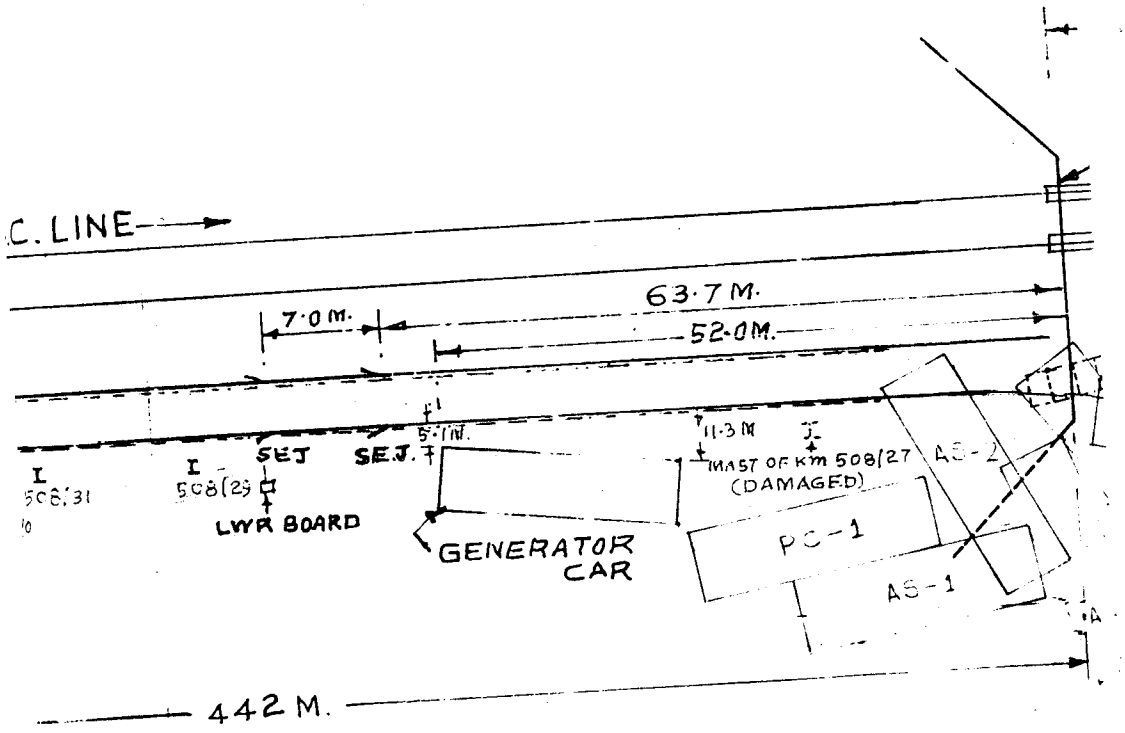
TIME SPEED GRAPH OF 2301 UP(L/NO.- 30002)



DEO-ROAD STATION
AT Km. 515·6



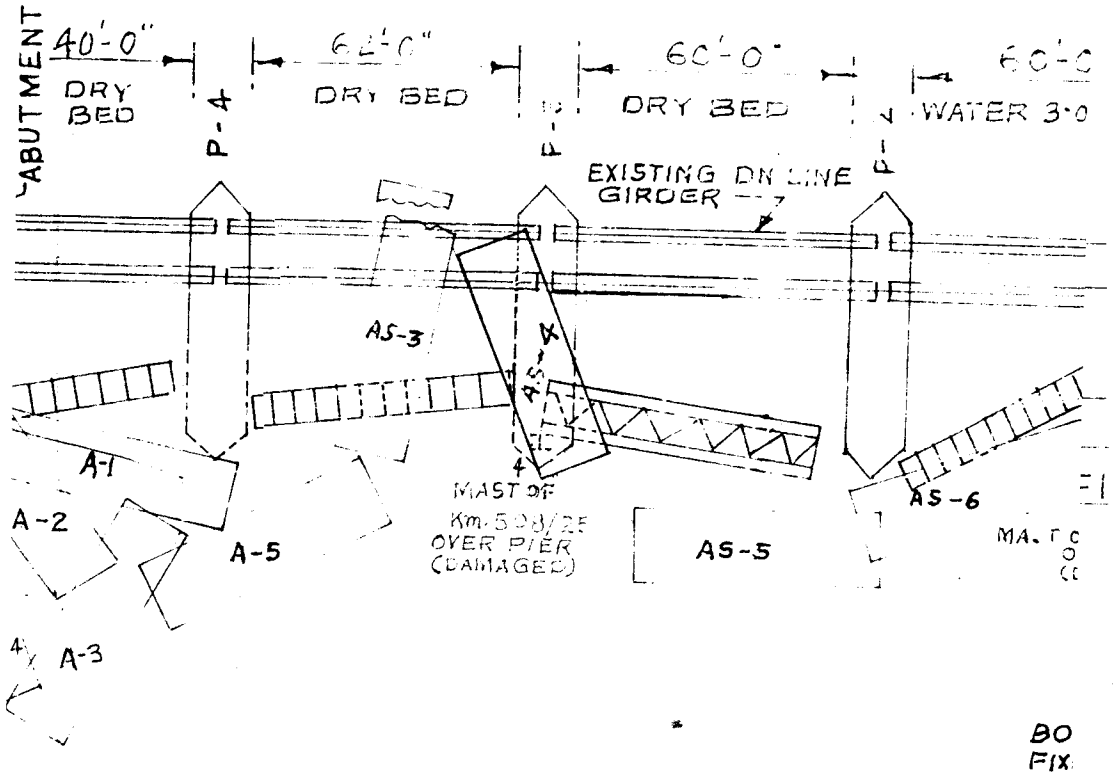




DAMAGED MASTS

1. KM. 508/23
2. KM. 508/25
3. KM. 508/27

BRIDGE NO. 445 (3 X [illegible]'-0" + 1 X 62'-0" + 1 X GIRDER) AT Km. 508/[illegible]



DIRECTION OF TRAIN

BO
FIX
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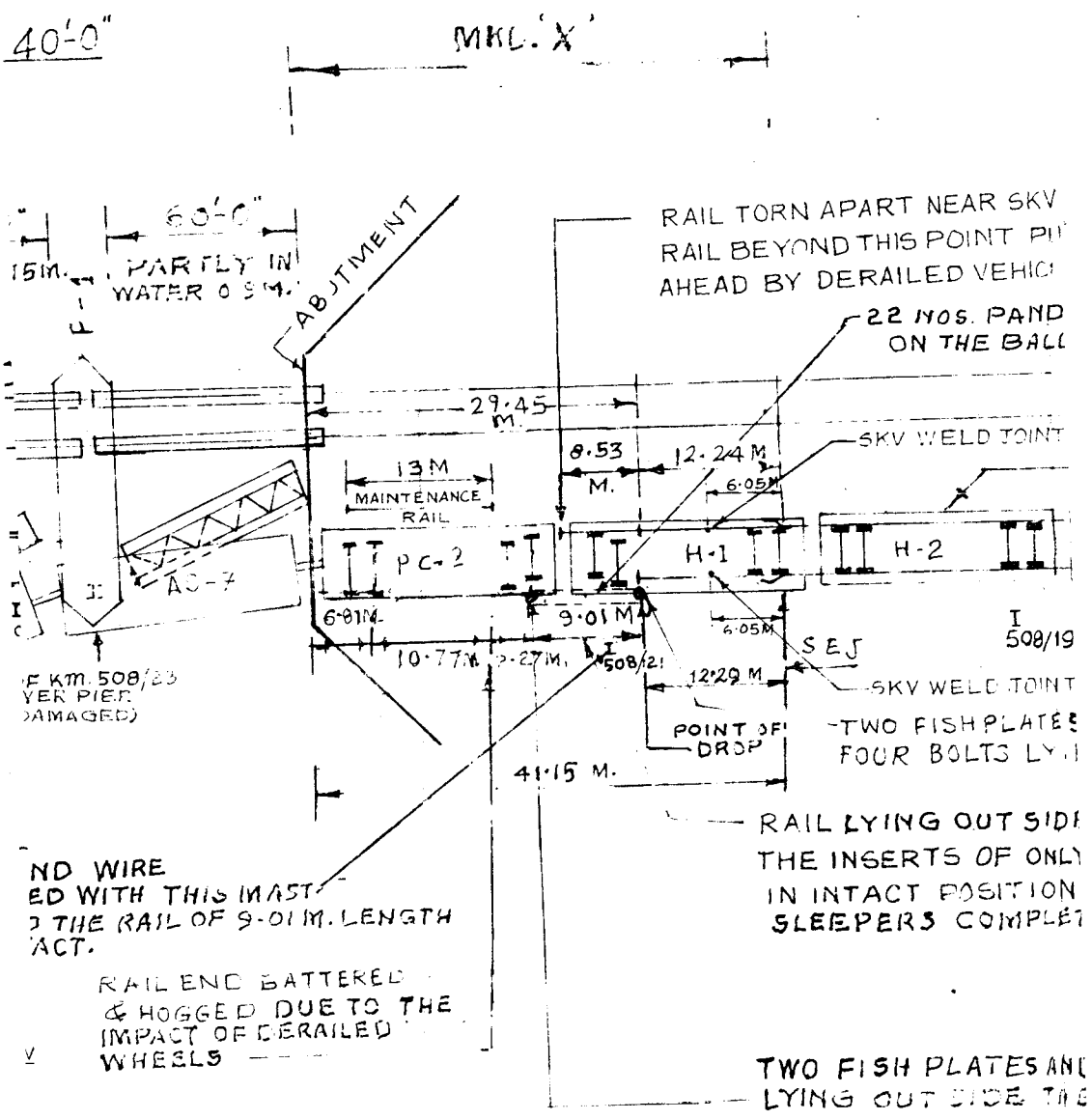
INT

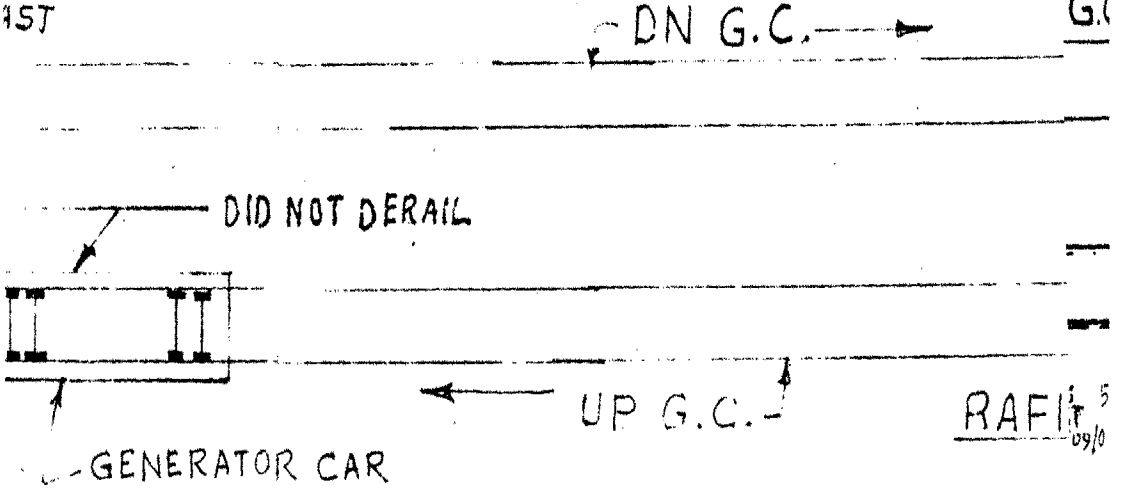
E1

LEFT HAN
12·2 M – RAIL IN POS
3·61 M – RAIL LYING
PS[illegible] LEFT
FIXED WITH
2·27 M – RAIL PUSHE
10·77 M – RAIL NOT
FACE IN I
EDGE FA
6·81 M – NO RAIL


40'-0"
MKL. 'X'
60'-0"
15M.
PARTLY IN WATER 0.9 M.
ABUTMENT
RAIL TORN APART NEAR SKV
RAIL BEYOND THIS POINT PU
AHEAD BY DERAILED VEHIC
22 NOS. PAND ON THE BALL
29.45 M.
SKV WELD JOINT
8.53 M.
12.24 M
6.05M
13M MAINTENANCE RAIL
PC-2
H-1
H-2
AC-7
6.01M.
9.01 M
6.05M
S E J
I 508/19
10.77M
9.27M.
I 508/21
12.29 M
SKV WELD JOINT
TWO FISH PLATES
FOUR BOLTS LY
POINT OF DROP
41.15 M.
RAIL LYING OUT SIDE
THE INSERTS OF ONLY
IN INTACT POSITION
SLEEPERS COMPLET
ND WIRE
ED WITH THIS MAST
THE RAIL OF 9.01 M. LENGTH
ACT.
RAIL END BATTERED & HOGGED DUE TO THE IMPACT OF DERAILED WHEELS
TWO FISH PLATES AN
LYING OUT SIDE TH
POSITION OF RAIL OVER 41.15 METRE ON APPR
D SIDE
ITION
OUT SIDE THE TRACK NEAR THE TOE OF THE
ERS WITH BOND WIRE OF MA
KM 508/21
IT.
D AHEAD
IN POSITION BUT LYING INSIDE WITH GAUGE.
DOWNWARD CONDITION AND
TTERED AND HOGGED WITH DERAILED WHEELS HITTING MARK ON RAIL HEA

WELD.
LED
ES.

OL CLIPS LYING
AST



AND
G ON THE BALLAST.

THE TRACK.
4 PSC SLEEPERS FROM THE HWH END JOINT
AND THE INSERTS OF THE BALANCE 10
ELY DAMAGED OVER THIS PORTION.

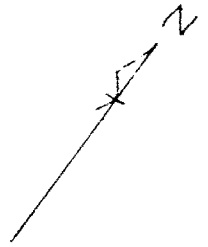
LE

FOUR BOLTS
TRACK

SR. DEI

OACH TO THE BRIDGE
RIGHT HAND SIDE
NO RAIL BEYOND BROKEN SKV WELL

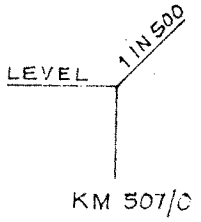
ABUTME



HWH END

BOND WIRE FIXED
WITH THIS MAST AND
THE RAIL OF 9·01M. LENGTH
INTACT.

GANJ STATION
AT Km. 507·1



RAIL END B
AND HOGGE
TO THE IMPA
DERAILED WI

4/9/02
SR.DEE/TRS/MGS

14.9.0
SR. DSTE/MG

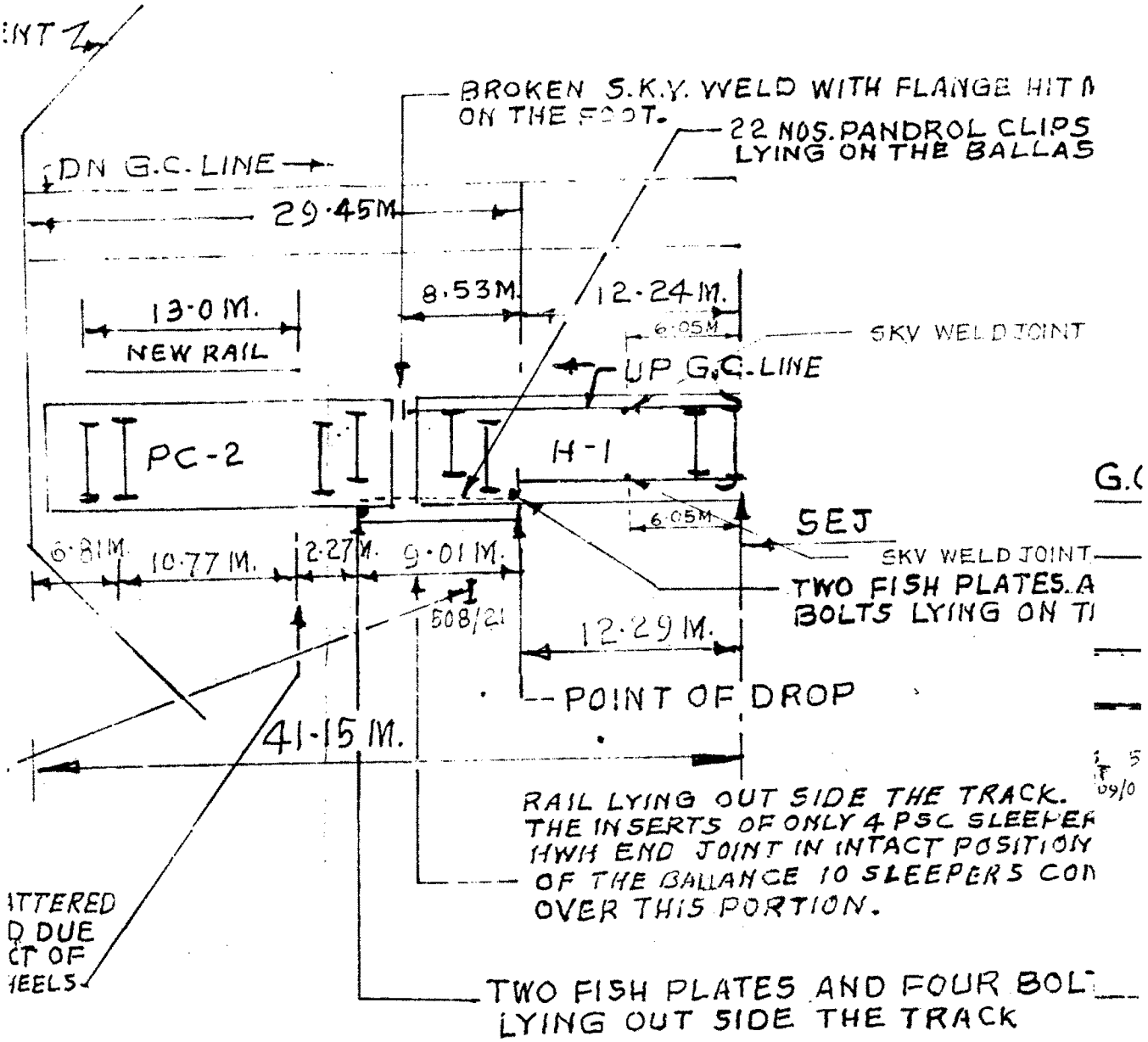
14.9.02
SR.DEE/TRD/MGS

4.9.02
DEE/TRS/MGS

14.9.0
ASTE/MG

14.9.2002
N/CO-ORD./MGS.

DI
EA

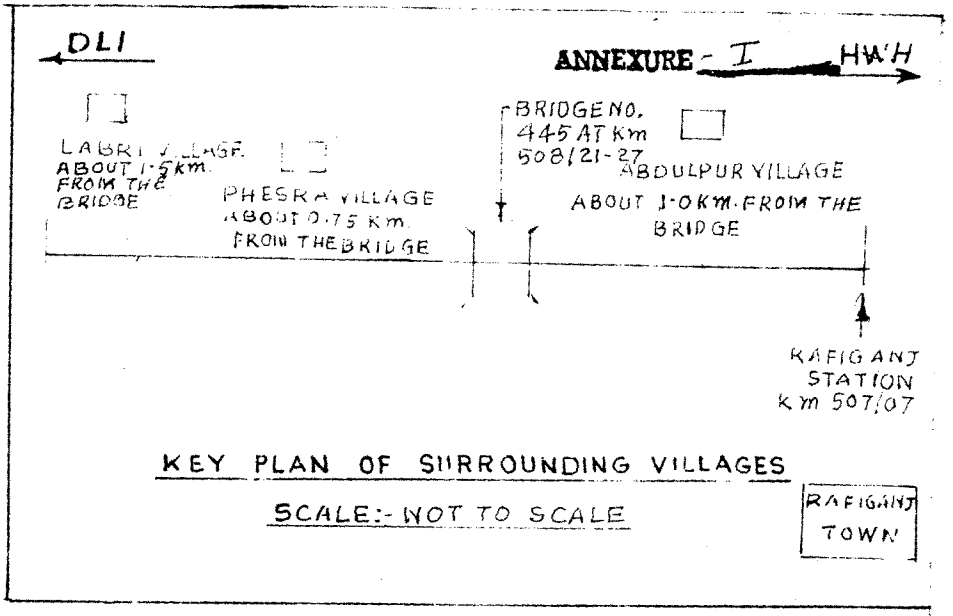


ENLARGED VIEW OF MKD. 'X'

16.9.02
AME/C&W/MGS

SR. DME (C & W) / MGS

VL. RAILWAY MANAGER
STERN RAILWAY, MUGHALSARAI



IRK

ID FOUR
E BALLAST

S FROM THE
AND THE INSERTS
PLETELY DAMAGED

14/9/02
DSO/MGS

EASTERN RAILWAY

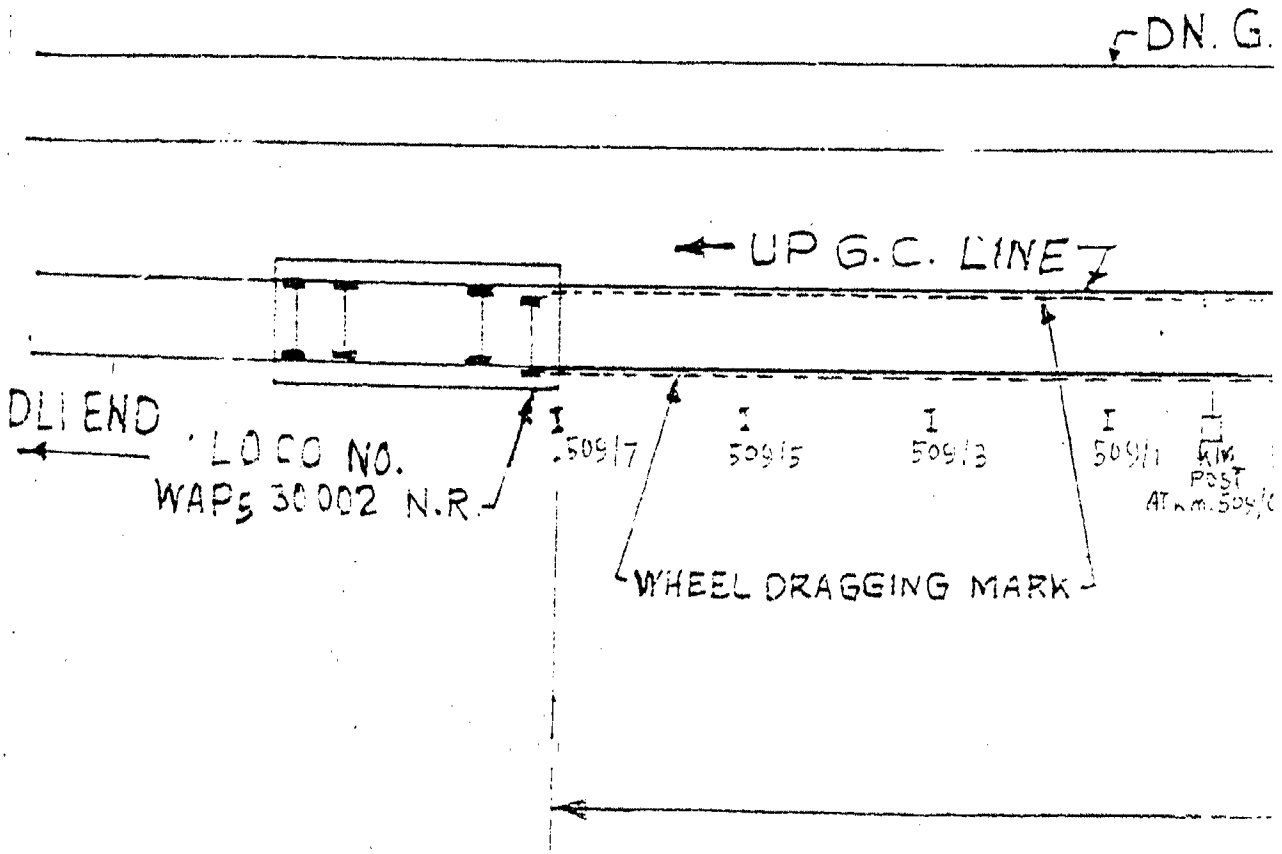
MUGHALSARAI DIVISION

SKETCH PLAN OF DERAILMENT SITE OF 2301 UP (HOWRAH-DELHI RAJDHANI EXPRESS) ON 9-9-2002 AT 22·42 HRS. AT KM 508/19-21 BETWEEN RAFIGANJ & DEO ROAD ON MUGHALSARAI DIVISION

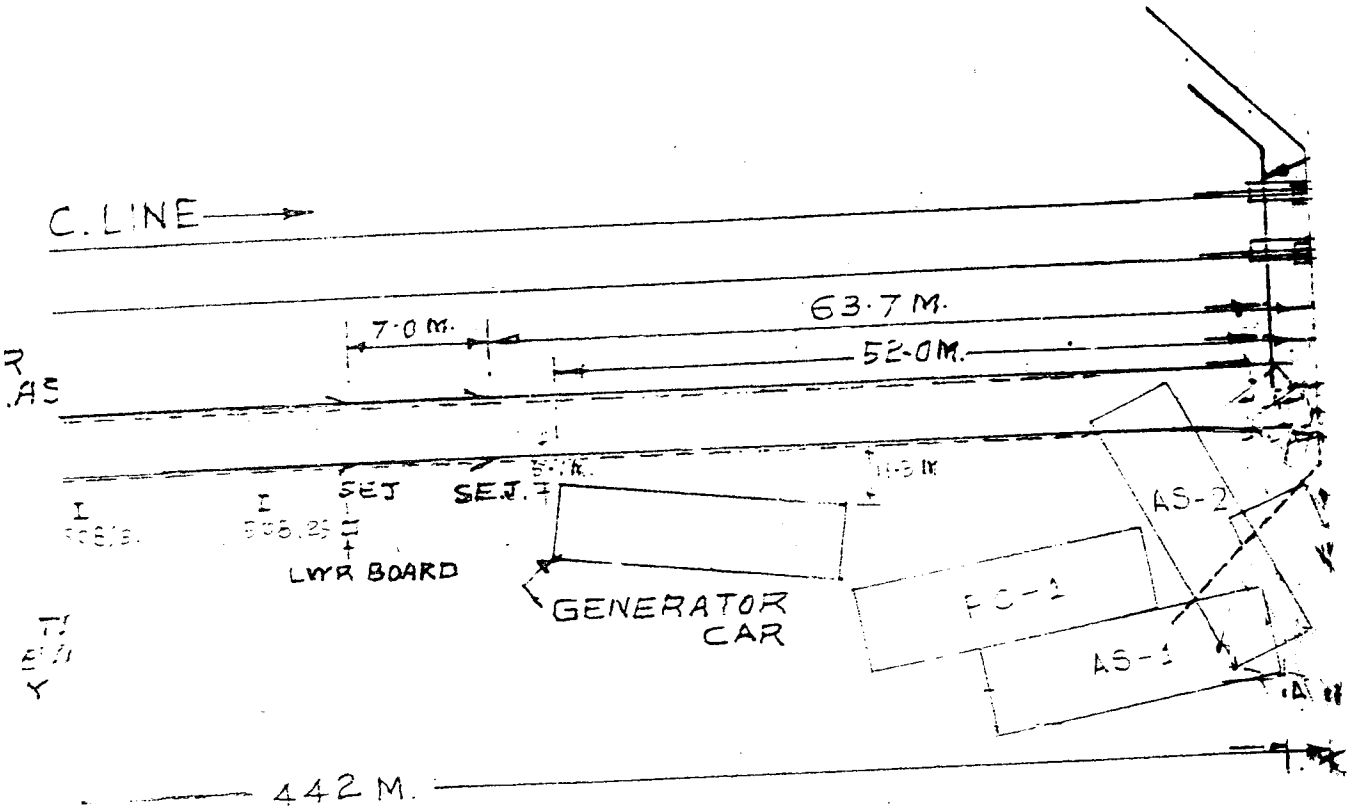
(NOT TO SCALE)

DRM/MUGHALSARAI PLAN NO. 99-2002.

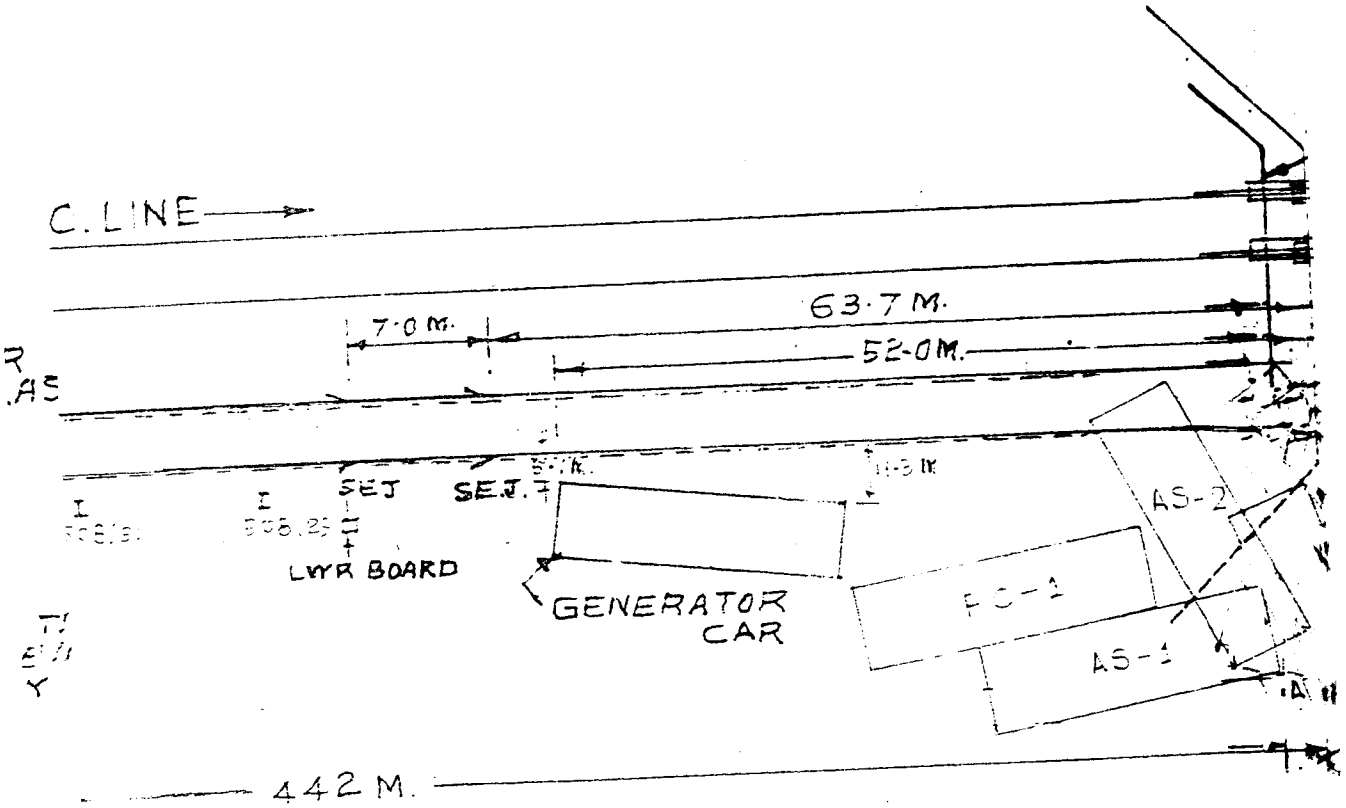
DEO-ROAD STATION
AT Km. 515·6



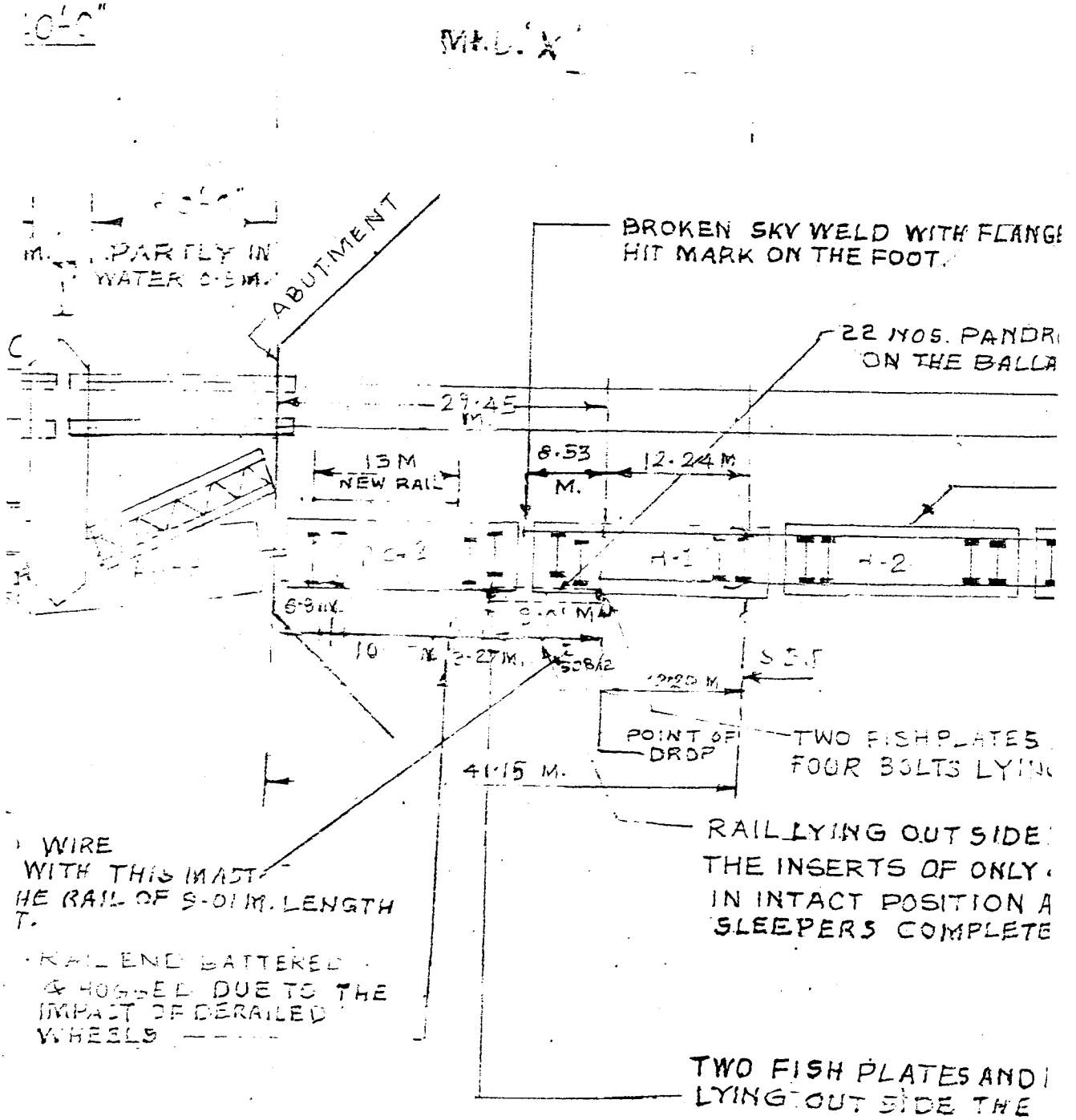
Annexure 1


C. LINE
7·0 M.
63·7 M.
52·0 M.
SEJ
SEJ.7
LWR BOARD
GENERATOR CAR
AS-2
AS-1
442 M.

Annexure 1


C. LINE
7·0 M.
63·7 M.
52·0 M.
SEJ
SEJ.
LWR BOARD
GENERATOR CAR
AS-2
FC-1
AS-1
442 M.

Annexure-1

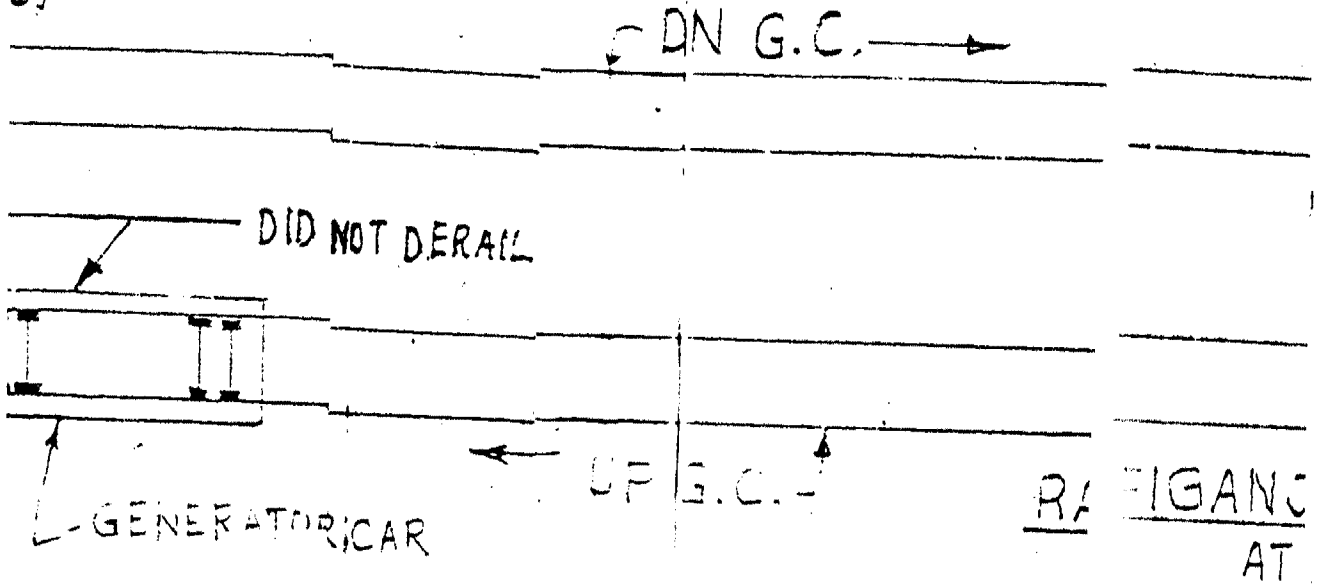


POSITION OF RAIL OVER 41·15 METRE ON APPRO

SIDE THE TRACK NEAR THE TOE OF THE
WITH BOND WIRE OF MAST OF KM 508/21

POSITION BUT LYING INSIDE WITH GAUGE
NORMAL CONDITION AND NO RAIL END RAIL
HEEL AND HOGGED WITH DERAILED WHEELS HITTING MARK ON RAIL HEAD.

DL CLIPS LYING
ST



RA IGANG
AT

AND
E ON THE BALLAST

THE TRACK.
4 PSC SLEEPERS FROM THE HEND JOINT
ND THE INSERTS OF THE B.NCE I
LY DAMAGED ONER THIS PORY.

FOUR BOLTS
TRACK

ICH TO THE BRIDGE
RIGHT HANDSIDE
NO RAIL BEOND BROKEN SHIELD.

14 92
SR DEN/CO-0

HWH END

BOND WIRE FIXED WITH THIS MAST AND THE RAIL OF 9-01 M. LENGTH INTACT.

J STATION
Km. 507·1

RAIL END BATTERED AND HOGGED DUE TO THE IMPACT OF DERAILED WHEELS.

14.9.02

SR. DEE/TRD/MGS

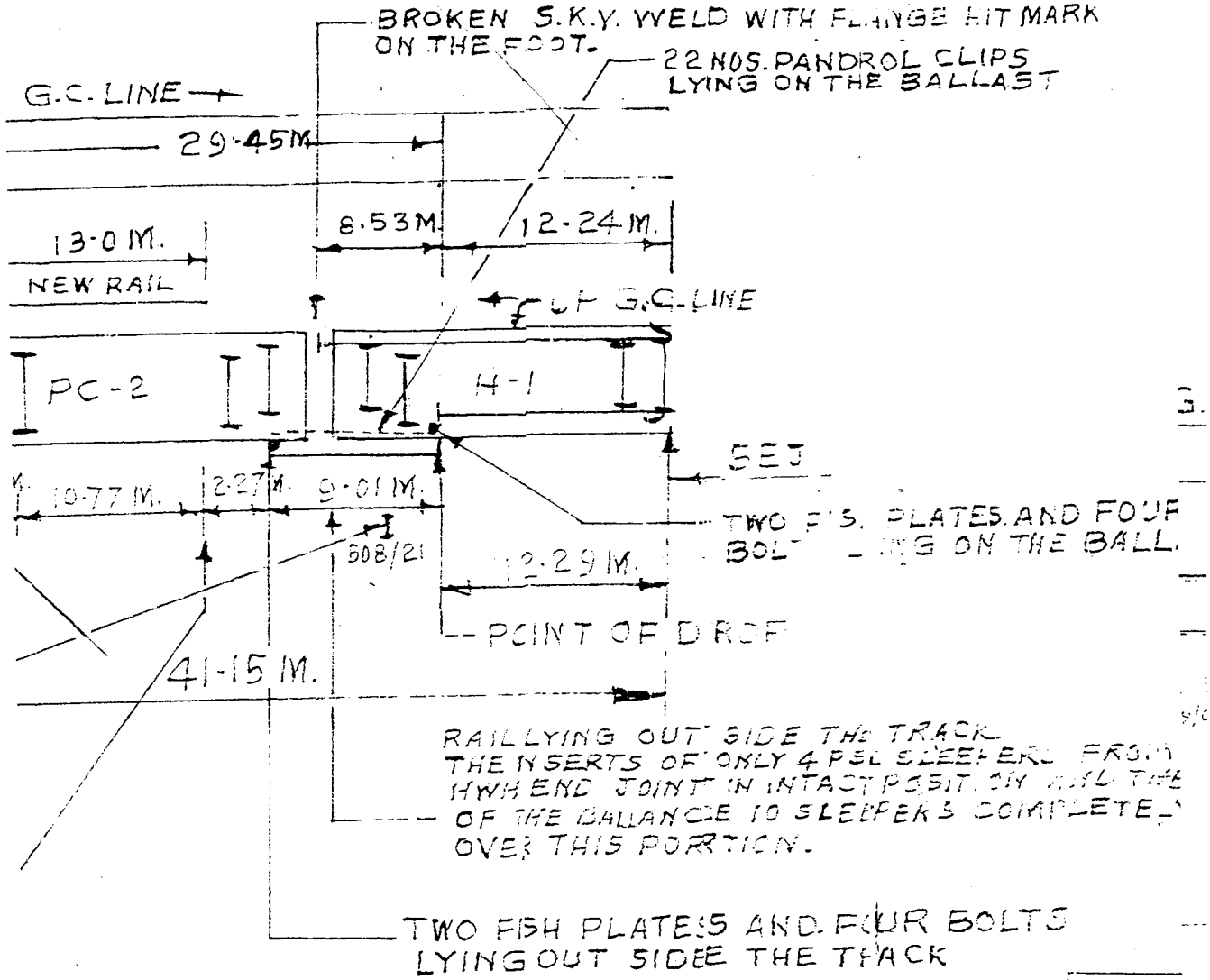
14.9.02

14.9.02

ORD./MGS.

DEE/TRS/M

ASTE/MGS



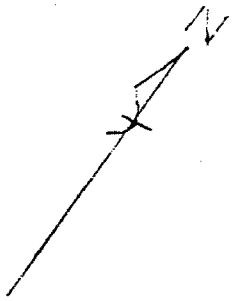
ENLARGED VIEW OF MRC-'X'

14.9.02
AME/C&W/MGS

SKET
(HOW
AT 2
RAIL

DRM/

Annexure-1



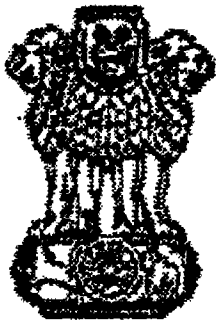
DSO/MGS

EASTERN RAILWAY
MUGHALSARAI DIVISION

CH PLAN OF DERAILMENT SITE OF 2301 UP RAH-DELHI RAJDHANI EXPRESS) ON 9-9-2002 2.42 HRS. AT KM 508/19-21 BETWEEN SANJ & DEO ROAD ON MUGHALSARAI DIVISION

(NOT TO SCALE)

MUGHALSARAI PLAN NO 99-2002.



सत्यमेव जयते

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS

Report on Investigation of sub-structure of Bridge No. 445 (Dhawa Bridge) near Rafiganj on Mughalsarai division of E. Railway.

BS - 49

OCTOBER , 2002

RESEARCH DESIGNS & STANDARDS ORGANISATION
MANAK NAGAR, LUCKNOW. 226011

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S.N.	Subject		Page No.
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Report on Investigation of sub-structure of Bridge No. 445 near Rafiganj on Mughalsarai division of E. Railway.

1. INTRODUCTION

1.1 In the night of 09.09.2002, 2301UP Sealdah-New Delhi Rajdhani Express met with an accident at 2242 hrs near Bridge No. 445 at Km 508/19-21 between Rafiganj-Deo Road stations of Eastern Railway. Keeping in view the severity of the accident, CRS Eastern Circle initiated the inquiry to find the cause of accident of this train. Meanwhile, Railway Board asked RDSO to examine the Bridge. On the following date, CCRS also instructed RDSO to conduct various types of testing so as to assess the strength of the bridge and thereafter submit the report.

Bridge No. 445 near Rafiganj on Mughalsarai division

1.2. Substructure of the bridge being masonry, much literature of testing of the bridge, particularly with NDT equipments is not available. Hence, RDSO contacted some premier institutions like IIT/Roorkee, IIT/Chennai and some leading NDT firms namely M/s. AIMIL New Delhi, M/s. S.J. Group, Mumbai, M/s. Intercontinental Consultants and Technocrat's Pvt. Ltd., New Delhi to obtain technical assistance/guidance from them. Assistance assured by above mentioned IITs, with whom some consultancy projects are already going on, were not encouraging. It was found that RDSO is even better equipped as compared to IIT/Roorkee and Chennai. In view of this, it

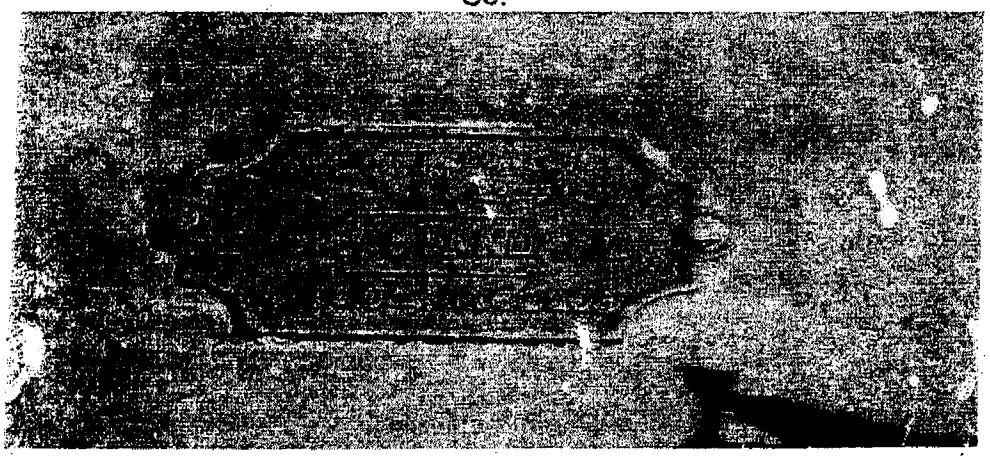
was decided to do the testing by the team of RDSO at its own with various NDT equipments available with them.

2. BRIEF DETAILS OF BRIDGE

2.1 Bridge No. 445 located at Km 508/19-21 was constructed on Dhawa River of Grand Chord of Eastern Railway. Substructure is common for UP and DN lines. Initially, the bridge was constructed in 1900. This bridge was having 3 central spans of 60' girders and 2 brick masonry arches at both ends. Substructures are in brick masonry. Initially , Dn line was opened to traffic on 01.03.1900. Later on, due to realization of adding waterway on MGS (Mughal Sarai) end, one span of 62' and another span of 40' were added during the year 1958-59. Simultaneously, end span of Arch Bridge on MGS end was eliminated. End span of Arch Bridge on HWH end was also made defunct by closing the same.

.2 UP line was added on the common substructure and opened to traffic on 16.02.1927.

2.3 As per bridge plaque of Up line bridge girders on which Rajdhani Express met with accident, the bridge was conforming to 1916 Standard of loading and was fabricated in 1925 by M/s Burn & Co.



Bridge plaque showing standard of loading and name of the fabricatc

DETAILS OF THE ACCIDENT

1 Sketch of the derailment site is attached as Annexure - I. As per this annexure, the point of drop is 41.15m before Abutment 1 (A1) starting from HWH end. All the girders of UP line had fallen in the riverbed. Part portions of Piers P3 and P4 were broken and other portions of substructure also got minor damages.

2 At the time of accident, water was flowing in Span 1 and 2 only as is shown in Annexure II.

4. INVESTIGATION OF SUB-STRUCTURE

4.1 Inter-action with IIT/Roorkee and IIT/Chennai revealed that these premier institutions are also not having much expertise in the Non-Destructive Testing (NDT) of the masonry structures. IIT/Roorkee desired to test the bridge by rebound hammer and ultrasonic pulse velocity meter. B&S Lab of RDSO is having more equipment including these two equipments. Accordingly, the Competent Authority took the decision that RDSO team should visit the site to collect the relevant details, conduct necessary tests and submit the report at.the earliest.

4.2 Accordingly, RDSO team visited the site with following equipments

i) Rebound Hammer
ii) Ultrasonic Tester
iii) Micro-covermeter
iv) Acoustic Emission equipments
v) Ground Impulse Imaging System.
vi) Crack detection microscope
vii) Profometer
viii) Corrosion monitoring equipments

5. FIELD OBSERVATIONS ABOUT PHYSICAL CONDITION

5.1 Before starting field investigations with the help of NDT equipments, physical condition of the pier and abutments of bridge sub-structure was thoroughly examined. The damage to the various portion of the substructure, location of cracks, epoxy grouting done in the past etc were plotted on the sketches enclosed as Annexure-III to Annexure - VIII The various observations taken during examination are as under:

5.2 **About strength of the mortar** – Each pier and abutment was thoroughly examined with the help of wire to assess whether there is any loss of strength in the mortar or not. Everywhere including that at broken portion of the piers, mortar was found in very sound condition. No leaching of mortar was observed in any of the piers and abutments.

5.3 **Condition of Bricks** – Bricks were found in excellent condition and no where any sign of efflorescence was noticed in any of the piers and abutments. Ringing sound was observed under impact of inspection hammer. Sample of bricks and masonry were collected for testing its strength in the laboratory.

5.4 **Condition of Sub-Structures** - No visible cracks were observed anywhere in the substructure of piers and abutments. At the broken portion of the pier, no loose mortar was found. At many places on existing as well as on broken piers, joints were raked using wires. The broken pieces of pier were in a chunk and loose bricks/mortar at joints were not found . From visual inspection, the condition of sub-structure appeared to be very sound. The sample of mortar, bricks and

broken pieces of masonry had been collected and tested for compressive strength including composition of mortar.

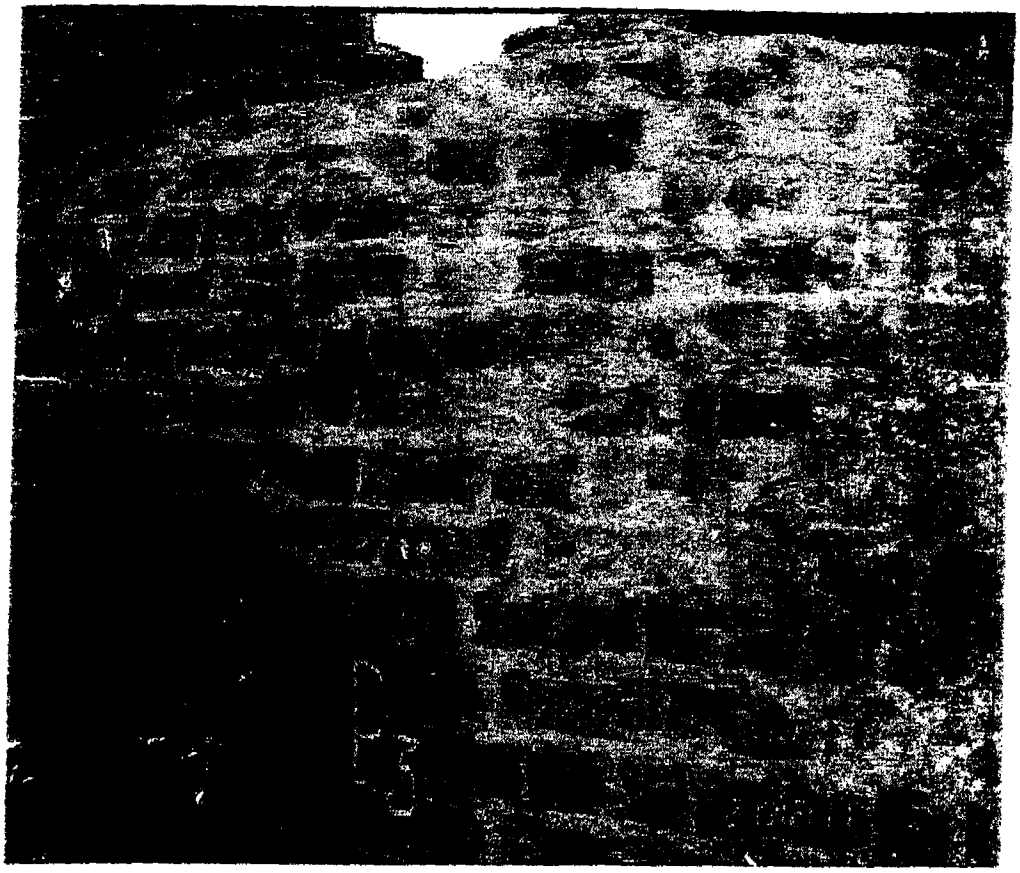
5.5 **Waterway & Scouring** – High flood level marks on abutment A1 and Pier P1 reveal that the bridge had witnessed severe floods in 1916 and subsequently in 1926. There was no further flood of those intensities. Further more, during 1958-59, two more spans of 1X62' and 1x40' were added towards MGS end. The observation of site indicates that waterway presently available is adequate as bridge is not limited to constricted portion of flow and has sufficient opening.

5.6 **Settlement** - Thorough examination of the foundations revealed that there is no sign of settlement in any of the piers and abutments. To ensure whether any chances of gradual settlement had taken place in the past or not, levels of the bed blocks of all the piers and abutments were taken. It was found that there is no old crack in any of the piers and abutments. Further more, difference in level of bed block as taken by AEN / Dehri-on-Son under the supervision of RDSO found to be only of 5mm(Annexure-IX). It is worthwhile to point out that least count of the measuring staff is of 5mm. Hence, it can be concluded that there is hardly any level difference, nullifying the possibility of gradual settlement of piers and abutments in due course of time.

5.7 **Condition of Epoxy Grouting** – All the epoxy groutings were thoroughly examined. It was found that groutings are in sound condition. Further more, no where development of any fresh crack beyond the grouted portion was found.

6 STRENGTH OF BRICKS / BRICK MASONRY BLOCKS

6.1 The samples of bricks were collected from bridge. These were tested in laboratory for assessing their compressive strength. The test results and procedure of tests are shown in table 1 for comparison, some bricks available in RDSO premises were also tested for their compressive strength and test results are shown in Table No.1 . It can be observed from Table No.1 that compressive strength of bricks varies from 14.88 to 67.00 N/mm2. The compressive strength of bricks taken from RDSO premises varies between 11.93 to 17.00 N/mm2, It can be observed that compressive strength of bricks taken from bridge site and piers & abutments of bridge is much higher than the bricks available nowadays. It is worthwhile to point out that compressive strength of first class brick should be 10.5 N / mm2 with this comparison also, bricks used in the bridge is of superior quality.



Damaged masonry pier (P-3)

Photographs clearly reveals that mortar is properly filled up and no weathering effect or voids are there.

6.2 The samples of brick masonry blocks of broken portions were taken and tested in lab for compressive strength. The results and procedure of testing is given in table No.2. The compressive strength of samples taken from abutment A1 and pier P3 & P4 was observed as 3...91, 12.80 & 24.51 N/mm2 respectively. This is approximately equal to the strength of bricks. It can be concluded that the brick masonry consisting of bricks and mortar are very sound and mortar strength is almost at par with the bricks

7 SCRUTINY OF BRIDGE REGISTER

The details of Inspection of this bridge in past few years were scrutinized by going through entries made in Bridge Inspection register. It was observed that Condition Rating Number (CRN) of all the components of the bridge was rated as 5 except the track portion for which CRN was rated as 4. The CRN of value 5 indicates the sound condition and of value 4 indicates a condition which requires routine maintenance. Based on this it can be said that the bridge was in sound condition.

8. INVESTIGATION OF SUBSTRUCTURE BY NDT EQUIPMENTS

8.1 Investigation using Acoustic Emissions Technique

8.1.1 Acoustic emissions are defined as the high frequency stress waves generated by the rapid release of strain energy that occurs within a material during crack growth, plastic deformation or phase transformation. This energy may originate from stored elastic energy as in crack propagation or from stored chemical free energy as in phase transformation. The location of crack/flaws in side the structure can be detected from this technique. It can also detect the activeness and severity of crack.

AE monitoring of bridge pier

8.1.2 Instrumentation: Sensors (Piezo-electric accelerometers) of 30 KH_Z and 60 KH_Z resonant frequency i.e. suitable for concrete masonry were used for acquisition of AE Signals. The surface was cleaned by emery sand papers and steel plates were fixed using araldite and hardener. Sensors were placed at selected locations with magnetic hold downs after applying grease coupulent. Grease was used between surface of structure and accelerometers to avoid any air gap and to provide better acoustic medium between accelerometer and surface of structure to minimize attenuation of AE signals. Sensors were connected with main control unit (Data Acquisition System i.e. Mistras System) through cables.

8.1.2 Analysis of data: Acoustic emission signals were recorded under running train. There was speed restriction of stop dead and proceed at 10 kmph on both UP and DN lines of bridge. While testing work in progress, AE signals were recorded on bed blocks as well as on masonry structures. Signals were analyzed using built-in software provided in the system for following AE parameters for each train:

a) Maximum amplitude
b) Energy
c) Counts
d) Hits

8.1.3 The summary of results of tests are shown in Table -3. The maximum amplitude was observed as 75.9 dB. The maximum hits, events,

counts & energy were observed as 5338 nos., 694 nos. , 19479, 27448 respectively.

8.1.4 The values of observed parameters are of very low intensity. In case of active cracks, the values of these parameters may be many times as compared to above observed values. As such, these are not indicative of presence of any flaws or active cracks inside the structure. It can be concluded that either there is no active crack/flaws inside the sub-structure or the stresses due to trains are not sufficient to activate the crack/flaws.

8.2 Rebound Hammer Test

8.2.1 Rebound hammer consists of a spring controlled mass that slides on a plunger within a tubular housing. When the plunger is pressed against the surface under testing, the spring controlled mass rebounds. The extent of such rebound depends upon the surface hardness of the structure and is taken to be related to the compressive strength of the structure. Based on the principle that the rebound of an elastic mass depends on the hardness of the surface against which the mass impinges, it provides a convenient and rapid indication of the compressive strength of structure under testing.

Testing of masonry using Rebound Hammer

8.2.2 This method is frequently used for assessing the compressive strength of the surface concrete with the help of suitable co-relations between rebound number and compressive strength. The strength of concrete can be predicted with an accuracy of +/- 20-30%. So far no standards are available for assessing compressive strength of brick masonry using this equipment. For this case efforts were made to assess condition of brick masonry of damaged piers by comparing the compressive strengths of intact piers and abutments. In addition, value taken can give a fair comparison with strength of concrete for which calibration chart are available. The rebound numbers were also observed on the bed blocks of piers and abutments also. The

locations of test are shown in Annexure 3 to 8 and compressive strengths calculated, based on the calibration curves of concrete supplied along with the equipment, is shown in Table 4 to 9.

8.2.3 Results of the Rebound Hammer : The compressive strength of CC bed blocks varies from 37 N/ mm^2 to 48N/ mm^2. The compressive strength of masonry structures of piers and abutments varies from 42.4 N/ mm^2 to 53.5 N/ mm^2 The compressive strength of mortar was also measured on the broken portion of the pier. It varies from 25.1 N/ mm^2 to 26.8 N/ mm^2

8.2.4 It was observed that the compressive strength of brick masonry is more as compared to compressive strength of CC bed blocks. This may be due to the plastering over the CC bed blocks and carbonation of the lime mortar, as lime mortar continues to gain strength for a longer period. These observations clearly indicates sound condition of brick masonry of damaged as well as intact piers and abutments.

Further more results of the rebound hammer on broken portion and intact portion of substructure are comparable indicating that the part portion of pier no. 3 and 4 broken not on account of weak ness but on account of very heavy impact beyond safe limit, due to derailment.

8.3 Ultrasonic Pulse Velocity Tests

8.3.1 This equipment is used for assessing the quality and uniformity of structure, presence and approximate extant of cracks, voids and other defects, modulus of elasticity and dynamic Poisson's Ratio. The velocity of ultrasonic pulse in a material depends on its density and elastic property. Comparatively higher values are obtained when the quality of concrete is good. The compressive strength of concrete can also be co-related with ultrasonic pulse velocity. Ultrasonic pulse is produced and transmitted by a transducer held in contact with concrete surface, which travels through a known length in concrete and received by second transducer held in contact with another or same surface of concrete member.

8.3.2 The equipment available with RDSO is suitable for concrete structures with 54 kHz transducer. The instruments being of new origin is mainly calibrated for concrete structures. No standards are available for ultrasonic testing of brick masonry. Therefore, efforts were made to assess the quality of bridge masonry by comparing the pulse velocities. Further more, by comparing the results obtained on brick masonry with that of concrete structure, fair idea about strength can be derived. The tests were conducted on sub-structure as well as on CC bed blocks of piers and abutments. As no signal was observed along the opposite faces of the piers, therefore, surface method was used for assessing the quality of masonry structure. The tests were conducted at the same locations where rebound hammer measurements were taken. The test results are shown in Table 10 to 15.

8.3.3 The locations of tests are shown in Annexure- 3 to 8 and pulse velocities observed at various locations are shown in Table 10 to 15. The pulse velocity observed in brick masonry varies from 370 m/sec to 850 m/sec on pier P1 and 610 m/sec to 1380 m/sec on pier P2. It also varies from 710 m/sec on to 1210 m/sec on pier P3 and 840 m/sec to 1190 m/sec on pier P4. By comparing these results of pulse velocities on intact and damaged piers and abutments, it can be concluded that there is not much difference between the strengths of masonries of broken piers from intact piers.

8.4 Measurement Of Cover

8.4.1 The cover of pier and abutments caps were measured using micro cover meter as inadequate cover may lead to corrosion of reinforcing bars which may further reduce the strength of concrete. This equipment is based on the principles that the presence of steel affects the Electro magnetic field.

8.4.2 The bed block of pier and abutment are made up of cement concrete. Therefore, concrete cover is having very little relevance. However, the same was measured on temperature reinforcements. It was found that minimum cover thickness was of the order of 19mm which is fairly adequate.

Measurement of Concrete Cover using microcovermeter

8.5 Crack Detection Microscope

This equipment is suitable for measuring crack width in masonry and concrete structures. There was no visible crack on the brick masonry of abutment/piers. As such results from this equipment is nil.

8.6 GROUND IMPULSE RADAR IMAGING SYSTEM

8.6.1 This system is based on the principle of transmission of short electromagnetic waves into the body of the structure and recording the subsequent signals from reflected and refracted waves from interface which help in estimating change in strata/profile. It was procured by Geo-Tech Dte of RDSO to map ballast penetration profile and

subsurface profile to estimate the puncturing of ballast. This system can also be used for detection of discontinuity or flaw in the masonry structure.

8.6.2 Discussion were held with the experts in the field of NDT's about the use of this equipment for investigation of brick masonry. Based on their guidance, observations were taken on all the piers (Ann-X). The display and line scan survey with GPR on each pier is almost similar on masonry structure of all the piers which indicate that affected and unaffected portions of piers are almost similar. Uniformity in results shows similar strength as well as absence of any cracks.

Monitoring of pier with Impulse radar

9. CONCLUSIONS

a) Nowhere presence of any efflorescence and leaching of mortar as well as nowhere any indication of loss of mortar indicates that although the bridge is old but still in very sound condition. Regarding this, it is clarified that strength of lime mortar increase with time due to more and more carbonation.

b) No where, presence of any cracks in any of the piers and abutments reveals that bridge substructure is in sound condition. Uniformity in the levels of bed blocks reveals that even no gradual settlement took place in any of the piers and abutments.

c) No sign of any scouring was found anywhere.

d) Waterway was found adequate.

e) Results of rebound hammer on the bricks as well as mortar reveals that these are in sound conditions, Bridge even being old, its strength is comparable with good quality of mass cement concrete. Further more, strength on the broken portion and on the intact portion was found to be of the same order.

f) Result of ultrasonic velocity reveals that there is no crack inside any of the piers and abutments. It also indicates fairly good strength. Further more, results on broken as well as intact portions are comparable.

g) Results of Acoustic Emission technique reveals that no cracks are there any where in any of the piers and abutments. If any cracks were there, then results might have been approximately 10 times more. Furthermore, here also, results on broken portion as well as on intact portions are comparable.

h) Results of the GPR also indicates presence of no any cracks in any of the piers and abutments. Broken portion as well as intact portion were found to be the same quality.

i) Laboratory testing of the bricks and masonry also reveals that the bridge substructure is having very good strength i.e. more than the required value.

) If masonry were weak, these bricks might had been crumbled and not broken in big size mass. This failure mechanism reveals that pier no. 3 and 4 were partly broken due to excessively very high impact of derailment which might had been beyond the ultimate strength limit.

k) Comparison of various results with bridge inspection register reveals that bridge was not having any problem and it was in excellent condition.

Finally, above factual positions considered with presence of point of drop about 41 m in the rear of bridge reveals that damage to the bridge took place due to derailment of the trains moving at its full speed of about 130 kmph. Bridge is not the cause of derailment/accident.

***

Table -1

Compressive strength of bricks

(Samples collected from Bridge site No.445 and from RDSO premises.)

Brick No.	Location of collection	Frog marking	Dimensions In mm	X-sectional area in mm2	Total crushing force kN	Compressive strength in N/mm2
1	Bridge site	ERSL-7	245x125x75	30625	510	16.65
2	-do-	ERSL-5	250x125x75	31250	765	24.48
3	do-	ERSL-7	250x125x75	31250	465	14.88
4	-do-	ERSL-7	245x125x75	30625	570	18.61
5	-do-	ERSL-7	247x125x75	30875	750	24.29
6	-do-	M&R	240x110x70	26400	1770	67.00
7	-do-	Not clear	240x110x70	26400	1665	63.00
8	RDSO Premises	R&S	240x110x70	26400	315	11.93
9	RDSO Premises	R&S	240x110x70	26400	420	15.91
10	RDSO Premises	R&S	240x110x70	26400	450	17.00
11	Bridge site -A1	SM	205x120x75	24600	405	16.46
12	-do- A2	ERSL-3	240x120x75	28800	750	26.04
13	-do- P3	ERSL-5	235x120x75	28200	760	26.95
14	-do- P4	ERSL-7	240x120x75	28800	710	24.65

1. Bricks were tested as per IS: 3495 (Pt-I to 4) –1992, within the facilities available in the B&S Lab.
2. Brick nos.1, 2, 3 & 8 were tested on 27.9.02, before the stipulated time period. Whole of the testing procedure was completed in two days i.e. on 26.9.02 & 27.9.02.
3. Remaining bricks were tested as per the procedure laid on in the relevant IS Code, on 3.10.02
4. The size of brick no.A1 got reduced because of the grinding of broken corner to make the brick faces parallel.
5. Bricks were tested under 3000 KN capacity compression testing machine available in B&S Lab. The calibration of the machine is valid up to 1.4.03.

Table -2

COMPRESSIVE STRENGTH OF BRICK MASONRY BLOCKS

(Sample Collected From Bridge No.445 (Dhawa Bridge) Eastern Railway

Block No.	Location	Size(mm)	Cross sectional area (mm^2)	Total crushing force KN	Compressive strength N/mm^2
1	A1	247x240x70	59280	2010	33.91
2	P3	255x245x70	62475	800	12.80
3	P4	255. x240x70	61200	1500	24.51

1. Blocks were taken out from masonry boulders collected from bridge site by chiseling.
2. The testing was done from 1.10.02 to 7.10.02
3. No IS specification was followed, edges and faces were flushed with 1:1 cement sand mortar for making the surface smooth.
4. The blocks were tested under 3000kN capacity compression testing machine of B&S lab. The calibration of machine is valid upto 01.04.03.
5. The samples from A2 location could not be chiseled out as the boulders broke during chiseling.

Table -3

AE Test Results

Bridge No. 445 near Rafiganj E.Rly.

S.No.	Pier No	Location on pier	Distance between two sensors in mm	Total no. of trains	Details of AE parameters					
					Max. Amp	Total Hits	Total Events	Total counts	Total Energy	Ref. No.
1	1	L-11	400	1 Passanger	< 40	3	0	5	1	Fig. 1
		Brick Masonry								
		MGS end								
2	2	L-8	625	2 passanger	< 40	14	0	16	3	Fig. 2
		Brick Masonry		3 Goods						
		MGS end								
3	3	L-1	550	5 passanger	61.8	2322	209	18463	13985	Fig. 3
		Conc.Bed Block		11 goods						
		MGS end								
		L-2	590	1 passanger	< 40	5	0	8	1	Fig. 4
		Brick Masonry		5 Goods						
		MGS end								
		L-3	540	9 passanger	61.8	5338	694	19479	27448	Fig. 5
		Brick Masonry		8 Goods						
		Gaya end								
		L-4	665	9 passanger	75.9	1944	238	5539	8541	Fig. 6
		Brick Masonry		8 Goods						
		L-7	325	2 passanger	60	915	142	4190	8547	Fig. 7
		Brick Masonry		3 Goods						
		Gaya end								
4	4	L-10	460	1 passanger	< 40	8	0	36	43	Fig. 8
		Brick Masonry								
		Gaya end								

Results of Rebound Hammer Test

Abutment No.A1

Table -4

SN	End	Bed Block/Masonry	Location	Rebound No	Mean Rebound number	Compressive StrengthN/mm2
1	MGS	B	B1	46	48	48
2		B	B2	49		
3		B	B3	49		
4		B	B4	48		
5		M	M0	54	50.7	53.5
6		M	M1	54		
7		M	M2	54		
8		M	M3	51		
9		M	M4	60		
10		M	M5	49		
11		M	M6	50		
12		M	M7	45		
13		M	M8	53		
14		M	M9	46		
15		M	M10	51		

Abutment No.A2

Table -5

SN	End	Bed Block/Masonry	Location	Rebound No	Mean Rebound number	Compressive Strength N/mm2
1	Gaya	B	B1	48	43.5	48
2		B	B2	49		
3		B	B3	-	Reading cannot be taken due to placement of crib.	
4		B	B4	-		
5		M	M1	50	50.6	53.5
6		M	M2	48		
7		M	M3	54		
8		M	M4	-	Reading cannot be taken due to placement of crib.	

Results of Rebound Hammer Test

Table -6

Pier No.P1

SN	End	Bed Block/Masonry	Location	Rebound No.	Mean Rebound number	Compressive Strength N/mm2
1	MGS	M	M1	54	49.4	49.8
2		M	M2	50		
3		M	M3	50		
4		M	M4	47		
5		M	M5	48		
6		M	M6	46		
7		M	M7	50		
8		M	M8	48		
9		M	M9	51		
10		M	M10	50		
1	GAYA	M	M1	46	49.2	49.8
2		M	M2	50		
3		M	M3	50		
4		M	M4	52		
5		M	M5	50		
6		M	M6	48		
7		M	M7	49		
8		M	M8	50		
9		M	M9	46		
10		M	M10	51		

Table -7

Pier No.2

SN	End	Bed Block/Masonry	Location	Rebound No.	Mean Rebound number	Compressive Strength N/mm2
1	MGS	M	M1	54	50.5	51.7
2		M	M2	51		
3		M	M3	48		
4		M	M4	52		
5		M	M5	49		
6		M	M6	50		
7		M	M7	52		
8		M	M8	47		
9		M	M9	50		
10		M	M10	52		
1	GAYA	M	M1	49	49.4	49.8
2		M	M2	50		
3		M	M3	52		
4		M	M4	54		
5		M	M5	48		
6		M	M6	44		
7		M	M7	49		
8		M	M8	50		
9		M	M9	48		
10		M	M10	50		

Results of Rebound Hammer Test

Table -8

Pier No.3

SN	End	Bed Block /Masonry	Location	Rebound No.	Mean Rebound No	Compressive Strength N/mm2
1	TOP UP (-90degree)	B	B1	45	39.6+2.7 = 42.3	37
2		B	B2	38		
3		B	B3	36		
4		B	B4	42		
5		B	B5	40		
6		B	B6	37		
7		B	B7	41		
8		B	B8	39		
9		B	B9	47		
10		B	B10	39		
1	TOP DN(-90 degree)	B	B1	48	44.3+2.7=47	46.1
2		B	B2	50		
3		B	B3	57		
4		B	B4	42		
5		B	B5	43		
6		B	B6	39		
7		B	B7	41		
8		B	B8	49		
9		B	B9	45		
10		B	B10	42		
1	MCS	M	M1	40	45.9	44.2
2		M	M2	45		
3		M	M3	44		
4		M	M4	44		
5		M	M5	46		
6		M	M6	48		
7		M	M7	50		
8		M	M8	47		
9		M	M9	50		
10		M	M10	45		
1	GAYA	M	M1	39	45	42.4
2		M	M2	46		
		M	M3	44		
4		M	M4	42		
5		M	M5	47		
6		M	M6	45		
7		M	M7	44		
8		M	M8	50		
9		M	M9	47		
10		M	M10	46		
1	BROKEN PORTION(-90 degree)	B	B1	42	41.6+2.7 =44.3	40.6
2		B	B2	35		
3		B	B3	50		
4		B	B4	44		
5		B	B5	50		
6		B	B6	45		
7		B	B7	42		
8		B	B8	40		
9		B	B9	46		
10		B	B10	39		
1	MORTAR	MR	MR 1	41	35.9	26.8
2		MR	MR 2	44		
3		MR	MR 3	40		
4		MR	MR 4	39		
5		MR	MR 5	41		
6		MR	MR 6	38		
7		MR	MR 7	46		
8		MR	MR 8	31		
9		MR	MR 9	29		
10		MR	MR 10	28		

Results of Rebound Hammer Test

Table -9

Pier No. 4

SN	End	Bed Block/ Masonry	Location	Rebound No.	Mean Rebound number	Compressive Strength N/mm2
1	TOP (-90 degree)	B	B1	42	39.8+2.7=42.5	37
2		B	B2	40		
3		B	B3	43		
4		B	B4	38		
5		B	B5	42		
6		B	B6	36		
7		B	B7	38		
8		B	B8	40		
9		B	B9	35		
10		B	B10	44		
1	MGS	M	M1	46	44.1	40.6
2		M	M2	42		
3		M	M3	41		
4		M	M4	Broken		
5		M	M5	"		
6		M	M6	45		
7		M	M7	48		
8		M	M8	40		
9		M	M9	47		
10		M	M10	44		
1	GAYA	M	M1	51	46.4	44.2
2		M	M2	40		
3		M	M3	40		
4		M	M4	54		
5		M	M5	Broken		
6		M	M6	42		
7		M	M7	50		
8		M	M8	52		
9		M	M9	50		
10		M	M10	Broken		
1	Broken Portion (-90 degree)	B	B1	44	43.28+2.2= 45.4	42.4
2		B	B2	52		
3		B	B3	42		
4		B	B4	48		
5		B	B5	42		
6		B	B6	52		
7		B	B7	46		
8		B	B8	53		
9		B	B9	40		
10		B	B10	41		
1	MORTAR	MR	MR 1	38	34.9	25.1
2		MR	MR 2	42		
3		MR	MR 3	43		
4		MR	MR 4	28		
5		MR	MR 5	48		
6		MR	MR 6	27		
7		MR	MR 7	29		
8		MR	MR 8	36		
9		MR	MR 9	39		
10		MR	MR 10	40		

Results of Ultrasonic Test

Table -10

Abutment No.A1

SN	End	Bed Block/ Masonry	Location	Pulse Velocity in m/sec	Remarks
1	GAYA (Face towards MGS)	B	B1	-	No signal received
2		B	B2	-	No signal received
3		B	B3	2870	Surface measurement
4		B	B4	2640	-do-
5		M	M0	1070	-do-
6		M	M1	1020	-do-
7		M	M2	-	No signal received
8		M	M3	-	No signal received
9		M	M4	1090	Surface measurement
10		M	M5	-	No signal received

Abutment No.A2

Table -11

SN	End	Bed Block/ Masonry	Location	Pulse Velocity in m/sec	Remarks
1	MGS (Face towards GAYA)	B	B1	-	Reading can not be taken due to placement of crib
2		B	B2	-	
3		B	B3	1850	Surface measurement
4		B	B4	1850	Surface measurement

Criteria For Pulse Velocity For Concrete
IS 13311 (Part-I) 1992

Sn	Pulse velocity by cross prot ing (Direct method) Km/Sec.	Concrete quality
1	Above 4.5	Excellent
2	3.5 - 4.5	Good
3	3.0 – 3.5	Medium
4	Below 3.0	Poor

* No criteria exists for measurement of pulse velocity by semi-direct or indirect method

Results of Ultrasonic Test

Pier No.P1

Table -12

SN	End	Bed Block/Masonry	Location	Pulse Velocity in m/sec	Remarks
1	Face towards GAYA	M	M1	830	Surface measurement
2		M	M2	850	-do-
3		M	M3	-	No signal received
4		M	M4	490	Surface measurement
5		M	M5	580	-do-
1	Face towards MGS	M	M1	540	-do-
2		M	M2	420	-do-
3		M	M3	510	-do-
4		M	M4	370	-do-
5		M	M5	800	-do-

Pier No.P2

Table -13

SN	End	Bed Block/Masonry	Location	Pulse Velocity in m/sec	Remarks
1	Face towards GAYA	M	M1	1020	Surface measurement
2		M	M2	1370	-do-
3		M	M3	1380	-do-
4		M	M4	1010	-do-
5		M	M5	1000	-do-
1	Face towards MGS	M	M1	680	-do-
2		M	M2	610	-do-
3		M	M3	930	-do-
4		M	M4	1310	-do-
5		M	M5	1188	-do-

Results of Ultrasonic Test

Pier No.P3

Table -14

SN	End	Bed Block/ Masonry	Location	Pulse Velocity in m/sec	Remarks
1	TOP	B	B1	1630	Surface measurement
2		B	B2	4050	Semi direct measurement
3	TOP(Broken	B	B3	1650	Surface measurement
4	Portion)	B	B4	2530	Semi direct measurement
1	Face towards GAYA	M	M1	710	Surface measurement
2		M	M2	-	No signal received
3		M	M3	1020	Surface measurement
4		M	M4	910	-do-
5		M	M5	1060	-do-
1	Face towards MGS	M	M1	1210	-do-
2		M	M2	-	Reading can not be taken due to placement of crib
3		M	M3	770	Surface measurement
4		M	M4	1190	-do-
5		M	M5	740	-do-

Pier No.P4

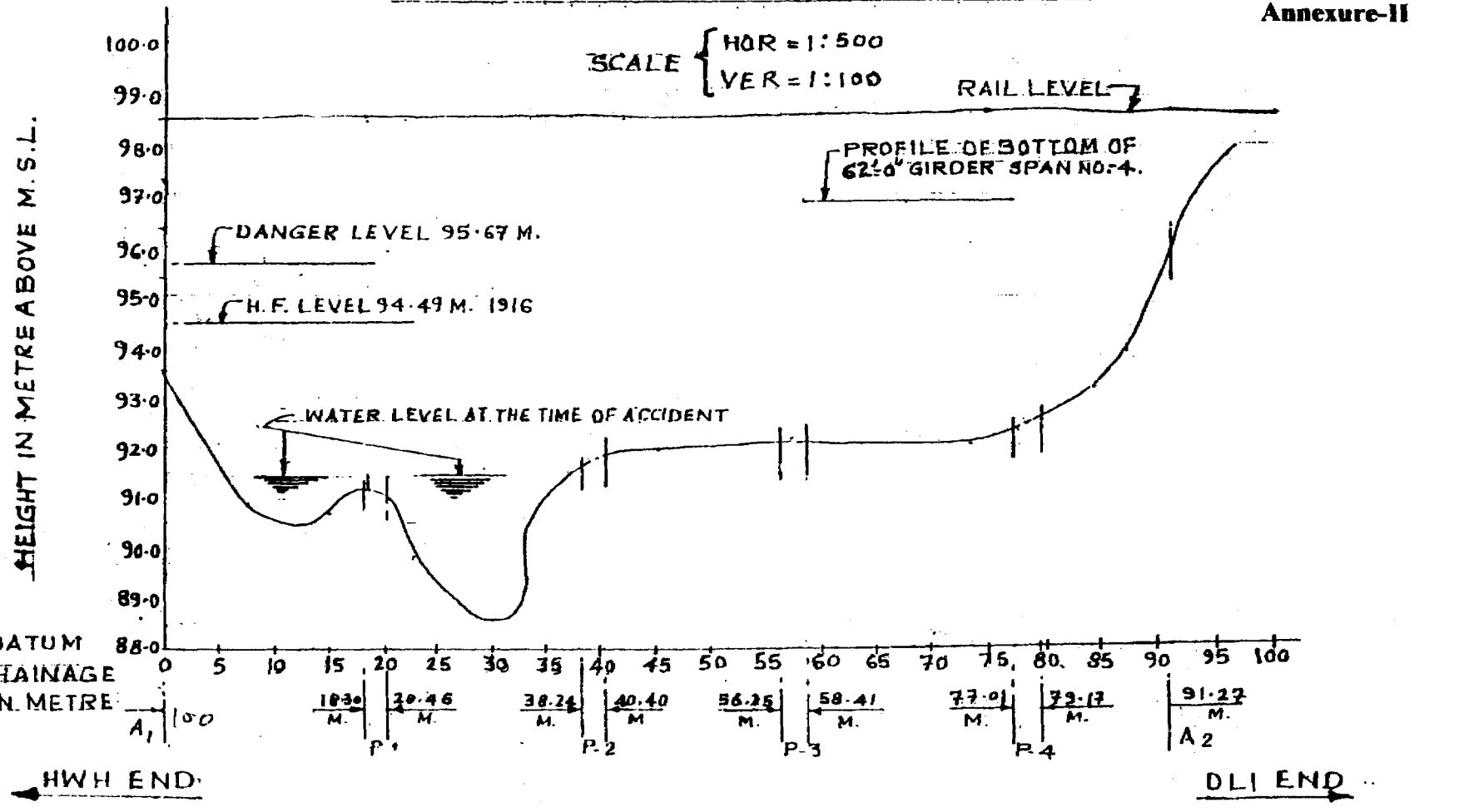
Table -15

SN	End	Bed Block/Masonry	Location	Pulse Velocity in m/sec	Remarks
1	TOP	B	B1	1650	Surface measurement
2		B	B2	1170	Semi direct measurement
3	TOP (Broken	B	B3	1930	Surface measurement
4	Portion)	B	B4	2570	Semi direct measurement
1	Face towards GAYA	M	M1	-	No reading was obtained as portion was broken
2		M	M2	1120	Surface measurement
3		M	M3	1190	-do-
4		M	M4	1170	-do-
5		M	M5	1190	-do-
1	Face towards MGS	M	M1	840	Surface measurement
2		M	M2	910	-do-
3		M	M3	1040	-do-
4		M	M4	-	No reading was obtained as portion was broken
5		M	M5	-	No reading was obtained as portion was broken

SR.DEN/CO-ORD/116

Annexure-II

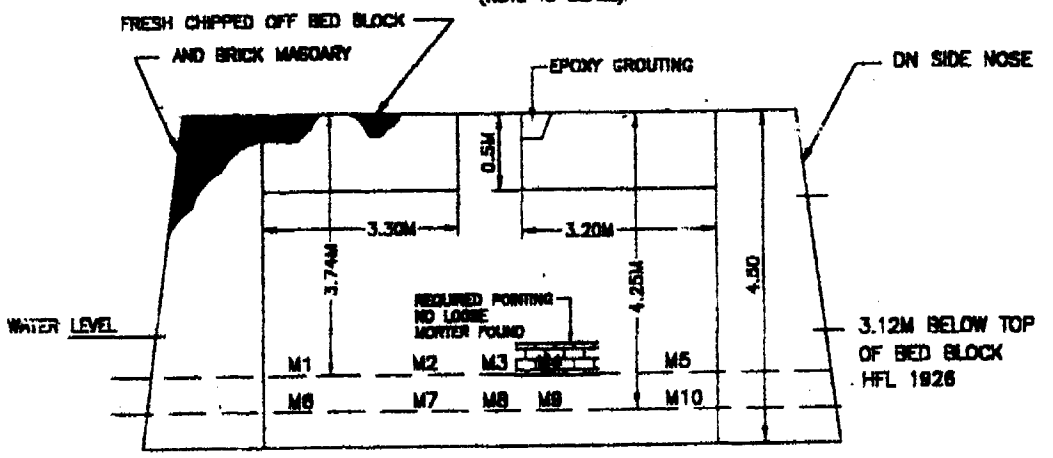
PROFILE OF RIVER BED AT BR. NO:445 AT Km. 508/21-27 IN BETWEEN STATION RAFIGANJ AND DEO ROAD.



DRM/MGS SKETCH PLAN NO.101-200

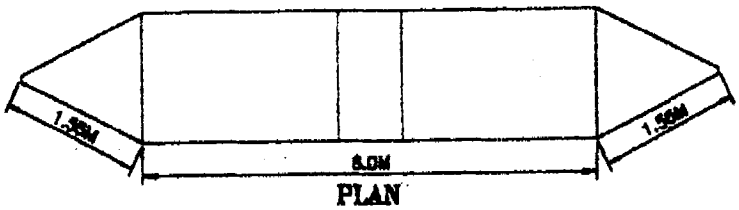
PIER No.1

(NOTE TO SCALE)

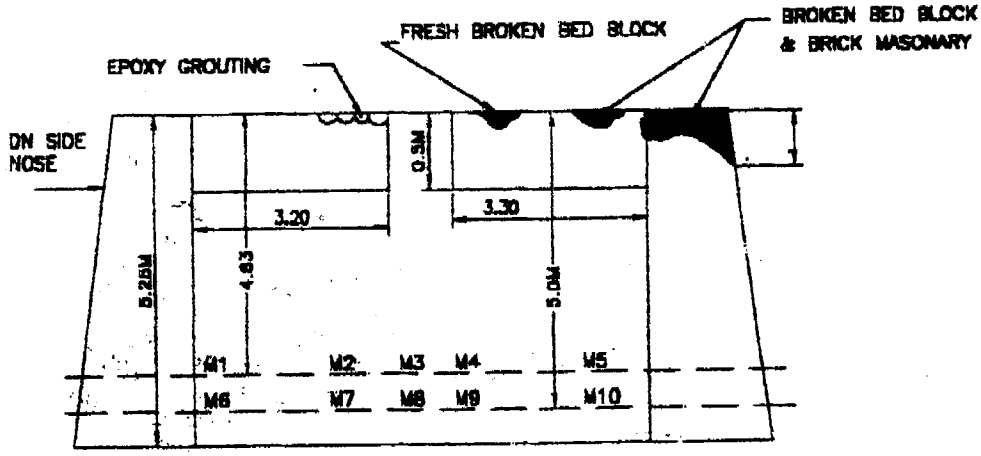


ELEVATION (HWH END)

(DIRECTION OF FLOW)



PLAN



ELEVATION (MGS.END)

(DIRECTION OF FLOW)

NOTE

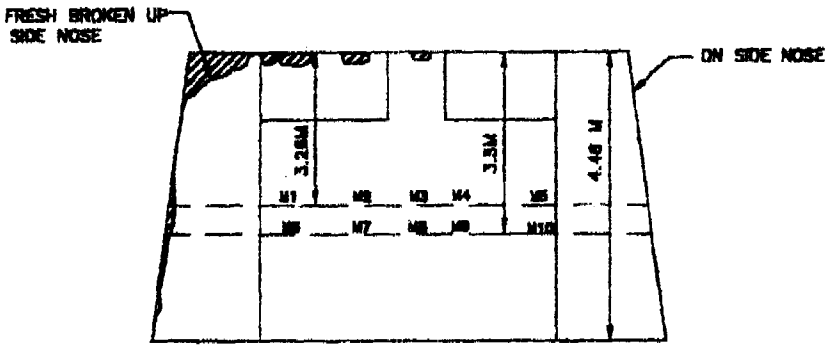
1. CONDITION OF MASONARY IS SOUND, NO WEATHERING EFFECT OBSERVED.
2. NO LOOSENESS AND LEACHING OF MORTER FOUND.
3. CONDITION OF EPOXY GROUTING IS GOOD. NEITHER ANY LOOSENESS NOR FURTHER DEVELOPMENT OF CRACK OBSERVED.
4. NO SIGN OF SCOUR OR SETTLEMENT OF FOUNDATION WAS OBSERVED.

DETAILS OF SUB–STRUCTURE OF BRIDGE No.445 MGS–GAYA SECTION

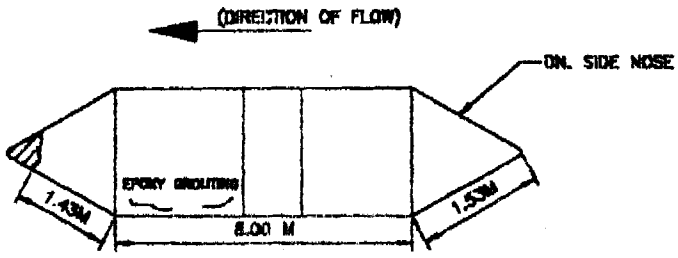
INSPECTED BY :DIR/BBS/T

PIER No.2

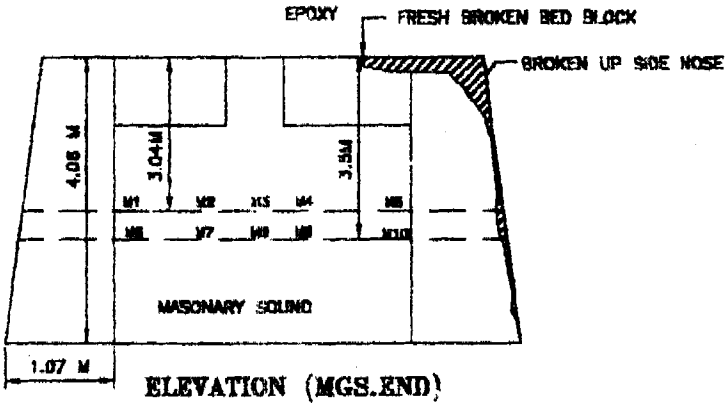
(NOTE TO SCALE)



ELEVATION (HWH END)



PLAN



ELEVATION (MGS.END)

(DIRECTION OF FLOW)

NOTE

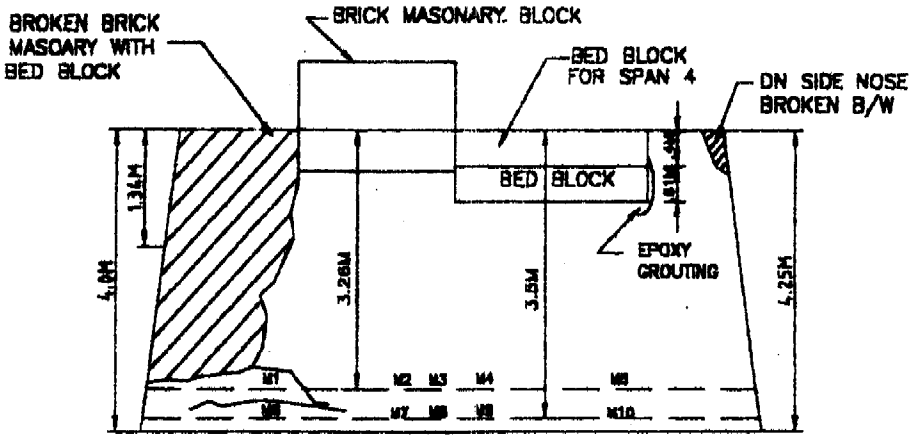
1. CONDITION OF MASONARY IS SOUND, NO WEATHERING EFFECT OBSERVED.
2. NO LOOSENESS AND LEACHING OF MORTER FOUND.
3. CONDITION OF EPOXY GROUTING IS GOOD. NEITHER ANY LOOSENESS NOR FURTHER DEVELOPMENT OF CRACK OBSERVED.
4. NO SIGN OF SCOUR OR SETTLEMENT OF FOUNDATION WAS OBSERVED.

DETAILS OF SUB-STRUCTURE OF BRIDGE No.445 MGS-GAYA SECTION

INSPECTED BY :DR/B&S/T

PIER No.3

(NOTE TO SCALE)

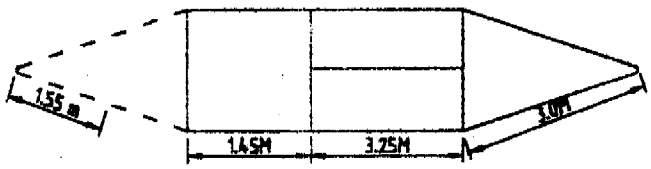


ELEVATION P–3 HWH END

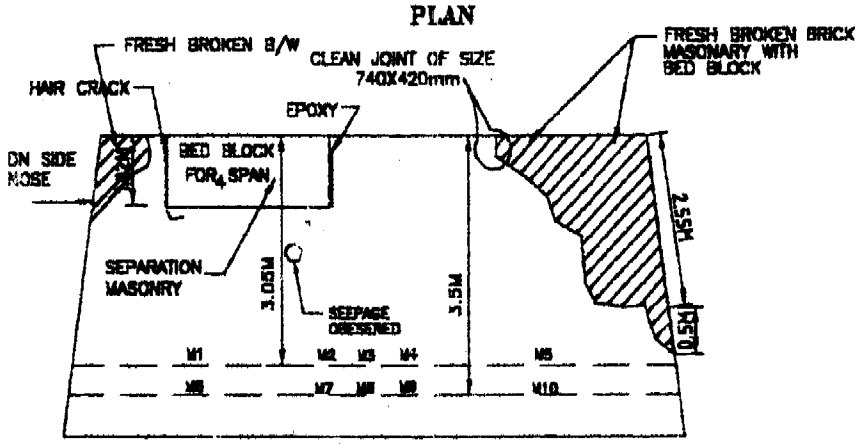
ELEVATION (HWH END)

NORTH (FOR PLAN)

(DIRECTION OF FLOW)



PLAN



ELEVATION (MGS.END)

(DIRECTION OF FLOW)

NOTE

1. CONDITION OF MESONARY IS SOUND, NO WEATHERING EFFECT OBSERVED.
2. NO LOOSENESS AND LEACHING OF MORTER FOUND.
3. CONDITION OF EPOXY GROUTING IS GOOD. NEITHER ANY LOOSENESS NOR FURTHER DEVELOPMENT OF CRACK OBSERVED.
4. NO SIGN OF SCOUR OR SETTLEMENT OF FOUNDATION WAS OBSERVED.

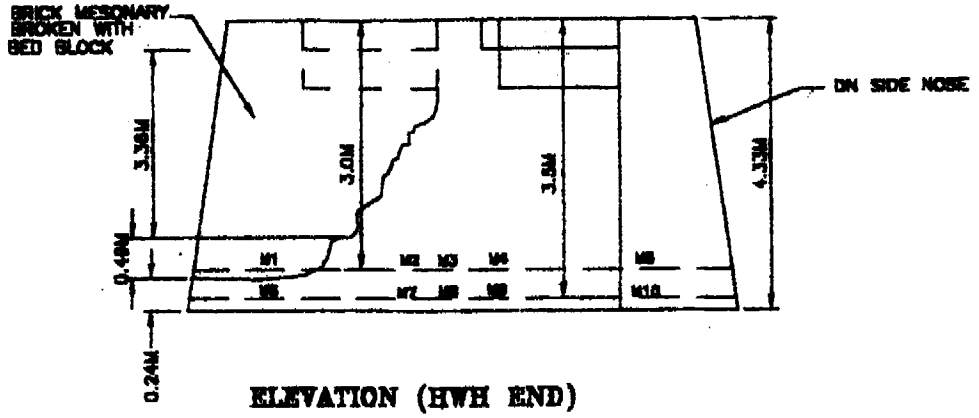
DETAILS OF SUB–STRUCTURE OF BRIDGE No.445 MGS–GAYA SECTION

INSPECTED BY :DIR/B&S/T

Annexure -VI

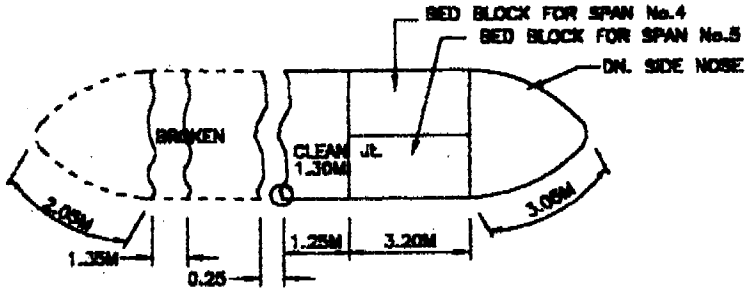
PIER No.4

(NOTE TO SCALE)

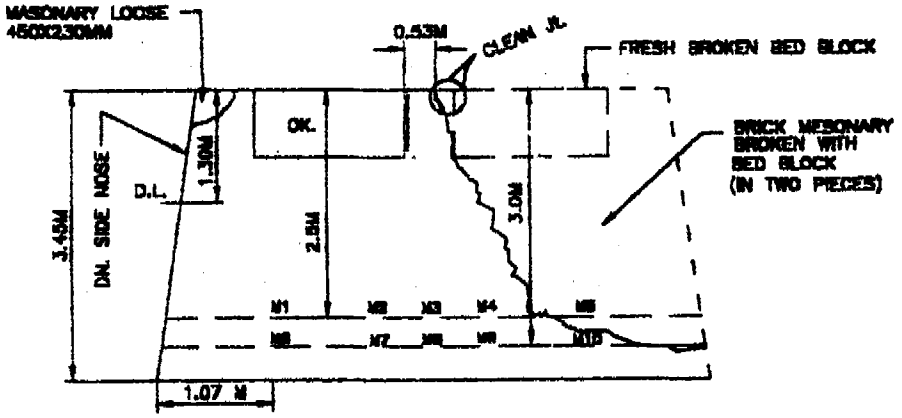


ELEVATION (HWH END)

(DIRECTION OF FLOW)



PLAN



ELEVATION (MGS.END)

(DIRECTION OF FLOW)

NOTE

1. CONDITION OF MESONARY IS SOUND, NO WEATHERING EFFECT OBSERVED.
2. NO LOOSENESS AND LEACHING OF MORTER FOUND.
3. NO SIGN OF SCOUR OR SETTLEMENT OF FOUNDATION WAS OBSERVED.

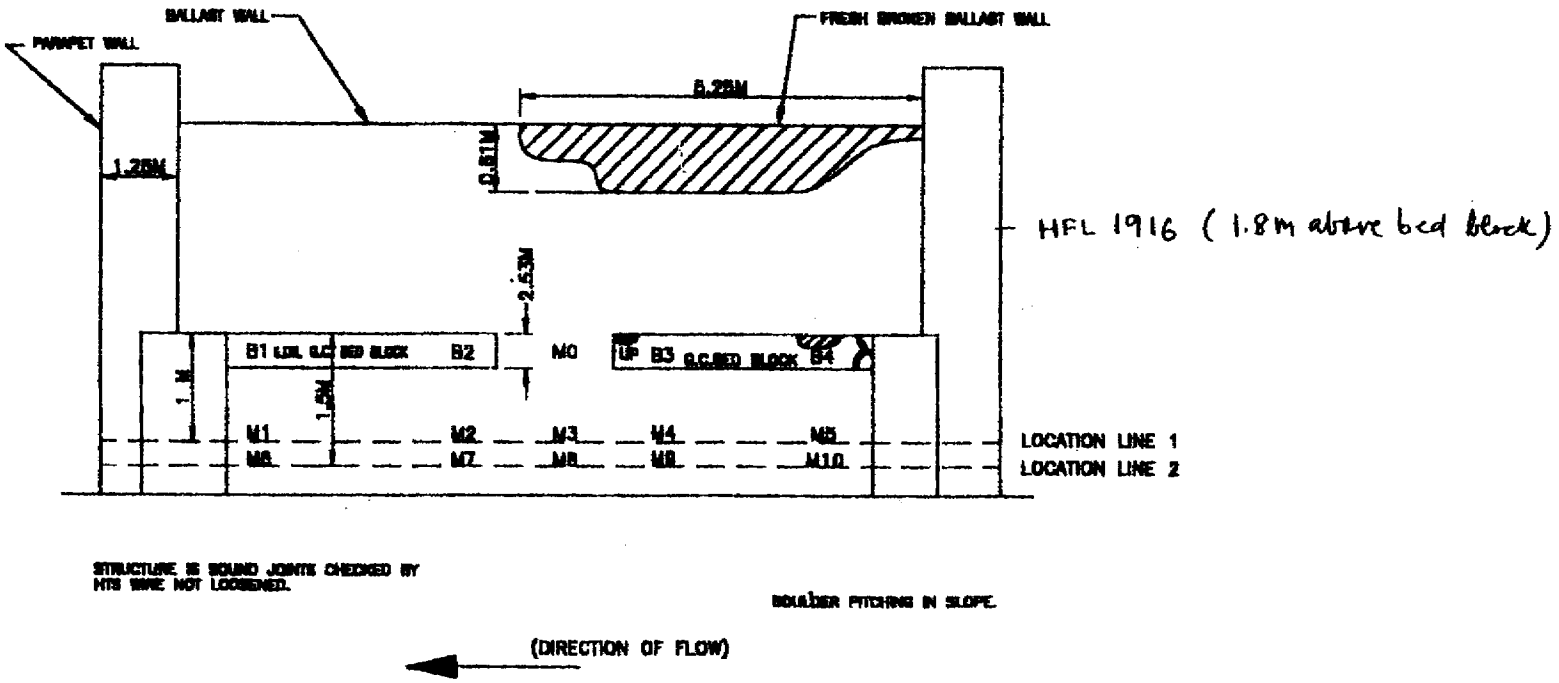
DETAILS OF SUB-STRUCTURE OF BRIDGE No.445 MGS-GAYA SECTION

INSPECTED BY :DrR/BMS/T

Annexure-VII

ABUTNENT No.1

(NOTE TO SCALE)



IN C/W DERAILMENT OF 2301 UP (HOWRAH–DELHI RAJDHANI EXPRESS) ON 8.9.2002 BETWEEN RAFIGANJ AND DEO–ROAD. E.RLY.

NOTE

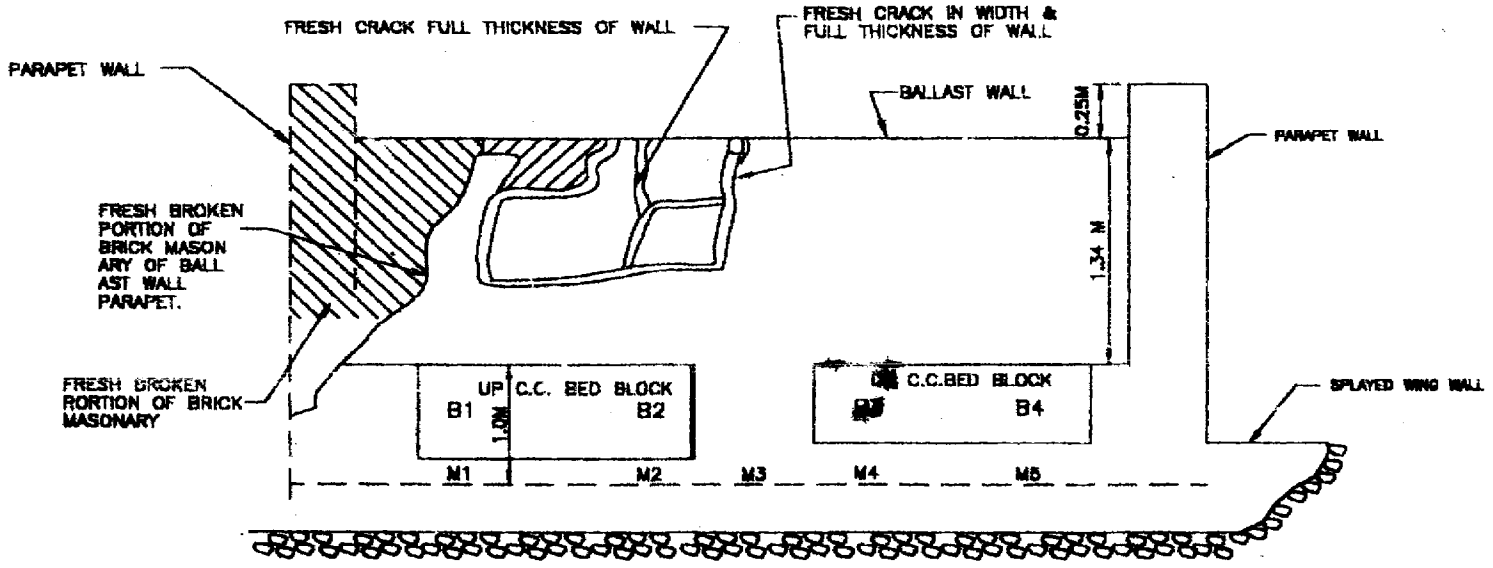
1. CONDITION OF MESONARY IS SOUND, NO WEATHERING EFFECT OBSERVED.
2. NO LOOSENESS AND LEACHING OF MORTER FOUND.
3. NO SIGN OF SCOUR OR SETTLEMENT OF FOUNDATION WAS OBSERVED.

DETAILS OF SUB–STRUCTURE OF BRIDGE No.445 MGS–GAYA SECTION

INSPECTED BY :DIR/BMS/T

ABUTMENT No.2

(NOTE TO SCALE)



ELEVATION (MGS.END)

(DIRECTION OF FLOW) →

NOTE

1. CONDITION OF MESONARY IS SOUND, NO WEATHERING EFFECT OBSERVED.
2. NO LOOSENESS AND LEACHING OF MORTER FOUND.
3. NO SIGN OF SCOUR OR SETTLEMENT OF FOUNDATION WAS OBSERVED.

DETAILS OF SUB-STRUCTURE OF BRIDGE No.445 MGS-GAYA SECTION

INSPECTED BY :DIR/B&S/T

Annx - 9

Reduced Levels on the bridge

Datum 100.00m at A1 Dn line Rail level

Details	A_1		P_1		P_2		P_3		P_4		A_2	
RL of Rail Level Dn Line	100.000		100.030		100.040		100.030		100.020		100.020	
RL of Top of bed block Dn line	97.570	97.570	97.595	97.595	97.570	97.570	97.580	98.080	98.080	98.285	98.285	
RL of Top of bed block up line	97.570	97.570	97.595	97.590	97.560	97.560	97.580	98.080	98.080	98.285	98.285	
Levels of HFL marks with Year (Only Highest one).	98.390 year 1948		~~95.865 in year 1916~~									
Level of Indicated Danger level									97.090			

Broken Piers

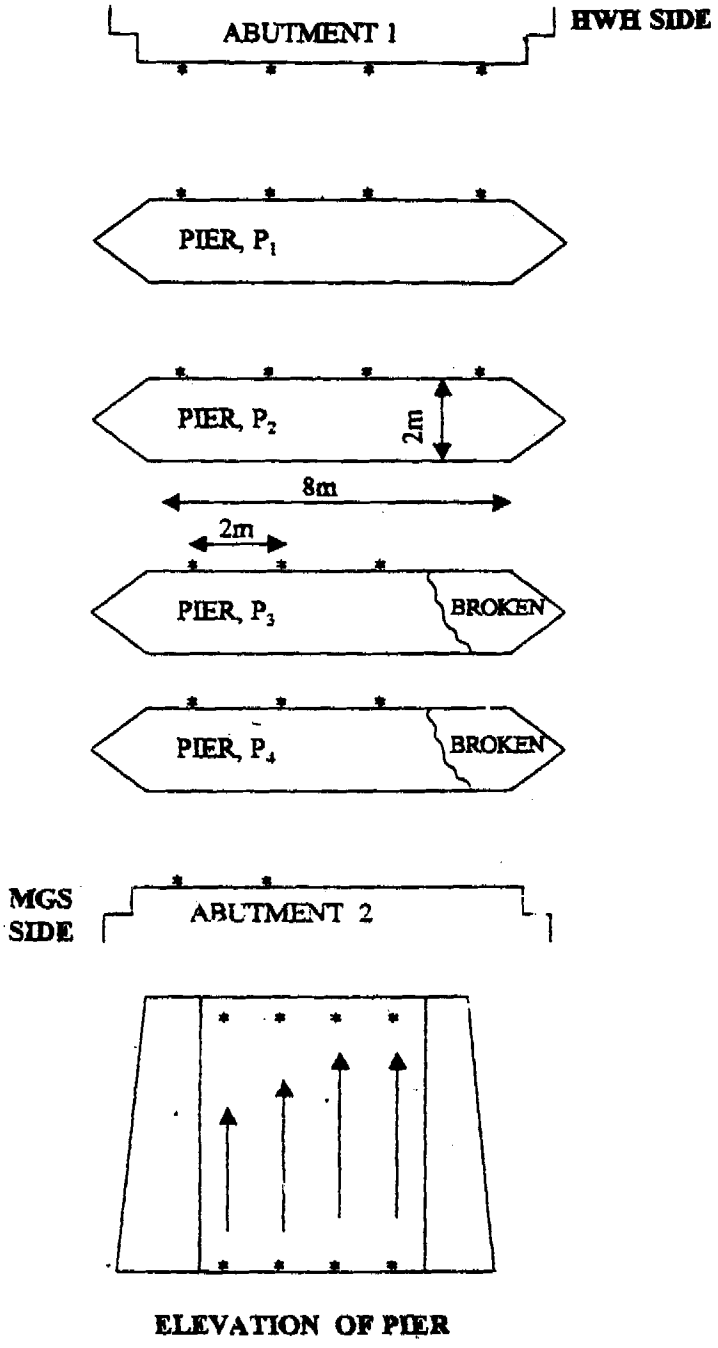
— No 3 — 2 No. 4 —

Driver Members (3.7)

Asst Engineering

Annexure- X

Scheme of GPR Investigation of Piers of Bridge on river Dhava, near Rafiganj station on Gaya - Mughalsarai Section, E.R.



ELEVATION OF PIER

NOTE: GPR ANTENNA MOVED AT LOCATIONS MARKED AS '*' FROM BOTTOM TO TOP PIER TOUCHING PIER SURFACE.

ANNEXURE - VIII

EASTERN RAILWAY
17, Netaji Subhas Road
Fairlie Place, KOLKATA-700001

No. W(3)/65/7/2 Dated 31.10.2002

The Commissioner of Railway Safety
Eastern Circle
14, Strand Road
KOLKATA.

Sub: Checking of design of Bridge no. 445 between Rafiganj and Deo Road stations of Gaya-MGS section.

Design calculations for checking of design of Pier No.3 (which is heaviest loaded pier as it supports 60' and 62' spans) of the bridge under subject was sent to RDSO for checking vide this office letter no. W(3)/65/7/2 dated 26.9.2002. After checking of the design calculations, RDSO gave certain observations vide their letter no. CBS/MBE dated 28.9.2002. Revised design calculations complying the RDSO's observations was submitted to RDSO for checking and after checking the revised design calculations, RDSO have advised vide their letter no. CBS/MBE dated 24.10.02 that pier has been found safe for MBG loading-1987. A copy of RDSO's letter no. CBS/MBE dt.24.10.02 is enclosed herewith for your information.

2. RDSO also undertook the checking of design of super structure of the bridge. Necessary details for checking of design of girders of bridge were furnished to RDSO. RDSO vide their letter no. CBS/MBE dated 30.10.2002 have advised that girders and bearings are safe for MBG loading-1987. Copy of RDSO's letter no. CBS/MBE dated 30.10.02 is also enclosed.

DA: As above

(Radhey Shyam)
Chief Bridge Engineer

//Fax : 91-0522-458500
तार : 'रेलमानक' लखनऊ
Telegram : 'RAILMANAK', Lucknow
टेलीफोन/Tele : 451200 (PBX)
450567 (DID)

सत्यमेव जयते

भारत सरकार - रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ - 226011
Government of India-Ministry of Railways
Research Designs & Standards Organisation
Lucknow - 226011

Accredited by the RvA
ISO-9001 REGISTERED ORGANISATION
DNV Certification B.V. THE NETHERLANDS

No: CBS / MBE

Dt.24.10.02

The Chief Bridge Engineer
Eastern Railway
17, Netaji Subhas Road
Fairlie Place
Kolkata - 700601

Sub: Checking of Design of substructure of Bridge no. 445 between Rafiganj and Deo Road on Gaya - MGS section

Ref: Your office letter No. W(3)/65/7/2 /L dated 10.10.2002

The calculations for checking existing pier P.3 of Bridge no. 445 between Rafiganj and Deo Road on Gaya - MGS section, submitted by Eastern Railway vide above referred letter, have been perused and the pier has been found safe for MBG loading - 1987.

(R.S.Khurana)
Director/B&S/CBII

: 91-0522-458500
: 'रेलमानक' लखनऊ
ग्राम : 'RAILMANAK', Lucknow
टेलीफोन/Telo : 451200 (PBX)
460067 (DID)
Tele fax: 91-0522-450398

सत्यमेव जयते

भारत सरकार - रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन
लखनऊ - 226011
Government of India Ministry of Railways
Research Designs & Standards Organisation
Lucknow - 226011

No. CBS/MBE

Date - 30-10-2002

BY FAX

Commissioner of Railway Safety,
Eastern Circle,
12th floor, Multistoried Building of Eastern Railway,
14 Strand Road,
Kolkata

Sub: Details of plate girder Bridge no. 445 between Rafiganj and Deo Road in Gaya-Mughalsarai section of Eastern Railway.

Ref: (i) This office fax of even number dated 22.10.2002.

(ii) Dy.CE/BR/HQ/, E. Railway Kolkata's letter no. W(3)/65/7/2 dt. 23.10.02

(iii)CBE/ E. Railway, Kolkata's letter no. W (3)/65/7/2 dated 29.10.2002.

(iv)Telephonic conversation on the subject matter with CBE/Eastern Railway.

(v) CBE/ E. Railway, Kolkata's fax no. W (3)/65/7/2 dated 30.10.2002.

(vi)CBE/E Railway, Kolkatt'a letter no. W(3)/65/7/2/L dated 10.10.2002

A. SUPERSTRUCTURE & BEARINGS

1.0 In connection with above bridge, details as per Annexure-I were asked from CBE, Eastern Railway vide letter under reference (i).

2.0 Details furnished by Eastern Railway are as per Annexure-II. No design calculations were submitted by Eastern Railway for superstructure and bearings.

3.0 On the basis of details furnished through drawings and over telephone, scrutiny has been carried out on following considerations:

i) Permissible stresses for bending and shear for 40', 60' and 62'-6" girders have been taken as per TABLE-II of Steel Bridge Code.

ii) From fatigue consideration, scrutiny has been done for 2 million and 4 million cycles.

iii) Permissible shear stresses for Holding Down bolts has been taken as per TABLE-II of Steel Bridge Code.

iv) Dispersion of longitudinal forces has been taken as per clause 2.8.3.2 of Bridge Rules

v) For 40', 60' and 62'-6" girders, details for calculation have been taken from sketches for cross section at center as reiterated by CBE, Eastern Railway vide fax no. W (3)/65/7/2 dated 30.10.2002.

4.0 Subject to the consideration at 3.0 above, calculated stresses in girders and sliding bearings have been found to be within safe limit for MBG loading-1987.

B. SUBSTRUCTURE -

The calculations for checking existing pier P3 of Bridge No. 445 , submitted vide letter (vi) referred above have been scrutinized and the piet has been found safe for MBG Loading - 1987.

30/10/02

(R S Khurana)
Director (B&S)/CB-II
for Director General (B&S)

Copy to:

i) CCRS, N.E. Railway DRM Office Compound, Ashok Marg, Lucknow-226002
ii) Chief Bridge Engineer, Eastern Railway, Fairlie Place, Kolkata-700001

Annexure-I

DETAILS ASKED FROM CBE, EASTERN RAILWAY

In connection with Bridge no. 445 between Rafiganj and Deo Road in Gaya-Mughalsarai section of Eastern Railway, following details were asked from CBE, Eastern Railway:

1. The Drawings
   - General arrangement
   - Bearings
   - All other drawings
2. The design calculations
3. Loading standard for which bridge was designed and its details
   - Locomotive
   - TLD
   - Max. speed considered
   - TE and BF values if any
4. The train formation operated in the section for passenger as well as goods traffic

Annexure-II

DETAILS SUPPLIED BY CBE, EASTERN RAILWAY

In connection with bridge no. 445 between Rafigunj and Deo Road in Gaya Mughalsarai section of Eastern Railway, following details were supplied by CBE, Eastern Railway:

1. Blue prints/ photo copies of following drawings were sent:

   (i) Chief Engineer's Drawing No. 82208.
   (ii) Chief Engineer's Drawing No. B-1137-44.
   (iii) Chief Engineer's Drawing No. B-362-58.
   (iv) Chief Engineer's Drawing No. B-810-50.
   (v) Chief Engineer's Drawing No. B-130-58.
   (vi) Chief Engineer's Drawing No. B-517-2002.
   (vii) Chief Engineer's Drawing No. B-518-2002.
   (viii) Chief Engineer's Drawing No. B-57-58.
   (ix) Chief Engineer's Drawing No. B-506-52.

   Comments in connection with above drawings are as under:

   i) Details in blue print of drawing no. 82208 (single sheet) for 60' span girder are, in general, not legible.
   ii) Blue print of drawing no. B-1137-44 is in single sheet and appears to be general arrangement drawing.
   iii) Rest of the drawings given above are not relevant from super structure point of view.

2. Details of 62'-6" span girder as collected from site (1 sketch showing elevation)

   This is a small sketch in one copy. Details are not legible.

3. Details of heaviest train permitted on the section.

4. Cross section at center for 40', 60' and 62'-6" span (total 3 sketches).

   For 40' girder mismatch in dimensions noticed between this sketch and drawing no. B-1137-44, CBE, Eastern Railway was informed about this. He confirmed vide fax no. W (3)/65/7/2 dated 30.10.2002 that details as given in sketches attached with the letter are as available at site and may be taken as final.

5. Details of bearing plates, location strip and Holding Down bolts (1 small sketch).

   No design calculations were submitted by Eastern Railway. In view of above, lot of details were taken from CBE, Eastern Railway on telephone. Checking is based on the details furnished by CBE, Eastern Railway on phone.

ANNEXURE - IX

17, नेताजी सुभास रोड
कोलकाता -700001
Eastern Railway
17, Netaji Subhas Road,
Kolkata - 700001

No.W(4)512/4/6/Vol.III

Daed : September 21, 2002.

The Commissioner of Railway Safety,
Eastern Circle,
Kolkata.

Sub : Derailment of 2301 Up Rajdhani Express between Rafiganj and Deo Road stations on 09.09.2002.

Ref : Your letter No.394 dated 18.9.2002.

As desired by you, please find enclosed herewith a site observation with technical appreciation of the above accident made by the undersigned.

Enclo : As above.

S. R. Chaudhuri 21.9.2002

(S. R. Chaudhuri)
Principal Chief Engineer.

Report of Shri S. R. Chaudhuri, Principal Chief Engineer, Eastern Railway on derailment of 2301 Up at Km.508/21-27 between Rafiganj and Deo Road on Up line in Mughalsarai Division on 09.09.2002.

Undersigned had received information regarding the accident of 2301 Up between Rafiganju and Deo Road in around 23.40 Hrs of 09.09.2002 through Emergency Control. The special train carrying GM with all PHOD had left Howrah at 01.48 Hr. of 10.09.2002 and reached site at Km.508/21 at 09.00 Hr of 10.09.2002.

On reaching site following site observations were made :

1. On the Up line at the approach of Br. 445 (Dhawa Bridge) about 40M short of the Howrah end abutment SEJ was provided. The SEJ was intact without any disturbance. One short rail about 6.5M long was welded with SEJ which was undisturbed. Beyond this rail fish plated joint existed.

2. The first fish plated joint after the SEJ was in open condition. The rail was about 9M long and the fish plates of both the joints on the left hand side rail (9M long) were in open condition. Two pairs of Fish plate and 4 bolts on each joints were lying by the side of track except one bolt on bridge end which was attached to the rail and the rail (left hand side) was lying tilted away from the alignment of track.

3. The left hand side rail whose fish plate and bolt were lying aside was however connected to the OHE mast by bond wire which was still intact. There was no damage to this rail.

4. There was shining mark on the rail top indicating that it was a running rail.

5. There was grazing mark on the rail head at the gauge face indicating that something had grazed on the gauge face side of the rail head.

6. The ERC clips for this left hand side rail were also lying on ballast scattered but there was no breakage or damage to the ERC clip of this area.

7. It was also observed that the first clear mark of wheel drop was on few sleepers just after the fish plated joint of the L.H. side rail about 30M behind the abutment and near the insert of the sleeper. This gave an indication of the first drop of wheel immediately after the fish plated joint with no rail existing approximately 30m short of the bridge.

8. All subsequent PSC sleepers were completely crushed with HTS strands completely exposed on the LH side.

9. The Pantry Car of the train was standing in derailed condition at the location of the displaced rail in front of SEJ on Howrah-end of the abutment. Front wheel of the front bogie of First AC coach (H1) of the train was also in derailed condition and both these wheels (Rear Axle of Pantry Car and Front Axle of AC First Coach) were in the area of 9M rail which was displaced due to opening up of the fish plates. The left hand rail (9M long) was still tied to OHE mast by bond wire.

10. All other wheels of the AC First Coach and also another AC First Coach (H2) in the rear were on rail. The generator car behind the AC First Coaches was also on rail.

11. The right hand side rail, however, got sheared off near a welded joint existing ahead of the SEJ. The breakage was fresh with shining broken surface and the rails ahead on R.H. side got pushed ahead and fallen on the span between abutment and the first pier.

12. The track on the Up line on the bridge was completely damaged with all the girders fallen. The rails were hanging but all provided with 1M long fish plate with 6 bolts.

    The ballast wall on Howrah-end abutment A_1 on Up line side was completely broken and fallen indicating that coaches had derailed prior to the bridge and plaughed the track at the approach and damaged the ballast wall.

13. One piece of new 60Kg rail was lying by the side of DN line track at Howrah-end approach of the bridge. This rail was rusted on rail table indicating that it was not a running rail and was probably brought for purpose of future maintenance need.

14. On the DN line, the track was not damaged except for the area on the bridge on which 2 coaches were resting. The fish plated joints on the DN line were also provided with 1M long fish plate with 6 bolts.

15. It was difficult to cross the bridge since Up line was completely smashed and down line was obstructed by 2 coaches between Pier No.3 & 4.

16. I had crossed to the other side by climbing down at P_3 with the help of a ladder and walked to the other side.

17. Relief work was in progress when I reached site.

18. DN line track on Mughalsarai-end was not damaged, however, the Up line track was badly bent and sheared. On the Up line on Mughalsarai-end also there was a SEJ about 50M from the abutment.

19. This SEJ was damaged by way of breakage of fittings and shearing off of bearing plate bolts.

Contd. ..... 3.

20. Beyond the SEJ on Mughalsarai-end of the Up line the ERC clips were all damaged on the inner side of RH rail and outer side of LH rail in the direction of motion. There was not much damage to the PSC sleeper however.

21. This damage continued upto Km.509/7 where the engine stopped.

22. I interrogated the Driver and Assistant Driver who informed that just at the Howrah-end approach of the bridge they felt a heavy jerk and the Loco was almost lifted up and the driver immediately applied emergency brake. He crossed the bridge and could stop only about 400m ahead of the bridge and he found that he had no trailing coach with the engine.

23. It was also noticed that leading wheel of the Loco on the L.H side had a shining grazing mark on the non-gauge face side which corresponded to the grazing mark on the gauge face of the rail on the L.H. side lying at the Howrah-end of the abutment of the bridge. (Ref. para 4 above). The trailing pair of wheel of rear trolley of the loco was in derailed condition. There was ballast crushing mark on the tread of the wheels of the loco.

24. It was observed that there was not much of damage to abutments A_1 & A_2 and also piers P_1 & P_2. The bed blocks on these were also practically undamaged. But the Up line side of the pier with bed block of P_3 & P_4 were knocked off. Huge masonry block including bed block of P_3 & P_4 got knocked off visibly by severe impact of the coaches and fallen on Mughalsarai side beyond the piers.

25. It was further observed that the cross frame and lateral bracings of span No.1 was completely damaged due to which two leafs of girder were separated and left hand side leaf was lying side turned and other leaf is vertical position. Mughalsarai-end of both leaf were resting on Pier No.1 and Howrah-end had dropped in span. Similar was the condition of span No.2. This was as result of derailed coaches travelled on span which had completely damaged the X-frames and lateral bracings. The stiffeners and top flange also had marks due to derailed coaches.

26. The condition of masonry seen from the sheared off surface gave impression of a very sound masonry structure. The balance masonry of the piers, abutments and bed block were also see to be in absolutely sound condition with no signs of cracks etc. Signs of earlier Epoxy grouting done in the piers was visible. The pointing of Brick masonry done by cement mortar was seen to be in sound condition.

Contd. ..... 4.

27. The river was flowing only in the first two spans from Howrah-end. Though the flow of water was quite swift, depth of water was not much. Due to high flow of water it was not possible to use small boat or small pontoon to cross the river. Every time for crossing from one end to the other (Mughalsarai-end) to Howrah end) a ladder was to be used to get up the Pier No.3 to take the DN line track and come to the other side. This problem of crossing the bridge had affected the restoration and relief operation.

From the above detailed observations following inferences are drawn :

(a) The first point of drop of derailment in the case is about 30M short of Howrah-end abutment of the bridge.

(b) The fish plates and bolts and ERC clips of the 9M rail on LH side of SEJ of Up line was in open condition before the train arrived the spot.

(c) The fateful rail created discontinuity in the track at the LH side of Howrah-end approach of the bridge which caused derailment.

(d) The damage to the girders on Up line was the result of impact of the coaches on the bridge after derailment. There was no breakage of girder. Signs of bending of plate girder and shearing of bracing were there. This indicated no failure of girders prior to derailment.

(e) Pier P_1 & P_2 were mostly undamaged even after the severe impact of derailment of coaches. Pier P_3 & P_4 were damaged by impact of derailed coaches. The breakage of masonry was fresh with shining mortar face. There was also heavy scratch mark on the masonry of Up line at P_4 indicating hitting on pier. This indicated no failure of any pier prior to derailment.

Dated : 21.9.2002

S. R. Chaudhuri

Principal Chief Engineer. 21.9.2002
Eastern Railway.

ANNEXURE - X

Note

No. EL/90/9/2/AKC
Kolkata, 20th Sept. 2002.

Sub : Accident of 2301 Up Rajdhani Express near Rafiganj on 9.9.02.

Ref : GM's note no AC.275/Safety dated 18.09.02,

Information in connection with the accident of 2301 Up Rajdhani Exp. near Rafiganj on 9.9.02 pertaining to Electrical Department as per the proforma is submitted as below :

1. OHE

i) OHE tripping time – 22:42 hrs. (CB-85 of Rafiganj Traction substation tripped)
OHE Shut down time – 22:44 ½ - BM 523 (Dn Line) & BM 524 (Up Line) at Rafiganj Traction Substation opened, thereby making the section between Rafiganj to Phesar dead.

ii). Action taken to safe guard the Passenger
The OHE was protected by keeping the section between Rafiganj to Phesar Off by operating BM 523 & 524. Also discharge rod was provided on both Up & Dn line at both end.

iii) Record of Last inspection of OHE - AOH of OHE - 25.7.02 (Up Line) &
27.7.02 (Dn Line)
Foot Patrolling – 26.08.02 (Both Up & Dn)

2. Damages

i) Electric Loco No. 30002 – WAP5 GZB Base of Northern Railway.
a) Cab2 CBC guide bracket plate crack.
b) PT2 damaged along with one roof bar
c) Body to bogie vertical damper guard damaged.
d) Wheel No. 7&8 has number of hit marks. Requires re-profiling.
e) Cab2 transition screw coupling shackle pin bent.
f) Bogie2 stopper plate rubber pad badly damaged.
g) The loco could not be energised, therefore electrical damages on panels, converter units etc. could not be ascertain accurately.

ii) OHE
a) 3 Nos. OHE mast damaged at location 508/23, 508/25, 508/27 on Up line & 4 Nos. cantilever damaged at these locations. OHE got parted.
b) 2 Nos. cantilever assembly damaged on Dn line at location 508/20 & 508/22.
c) 280 mtrs. of contact and catenary wire along with droppers replaced because of damage on both line.

iii) Coaches

a) RMPU – 12 Nos. damaged beyond repair.
b) Under slung AC equipment – 12 sets damaged beyond repair (each set consisting of compressor, condenser, blower motors and panel).
c) Lights, fans and inter vehicular couplers damaged beyond repair in all 14 coaches.
d) Power pack with control panel – 2 sets damaged beyond repair.

3. Cost of damage

a) Loco – Rs 10 lakhs (Approx.)
b) OHE – Rs. 2.18 lakhs (Approx.)
c) Coaches - Rs. 206 lakhs. (Approx.)

4&5. Does not arise since accident was not a Fire accident.

6. Bio-data of Driver involved in Accident – Annexure – I.

7.&8. Since accident was not on account of Electrical fire does not arise.

9. Coaches. –

a) Condition of Electrical Equipment.
All electrical equipments and AC equipments got damaged in 14 coaches including one power car and one pantry car.

b) Particular of electric protection.
All electrical protection in AC equipment and electrical fittings were functional.

c) Record of last inspection.
Last trip inspection was done at TKPR Yard on 9.9.2002. No coach was overdue POH.

d) Whether supply for fans and lights was switched on.
All lights and fans were working till accident occurred. After that it did not work due to no power from power car.

10. Appreciation report of the Accident.

a) Probable cause–

The locomotive was found standing at Km 509/11 with wheel No. 7&8 (rearmost axle) in derailed condition.

The driver and co-driver of 2301 Up, involved in the accident on 9.9.02 stated that a heavy jerk was experienced by them at the time of approaching bridge no. 445. Consequently the LI who was on footplate had fallen down inside the cab. This suggests that there was some abnormality in the track before approaching bridge. Records& datas extracted from the locomotive suggests that brakes were applied at a distance of 571 mts. towards HWH end from where the loco was standing after the accident. Considering the reaction time of the driver and the distance travelled after derailment of the coaches but before parting, it can be said

were taken. The profile & wheel gauge were found within permissible limits.

2) Rear coaches WLRRM 00856A, WFAC 90016A & WFAC 99002A

The measurements of these coaches were taken & the following observations were made:

a) All the wheel profile measurements & Wheel gauge measurements were taken & found to be within permissible limits.
b) Centre pivot of all these coaches were intact.
c) The 'A' & 'B' dimensions i.e. clearances between axle box crown & stop screw, & between top of Bolster and the bogie sole plate respectively were found to be within permissible limits.
d) Side bearer & dashpot oils were available in adequate quantity.
e) Side bearer piece & wearing plate were found to be O.K.

3) Coach no. WCBAC 82803A :

This coach had derailed and capsized, after which it was re-railed. Measurements of this coach were also taken, but since this was an affected coach & had been dragged & had capsized, the measurements were slightly beyond permissible limits.

Fitness of crew :

1	Name	R.D. Shaw/DHN	A.K.Sinha/DHN
2	Grade	'A' Spl	'A' Spl.
3	PF A/c. No.	900128	919826
4	Date of birth	15.1.1943	4.1.1957
5	Safety Gradation	A	A
6	L.I.	Sri Ram	Sri Ram
7	Tech refresher – Done Due	29.6.2002 28.6.2005	1.7.2000 30.6.2003
8	Transportation – Done Due	25.10.2000 24.10.03	9.2.2001 8.2.2004
9	Safety Camp- Done Due	18.11.2000 17.11.2003	21.10.2000 20.10.2003
10	Sight test – Done Due	23.1.2002 22.1.2003	09.1.2002 08.1.2004

Remarks :

From the above details, coach maintenance parameters were safe for run and may not have led to unsafe condition during run.

O/C.

CME may pl sign

(Pramod Kumar)
Chief Mechanical Engineer./E Rly.

ANNEXURE - XII

V.K.AGNIHOTRI
Retd. Member Engineering,
A-305,
Heritage Building of Ashiyana
Sector-4, Vaishali,
GAHZIABAD - 201010

My Dear Mahesh Chand,

15th September, 2002

Reg: Ill-fated accident of Howrah-New Delhi Rajdhani Express near Rafiganj Railway Station on 09.09.2002

A lot of news and opinions have featured in Electronic and Print Media. As retired Member Engineering, Railway Board, I have been quite alive with various information pouring from various corners. I intend to put.down my views on the subject which have also been given to the Press and Television. A copy containing the aforesaid views is enclosed with this letter which you may like to consider.

Yours sincerely

Encl: As above

(V.K.Agnihotri)

Shri Mahesh Chand,
Commisioner Railway safety,
Eastern Circle,
Kolkata

Copy:Dr. Rajamani
CCRS,Lucknow

From TV and Newspapers I have seen that there are fundamental doubts in the minds of people in relation to the derailment of Rajdhani Express on 09.09.2002 at Rafi Ganj. The three issues which are bothering people are given below:

1. How come engine and another bogie crossed the portion of the track which had been disturbed by removal of fish plate without derailing?

2. The train passed the same location 20 minutes ago and nothing happened to that train how come within 20 minutes fish plate could be removed?

3. The bridge is 86 years old and said to have become weak.

I have certain technical and practical information about all the above subjects which I would like to share.

As far as movement of engine on a portion of track where fish plates have been removed or rail has been disturbed is concerned the first thing to understand is the time taken to negotiate 13 meters length at a speed of 130 kmph. This time is $1/3^{rd}$ of a second which is even difficult to perceive. Further when a train is in motion at 130 kmph it has lot of kinetic energy in forward direction and whatever disturbances will be imposed on this train due to discontinuity in the rail would take time to disturb the motion of the train. Further more the wheelers of the train are rotating at a very high speed when it is travelling at 130 kmph which generates a gyroscopic effect. In layman's language gyroscopic effect can be understood from the rotation of the top which children are playing with. A top continues to rotate in vertical direction as long as it has speed and as soon as speed comes down it drops down. This very gyroscopic effect is used in the two wheeler vehicles whether it is scooter or cycle wherein the rotating motion in the

wheel keeps the direction of the two wheeler and as soon as two wheeler comes to a stop it cannot stand vertical and it drops down. Therefore, when Rajdhani Express at 130 kmph would have come against the discontinuity in the rail it cannot suddenly change direction and in 1/3rd of a second the wheels will again find a proper support in the next rail. Even in the 13 meters gap where the rail may not be in a perfect condition there would be sleepers and ballast. Few wheels can easily pass over ballast and sleepers before the sleepers and ballast disintegrate. Therefore, after one or two vehicles pass in a situation where rail continuity is not there subsequent coaches starts plouging in into the ballast and formation thereby reducing the speed drastically and boggies from behind which are still travelling comparatively at a higher speed, mount on the vehicles in front. This is the classical method of derailment of a train finding discontinuity in rail. So there should be no misunderstanding that if engine and a bogie has passed there was no discontinuity in the rail.

As far as doubt regarding time not being available between two trains to disturb the rail, I have a practical experience of 8th October, 1990, when the then P.M. made a programme to come to Patna where I was posted as DRM/Danapur. The C.M. informed me that he is anticipating trouble on the railway track and I must proctect it by all means so that trains can come safely to the station. I introduced a patrolling system on the railway track which included on-foot patrolling of half an hour interval where every portion of track was checked every half an hour by responsible and competent railwaymen. Apart from this patrolling engine were also put in service to further reduce the time when track remains unchecked. Inspite of all this effort by Railway and efforts put in by the state government to protect the track, a rail was physically removed near Hathida station and thrown away. Rail had to be retrieved and put back to allow further movement of train and infact the patrol engine derailed on this disturbed track. Therefore, the competence and knowledge of people in that area to disturb the railway

track is well proven. Hence, a 20 minutes difference between one train passing safely and other train derailing is quite possible due to disturbance in track having been done in that interval.

As far as strength of the bridge which broke down in the accident it may be pointed out that it was made 86 years ago when there was no cement and, therefore, surely it would be made with lime mortar. Here it has to be understood that cement attains itself full strength after 28 days whereas lime mortar which gains strength by a natural process of absorption of atmospheric carbon dioxide. This chemical reaction of atmospheric carbon dioxide with the lime takes very long time and ultimate strength may take hundreds of years to achieve. In fact ultimately when all lime is converted to stone it would be a complete cycle of nature. Therefore, any doubt that bridge was losing strength because it was old is contrary to scientific truth because lime mortar continues to gain strength by natural process of carbon dioxide absorption.

ANNEXURE - XIII

गोपनीय

EASTERN RAILWAY

CONFIDENTIAL

No.Accident/ER/2002. Dated, Kolkata, the 22nd October, 2002.

Commissioner of Railway Safety,
Eastern Circle,
14, Strand Road (12th Floor),
Kolkata – 700 001

(Kind Attention : Shri Mahesh Chand)

Sub : Derailment of 2301- UP Howrah-New Delhi Rajdhani Express at Km. 508/19-21 on the approach of Dhawa Bridge between Rafiganj and Deo Road stations of Mughalsarai Division of E. Rly., on 09.09.2002.

Ref : Your office letter No.439 dated 11.10.02.

With reference to above, item-wise reply is given below :-

i) Daily Intelligence Reports are received from CSC regularly. This is treated as information to the management for gearing up in case of any eventuality. Action on security matters like these is taken by the RPF Organisation which is headed by CSC. However, in cases where trains are likely to get dislocated due to public/staff agitations etc., it becomes necessary to take precautionary steps for regulation of trains as well as for ensuring attendance of staff, etc. It could also be necessary to open Emergency Cell in some cases like 'bundhs' etc.

When staff matters are involved, it may be necessary to have a dialogue with unions at appropriate level or any other action based on these reports.

ii) Yes.

iii) On 2-09-02

iv) As these reports were meant only for the information of AGM , no specific orders were passed. However, it is advised that the following action has been taken :

For report (A) pertaining to Danapur Division, necessary measures were to be taken by CSC/Kolkata and DSC/Danapur and the same was done. It may, however,be mentioned that this report pertained to particularly Patna - Gaya, Kiul - Gaya and Buxor Patna sections.

For report (B) pertaining to Jharkhand and Bihar portion of the Eastern Railway, action has been taken by the Organisation of CSC/RPF.

v) The responsibility for safeguarding the railway properties rests with the RPF Organisation in co-ordination with the respective State Governments.

vi) No.

This issues with approval of G.M.

(B.M. Lal)
Addl. General Manager.

ANNEXURE - XIVA

(CONFIDENTIAL)

Eastern Railway

No.SC.47/TA/INT/2002/617 Kolkata, Date:-20th September 2002

The
Commissioner of Railway Safety,
Eastern Railway/ Kolkata.

Sub:- Derailment of 2301 Up Rajdhani Express between Rafiganj and Deo Road station on 09-09-02
Ref:- Your No.401 dt. 19-09-02

Reference above there was no reports of any threat of subversive activities between 22-09-2002 to 01-09-2002 and 03-09-20002 to 09-09-2002. However, on 02-09-2002 two reports were reported from Danapur SIB, extract which are given below:-

2-09-2002

(A) **Activities of Ranver Sena:** - Information indicates that a sense of discontentment is prevailing amongst the members and supporters of Ranver Sena over Bihar State due to arrest of their supremo Sri Barmeswar Singh by local police on 29-08-2002. This contentment may lead to greater agitational programme like damage and destruction of railway property, obstruction of train movement in Patna-Gaya section, Kiul – Gaya section, Buxar-Patna section. Developments are under watch.

(B) **Activities of P.W.G:-** A sense of discontentment is prevailing amongst the activists of PWG due to arrest of their leader one Ajoy Kumar @ Ravi, area commander, by police. This discontentment may lead to greater agitational programme like damage and destruction of railway property, Rail Chakka Jam agitation etc. over Jharkhand and Bihar portion of Eastern Railway. Situation is under watch.

As regards the disposal of this intelligence report the same has been communicated to the following officers: -

1. General Manager, E.Rly/Kolkata.
2. Addl.General Manager, E.Rly/Kolkata.
3. Chief Personnel Officer, E.Rly/Kolkata
4. Chief Operating Manager,E.Rly/Kolkata
5. Director General/RPF/Railway Board/New Delhi
6. Joint Director (Intelligence)/RPF/Railway Board/New Delhi.

Chief Security Commissioner/RPF
Eastern Railway
Kolkata.

ANNEXURE - XIVB

SECRET

Eastern Railway

No.SC.47/TA/INT/2002 Kolkata, Dated:- 21 /10/2002

To
The Commissioner of Railway Safety,
Eastern Circle/Kolkata.

Sub:- Derailment of 2301 Up(HWH-New Delhi Rajdhani Exp) at Km.508/19-21 on the approach of Dhawa Bridge between Rafigunj and Deoroad station of Mughalsarai Division of Eastern Railway on 09-09-2002.

Ref:- Your letter no 438 dated 11-10-2002.

Refer your letter above, it is further clarified that RPF Special Intelligence Wing /Eastern Railway/HQs receive reports from the Divisional Units on Trade Union activities and other activities like Bundh, Agitation etc. which may affect normal Railway functioning on a daily basis. These reports are thereafter compiled and Daily Intelligence Reports are prepared duly endorsing copies to the Zonal Railway Management, DG/RPF and JD/RPF/Intelligence/Railway Board for information.

The item wise reply is given below:

(i) On receipt of specific information the Divisional Security Commissioners co-ordinates with their counter parts in the Civil and Police Administration of concerning Districts for making security arrangements. Divisional Security Commissioners also alerts their own men for safeguarding of Railway property.

(ii) The information in Sl(i) of Daily Intelligence Report of 02/09/2002 pertains to Danapur Division while the report under Sl.(ii) was purely routine and not authenticated from the State and Central Intelligence Units. Hence, question of preventive measures to safeguard railway property by Divisional Security Commissioner/Mughalsarai does not arise.

(Contd...P/2)

(iii) The intelligence report of 02-09-2002 under Sl.(i) was a special one and on receipt of the information Divisional Security Commissioner took immediate necessary action and accordingly the information was passed on to all concerned, viz. DMs/SPs of the concerning districts, SP/Railways/Patna and ADG/Rly's/Patna requesting them to make all security arrangement to avoid any untoward incident.

As regards the information under Sl(ii) of the said letter the information was purely casual and not specific in respect of area of apprehension nor was it authenticated by the State and Central Intelligence Units. However, considering the activities of PWG and apprehending that this arrest may lead to agitation which may have repercussion over Jharkhand and Bihar portion of Eastern Railway, it was incorporated in the Daily Intelligence Report and the same information was also passed on to both ADG/Rly's/Bihar and Jharkhand requesting them to instruct all concern to take necessary precautionary measures.

(iv) Prior to this information, one information was received on 09-08-2002 warning of increased militant activities throughout the country in view of Independence Day celebrations. Accordingly all the Divisional Security Commissioner were alerted to take adequate preventive and precautionary measure in co-ordination with GRP/Local Police and Civil administration to ensure security to railway passengers, platforms, tracks, bridges, trains and vital installations of Railway. They were also advised to put their own staff on maximum alert. A similar information regarding apprehension of attack by Jaise-E-Mohammad was also received on 16/08/2002 and Divisional Security Commissioners were similarly alerted on same lines.

(v) No.

Chief Security Commissioner/RPF
Eastern Railway /Kolkata.

मुख्य परिचालन प्रबंधक
CHIEF OPERATIONS MANAGER

ANNEXURE - XV
पूर्व रेलवे
EASTERN RAILWAY
17, नेताजी सुभाष रोड
17, NETAJI SUBHAS ROAD
कोलकाता - 700 001
KOLKATA - 700 001

No: Accdt/ER/2002. Kolkata, 24.10.2002

Commissioner of Railway Safety,
Eastern Circle,
14, Strand Road,(12th Floor),
Kolkata-1.

Sub: **Derailment of 2301 Up Howrah-New Delhi Rajdhani Exp at Km 508/19-21 on the approach of Dhawa Bridge and Deo Road stations of Mughalsarai Divn of E.Rly on 9.9.2002.**

Ref: **Your office letter No.436dt. 11.10.2002.**

With reference to the above, item-wise remarks are furnished as under :-

1. Item-1 Some of the DIRs are received by COM's office whenever such an information pertains to any eventuality which may result in dislocation of train services etc. Necessary arrangements in all such cases are made at Hqrs or the Divisional level as necessary. Assistance, if any, from the Head Quarters operating branch is always extended to the Divisions for smooth train operations.

   No specific assistance, however, was requested for in respect of the above reports.
2. Item-2 Yes.
3. Item-3 On 2.9.2002.
4. Item-4 Since these reports were meant only for information, no specific orders were passed.
5. Item-5 The responsibility for safeguarding the railway properties rests with the RPF organization in co-ordination with the respective State Governments.
6. Item-6 No.

(L.R.Thapar)
CHIEF OPERATIONS MANAGER

ANNEXURE - XVI

अनुसूची 47, प्रपत्र सं०-118 संलग्न
भा० ह० प्रपत्र सं०-30 (नियम-143) **प्राथमिकी (F. I. R.)** 2048352
(दं० प्र० सं० की धारा 154 के अधीन)

1. *जिला औरंगाबाद (Distt.) *उपमंडल सदर (S. Div.) *थाना रफीगंज (P.S.) *वर्ष 2020 (Yr.) *प्राथमिकी सं० 421 (F.I.R. No.) *तिथि 29.5.2020 (Date)

2. (I) *अधिनियम (Act) I.P.C *धाराएँ (Sections) 399/402/307/353

(II) *अधिनियम (Act) आर्म्स ऑक्ट (Arms Act) *धाराएँ (Sections) 27

(III) *अधिनियम (Act) — *धाराएँ (Sections) — Cr.P.C 96(1)/2000

(IV) *अन्य अधिनियम एवं धाराएँ (Other Acts and Sections) —

3. (क) *अपराध की घटना डेकैती की रात्रो (Occurrence of offence) *दिन सोमवार (Day) *तिथि से 28.5.2020 (Date from) *तिथि तक 29.5.2020 (Date to)

*समयावधि (पहर) 2030 (28.5.2020) बजे से 2130 (29.5.2020) *बजे तक
(Time period) (Time from) (Time to)

(ख) थाना में प्राप्त सूचना तिथि 29.5.2020 समय 1900 बजे

(ग) प्राथमिकी दर्ज करने की तिथि 29.5 समय 0315 बजे

(घ) थाना दैनिकी संदर्भ—प्रविष्टि सं० 425 समय 0315 बजे

4. सूचना का प्रकार (Type of information *लिखित/मौखिक (Written/Oral)

घटना स्थल—(क) थाना से दिशा एवं दूरी 3 km (पश्चिम दिशा) गश्त सं० 7/(सात) 423

(ख) *पता (Address) थाना बड़ी पुलिया (तीन पुल) से लगभग 100 मी पश्चिम, ग्राम-लवरी, थाना: रफीगंज जिला: औरंगाबाद

(ग) थाना की सीमा से बाहर होने की दशा में थाना का नाम ..... जिला .....

5. परिवादी/सूचना दाता :

(क) नाम अ० नि० राज कुमार /लवरी

(ख) पिता/पति का नाम —

(ग) जन्म-तिथि — (घ) राष्ट्रीयता भारतीय

(ङ) पारपत्र सं० — निर्गम तिथि — निर्गम स्थान .....

(च) पेशा पुलिसकर्मी

(छ) पता ग्राम - रफीगंज जिला - औरंगाबाद

7. ज्ञात/संदिग्ध/अज्ञात अभियुक्त का विवरण (यदि आवश्यक हो तो अलग से पन्ना लगाएं)

15-20 अज्ञात अपराध कर्मी

संदिग्ध व्यक्ति की शारीरिक विशेषताएँ, विरूपता तथा अन्य विवरण :—

*लिंग (Sex)	*जन्मतिथि (तिथि/मास/वर्ष) Date of Birth (Date/Month/Year)	*शारीरिक गठन (Build)	*ऊंचाई से० मी० में (Height) (in Cms)	*वर्ण (Complexion)	*पहचान चिह्न (Identification mark)
1	2	3	4	5	6

*विरूपता/विलक्षणता (Deformities/ peculiarities)	*दांत (Teeth)	*बाल (Hair)	*आँख (Eye)	*आदतें (Habits)	पहनावा (Dress Habits)
7	8		10	11	12

स्थान				
निशान (Mark)	*श्वेत कुष्ठ (Leucoderma)	*तिल (Mole)	*जख्म चिह्न (Scar)	*गोदना (Tattoo)
	15	16	17	18

यदि परिवादी/इत्तिला देने वाले/पीड़ित व्यक्ति द्वारा संदिग्ध व्यक्ति के संबंध में कोई एक या अधिक विशिष्टतायें दी जाएं तभी इन स्तंभों में प्रविष्टियाँ की जाएंगी। इसका उपयोग अनुसन्धानक के सहायतार्थ केवल प्रारंभिक सुधार के प्रयोजन से ही किया जाएगा।

इस प्रकार बनाए गए आंकड़े बाद में किसी संदिग्ध व्यक्ति को विभिन्न मामलों, यदि कोई हो, से जोड़ेगा।

जब कोई अभियुक्त गिरफ्तार किया जाए तब पूर्व—संदेह पर विचार के किए बिना सभी बातों से संबंधित व्यापक और पूर्ण आंकड़े पुनः तैयार किए जाएंगे।

13. उन साक्षियों की विशिष्टियां जिनको परीक्षा की जाएगी।

क्रम सं०	नाम	पिता/पति का नाम	जन्म तिथि/वर्ष	पेशा	पता	दिए जानेवाले साक्ष्य का प्रकार
1	2	3	4	5		7
1.	अ०नि० एस० कुमार तिवारी					
2.	अ०नि० विजय राम सिंह					
3.	अ०नि० मैसूद अली					
4.	अ०नि० प्रेम कुमार [illegible]					
5.	स० अ०नि० [illegible]					
6.	[illegible]					
7.	हवलदार [illegible]					
8.	हवलदार [illegible]					
9.	हवलदार [illegible]					
10.	आ० 267 [illegible]					
11.	आ० 792 [illegible]					
12.	आ० 817 [illegible]					
13.	आ० 930 [illegible]					

14. यदि प्रावधिकी विषय हो तो भारतीय दंड संहिता की धारा 82/111 के अधीन की गई या की जाने के लिए प्रस्तावित का उल्लेख करें।

14. आ० 791 राजेश कुमार सिंह
15. आ० 567 अरुण [illegible]
16. आ० 243 [illegible]
17. आ० 987 [illegible]
18. आ० 887 [illegible]
19. आ० 666 [illegible]
20. आ० 203 [illegible]

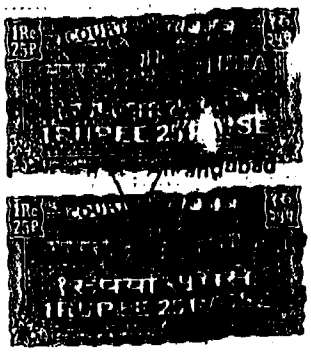
15. प्रयोगशाला विश्लेषण का परिणाम

[illegible]

16. केस से संबंधित संक्षिप्त तथ्य [यदि आवश्यक हो तो अलग से पन्ना लगायें]

(Brief Facts of the Case) [Add separate Sheet if necessary]

[illegible]



आवेदन के लिए कॉपी की तारीख Date of application for the copy.	स्टाम्प और फीसों की अपेक्षित संख्या सूचित करने की तिथि Date fixed for notifying the requisite number of stamps and folios.	अपेक्षित स्टाम्प और फोलियो देने की तारीख Date of delivery of the requisite stamps and folios.	प्रतिलिपि तैयार है Date on which the copy was ready for delivery.	तारीख Date of making over the copy to the applicant.
12-9-2002	12-9-2002	12-9-2002	12-9-2002	12-9-2002

/तामिल की गयी नोटिस का निर्देश करें
पावती लगाई जाएगी)

हां/नहीं.....तारीख.....

12-9-2002

दिनांक.....

हस्ताक्षर

अंतिम रिपोर्ट/आरोप पत्र/दोषसिद्धि/दोषमुक्ति
अनुसंधान पदाधिकारी का हस्ताक्षर।

नाम.....

पदनाम.....

सेवा में,

थाना-प्रभारी

रघोगंज थाना,

महोदय,

सूचित करना है कि आज दि. 22/5/2000 को संध्या 19/00 बजे एक मुखबिर ने थाना आकर सूचित किया रघुगंज से पश्चिम ग्रैण्ड कार्ड रेलवे लाइन के धावानद पुल (गाहरपुल) के आसपास 15-20 नकाबपोश अपराधी जमा है, जो रेलवे का पोस्टलेट खोलकर किसी ट्रेन को गिरा कर लूटपाट करना चाहते हैं। इस सूचना को थाना दैनिकी प्रविष्टी सं. 422 में दर्ज कर सूचना के संबंध में श्री एम. आर. नाईक, भा.पु.से. (परि.) एवं थाः प्रः रघोगंज से विचार-विमर्श कर थाने पर उपलब्ध ① म०नि० मंजर अली, स० अ०नि० पंजी संख्या 1, सूचक विन्देश्वरी सिंह, हवः हीरालाल राम, आ० 267 अजय कुमार, आ० 297 अभय नंदन वैद्य, 819 लोक प्रसाद 930 भंडारी वैद्य, 791 राजबल्लभ सिंह, ② अ०नि० संजय कुमार सिंह, स० अ०नि० विभूति भूषण, ट्रे० पी० ली० 1540 नरेन्द्र मंडल, आ० 145 सहदेव चौधरी, हवः रघुनाथ राउत, आ० 704 धर्मवीर पांडेयन, आ० 320. अशोक वैद्य आ० 201. भुवनेश्वर राम; एवं ③ श्री एम. आर. नाईक, भा. पु. से. (परि.), मैं (अ०नि० आर० के० तिवारी) स्वयं, आ० विश्वनाथ सिंह, अ०नि० दीनानाथ यादव, आ० 567 अरुण एक्का, आ० 243 विपिन कुमार शर्मा, 987 रंजन यादव, 287 उमाशंकर पाण्डेय, 462 मोइज अलमतु 611 रामेन्द्र सिंह, 20 उमानाथ सिंह का तीन दोपामारे दल तैयार कर सभी को उनके द्वारा समझाकर जाने वाली जगहों के संदर्भ में समझाकर उसका पूरब दक्षिण एवं उत्तर से दोपामारी देते हुए [illegible] पहुँचने के लिए 23/00 बजे थाना से प्रस्थान किया मैं अपनी टुकड़ी के साथ उत्तर तरफ से धावानद के बगल से होते हुए, जब रेलवे लाइन से करीब 100 गज उत्तर लगभग 21:15 बजे पहुँचा तो कुछ लोगों के भुनभुनाहट का आवाज सुनाई दिया, जिस पर विश्वास हुआ कि इस सुनसान जगह में अपराधी तत्व हैं तब मैंने अपने साथ के पदाधिकारी एवं आरक्षियों को खोलकर सर्चलाइट के साथ तीन दिशा से बढ़ते हुए [illegible] कार्यवाई करने का निर्देश [illegible] आगे

--ठीक उसी समय काफी तेज वर्षा होने लगी। लगभग 40-45
गज आगे बढ़ने पर रेलवे लाइन के किनारे झोपड़ा
के बगीचे से अंधाधुंध फायरिंग हमलोगों पर
अपराधियों द्वारा किया जाने लगा। तब मैंने अपने
को एक ताड़ के पेड़ के आड़ किया तथा पार्टनर को दिशा
में टार्च जलाया। तो देखा कि 15-20 अपराधकर्मी अपने-
अपने हाथों से पेड़ का ओट लेकर फायर कर रहे हैं।
अपने तथा अपने साथ के पुलिस बल प्राणों पर उपस्थित
की स्थिति देख आवश्यकता अविष्कार प्रयास होने
तथा अपराधियों को घेरने का निर्देश ऊँचे स्वर में
दे देते हुए अपने पिस्तौल से फायर किया। पुलिस बल
द्वारा आक्रमण आरम्भ करते ही बगीचे से फायरिंग बंद
हो गया। तब मैं पुनः अपने साथ में लिए टार्च को
ऑन कर जलाया तो पाया कि अपराधकर्मी भागकर
रेलवे क्रॉसिंग पर पटरी के दक्षिण की ओर भाग रहे हैं
हमलोग उस ओर दौड़ा। वर्षा के कारण फिसलन के
कारण दौड़ना काफी मुश्किल हो रहा था। जब हम
लोग रेलवे लाइन पर पहुँचे तो अपराधकर्मी गहरे
झाड़ी एवं अंधेरा का लाभ लेकर दक्षिण तरफ
भागने में सफल हो गये। मैंने उनके पलायन के दिशा
में पुलिस बल के साथ ग्राम पूरैना, माड़ीडीह एवं अगल-
बगल में तत्काल छापामारी किया परन्तु अपराधियों
का पता नहीं चल सका। पुनः घटनास्थल पर लौट
का इनवीन किया तो वहाँ से एलाइड रंग एक
लोहे का सब्बल एक हथौड़ा, एक इलेक्ट्रिक लोहे का
औजार 10-12 जोड़ चप्पल पड़ा मिला पाया
इसी बीच अफरा-तफरी तथा फायरिंग का आवाज
सुनकर अगल-बगल के गाँवों के काफी लोग इकट्ठा
गये जिनमें से स्वतंत्र साक्षी-① मोहम्मद पाकलान
पेशा बालू ढुलाई पालकाडीह थाना - रघुनाथगंज एवं
② मो० नईम पेशा मोटर मैकेनिक साकिन अमवाँ थाना-कोच होने
मुखबिरोफाल्ट के समस्त उपरोक्त सामानों का विधिवत
जप्ती-सूची बनाते हुए जप्त किया। तीनों छापामार
दल के पदाधिकारियों एवं आक्रमियों के हथियारों का
निरीक्षण किया तो पाया कि आ०-567 मक्का एक
S.L.R से 3-पक्ष 243 विपिन कुमार शर्मा S.L.R से 3-पक्ष
984 रंजीत पांडेय S.L.R से एक पक्ष 287 उमाशंकर
पाण्डेय S.L.R एक पक्ष आ-466 अमरेन्द्र सिंह

ANNEXURE-XVI

-रामपत से एक-पत्र, 20- उमानाथ सिंह रामपत से एक-पत्र
267- मजीत कुमार रजक रामपत से 2-पत्र तथा एक निरमा
मा० 819 श्रलोक प्रसाद रामपत से 2-पत्र, 130- केदार बैठ,
एक-पत्र, मा०- राजवल्लभ खेत एक-पत्र तथा बैठा मा०
सोनेस पेन-तेल से दो-पत्र कागज लेकर [illegible]
मेरा दावा अनाम 15-20 आपापरिचितों
के विरुद्ध सशस्त्र डकैती का तैयारी [illegible]
बनाने तथा पुलिस-बल पर आक्रमण [illegible]
का है।

आवश्यक क्रियार्थ,

[illegible]
23.5.2000 मा. पे
02.15 बजे x-mpl
[illegible]
(1111)

Rabiganj thana registered case no. 44/2000 dated 23/5/2000 u/s 399/402/307/353 I.P.C. and section 27 of Arms act.

I will personally investigate it.

23/5/2000
(M R Naik, IPS)
ASP(P),
o/c Rabiganj P.S.

ANNEXURE - XVI

प्र. पत्र सं० 122
पृष्ठ सं० 32

अंतिम प्रपत्र/रिपोर्ट
(FINAL FORM/REPORT)

(दण्ड प्र० संहिता की धारा 173/174 के अधीन)

..... के न्यायालय में

(In the court of)

266849

•जिला ..... •थाना ..... •वर्ष 2000 •प्राथमिकी सं० 44/2000 •तिथि 23/5/2000
Distt.), (P.S.) (Year) (FIR No.) (Date)

•अंतिम रिपोर्ट/आरोप पत्र सं० 85/2000 3. •तारीख 5.11.2000
(Final Report/Charge Sheet No.) (DATED)

[1] •अधिनियम (Act) आर्म्स एक्ट •धाराएं (Sections) 397/402/307/353
[2] •अधिनियम (Act) ..... •धाराएं (Sections) 27 आर्म्स एक्ट
[3] •अधिनियम (Act) ..... •धाराएं (Sections)
[4] •अन्य अधिनियम एवं धाराएं (Other Acts & Sections) .....

•अंतिम प्रपत्र/रिपोर्ट का प्रकार :—आरोप पत्र/साक्ष्य के अभाव में आरोप-पत्र नहीं दिया गया/अंतिम रिपोर्ट सत्य-पता नहीं चला/अंतिम रिपोर्ट सत्य-खोज नहीं हो सकी/अंतिम रिपोर्ट सत्य अपराध उपसांसित किया गया/अंतिम रिपोर्ट-नहीं घटित हुई।
(Type of Final Form/Report—Charge Sheet/Not Charge Sheeted for want of evidence/FRT Undetected/FRT Untraced/FRT offence abated/FR Nhoctured)

•यदि अ० रि० अगृहित हो—मिथ्या/तथ्यों की भूल/विधि की भूल/असंज्ञेय/दीवानी प्रकृति का
(If F. R. Unoccured/False/Mistake of Fact/Mistake of law/non-cognizable/Civil Nature.)

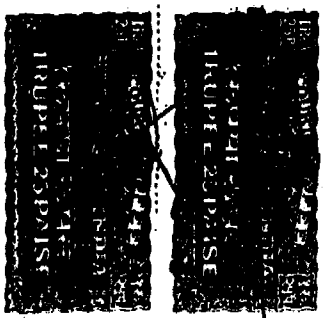
•यदि आरोप पत्र हो तो मूल/अनुपूरक
(If Charge-sheet-Original/Supplementary)

•अनुसंधान पदाधिकारी का नाम एस एच ओ पी एस [illegible] पदनाम ..... सं० .....
(Name of I. O.) [illegible] (Rank) [illegible] (No.)

[क] परिवादी/सूचनादाता का नाम .....
[ख] पिता का/पति का नाम .....

अनुसंधान के दौरान बरामद/जप्त ऐसी संपत्तियों/वस्तुओं/दस्तावेजों का विवरण जिन पर निर्भर किया गया हो। यदि आवश्यक हो तो अलगसे सूची संलग्न की जा सकती है।

क्रम सं०	सम्पत्ति का वर्णन	प्राक्कलित मूल्य (रूपये में)	थाना का संपति रजिस्टर सं०	किससे/कहां बरामद या जप्त की गयी	निपटाव
1	2		4	5	6



ANNEXURE – XVI

I.I. आरोप पत्रित अभियुक्त व्यक्तियों की विशिष्टियां (हरेक अभियुक्त के लिए अलग पन्ना उपयोग में लायें)

(Particulars of accused persons charge-sheeted)

(i) *नाम (Name) [illegible] सत्यापित है या नहीं.....

(ii) पिता/पति का नाम [illegible]

(iii) जन्म तिथि/वर्ष [illegible]

(iv) लिंग [illegible] (v) राष्ट्रीयता [illegible]

(vi) पारपत्र सं० [illegible] निर्गम तिथि.....

निर्गम स्थान [illegible]

(vii) धर्म [illegible] (viii) क्या अनुसूचित जाति/अनुसूचित जन जाति से [illegible]

(ix) पेशा [illegible] (x) पता [illegible]

[illegible] सत्यापित है या नहीं [illegible]

*औपबंधिक अपराध सं० (Provisional Criminal No.)

(xii) नियमित अपराध सं० (यदि ज्ञात हो) Regular Criminal No. (if known)

(xiii) *गिरफ्तारी की तिथि.....

(xiv) *जमानत पर रिहा होने की तिथि (Date of release on bail).....

(xv) *न्यायालय में अग्रसारण की तिथि (Date on which forwared to Court).....

(xvi) *किन अधिनियमों एवं धाराओं के अधीन (Under Acts & Sections).....

*जमानतदारों/प्रतिभूतिदाताओं का नाम और पता.....

Name(s) of bailers/Sureties and address(es).....

(xviii) कस निर्देशों सहित पूर्व दोष सिद्धि.....

(xix) अभियुक्त की परिस्थिति (Status of the accused)

अग्रसारित/पुलिस द्वारा जमानत पर रिहा/न्यायालय द्वारा जमानत पर रिहा/न्यायिक अभिरक्षा में/फरार/उद्घोषित अपराधी

(Forwarded/Bailed by Police/Bailed by Court/In Judicial Custody/Absconding/Proclaimed offender)

12. ऐसे अभियुक्त व्यक्तियों की विशिष्टियां जो आरोप पत्रित नहीं (संदिग्ध) है। (हरेक संदिग्ध व्यक्ति के लिए अलग से पन्ना व्यवहार में ¥)

(Particulars of accused persons not charge sheeted (separate sheet for each suspect.)

क्रम सं०

(i) *नाम (Name).....सत्यापित है या नहीं.....

(ii) पिता/पति का नाम.....

जन्म तिथि/वर्ष.....

लिंग..... (v) राष्ट्रीयता.....

(vi) पारपत्र सं०..... निर्गम तिथि..... निर्गम स्थान.....

(vii) धर्म..... (viii) क्या अनुसूचित जाति/अनुसूचित जन जाति से ?

पेशा..... (xi) पता.....

.....सत्यापित है या नहीं.....

(xi) *औपबंधिक अपराध सं० (Provisional Criminal No.).....

(xii) *संदेह अनुमोदित (Suspicion Approved) (हाँ/नहीं) (Yes/No).....

(xiii) *अभियुक्त [संदिग्ध व्यक्ति] का स्तर : पुलिस द्वारा जमानत पर रिहा/न्यायालय द्वारा जमानत पर रिहा/न्या येक अभिरक्षा में/गिरफ्तार नहीं किया जा सका। (Status of the accused Suspect) (Bailed by Police/Bailed by Court/In Judicial Custody Not arrested).....

(xiv) किन अधिनियमों और धाराओं के अधीन.....

(xv) आरोप-पत्रित नहीं करने के कारणों सहित कोई विशेष अभ्युक्ति.....

.....

.....

ANNEXURE-XVI

8. परिवादी/सूचक द्वारा सूचना देने में हुए विलंब का कारण : .....

.....

.....

9. चुरायी गई/अन्तर्ग्रस्त/बरामद सम्पत्तियों के ब्यौरे (यदि आवश्यक हो तो अलग से पन्ना लगायें)

.....

.....

.....

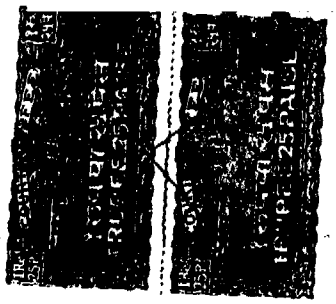
10. *चुराई गयी/अन्तर्ग्रस्त/बरामद सम्पत्तियों का कुल मूल्य (Total Value of properties stolen/involved/recovered).

.....

11. *अस्वाभाविक मृत्यु कांड सं०, यदि हो तो (U. D. CaseNo., if any).....

.....

12. प्राथमिकी की अन्तर्वस्तु (अलग से पन्ना लगायें, यदि आवश्यक हो)



ANNEXURE-XVI

प्रतिलिपि के लिए आवेदन की तारीख Date of application for the copy.	स्टाम्प और फीस की अपेक्षित राशि सूचित करने की तिथि Date fixed for notifying the requisite number of stamps and folios.	अपेक्षित स्टाम्प और फोलियो दे दी गयी Date of delivery of the requisite stamps and folios.	प्रतिलिपि तैयार थी Date on which the copy was ready for delivery.	सौंपे जाने की तारीख Date of making over the copy to the applicant.
12.9.2002	12.9.2002	12.9.2002	12.9.2002	12.9.2002

दी 47, प्रपत्र सं०—118

की गयी कार्रवाई : चूँकि उपर्युक्त सूचना से मद सं० 2 में उल्लिखित धाराओं के अन्तर्गत अपराध किया जाना प्रकट होता है अतः कांड दर्ज किया गया एवं अनुसंधान प्रारम्भ किया* [illegible] पदनाम [illegible] अनुसंधान करने का निर्देश दिया/अनुसंधान करने से इन्कार किया/आधिकारिता के प्रश्न पर..... थाना को अंतरित किया गया। प्राथमिकी परिवादी/सूचनादाता को पढ़कर सुनायी गयी। उसने उसे सही रूप में अभिलिखित किया गया, पाकर स्वीकार किया और उसकी एक प्रति परिवादी/सूचनादाता को निःशुल्क दी गयी। (Action taken: Since the above report reveals commission of offence (s) u/s as mentioned at Item No. 2. registered the case and took up the investigation/ directed*.....Rank.....to take up the investigation.)

परिवादी/सूचना दाता का हस्ताक्षर/अंगूठा का निशान। मूल लिखित प्रतिवेदन पर हस्ताक्षर

थाना से न्यायालय में प्रेषण की तिथि एवं समय— निरोध हेतु

थाना प्रभारी का हस्ताक्षर 23/9/02

Authorised Under Section 80 Act 1 of 1967

नाम (Name) M. R. Naik, IPS

पदनाम (Designation) ASP(P), C/o Kargil

बारा नरसंहार के अभियुक्तों को मिली सजा से बौखलाए आतंकी

रेल लाइन या स्टेशन पर हमले की आशका

निज संवाददाता

औरंगाबाद, 4 अगस्त। बारा नरसंहार कांड के अभियुक्तों को सजा सुनाये जाने से बेहद बौखलाये उग्रवादी संगठन माओवादी कम्युनिष्ट केन्द्र ग्रैण्ड कार्ड रेल लाईन पर या किसी रेलवे स्टेशन पर अगले कुछ दिनों में हमला कर सकता है। यह सूचना खुफिया रिपोर्टों में दी गयी है।

रिपोर्ट में कहा गया है कि औरंगाबाद जिला क्षेत्र में गया की तरफ ग्रैंड कार्ड लाइन पर एम.सी.सी. आक्रामक कार्रवाई कर सकती है। पटरी उखाड़े जाने की आशंका भी व्यक्त की गयी है। पटरी उखाड़े जाने की आशंका भी व्यक्त की गयी है। रिपोर्ट के अनुसार ग्रैंड कार्ड लाईन पर हमले के लिए एम.सी.सी. की गतिविधियां इधर बढ़ी होने की सूचना है ज्ञात हो कि 10 दिन पूर्व देव गोड़ रेलवे हाल्ट

खुफिया विभाग ने किया सावधान

(औरंगाबाद) के समीप एम.सी.सी. एरिया कमांडर दीपक पासवान के नेतृत्व में एम.सी.सी. का जत्था एकत्र हुआ था पर बेड़ना पुलिस पिकेट द्वारा मूवमेंट करने पर वह कुछ पर्चे छोड़ कर भाग गया। पर्चे में बारा कांड के अभियुक्तों को सजा देने पर अतिरिक्त घातक कार्रवाई करने की धमकी अंकित थी। खुफिया रिपोर्ट में कहा गया है कि देव गोड़ हाल्ट एवं जाखिम स्टेशन एम.सी.सी. के हमले की आशंका सर्वाधिक है। ज्ञात हो कि हाल ही में सोननगर बरवाडीह रेलखंड पर सतबहनी स्टेशन के पास ट्रेन हमला कर नक्सलियों ने एक गार्ड की हत्या कर दी थी व सिपाही को घायल कर दिया था। इस घटना के पश्चात औरंगाबाद में ट्रेनों की सुरक्षा को लेकर पुलिस को सर्तक कर दिया गया था। ज्ञातव्य है कि औरंगाबाद जिले में देव गोड़ रेलवे हाल्ट य को मई 1994 में तथा कैसर स्टेशन पर पूर्व में उग्रवादियों ने हमला कर जला दिया था। फरवरी 1995 मे बाघोई स्टेशन के समीप ट्रेन में चार बी.एम.पी. कर्मियों की हत्या कर उनके हथियार लूट लिये थे।

ANNEXURE -XVIII

अनुसूची 47, प्रप० सं०-113

आ० द० प्रप्र सं० 326 (नियम-143)

प्राथमिकी (F.I.R.) संख्या-8 (2002)

(दं० प्र० सं० की धारा 154 के अधीन) 127462

1. * जिला [illegible] अनुमंडल [illegible] * थाना [illegible] वर्ष 02 * प्राथमिकी सं० 140 तिथि 10.9.02

(Distt.) (S. Div.) (P.S.) (Yr.) (F.I.R. No.) (Date)

2. (I) * अधिनियम (Act) [illegible] * धाराएं (Sections) 307 338 193 201

(II) * अधिनियम (Act) ..... * धाराए (Sections) .....

(III) * अधिनियम (Act) [illegible] * धाराएं (Sections) 120 B 149

(IV) * अन्य अधिनियम एवं धाराएँ (Other Acts and Sections) .....

3. (क) * अपराध की घटना [illegible] * दिन [illegible] * तिथि से 9.9.02 * तिथि तक .....

(Occurrence of offence) (Day) (Date from) (Date to)

* समयावधि (पहर) [illegible] * बजे से 22.45 * बजे तक

(Time period) (Time from) (Time to)

(ख) थाना में प्राप्त सूचना तिथि 9.9.02 समय 22.45 Hrs

(ग) प्राथमिकी दर्ज करने की तिथि 10.9.02 समय 16.00 Hrs

(घ) थाना दैनिकी संदर्भ-प्रविष्टि सं० 136 समय 16.00 Hrs

4. सूचना का प्रकार (Type of information) * लिखित मौखिक (Written/Oral)

5. घटना स्थल-(क) थाना से दिशा एवं दूरी [illegible] गश्त सं० VII

(ख) * पता (Address) [illegible]

(ग) थाना की सीमा से बाहर होने की दशा में थाना का नाम ..... जिला .....

6. परिवादी/सूचना दाता :

(क) नाम [illegible]

(ख) पिता/पति का नाम .....

(ग) जन्म-तिथि ..... (घ) राष्ट्रीयता [illegible]

(ङ) पारपत्र सं० ..... निर्गम तिथि ..... निर्गम स्थान .....

(च) पेशा [illegible]

(छ) पता [illegible]

अनुसूची 47, प्रपत्र सं०–11B

ANNEXURE XVIII

7. ज्ञात/संदिग्ध/अज्ञात अभियुक्त का विवरण (यदि आवश्यक हो तो अलग से पन्ना लगाएं)

रेल एवं पूर्व रेल एवं रेल सेवा से जुड़े भारतीय रेलवे के कर्मचारी एवं पदाधिकारी अज्ञात

संदिग्ध व्यक्ति की शारीरिक विशेषताएं, विरूपता तथा अन्य विवरण :-

*लिंग (Sex)	*जन्मतिथि (तिथि/मास/वर्ष) Date of Birth (Date/Month/Year)	*शारीरिक गठन (Build)	*ऊंचाई सं० मी० में (Height) (in Cms)	*वर्ण (Complexion)	*पहचान चिह्न (Identification mark)
	2	3	4	5	6

*विरूपता विलक्षणता (Deformities/ peculiarities)	*दांत (Teeth)	*बाल (Hair)	*आंख (Eye)	*आदतें (Habits)	*पहनावा (Dress Habits)
7	8	9	10	11	12

*भाषा/बोली (Language/ Dialect)	स्थान				
	*जले का निशान (Burn Mark)	*श्वेत कुष्ठ (Leucoderma)	*तिल (Mole)	*जख्म चिह्न (Scar)	*गोदना (Tattoo)
13	14	15	16	17	18

यदि परिवादी/इत्तिला देने वाले/पीड़ित व्यक्ति द्वारा संदिग्ध व्यक्ति के संबंध में कोई एक या अधिक विशिष्टतायें दी जाएं तभी इन स्तंभों में प्रविष्टियाँ की जाएंगी। इसका उपयोग अनुसन्धानक के सहायतार्थ केवल प्रारंभिक सुधार के प्रयोजन से ही किया जाएगा।

इस प्रकार बनाए गए आँकड़े-बाद में किसी संदिग्ध व्यक्ति को विभिन्न मामलों, यदि कोई हो, से जोड़ेगा।

जब कोई अभियुक्त गिरफ्तार किया जाए तब पूर्व–संदेह पर विचार के किए बिना सभी बातों से संबंधित व्यापक और पूर्ण आंकड़े पुनः तैयार किए जाएंगे।

अनुसूचा 47, प्रपत्र सं०–118

ANNEXURE - XVIII

8. परिवादी/सूचना दाता द्वारा सूचना देने में हुए विलंब का कारण : .....

.....

.....

9. चुराई गई/अन्तर्ग्रस्त/बरामद सम्पत्तियों के ब्योरे (यदि आवश्यक हो तो अलग से पन्ना लगायें)

.....

.....

.....

10. * चुराई गई/अन्तर्ग्रस्त/बरामद सम्पत्तियों का कुल मूल्य (Total value of properties stolen/involved/recovered).....

.....

11. * अस्वाभाविक मृत्यु कांड सं०, यदि हो तो (U.D. Case No., if any)

.....

12. प्राथमिकी की अन्तर्वस्तु (अलग से पन्ना लगायें, यदि आवश्यक हो) ।

पादी का सह तत्पारेखन उपदेन का इस कांड का अधार है की मुल अभि मुल के सावा अन्य के द्वारा दाखा अभि सपोन है ।

अनुमंडल
10/9/02
पदाधिकारी
रक्सौल

ANNEXURE-XVIII

अनुसूची 47, प्रपत्र सं०–118

3. की गयी कार्रवाई : चूँकि उपर्युक्त सूचना से पद सं० 2 में उल्लिखित धाराओं के अन्तर्गत अपराध किया जाना प्रकट होता है अतः कांड दर्ज किया गया एवं अनुसंधान प्रारम्भ किया/ पदनाम ..... का अनुसंधान करने का निर्देश दिया/अनुसंधान करने से इन्कार किया/आधिकारिता के प्रश्न पर .....थाना को अंतरित किया गया । प्राथमिकी परिवादी/सूचनादाता को पढ़कर सुनायी गयी । उसने उसे सही रूप में अभिलिखित किया गया, पाकर स्वीकार किया और उसकी एक प्रति परिवादी/सूचनादाता को निःशुल्क दी गयी । (Action taken : Since the above report reveals commission of offence (s) u/s as mentioned at Item No. 2 registered the case and took up the investigation/directed ' .... Rank ..... to take up the investigation)

14. परिवादी/सूचना दाता का हस्ताक्षर/अंगूठा का निशान ।

15. थाना से न्यायालय में प्रेषण की तिथि एवं समय–

10/9/02

थाना प्रभारी का हस्ताक्षर

नाम (Name).....

पदनाम (Designation).....

ANNEXURE-XVIII

अनुसूची 47, प्रपत्र 24.6–118
आ० इ० प्रपत्र सं०–26 (नियम–143)

प्राथमिकी (F. I. R.) संख्या – B
(दं० प्र० सं० की धारा 154 के अधीन) 127463

1. * जिला (Distt.) * अनुमंडल (S. Div.) * थाना (P.S.) * वर्ष (Yr.) * प्राथमिकी सं० (F.I.R. No.) 14163 तिथि (Date) 11.09.07

2. (I) * अधिनियम (Act) ..... * धाराएँ (Sections) 341, 323, 420

(II) * अधिनियम (Act) ..... * धाराएँ (Sections) .....

(III) * अधिनियम (Act) ..... * धाराएँ (Sections) 120

(IV) * अन्य अधिनियम एवं धाराएँ (Other Acts and Sections) .....

3. (क)* अपराध की घटना ..... * दिन ..... * तिथि से 09.09.07 * तिथि तक .....
(Occurrence of offence) (Day) (Date from) (Date to)

* समयावधि (पहर) ..... * बजे से 22.45 hrs * बजे तक
(Time period) (Time from) (Time to)

(ख) थाना में प्राप्त सूचना तिथि 11.09.07 समय 1.00 hrs

(ग) प्राथमिकी दर्ज करने की तिथि 11.09.07 समय 1.30 hrs

(घ) थाना दैनिकी संदर्भ–प्रविष्टि सं० 1015 समय 1.00 hrs

4. सूचना का प्रकार (Type of information) * लिखित/मौखिक (Written/Oral)

5. घटना स्थल–(क) थाना से दिशा एवं दूरी ..... गश्त सं० XII

(ख) * पता (Address) .....

(ग) थाना की सीमा से बाहर होने की दशा में थाना का नाम ..... जिला .....

6. परिवादी/सूचना दाता :

(क) नाम .....

(ख) पिता/पति का नाम .....

(ग) जन्म-तिथि ..... (घ) राष्ट्रीयता .....

(ङ) पारपत्र सं० ..... निर्गम तिथि ..... निर्गम स्थान .....

(च) पेशा .....

(छ) पता .....

ANNEXURE -XVII

अनुसूची 47, प्रपत्र सं०–118

7. ज्ञात/संदिग्ध/अज्ञात अभियुक्त का विवरण (यदि आवश्यक हो तो अलग से पन्ना लगाए)

अज्ञात

संदिग्ध व्यक्ति की शारीरिक विशेषताएँ, विरूपता तथा अन्य विवरण :-

*लिंग (Sex)	*जन्मतिथि (तिथि/मास/वर्ष) Date of Birth (Date/Month/Year)	*शारीरिक गठन (Build)	*ऊँचाई सं० मी० में (Height (in Cms)	*वर्ण (Complexion)	*पहचान चिह्न (Identification mark)
1	2	3	4	5	6

*विरूपता/विलक्षणता (Deformities/ peculiarities)	*दांत (Teeth)	*बाल (Hair)	*आँख (Eye)	*आदतें (Habits)	*पहनावा (Dress Habits)
7	8	9	10	11	12

*भाषा/बोली (Language/ Dialect)	स्थान				
	*जले का निशान (Burn Mark)	*श्वेत कुष्ठ (Leucoderma)	*तिल (Mole)	*जख्म चिह्न (Scar)	*गोदना (Tattoo)
13	14	15	16	17	18

यदि परिवादी/इत्तिला देने वाले/पीड़ित व्यक्ति द्वारा संदिग्ध व्यक्ति के संबंध में कोई एक या अधिक विशिष्टतायें दी जाएं तभी इन स्तंभों में प्रविष्टियां की जाएंगी। इसका उपयोग अनुसन्धानक के सहायतार्थ केवल प्रारंभिक सुधार के प्रयोजन से ही किया जाएगा।

इस प्रकार बनाए गए आंकड़े बाद में किसी संदिग्ध व्यक्ति को विभिन्न मामलों, यदि कोई हो, से जोड़ेगा।

जब कोई अभियुक्त गिरफ्तार किया जाए तब पूर्व–संदेह पर विचार के किए बिना सभी बातों से संबंधित व्यापक और पूर्ण आंकड़े पुनः तैयार किए जाएंगे।

ANNEXURE - XVIII

To

The Station House officer
Rafiganj

Sub:- Accident of 2301 UP (Kolkata Rajdhani Expss)

On 9 of 2002, 2301 UP (Kolkata Rajdhani Express) was running with 18 coaches loaded 9 got derailed at 22.40 hours at the approach of bridge no - 445 (Dhanki) between Rafiganj and Dev Nand after passing Rafiganj at 22.40 hours. On this accident, the coaches from the rear end of the train where intact on the rails and all the remaining coaches have derailed and overturned. It was seen that one rail of left hand side with, four fish plates and eight (8) fish bolts were found outside on the approach of the bridge which may have led to the derailment.

You are requested to please investigate into the matter and take necessary action

Received and Registered
Rafiganj P.S. Case No. 14/02
dt 11.9.02 U/s 431/440 IPC
and 126 Indian Railway act.
Sub. Md. Asghar, C.I. Rafiganj
Will Pl. Investigate this case.
as ordered by Superior Officer
11.9.02
O/C Rafiganj P.S

Y. N. Singh
(Yogendra Narayan Singh)
Y.N. Singh
Hqrs | Rafiganj
11-09-2002

ANNEXURE - XVIII

अनुसूची 47, प्रपत्र सं०–118

8. परिवादी/सूचना दाता द्वारा सूचना देने में हुए विलंब का कारण : .....

.....

.....

9. चुराई गई/अन्तर्ग्रस्त/बरामद सम्पत्तियों के ब्योरे (यदि आवश्यक हो तो अलग से पन्ना लगायें)

.....

.....

.....

10. * चुराई गई/अन्तर्ग्रस्त/बरामद सम्पत्तियों का कुल मूल्य (Total value of properties stolen/involved/recovered).....

.....

11. * अस्वाभाविक मृत्यु कांड सं०, यदि हो तो (U.D. Case No., if any)

.....

12. प्राथमिकी की अन्तर्वस्तु (अलग से पन्ना लगायें, यदि आवश्यक हो)

वादी का लिखित उत्तर 6वां इस कागज का
ऊपर है गवाह गण चली गुप्त के साथ गुप्त
के साथ जमीन पर सलाह है।

थाना प्रभारी
अमीगढ़

ANNEXURE -XVIII

((4)

अनुसूची 47, प्रपत्र सं०–118

13. की गयी कार्रवाई : चूँकि उपर्युक्त सूचना से मद सं० 2 में उल्लिखित धाराओं के अन्तर्गत अपराध किया जाना प्रकट होता है अतः कांड दर्ज किया गया एवं अनुसंधान प्रारम्भ किया *[illegible] पदनाम [illegible] का अनुसंधान करने का निर्देश दिया/अनुसंधान करने से इन्कार किया/आधिकारिता के प्रश्न पर .....थाना को अंतरित किया गया । प्राथमिकी परिवादी/सूचनादाता को पढ़कर सुनायी गयी । उसने उसे सही रूप में अभिलिखित किया गया, पाकर स्वीकार किया और उसकी एक प्रति परिवादी/सूचनादाता को निःशुल्क दी गयी । (Action taken : Since the above report reveals commission of offence (s) u/s as mentioned at Item No. 2 registered the case and took up the investigation/directed * ..... Rank ..... to take up the investigation)

14. परिवादी/सूचना दाता का हस्ताक्षर/अंगूठा का निशान ।

15. थाना से न्यायालय में प्रेषण की तिथि एवं समय–

11/9/02

थाना प्रभारी का हस्ताक्षर

नाम (Name).....

पदनाम (Designation).....

ANNEXURE-XVIII

Self Statement of S.I. Ashok Kumar Sinha of Rafiganj P.S recorded on 10-9-02 at 1.30 pm at the Pol Side of accident Dhawk Bridge, PS - Rafiganj Distt. Aurangabad

—x—

मेरा नाम अशोक कुमार सिन्हा Rafiganj में थाना प्रभारी एफीजीज के रूप में पदस्थापित एवं कार्यरत हूँ। दिनांक 9-9-02 को 11.45 बजे रात्री में एफीजीज रेलवे स्टेशन एफीजीज द्वारा निम्नांकित सूचना प्राप्त हुई :—

ओ०सी० आर०पी०एफ० तथा थाना प्रभारी एफीजीज
9-9-02. 11.30

आपको सूचित किया जाता है कि आज दो 2301 अप राजधानी एक्सप्रेस ट्रेन का पुल के पास उथा रुकी है। ट्रेन पुलिया टूट गया है और डब्बा लटक रहा है। इसमें दुर्घटना भी हो सकता है आप अतिशीघ्र आकर उचित कार्यवाही करें।

Pol Side

उक्त सूचना एफीजीज थाना द्वारा दूरभाष पर दिनांक 9-9-02 को दिया गया इसकी सूचना आर०पी०एफ० एवं थाना के सभी पदाधिकारी एवं सशस्त्र बल को दिया एवं ट्रांजिट एफीजीज ओ०सी० आर०पी०एफ० के सभी पदाधिकारी तथा सशस्त्र बल के साथ रात्री 23.50 बजे घटना स्थल के लिए प्रस्थान किया। उपरोक्त सूचित किया के थाना से रवाना होकर रेलवे फाटक पर पहुँचा तो पाया कि अप 2301 हावड़ा - नई दिल्ली राजधानी एक्सप्रेस ट्रेन रात्री रेलवे पुल पर जाकर दुर्घटना ग्रस्त हो गई है और रेलवे पुल टूट गया है। ट्रेन के अन्दर के यात्रीगण भी चिल्लाने की आवाज सुन रही है। मैं तथा थाना के सभी पुलिस बल के जवान यात्रियों के जान माल की रक्षा हेतु उतरे। ट्रेन के बोगी के अन्दर के यात्रियों को सुरक्षित बाहर निकाले। इसी बीच एफीजीज सेरुखा से आमिला घटनास्थल पर पहुँचा गये एवं राहत कार्य में सहयोग करने लगे। जख्मीयों को पुलिस गाड़ीयों एवं एफीजीज अस्पताल पहुँचाया जाने लगा। आर०पी०एफ० के पुलिस पदाधिकारी एवं जवान भी इस राहत कार्य में सहयोग कर रहे थे। थाना के पुलिस पदाधिकारी घाट चौकीदार में बट गये। कुछ पदाधिकारी एवं जवान थाना रेलवे पुल के पश्चिमी छोर एवं कुछ पूर्वी छोर की ओर। पश्चिमी छोर की ओर ट्रेन की बोगी काफी क्षतिग्रस्त अवस्था में पाया गया। मैं और थाना के पदाधिकारी एवं जवान एवं आर०पी०एफ० के जवान जख्मीयों को गाड़ीयों से अगवा एफीजीज अस्पताल भेजते रहे। करीब एक घन्टा के बाद से डुमरी थाना के पदाधिकारी एवं पुलिस बल घटनास्थल पर पहुँचने लगे और राहत कार्य एवं यात्रीयों के सुरक्षा में सहयोग प्रदान करने लगे। कुछ जख्मीयों को औरंगाबाद सदर अस्पताल एवं जिला के अन्य थानों से काफी

ANNEXURE-XVIII

पुलिस को सूचना मिलने पर कई गवाहों ने घटनास्थल पर पहुंचकर मौके तथा गाड़ी का निरीक्षण, दोनों पक्षों के बयान आदि लेकर जांच की। चौकी के सिपाही सुरेन्द्र पाल सिंह एवं अन्य लोगों को मौके पर भेजकर घायलों को अस्पताल भिजवाने तथा घटनास्थल की सुरक्षा की जिम्मेदारी सौंपी गई। कई घायलों को गंभीर होने के कारण राजकीय अस्पताल सादुल्लापुर भिजवाया गया। घायलों के बयान लेकर तथा घटनास्थल का निरीक्षण करने के बाद मुकदमा दर्ज कराया गया।

दिनांक 10-9-02 को करीब 10:30 बजे दिन को थाना दो इनके पुत्र की मृत्यु के बारे में सूचना मिली कि इनके पुत्र का शव सादुल्लापुर अस्पताल में पड़ा है। मौके पर जाकर निरीक्षण किया तो पता लगा कि रेलवे का कोई ड्राइवर श्री पहले कुमार पुत्री पन्नी लाल निवासी ग्राम सादुल्लापुर निरीक्षण से घटनास्थल पर निधन हो गई थी।

(I) अप रेलवे लाइन के उत्तरी ट्रैक पर हुआ हुआ था। दूसरे पटरी के दोनों सिरों का हुआ हुआ और दूसरे से एक हुए दो सिर एवं धड़ों पर जोड़ भी था। शायद ट्रेन्स प्रतीत होना हो हुए सिर पर पटरी आयी आयोग्य जिसके बाद से पटरी का धड़ सिर्फ हुए हो गया है।

(II) अप रेलवे लाइन का दक्षिणी पटरी नहीं पाया गया। पटरी पुल के नीचे नदी में गिरा पाया गया तथा पटरी का कोई हुए हुआ पाया गया।

(III) दक्षिणी पटरी जहाँ तक सही था वहाँ एक दो या तीन फीस्ट बोल्ट पटरी के जोड़ पर सही हालत में रहना पाया गया जबकी इतने सारे बोगी तेज गति से गुजरने के कारण इन्हें निकल जाना चाहिये था। इससे साफ है कि खींचने, गिराने आदि का प्रयास तेजी से करने की संभावना प्रतीत होती है।

(IV) दोनों पटरियों के बीच का गुडगर सीमेन्ट स्लीपर पूरा का पूरा पाया गया तथा नदी पुल तक का स्लीपर्स सही था।

(V) जहाँ से पटरी क्षतिग्रस्त होना शुरू हुआ वहाँ से उत्तरी पटरी के फिश प्लेट बोल्ट में 6 नट बोल्ट (Nut-bolt) गायब पाया जबकी दक्षिणी पटरी के 4 (चार) बोल्ट (नट बोल्ट) पाया गया जिसका एक पटरी-पटरी था।

(VI) ट्रेन का इंजन एवं एक डब्बा सुरक्षित रेलवे पुल से पार कर रेती क्षेत्र में पुल से कुछ दूर पर गिरा पाया गया।

(VII) रेलवे पुल का सब्सट्रक्चर पुल नदी में गिरा पाया गया तथा सुपरस्ट्रक्चर क्षतिग्रस्त पाया गया।

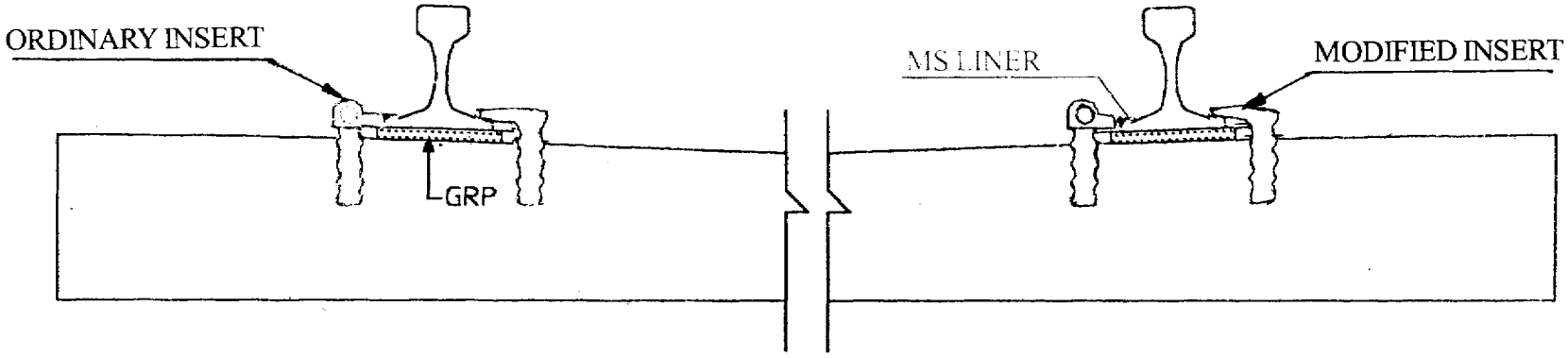
(VIII) अप रेलवे पटरी के उत्तर दक्षिण में करीब 8 फीट पानी पुर्जे बिखरे पड़े थे।

(IX) अधिकांश बोगी पुल के पुर्वी पुर्वी ओर के तरफ से

ANNEXURE-XVIII

Return to P.S. and Registered Ratlam
P.S. Case no 1110/02 dt 10.9.02
U/s 337/338/143/201 IPC and
128/129 Indian Railway act.
Sub. Md. Nishad S/o Ratlam will
Pl. investigate this case as ordered by
Superior officer Pawna
10.9.02
Ot. Ratlam PS

10.9.02



ANTI SABOTAGE TYPE CONCRETE SLEEPER

ANNEXURE - XX

On the night of 10/11.9.2002, at 0100 hrs. the Divisional Commissioner (Magadh Division) informed me that the Howrah- New Delhi Rajdhani Express had met with an accident at Rafiganj leading to a lot of casualties and that I should proceed to the accident site in Aurangabad. I immediately ordered my Adjutant Jamadar to get three companies of recruits ready along with regular officers and men. The Motor Transport Officer was asked to get atleast five large vehicles watered, fuelled and in a ready state. I surmised that as the rescue ops would be well underway before day-break, there would be a need of flashlights in substantial nos.; they would prove handy even during day-hours when rescue work would be going on inside the mangled and ill-lit coaches of the train. With this end in view a total of 50 flashlights were also kept in the ambulance. As the entire train was air-conditioned, meaning locked doors at night, and sealed glass windows, it seemed necessary to take along a large no. of digging and consruction implements for breaking open doors and windows. It being felt that carrying of arms and ammunition by armed forces who double up as rescuers on the occurence of such calamities only leads to their being reduced to the level of lookers-on, I decided to take along only a single section of armed force, the rest being considered better equipped to handle the problem if they were empty-handed or armed with digging implements. At the same time, since the gathering of a huge crowd at the accident site was not ruled out, I decided to carry a substantial no. of lathis, both, for cordoning off the area so essential for the VIP visits which were sure to follow, as well as to ensure that the relief and rescue ops proceeded unhampered and miscief-mongers were kept at bay.

At 0230 hours, I proceeded for the accident site from the battalion hqrs at Bodh Gaya with the following no of personnel, vehicles and material :

Personnel

- Inspectors : 3
- Sub-Inspectors : 11
- Head Constables : 11
- Driver Head constables : 4
- Constables : 250
- Driver Constables :
- ~~Constables :~~ Nursing Orderlies : 2

Vehicles : 8

- Five-tonners : 2
- Buses : 2
- Tata 709 : 1
- Ambulance : 1
- Gypsy : 1
- Commander Jeep: 1

Material

- Flash-lights : 50
- Spades : 34
- Pick-axes : 24
- Crowbars : 20
- Shovels :10
- Lathis : 116
- Rope : 10 lengths
- First Aid box : 1

Our party reached the accident site at 0500 hours. On the orders of the DIG (Magadh Range), I immediately started rescue work on coaches A2 and AS2 with two platoons of my men. One party of about 60 men was deployed for cordoning off the area (with use of lathis). The rest of the men were divided into parties led by head constables and sub-inspectors for concentrating their attention on specific coaches. Two sections of men were employed exclusively to help the railway staff lift and carry their equipment like cold-cutters and gas cylinders. Scores of injured and dead were brought out by BMP personnel from the mangled coaches, often at great risk to their own life and limb. The risk was all the more greater because many of the coaches were hanging precariously at impossible angles and access to them had been made difficult owing to the slippery metallic surfaces, rendered even more inaccesible due to the pouring rain. About 70 dead bodies were recovered by BMP personnel and carried, first to the area where the post-mortem examinations were being done, and then to the trucks waiting to receive them. Displaying exemplary honesty, valuables like mobile phones, jewellery, credit cards and wallets, were all being regularly brought to the local administrative and police officials by the recruits and officers of BMP 18 and 19. All the luggage being recovered was neatly laid out in rows to

facilitate easy identification. The party set to guard the luggage also carried the respective luggage of the survivors to the special trains leaving for Gaya and Mughalsarai. Right from carrying the dead and the seriously injured out of the coaches , and taking them to the waiting vehicles, feeding the less injured water/tea/snacks, helping them make telephone calls from the satellite phone booth, down to announcing the names of survivors as requested by their kith and kin, there was not a single portion of the rescue and relief ops that the officers and men of BMP did not not take part in and accomplish with admirable enthusiasm.

Returning to the Bn. Hqrs. at 0230 hours after completing the bulk of the rescue and relief ops., the next day, ie. on 11.9.2002, another company of 76 recruits along with 1 head constable and 2 officers reached the accident site as directed by ADG (Patna zone) and managed to recover 19 more dead bodies, of which 5 were loaded in the special train leaving for Delhi. Valuables and luggage recovered from the coaches were handed over to the local administrative officials. After completing the ops for the day, the BMP company returned to Bn. Hqrs. at 2315 hours.

Again on 12.9.2002, responding to a directive from DIG (Magadh Range), one platoon of recruits (23), led by one head constable and one officer were directed to report to DM Gaya. Overcoming the stench from bodies in an advanced stage of decomposition, which no one else was ready to handle, this highly motivated platoon of men removed the 16 as yet unidentified corpses from their coffins and carried them inside the post-mortem room at the Gaya Medical College mortuary.

The recruits, men and officers of BMP 18 and 19, displayed a great sense of duty and responsibility. Working for impossibly long hours at a stretch, with admirable self-discipline and motivation, without regard for food or water, in pouring rain, they managed to save a large no. of lives. In fact, owing to their being by far the largest in numbers amongst the plethora of organisations involved in the rescue and relief ops,like Aurangabad police,GRP,RPF,Army (one company), and because they, save for the Army personnel, were unencumbered with rifles and ammunition, and also because they alone were able to bring the digging and construction implements into play, the men and officers belonging to BMP 18 and the officers, men and recruits of BMP 19 (the latter being engaged in training activities at the Bn. Hqrs. of BMP 18 at Bodh Gaya), contributed the maximum.

B. **Inspection Report of Electric Loco Trip Shed, Eastern Railway, Bamangachi on 19.10.2002 regarding trip inspection of WAP-5 Locomotive.**

1.0 The Trip Shed for WAP-5 Electric Locomotive at Bamangachi was inspected with CELE/Eastern Railway and Sr.DEE(TRS)/HWH on 19.10.2002.

2.0 The electrical and the mechanical items inspected during the trip inspection are given in Annexure 2 & 3 respectively. Also give alongside therein are the remarks/ observations/values noted during the trip inspection of the WAP-5 electric locomotive No.30002 on 09.9.2002 (the locomotive of the Rajdhani Express which met with the accident on 09.9.2002). The remarks noted in the Observations Register for this particular locomotive on 09.9.2002 by SSE/TRS/BMG are enclosed at Annexure 4.

2.1 The trip inspection is carried out by three teams of 2 staff each (one fitter and one helper) for electrical, mechanical and pneumatic sections respectively, all under one supervisor. The Observations Registers giving details of items inspected /attended during trip inspections are being kept individually for each locomotive (total 10 WAP-5 locomotives) and, after completion of each inspection, are being signed by SSE/ TRS/BMG.

2.2 Only two types of documents are being maintained at the Trip Shed :

i) Observations Register for each WAP-5 locomotive.
ii) Trip Schedule Register (datewise, for all locomotives, giving details of the items inspected as per the list of scheduled trip inspection).

2.3 The list as per which the items are inspected during trip inspection (as given in Annexure 2 & 3) was informed to be that circulated by GZB Electric Loco Shed earlier. The RDSO's letter as per which this list had been prepared, was not available at the Trip Shed. Also, the ABB manual for maintenance of WAP-5 locomotives was not available at the Trip Shed.

2.4 The main Electric Loco Shed at BMG is located adjacent to the Trip Shed. This main loco Shed is under a DEE, who it was informed, does carry out general inspection of the Trip Shed once in a while, but does not carry out any intensive checking/surprise checks of any WAP-5 locomotive at the Trip Shed.

3.0 At the time of the inspection, no WAP-5 was available at the Trip Shed. However, WAP-7 electric locomotive was available at the pit line in the Trip Shed. The inspection gang was asked to demonstrate how they carry out the inspection of each of the items given in the list. Our observations are as follows:-

a) The examination is mainly 'visual' and only minor maintenance work like replacement / tighting of bolts and nuts, topping up of lubricants etc. are being carried out.

b) For any item involving major repair, it is either repaired by the adjacent main Electric Loco Shed, if possible, or by Gomoh Electric Loco Shed or by Ghaziabad Electric Loco Shed, which is the homing shed of WAP-5 locos.

c) From the records it was observed that there were no items involving major repairs during the last six months.

d) The item involving the inspection of the clearance between body and bogie frame is carried out only visually and no measurement/ go-no go are being used.

e) Each trip inspection has been allotted 2 hours to carry out the scheduled maintenance.

4.0 There is no facility available for retrieving data from the MEMOTEL installed in the locomotive.

5.0 Only a rudimentary store room is available at the Trip Shed for storing items like lubricants, nuts, bolts etc. in small quantities (the major store being in the adjacent electric loco Shed).

6.0 Regarding the staff, Sr.DEE (TRS)/HWH informed that there are no vacancies as far as the Trip Shed is concerned.

7.0 **RECOMMENDATIONS SUGGESTED**

7.1 As per the Minutes of Meeting on Maintenance Scheddules of WAP-5 locomotives circulated vide Director (Standards)/ Electrical/ RDSO's letter No. EL/3.1.35/2 dt. 11/12-7-2001, one PC alongwith data extraction unit with a few spare cassettes, must be provided at the Trip Shed. This will help in assessing the performance of the driver on line.

7.2 The documents like the instructions circulated by RDSO for maintenance schedules to be carried out during the trip inspections should be available at the Trip Shed. Similarly the maintenance manual of the WAP-5 loco must be available at the Trip Shed.

7.3 The list of instructions for maintenance to be carried out during the trip inspection must be prominently displayed at the shed.

7.4 The clearance between the body and bogie frame must not merely be observed visually but checked with a measurement or go-no-go gauge.

7.5 The pit must be provided with adequate lighting for ease of inspection during the night time.

C. INSPECTION REPORT OF THE ELECTRIC LOCO SHED, NORTHERN RAILWAY, GHAZIABAD ON 21.10.2002 AND 22.10.2002 REGARDING INSPECTION AND MAINTENANCE OF WAP5 LOCOMOTIVE.

1.0 The Electric loco shed at Ghaziabad was inspected on 21.10.2002 and 22.10.2002 to examine the inspection and maintenance schedules being followed for WAP5 locomotives in general and the lifting up and examination and testing of the springs of the WAP5 loco no. 30002 of the accidented Rajdhani Express in particular.

2.0 INSPECTION & MAINTENANCE SCHEDULES.

The periodicity of the various inspection and maintenance schedules being followed for the WAP5 locomotives as circulated vide RDSO's letter No. EL/3.1.35/2 dt. 27.8.99, have been modified as under: -

S. No	Type of schedule	Periodicity	Place of Schedule	Time Taken for Schedule
1	Trip inspection .T	Every trip	Trip shed	2 hours
2	Schedule IA	Once in three month	Home shed	4 hours
3	Schedule IB	Once in six months	Home shed	8 hours
4	Major overhaul (MOH)	Once in eighteen months (1.5 years)	Home shed	4 days
5	Intermediate Overhaul (IOH)	Once in 6 years ± 6 months or 10-11 lakh Km whichever is earlier	Home shed	10 days
6	Periodic Overhaul (POH)	Once in 10 years ± 6 months or 20 lakh Km whichever is earlier	ELW/BSL	20 days

These modifications are in line with the Minutes of the Meeting on Maintenance Schedules of WAP5 / WAG9 locos on 21.4.2001 circulated vide RDSO's letter No. EL/3.1.35/2 dt. 11/12-7-2001.

.2.1 The proformae for the various schedules were observed to be as per the list circulated vide RDSO's letter No. EL/3.1.35/2 dt. 27.8.98.

2.2 It was enquired whether any intensive examination, once in 3 months, was being carried out at AEE level in the shed. The Sr.DEE/TRS/GZB informed that while checks were being carried out on the locos by officers almost on a daily basis, no written instructions regarding such intensive checks by any officer exist at present. No records to this effect were, therefore, being maintained.

3.0 The WAP5 loco number 30002 was lifted and was got examined.

(i) Before lifting, the vertical and lateral clearances between the axle box and the bogie frame were checked. The observations are attached as Annexure- 5 These values are within the specified limits.

(ii) The vertical and lateral clearances between the bogie frame and the under frame were checked and all values were within the specified limits except one, which is 68 mm. This is due to the crushing of rubber because of derailment.

(iii) The Primary springs and the Secondary springs were tested for free height and height under specified load. These were also found to be within limits.The observations are given in Annexure-

(iv) No deficient/defective equipments were noticed.

Conclusion: No defective and missing components were noticed which could lead to the derailment of locomotive.

4.0 Inspection of the shed to examine the procedures followed for different schedules of maintenance of the WAP5 locomotives was undertaken.

The different facilities available in the shed were also inspected. Some of which require special mention are : -

(i) Pneumatic Room - All DVs, SA9 and A9 are checked for functioning before fitment, on a pneumatic test bench developed by the shed.

(ii) E4(Electronic) Section : - Speedometers of different locomotives are calibrated with the Master Speedometer once a year. The head light, flasher light and the marker light control box repair and testing are also carried out in the section.

(iii) Electronic Testing Room - Power electronics of the loco are checked for correctness.

Moreover, the working of the speedometer and the recording of MEMOTEL of WAP5 Loco is checked in every schedule. The Master speedometer is supplied by M/s Medha and Autometer. These are calibrated once a year by the original manufacturer.

The working of the Automatic Flasher Light and ACP circuits was checked on WAP-1 loco number 22009 and was found to be working.

5.0 The list of items being inspected during the Trip Inspection at Trip Shed, Bomangachi was compared with the list of items to be inspected as circulated by RDSO. It was, however, seen that the list of items being followed by the Trip Shed does not cover all the items of RDSO's list. These need to be included along with the maintenance instructions given for each item in the RDSO's list.

6.0 The Data Extraction unit for MEMOTEL should be provided at every Trip Shed along with the Divisional Headquarters of Divisions lying along the Rajdhani route where these locos ply.

7.0 The Loco shed has all the relevant manuals of WAP5 issued by M/s ABB/Switzerland as well as by RDSO. Different drawings are available which are used for procurement of different stores. As informed by Sr.DEE/TRS/GZB, there is no shortage of any staff and stores. However, the pit wheel lathe which is used for wheel profiling, is an old one, well past the codal life of nine years (its age being 19 years) and has been down for 93 hours during the last 6 months. Since wheel profile maintenance is a safety item, it is recommended that the old pit wheel lathe may be replaced so that the quality of work does not suffer on this account.

(B.S.Dohare)
Dy.Commissioner of Railway Safety(M

(Ashutosh Pant)
Dy.Commissioner of Rly.Safety

Annexure - I

ELECTRICAL ITEMS BEING INSPECTED DURING THE TRIP INSPECTION OF WAP5 LOCO

Sl No.	Description	Observations made during the trip inspection of loco no. 30002 on 09-09-2002.
1.	Horn Operation	OK
2	Wiper / Washer Operation	OK
3	Water Tank	OK
4	Main Compressor	OK
5	Traction Convertor	OK
6	Main Transformer	OK
7	Traction Motor	OK
8	Air Drier	OK
9	BA Voltage / CHBA Voltage	102 V / 110 V
10	Building up of MR Pressure	10.5 kg/cm³
11.	Building up of BP Pressure	5.3 kg/cm³
12	Building up of FP Pressure	6.4 kg/cm³
13	Condition of Air Flow Indicator	0 Deflection
14	Working of Brake Cylinders	OK

READING OF THE PRESSURE GAUGE

1.	MR Air Pressure	10.5 kg/cm³
2	BP Air Pressure	5.3 kg/cm³
3	FP Air Pressure	6.4 kg/cm³
4	BC Air Pressure by A9	5 kg/cm³
5	BC Air Pressure by SA9	5 kg/cm³

READING OF THE OIL LEVEL

1.	SR-1 Oil Level	20°C
2	SR-2 Oil Level	30°C
3	Main TF Oil Level	30°C
4	RGCP condition	—
5	Fire Extinguisher	4/2 (4 in Cab 2)

Sd/ (B. Majhi)
Fitter

Annexure - 3

MECHANICAL ITEMS BEING INSPECTED DURING THE TRIP INSPECTION OF WAP5 LOCO.

S. No.	Description
1.	Internal Door Locks
2.	Center Buffer Coupler
3.	Buffer
4.	Traction Link and Bar
5.	Gear Case
6.	Hurth Coupling
7.	Sand Box
8	Flange Lubricator
9.	Brake Pad.
10.	Scrubber Brake Actuator
11.	Brake Cylinder Actuator
12	Bogie Isolating Cock
13	Clearance between Body and Bogie Frame
14.	Primary Suspension
15	Secondary Suspension.

(Observation 'OK' made for all the above items during the trip inspection of loco no. 30002 on 09-09-2002)

Sd.
(S. Gupta)
Helper

(A.K. Parmanik)
Helper.

Op/T48

Eastern Railway
Operating Department
Station Diary

Op/D2

Ann. 4

09/09/02 Loco 30002 230 Up. 230 Dn.

No repair has been booked by the incoming driver.

Trip inspection done as per schedule & found normal. K/E panders have been made ready for service

U/F, Roof inspection done, no abnormality was noticed

Pantographs have been checked & found OK.

Observation: Normal in all respect.

SSE/TRS/BMG
09/09/02
(N. K. De)
SSE/TRS/BMG

ANNEXURE 5

CLEARANCEs FOR LOCO 30002

Clearance from Axle Box to Bogie :

Axle Box No.	Lateral Clearance (in mm) (10-20 mm)	Vertical Clearance (in mm) (27-35mm)
1	13	29
2	17	30
3	16.5	28.5
4	15	29
5	15	31.5
6	18	29
7	18	29
8	14	31

Car Body to bogie clearances

		Lateral (20-40mm)	Vertical (32-60)
Cab1	Driver side	31	38
	Asst. Driver side	30	39
Cab2	Driver side	35	39
	Asst. Driver side	68*	40

* Pad Crushed as a result of derailment.

ANNEXURE 6

ANNEXURE - XXIA.

LOCO 30002 PRIMARY SPRING HEIGHT

S. No	Free Height	Static Load Height (at 41.1 KN)
Specified	228.2-231.0	175.0-177.8
1 LH	229	178
RH	228	178
2 LH	228	179
RH	228	179
3 LH	228	178
RH	229	177
4 LH	230	179
RH	229	178
5 LH	229	179
RH	229	178
6 LH	230	179
RH	229	179
7 LH	228	178
RH	229	179
8 LH	229	178
RH	229	179

LOCO 30002 SECONDARY SPRING HEIGHT

S. No	Free Height	Static Load Height (at 61.5KN)
Specified	664.5-679.1	480.0-494.6
1	670	494
2	667	493
3	666	492
4	667	491
5	667	492
6	667	494
7	666	493
8	667	495

REPORT OF THE Dy.CRS (MECH)/LKO AND Dy.CRS(ELECT)/LKO ON THE LOCOMOTIVE AND COACHES OF 2301 UP RAJDHANI EXP. AT MUGHALSARAI, RAFIGANJ, ACCIDENT SITE AND AT LILUAH WORKSHOP, KOLKATA.

A) The accident to 2301 up Rajdhani Exp. near Rafiganj station of Mughalsarai division of Eastern Railway took place on 09/09/2002.
We , the Dy.CRS(Mech.)/ LKO and Dy.CRS(Elect.)/LKO were directed by the CCRS/LKO to proceed to MGS and GYA to examine the locomotive and the coaches of the accidented train and later to Liluah Workshop of Eastern Railway at Kolkata for lifting of the accidented coaches and examination of the under gear equipment.

B) OBSERVATIONS ON THE ELECTRIC LOCOMOTIVE AT ELS/MGS

As per the directions , we proceeded to MGS by 2402 Shramjeevi Exp. and reached MGS on the morning of 16/09/2002. The electric locomotive No. 30002 WAP5 of the above train was parked at Electric Loco Shed, MGS. The home shed of this locomotive is ELS/GZB. The locomotive was examined in the presence of Sr.DEE/TRS/ELS/MGS and his officers along with DEE/TRS/ELS/GZB. Observations were made of the undergear equipment including the wheels and the details are given at Annexure-1 . The data from the speedometer was also down-loaded and the speed, time, distance and braking characteristics were obtained. Important observations are summarized below.

1. No hitting marks (or ballast marks) were found on wheel nos.1,2,3 & 4. Axle crown of wheels No.4 was found to be having a hit mark 2mm deep.
2. Groove marks which appear to be machining marks were found on the tread on wheel Nos.5 & 6.
3. On wheel No.7 rubbing marks on gauge face and marks on the tread were noticed.
4. On wheel No.8, material has flown on the outside face probably due to hitting; Black spots were seen on the tread.Oil flange lubricator assembly fixing bolt was broken . Rubbing/hitting marks were observed on the sand box and , correspondingly , on the bogie frame .
5. Hit mark, 3.00mm deep, were observed on the axle crown of wheels 7 & 8.
6. No hitting/ballast marks were observed even on the lowest under-frame equipment.
7. All the wheel dimensions were found to be within limits.
8. On axle box 1 , the guide rod of aluminium was found bent and a fresh crack on the opposite side was observed.
9. The vertical damper guard of bogie no.2 (driver side) worked out.The bump stop had hitting marks and the rubber pad on Assistant's side was found crushed.

C. Observations on the coaches of 2301 UP Rajdhani Express made on 17/09/2002 at the accident site and at Rafiganj Station.

We reached GYA on the morning of 17/09/2002 by KLK Mail from MGS. As per the directions of CRS/EC , we went to the accident site on tower wagon and reached there by 11:30 hrs.
As directed , the observations of the first two coaches i.e. 6696 A WLRRM (Ist from TE) and 92802 A (2nd from TE) were made at the site in respect of the following:-

i) Condition of the Coaches.
ii) Deficiencies noticed.
iii) Any rubbing / hitting marks on the under gear components including the wheels.

The summarised observations are given below while details are given at Annexure- II.

a) **Coach No. 6696A WLRRM (Power car)**

i) The power car was lying on the left side of the up line.
ii) Both the bogies were found to be attached with the coach.
iii) Only one axle with wheels out of four was attached to the bogie of the coach. The other three axles had been detached and were found lying at the site.
iv) Measurements of all the wheels were taken. The wheels were also checked using a tyre defect gauge and all the dimensions were found to be within limits.

b) **Pantry Car No.92802A**

i) The coach was lying over turned and resting on its roof fully smashed.
ii) Both the trolleys had detached and were thrown away.
iii) The wheels of this coach were lying scattered. There were traced and measurements were taken. As per measurement with the tyre defect gauge the dimensions were within limits.
v) No hitting or rubbing marks were noticed.

c) **WCBAC 82803A Pantry Car(15th from TE) at Rafiganj Station.**

i) Right side body panels of the coach were found smashed due to handling with the chain of the crane. One under frame transformer was found missing . It was learnt that this was the removed to facilitate lifting of the upturned coach by the crane.
ii) Some rubbing marks were noticed on the wheel disc.The measurement of all the wheels was taken and all the dimensions were found to be within limits.

d) Coaches Nos.WFAC 99002A(16th from TE) WFAC 90016A (17th from TE) and WLRRM 00856A(18th from TE).

i) Observations were taken . No abnormalities were observed . All the wheel dimensions were measured with tyre defect gauge and were found to be within limits.

D. Observations made on the coaches at Liluah

Coach No.WCBAC 82803A , WFAC 99002A , WFAC 90016A and WLRRM 00856A which were the 15th , 16th, 17th & 18th coaches respectively were taken to Liluah workshop from Rafiganj Station at 50kmph. The detailed observations spring and wheel measurements were taken on 21.9.2002 which are attached as Annexure-III.

As per the observations of the above coaches the following points are noted:-

i) Fresh breakage of one spring (No.-13) of WFAC 99002A was found.
ii) All the wheel dimensions were within limits and no hitting marks were noticed.
iii) Groupings of axle and bolster springs of the four coaches were tested at LLH workshop and the details are annexed as Annexure-IV. It was found that a few axle springs and bolster springs fitted in bogies were not of the same groups. Details of these spring as follows:-

I. Coach No. 99002 A WFAC

		Axle Box (Spring)	Bolster Spring
Bogie no.1	(i)difference in Spg.No.	1&2 is 6 mm	(i) 1& 2 is 2 mm
	(ii) --do--	3 & 4 is 6 mm	(ii) 3& 4 is 8 mm
Bogie No.2	(I) --do--	11&12 is 3 mm	--
	(ii) ....do....	.15&16 is 5 mm	--

II. Coach No. 82803A WCBAC -

	Axle Box (Spring)	Bolster Spring
Bogie No.1 (i) difference in Spg.No	1&2 is 6 mm	--
Bogie No.2 (i)... do...	13&14 is 6 mm	--

III. Coach No.00856A WLRRM

	Axle Box (Spring)	Bolster Spring
Bogie No.1 (i) difference in Spg.No	3&4 is 10mm	
(ii) --do--	5&6 is 1 mm	
Bogie No.2 (i) ...do...	11&12 is 7 mm	--
(ii) ....do....	15&16 is 6 mm	--

IV. Coach no. 90016A WFAC

	Axle Box (Spring)	Bolster Spring
Bogie No.1 (i) difference in Spg.No.	1&2 is 5mm	5 & 6 is 3mm
(ii) ....do....	5 & 6 is 5mm	--
Bogie No.2 (i)....do....	13&14 is 7 mm	--
(ii)....do....	15 & 16 is 6mm	--

As per the springs height measured under testing load at Liluah Workshop, the difference in spring height of springs which are of not same groups are 10mm, 6mm,5mm,3mm & 1mm as against the specified limit of sum for spring height under testing load .

The difference in spring height will affect the magnitude of load coming on springs. It may cause breakage of springs.

E. Recommendations :-

i) The possibility of using sealed type dash pots or, alternatively, equipment which eliminate leakage of oil during run should be examined to improve the riding characteristics of coaches.

ii) All major coaching depots and ARTs should be provided with a computer based profilometer to check the wheel profiles.

iii) AC coaches should have emergency exits on both the sides with proper indications which are visible even in dark. The procedure of opening it and its location should also be displayed prominently in the coach.

iv) All the train running staff including the TTEs should be trained in rendering first aid and in other life saving techniques i.e. CPR .

v) The possibility of using Centre Buffer Coupler with shelf or pocket may be examined . This will reduce the chances of the uncoupling and subsequent capsizing of the rolling stock.

vi) It was observed that the guide rod of the first axle of the locomotive got bent apparently due to emergency braking . The design of the same may be examined

ANNEXURE - XXIB.

F. Conclusion

(i) As per the observations made on the locomotive at Mughal Sarai Loco Shed, we are of the opinion that there are no such deficiencies/defects in the locomotive which could have led to the derailment.

(ii) The observations made on the derailed coaches No. 6696A WLRRM (first coach) and No. 92802 A WCBAC (second coach) at the accident site do not point to any deficiencies/defects in the above coaches which could have led to the derailment.

(iii) No such deficiencies were observed on the coaches No. 82803A WCBAC (15th coach), No. 99002A WFAC (16th coach), No. 90016A WFAC (17th coach) and No. 00865A WLRRM (18th coach) at Rafiganj and subsequently in Liluah Workshop, which could have led to the derailment. Further, we are of the opinion that if all the other coaches had also been maintained to the same standards as the above four coaches, they would not have initiated the derailment.

(Ashutosh Pant)
Dy.Commissioner of Rly.Safety(ET)
Lucknow.

(B.S. Dohare)
Dy.Commissioner of Rly.Safety(M)
Lucknow.

ANNEXURE-XXI-C

INSPECTION REPORT OF DY.CRS(M)/LKO. & DY.CRS(ET)/LKO. IN CONNECTION WITH THE RAJDHANI EXP. ACCIDENT ON 09-09-2002.

A. Inspection of Tikiapara Primary Maintenance depot to check the procedures followed for Primary Maintenance of coaches.

The system of pre-inspection before placing of rake on washing pit for maintenance is followed. The same is:-

(i) Rolling-in-examination of rake is done at platform by train passing staff.

(ii) Escorting TXR submits his report in TXR train passing office in writing as soon as he arrives at HWH after completing the journey. This report is sent to SSE/Rajdhani/Washing Pit on same day.

(iii) Escorting TXR also informs to SSE, washing pit of Rajdhani Express regarding works carried out during run and abnormality noticed on phone also.

(iv) Some time Escorting TXR presents himself before Sr. DME if any serious abnormality is noticed during run. Sr. DME then directs to SSE/Washing pit/Rajdhani verbally.

(v) One washing pit gang also checks the rake at the entrance of washing pit complex-regarding wheel defects i.e. wheel flats. They also check the rake for heavy repair which needs detachment. The coaches are detached and attached in the night and placed in washing pit in morning for maintenance.

(vi) Nine different gangs were engaged for undergear maintenance namely Air Brake Testing, HWH/End adjusting, Delhi/ End Adjusting, Schedule Special, under gear examination, Special Undergear Examination, Dash Pot Oiling, Buffer/ Coupling Oiling & Trolley Cleaning Gang.

For upper gear maintenance separate gangs are deputed.

(vii) On washing pit 18 =36 coaches were placed after detaching of 2=4 coaches. Out of these two one was extra coach no.96101 A and other coach 1 =2 i.e. 95853 A was detached for Root radius and Dash pot spring weak. 95853 A was replaced by 92851 A WLRRM before placement on washing pit.

(viii) The staff working on washing pit were interogatted on working spot about their job. They answered correctly. The staff working on B/Block fitment, slack adjuster 'A' dimension, piston stroke & centre pivot attention was asked to demonstrate the work done & they performed successfully.

(ix) One Dash Pot of Coach numbered 99134 A was checked for oil and no oil was noticed. However last dash pot oiling was done only on 06/10/02. This shows that the present practice of checking of dash pit oil at interval of 15 days are insufficient. The dashpot oil in Rajdhani rake can be checked in every trip at Primary Maintenance Depot.

(x) Piston stroke and slack adjuster 'A' dimension of 92851A and 92803-A was checked and found within limit of 90±10 & 22+2/-0

(xi) Gauges to check the wheel profile, slack adjuster 'A' dimension, Piston Stroke, axle box crown clearance and gap between bolster and trolly was checked and found O.K.

(xii) Supply of safety fittings, availability of staff for Rajdhani rakes and availability of coaches are reported to be adequate by the CDO Shri B.K. Jha. In support of it he has submitted his statement which is annexed as annexure 1

(xiii) Following registers are maintained in coaching depot to keep the vital stalistcs of different coaches.

(a) Daily damage and defficiency register- All details regarding works carried out on washing pit on individual coach are maintained i.e. schedule, wheel, piston stroke, slack adjuster details are few of them

(b) Safety item:- It is used for keeping records regarding availability of different safety brakets.

(c) Check of underslung items- In this register condition of fitment of all underslung items are recorded.

(d) History Sheet- It indicates the periodicity of damage of Coach alongwith its cause. It helps to no the repeatability of coach detachment.

(e) Coach Kilometrage- To know the kilometrage carried by Coach. This facilities information for sending of Coach for IOH & POH

(f) Coach Position-To check the integrity of rake.

(g) Escorting TXR - trip records- It gives information regarding unusual occurence during run and bad riding behaviour of any coach.

All Primary maintenance depot should keep the records as indicated above.

(xiv) The details of trip examination is recorded on a printed proforma called Daily damage and deficiency register. The other schedules i.e. Sch 'A', 'B' & 'C' are recorded on a proforma prepared by the depot. A similar practice should be adopted by all coahcing depot of Indian Railways.

(xv) As per statement given by CDO on 17/10/2002 as per Annexure 1 no coach is due for any schedule running in Rajdhani & Shatabdi rake.

(xvi) There is a divisional staff training school at Tikiapara. Refresher courses for supervisor and skilled staff are conducted. During the Oct 2001 to Oct 2002, 26 supervisors attended the course of 21 days. The periodicity of this course is of 3 years and as on 17-1-2002 no supervisor was over due for refresher

course. Similarly 174, skilled staff were given 3 days refresher course from Oct. 2001 to Sept.2002. The periodicity of refresher course for skilled staff is 5 years. No skilled staff was over due for refresher course on 17-01-2002..

(xvii) Adequate equivalent facilities for testing of Air Pressure i.e. air compressor, Rake testing and single coach testing ring is available.

Short Coming or deficiencies noticed during inspection of Tikiapara depots:-

(a) Infrastructural deficiency-:- (1) Flooding of Washing Pit during rain-hence continuous pumping out of water is required which affects the maintenance of rake.

(2) No Cat Walks- There is very less space between two washing pit which affects the movement of material trolly as well as staff.

(3) All washing pit lines are curved- Due to it few buffers remains compressed & these could not be checked/attended at washing pit. Ease out of curve is essential.

(4) No Pavement- Poor road approach to washing pit which affects movement of material trollies.

(5) No light in W/Pit- These are no light fittings inside the washing pit, which affects the maintenance even in day times especially in rainy season when it becames dark even in day time. Night maintenance is very difficult.

(b) Staff:- As per the statement of CDO, there is shortfall of 98 staffs for rakes other than the Rajdhani Coaches.

(c) Coaches- As per the statement of CDO, there is shortage of Non-AC Coaches, specially WGSCN Coaches. There are 422 WGSCN Coaches against the requirement of 479 Coaches.

(xviii) Recommendation:- As per the strength and weakness of Tikiapara depot following are recommended:-

(i) Dashpot Oil should be checked at every trip for Rajdhani Coaches. A friction or sealed type equipment should be used in place of present system of Dash Pot Oil arrangement to avoid wastage of money through replenishment of Oil leakage and for easy maintenance also.

(ii) Infrastructural facilities, adequate staff and coaches should be provided.

(xix) It has been noticed that few stipulations mentioned in Railway Board's letter no. 95/MC/141/1 dt. 29/10/2001 is not followed. They are:-

(a) New Trains:- As per this letter before introduction of any new trains, compliance with the RPC No.4 (Revised) will be certified formally by CPTM and CRSE of the originating Railways duly consulting the terminating railways. The RPC No. (Revised) give, details regarding requirement of staff and facilities.

Hence it is recommended that information as per para 1 of Railway Board's letter No. 95/MC/141/1 dt.29/10/01 should be certified and should be sent to CRS for information before introduction of New trains.

(b) It has been noticed that all mandatory conditions stipulated for primary maintenance and other end as per Railway Board's letter no. 95/MC/141/1 dt.29/10/01 are not met. Hence it recommended that CME's of Zonal Railway should comply the condition before implementing the instructions contained in above referred Railway Board's letter.

(xx) Conditions to be fulfilled to run at 130 Kmph as per ACR's/NE Circle's Calcutta letter No. 1744 dt. 22/10/71 pertaining to coaches:-

(a) One of the important stipulation is that Rajdhani rake should be checked at least once a month by AME:-

The record of the depot was checked and found that CDO(DME)/Tikiapara has checked the Rajdhani rake (2301) on 6/6/02,22/7,13/8, and 6/9

(b) The other stipulation that entire rake should be checked at MGS within permitted time by deputing sufficient staff.:- Depot incharge informed that it is done but they could not produce and record in support of it. Hence it is presumed that this practises is not followed.

This condition must be complied by Zonal Railways.

(xxi) Technical Circular No.33(issued by CCRS Office)

(a) The record of escorting TXR was checked it was noticed that escorting TXR makes his report in two copies. One Copy is submitted to CDO/ Tikiapara whereas other copy is sent to Sr.DME,HWH for his information These reports are put up to Sr.DME for necessary action.

(b) It has been noticed that working condition of PEASD (Passenger emergency alarm signal device) is checked at washing pit and one washingpit supervisor comes from washing pit to check the continuity of Air Brake alongwith train passing TXR at plateform.

(c) There is system of running out of trolly only once in between consecutive POH i.e. during IOH in Liluah Workshop for Rajdhani Coaches

ANNEXURE-XXII

कार्यालय जिला पदाधिकारी एवं समाहर्त्ता, औरंगाबाद।
(जिला गोपनीय शाखा)
पत्रांक 2742 / गो0

प्रेषक,

जिला पदाधिकारी,
औरंगाबाद।

सेवा में,

श्री महेश चाँद,
रेलवे संरक्षा आयुक्त,
कोलकता।

औरंगाबाद, दिनांक 24 सितम्बर, 2002 ई0

महाशय,

आरक्षी अधीक्षक, औरंगाबाद, श्री सुनिल कुमार झा के द्वारा आरक्षी उप महानिरिक्षक, मगध प्रक्षेत्र, गया, अधोहस्ताक्षरी के साथ भ्रमण के पश्चात उनके द्वारा किये गये अनुसंधान के पश्चात घटना के संबंध में एक विस्तृत प्रतिवेदन तैयार किया गया है, जो भवदिय को संबोधित है, कि प्रति इस पत्र के साथ संलग्न कर भेजी जा रही है।

अतः अनुरोध है कि इस प्रतिवेदन में उल्लखित बिन्दुओं को जाँच में सम्मलित करने की कृपा की जाय।

अनुलग्नक – यथोक्त।

विश्वासभाजन,

जिला पदाधिकारी,
औरंगाबाद।

P-5/ confi/ M.Chand.

ANNEXURE-XXII

OFFICE OF THE SUPDT OF POLICE, AURANGABAD.

L.No. 1589 /C

From,

Supdt. of Police,
Aurangabad (Bihar).

To,

Shri Mahesh Chand,
Commissioner,
Railway Safety, Calcutta.

Aurangabad, dated 23 Sept. 2002.

Sir,

Kindly refer to the deposition which the D.I.G (Magadh Range), D.M., Aurangabad, and the undersigned made on 17/09/2002 before you in Gaya, in connection with the unfortunate mishap of Rajdhani Express on 09/09/2002. On that very day (17/09/2002) the railway officials handed over a sketch of the accident site to the Investigating Officer, Inspector Mohd. Azhar. On cursory perusal of this map it came to notice that vital information has not been furnished in the aforesaid map. For example, only one of the two broken end of the rail is shown, the damage inflicted on the rail over the bridge, piers of the bridge and girders was held back, and the pre-existing cracks at the point of breakage of atleast two piers which are easily identifiable by the darker different colour apparently formed by seepage of water and other substances through the crack was not mentioned. It may be relevant to put on record that the D.I.G (Magadh Range), D.M., Aurangabad, and the undersigned, alongwith Shri Radheshyam, Chief Bridge Engineer inspected these cracks on 18/09/2002. It is also pertinent to put on record that Shri Radheshyam acknowledged the cracks, but stated they could not have caused this accident. However, the breaking of these piers along the line of crack, and Epoxy grouting material visible on the surface of the area exposed because of this breaking, is the subject- matter of investigation.

The aforesaid omission in the sketch of the accident-site does create lurking suspicion that what existed on the ground, and was difficult for the railways to explain in support of their sabotage theory, was not shown in so vital a document as the sketch-map. This is a vital document because now the tracks and girders have been replaced and restored, and the bridge is in the process of being repaired. In short the ground-scape of the accident site has changed. What remains in sole mute testimony is the Accident Site-Sketch on which experts will rely to give their findings. This Accident Site Sketch Plan, therefore, conceals incontrovertible facts.

Therefore, I may be permitted to mention evidence which has surfaced during investigation and which in its entirety, goes against the Sabotage Theory.

Shri B.Naskhar (Section Engineer), Shri Y.N. Singh (P.W.I) and Shri Maheshwar Mishra a class IV employee working in the store, were the first railway officials to visit the site. It is in their statement that they reached the accident site (Howarh End of the Bridge) around 2310 HRS. In the UP Line they found that in the southern rail, a rail had been removed and kept about one and a half feet outside the rail-track parallel to it, towards south. The 4 fish-plates at both ends and corresponding 8 nut-bolts were lying in close proximity to their respective fish-plate joints. These three railway officials also found the pandrol clips lying on the ballast. From the inspection of this accident site it was found that the very next rail towards Delhi End had snapped and the snapped rail was 10.77 metre in length. The snapped portion of this rail was 6.81m from the abutment of the bridge. All sleepers under this rail were not in their place but had been dragged into the river. This scenario compels me to put a question to myself : if the snapped rail was not connected with the "removed" rail by fish-plates, then where did the resistance come against the force which even dragged the sleepers below it, and snapped this rail ? This physical evidence irrefutably establishes that the snapped rail was joined with

fish-plates to the "removed rail" and this "removed rail" was in turn joined to the preceding rail with fish-plates at the time of snapping of the said rail.

This vital evidence, the broken end of the aforesaid rail has not been shown in the Site-sketch prepared by Senior D.E.N (Co-ordination) Mughalsarai, and Divisional Safety Officer, Mughalsarai. This critical omission appears to be a part of the larger conspiracy which at the first instance assumed sabotage and now is determined to prove it so. The first wheel marks on the sleepers on the southern rail is perhaps due to the loss of alignment of the southern rail due to the tremendous pressure exerted by the rails ahead which ceased with the snapping of the southern rail.

Another piece of evidence if seen with the above fact further strengthens the conspiratorial cover-up which this section of railway employees gave precedence, even to the Accident Relief Train, which left Gaya at 12 O'clock midnight on the night of 9/10/09/2002. This Accident Relief Train reached the accident site at 0120 HRS on 10/09/2002. The distance from Gaya to the accident site is 39 Km. For some inexplicible reason this Accident Relief Train stopped at Guraru, Ismailpur, and Rafiganj railway stations. In short this train took one hour and twenty minutes to reach the accident site from Gaya.

Further, Rafiganj P.S. is only at a distance of one kilometre from the Rafiganj railway station and at both places there are telephones. However the Station Superintendent Shri Thakur chose to write a letter to O/C, Rafiganj P.S. informing him about the accident. It is noteworthy that G.R.P. has no establishment at Rafiganj railway station and therefore O/C, Rafiganj P.S. should have been informed at the earliest through quickest possible means, which is certainly not a letter written after the accident. It seems that this mode of communication, when more efficient was available, was a ploy to buy time. And time the ploy did buy : the accident took place at 2242 HRS and this fact was communicated to the O/C, Rafiganj at 2340 HRS, through a letter.

The statements of the three railway official – Shri Y.N. Singh, Shri B.Naskhar and Shri Maheshwar Mishra – who were the first to reach the accident site contradict each other. However there is agreement in their statement that Shri B. Naskhar and Shri Y.N. Singh met at the Rafiganj Railway Station after the accident. Then both of them walked to Shri Maheshwar Mishra's house, and woke him up. The moot point is why did these two class III employees consider it necessary to walk down to a Class IV employees house. The Store was housed in the same campus in very close proximity to Shri Maheshwar Mishra's house. And Shri Maheshwar Mishra was also the Store-Keeper under Shri B.Naskhar. Statement of these two revealed that the keys of the Store were kept with either of them. These circumstance do compel a viewpoint that the four fish-plates, eight nut-bolts, and the numerous pandrol clips found at the accident-site rested in the Store and were not part of the 'derailed rail'. This access to the Store, combined with experience ; Shri Y.N. Singh had dealt with railway accident earlier. And then these three, and these three only, proceeded to the accident-site. The other railway engineering personnel were all housed at 100 yards from the Railway Station, but no effort was made to take them along, though the accident and the pitch darkness at night must have made their psyche eerie . It is common sense that a covert mission works on the need to know theory.

The letter written by the Station Superintendent, Rafiganj to the O/C, Rafiganj P.S. mentions that the Dhava Bridge has collapsed. Station Superintendent stated before the Police that the Guard who was at the rear of the train informed him that the Bridge had collapsed. The Guard must have lit his torch while walking towards the Bridge. If the rail whose fish-plates were alleged to be removed and was lying away from the rail-track, the Guard in no way could have over-looked it, for the route to the bridge is not possible without seeing this rail. The protagonists of the sabotage theory have no answer

to this. Perhaps they will say that the Guard did not take this route, he encircled the earth to reach the Bridge.

It was P.W.I. Y.N. Singh who propounded and informed that it is sabotage. It does not require elaboration that the Guard of the train was the first railway official, and not Shri Y.N. Singh, to inspect the accident site. What is more ominious is that Shri Y.N. Singh, Shri B.Naskhar, and Shri Maheshwar Mishra remained oblivious to the cry and wailing of the passenger victims and decided that a photographer was the need of the moment. So be it. A photographer was awakened and brought to the site, Having created evidence they wanted to secure it. It must have been their moment of triumph.

Kindly refer to Estimate No. 3/TR/MGS of 2002-2003 which was framed by Shri S.C. Srivastava, Junior Engineer 1/Dro and signed on 30/04/2002 by Senior Divisional Engineer (II) / M.G.S. The estimate was for renewal of bridge timbers with new steel channel sleepers over 12 bridges. The Dhawa bridge, the site of the accident, was one of them. The justification for this work given by the Senior Divisional Engineer (II) / Mughalsarai is reproduced below.

"Existing wooden sleepers used as bridge timbers in bridges become worn out and spike killed and bunched at rail seat under bearing plate. Existing sleepers are very old. For the safety of the traffic and maintainability these renewal is justified. Speed restrictions have also been continuing over the bridges due to un-servicable sleepers" .

In effect what this note says is that traffic is endangered because the sleepers are very old and the spike killed and bunched at rail seat. This opinion of the Senior Divisional Engineer (II)/ Mughalsarai, an expert was verbally communicated to you during our deposition of 17/09/2002. On this a senior railway official, who was present there, remarked that these notings are meant for the archives. It shows the archival mind-set which incorporates in it utter contempt for experts. It is perhaps this mind-set that reduced the expert to an archivist and made Rajdhani Express its victim. Therefore neither the wooden

sleepers were changed nor the expert's opinion regarding speed restrictions clamped. And then what happens after the accident. Both the UP and Down wooden sleepers over the Bridge were replaced by a new set of wooden sleepers though the Down Line sleepers were in main, intact. Most of the wooden sleepers in the UP Line over Dhawa Bridge have been seized by Rafiganj P.S. and will be sent to an expert to determine whether they were in a condition to withstand the weight of a train hurtling at 127 kmph.

When the prestigious 2301 Rajdhani Express met with the accident the knee-jerk reaction of the managers of the Indian Railways was that it was sabotage. This knee-jerk reaction is normal but with time should have given way to reasoned deductions. They even had the identity of the groups who could have committed this sabotage : M.C.C. a ultra-left organization, one, and criminals, two.

Every crime that is committed has a motive. There can never be a crime without motive. M.C.C's presence in the area of accident has been for more than three decades. Besides, M.C.C. has presence in other parts of Bihar, almost the whole of Jharkhand, and part of East UP. However, history testifies that the M.C.C. had never sabotaged a passenger train. What publicity will it give to the M.C.C. , except unanimous denuniciation from all sections of society. Therefore they never sabotaged a passenger train. The violence of the M.C.C. is limited to those sections which it perceives as exploiters and is, in main, land-related. The objective of their violence is public consolidation behind its ideology so that its grass-root support expands. That is why the M.C.C. was swift to deny its hand in this mishap. Even in carnages, the M.C.C. maintains an iota of ethics, both in its killings, and in its cruelty : only the men are killed, women and children are spared. Assuming that the M.C.C. decides to sabotage a passenger train. Which location will it choose : Bihar or Jharkhand. The M.C.C. has been agitating against POTA. POTA has been promulgated in Jharkhand, but not in Bihar. Besides, the terrain is move favourable for

sabotage in Jharkhand than in Bihar. Morever the Rajdhani Express runs through both Bihar and Jharkhand.

Now coming to criminals. Their motive to sabotage the Rajdhani Express would be to loot and plunder the passengers. After the accident before the villagers came, before the police came, and before the railway officials came to the accident-site, they had ample time. But not one passenger complained of such an incident.

Investigation was also conducted in the villages around the accident-site. 20 witnesses were examined. However no movement of criminals / M.C.C. / other people came to light before or after the accident.

During investigation, the Police will have to familiarize itself with the technology which runs the trains. Tracks, sleepers, bridges, coaches, the railway engine all come in its ambit. Also the Railway Manuals, and inquiry reports of previous railways accidents will necessarily have to be perused and experts examined. You will agree that all this will take time. Once all this is investigated, I will again revert back to you. In the meantime below are some excerpts from experts which need thought.

Shri C.M. Kulshrestha, a retired senior railway officer, who was associated for 9 years with rail safety, writes after this accident, "The nation has a right to know the answers to some basic issues. For instance, in the case of the latest tragedy we ought to know when G.M. of the Eastern Railway last held a meeting of this kind. Had monsoon patrolling been ordered as laid down in the Engineering Code ? If so, was there a super-check and at which level ? Were the patrolmen actually deployed or do they exist only on paper ? Have the roster and the register been seized ? Has the speedometer of the locomotive been seized ..... . When did any senior officer last undertake inspection of any section on this stretch at night on the foot-plate of the Rajdhani locomotive...."

Then there is a UNI dispatch dated 20/09/2002 which is reproduced fully. "Bridge engineers have questioned , sabotage

theory and described the collapse of the Bridge No. 445 on Dhawa river as a" catastrophic structural failure" .

"Members of the American society of Civil Engineers have blamed the 'Age factor' for the collapse of the bridge near Rafiganj" .

"A disaster can happen on any bridge which is more than 90 years old as its capacity to withstand load decreased with the passage of time due to weathering and chemical reaction. This can also result due to fatigue". Alok Sarkar, who worked as a Project Manager with the New York. Department of Transportation, said. "Moreover, the bridge on Dhawa river had developed cracks at several places. Any severity of the damage cannot shatter five girders and three piers as it has been found on this bridge," said Mr. Sarkar, who had rehabilitated several bridge in New York and Brooklyn.

"In the USA, any bridge which is over 50 years old is considered obsolete. The bridge is only considered safe for transportation after a committee gives a green signal. In 1967 after the collapse of Silver Bridge in Ohio, the American engineers decided to inspect every bridge after one or two years, he added."

The above statement of Shri Sarkar that no matter how serious the train accident, it cannot shatter five girders and three piers, has made a pointed assessment of what our common-sense also questioned. More than that, some part of the train hit the first Girder and the huge dent which this impact made exists on this Girder. Girders are below the track-level and this Girder was joined with the abutment of the bridge. Perhaps the bed-block on which this Girder rested has out-lived its utility and therefore the Girder tilted. This Girder has to come up above the track-level to be hit. Morever, the sketch of the accident site submitted by D.S.O. and Shri D.E.N (Co-ordination) shows that 9 coaches travelled all the way and fell beyond Pier-3. Incidently, Pier-3 and Pier-4 are the most damaged piers of the bridge. The question is why did the coaches fall where they did.

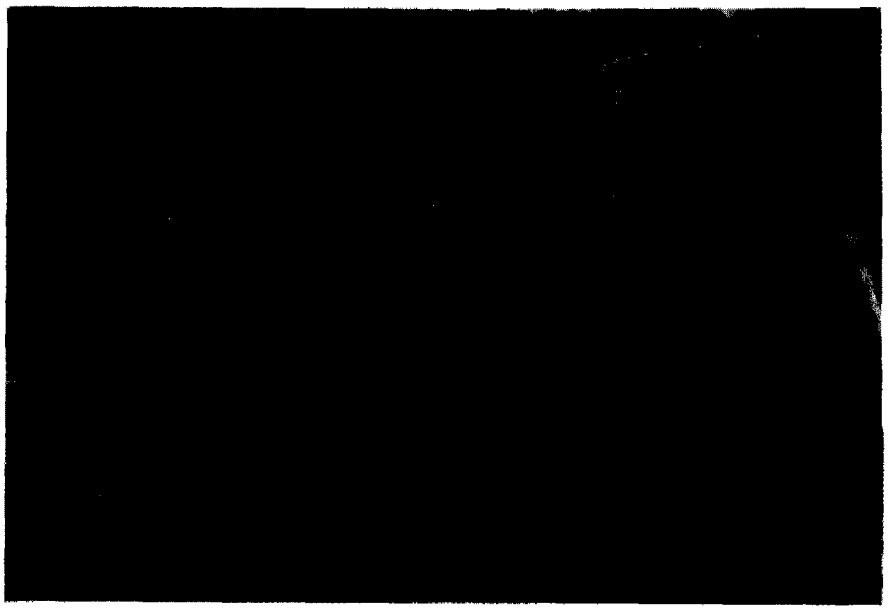
It will be my endeavour to discern and unravel the truth through investigation. Truth alone can reveal why this accident took place. Truth alone can suggest real remedial measures so that the Indian Railways becomes a safer mode of transport.

Yours Sincerely,

(S.K. Jha)
Supdt. of Police,
Aurangabad (Bihar).

Copy to :- 1- A.D.G.P., Patna Zone, Patna for information.
2- D.I.G., Magadh Range, Gaya for information.

DERAILED COACHES ON SPAN 1 AND 2 OF BRIDGE



DERAILED COACHES ON DELHI END OF BRIDGE

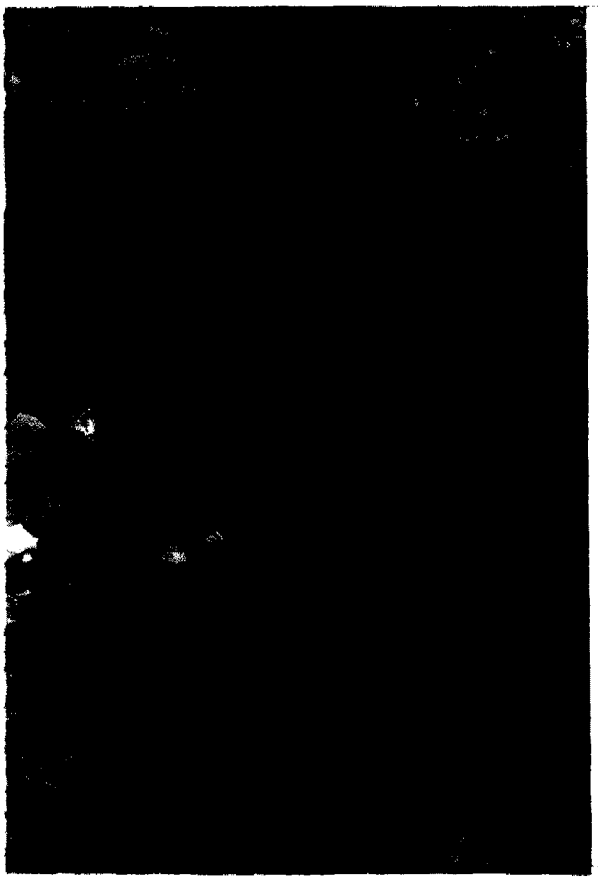
REMOVED FISH PLATES, BOLTS AND ELASTIC RAIL CLIPS OF LEFT RAIL (HOWRAH END JOINT) AND RUNNING RAIL LYING OUTSIDE

REMOVED FISH PLATES, BOTLES AND ELASTIC RAIL CLIPS OF LEFT RAIL (HOWRAH END JOINT) AND RUNNING RAIL LYING OUTSIDE

REMOVED FISH PLATES, BOLTS AND ELASTIC RAIL CLIPS OF LEFT RAIL (HOWRAH END JOINT) AND RUNNING RAIL LYING OUTSIDE

REMOVED FISH PLATES, BOLTS AND ELASTIC RAIL CLIPS OF LEFT RAIL (HOWRAH END JOINT) AND RUNNING RAIL LYING OUTSIDE

STRUCTURE BOND BETWEEN RUNNING RAIL
LAYING OUTSIDE WITH OHE MAST

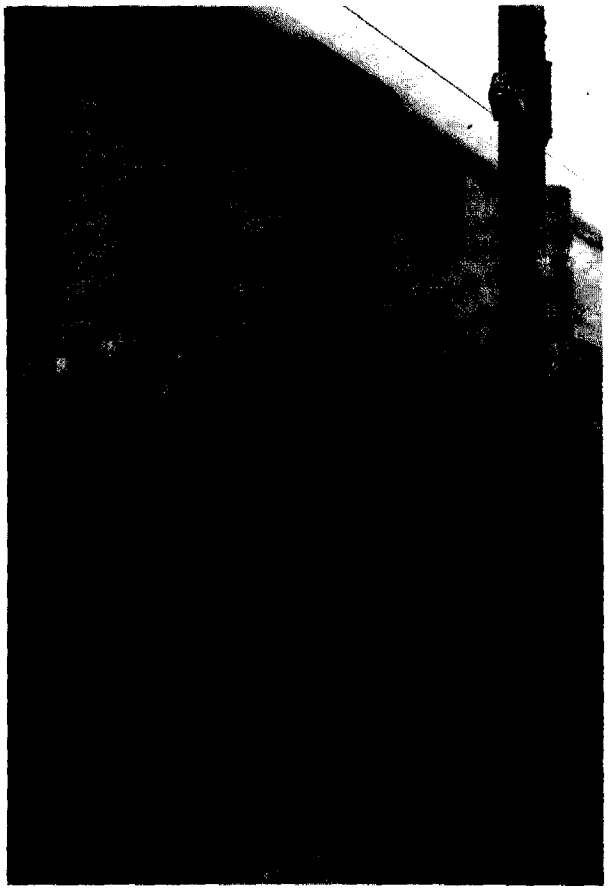


STRUCTURE BOND BETWEEN RUNNING RAIL
LYING OUTSIDE WITH OHE MAST

RUNNING RAIL LYING OUTSIDE
(DELHI END JOINT LYING OPENED)

RUNNING RAIL LYING OUTSIDE
(DELHI END JOINT LYING OPENED)

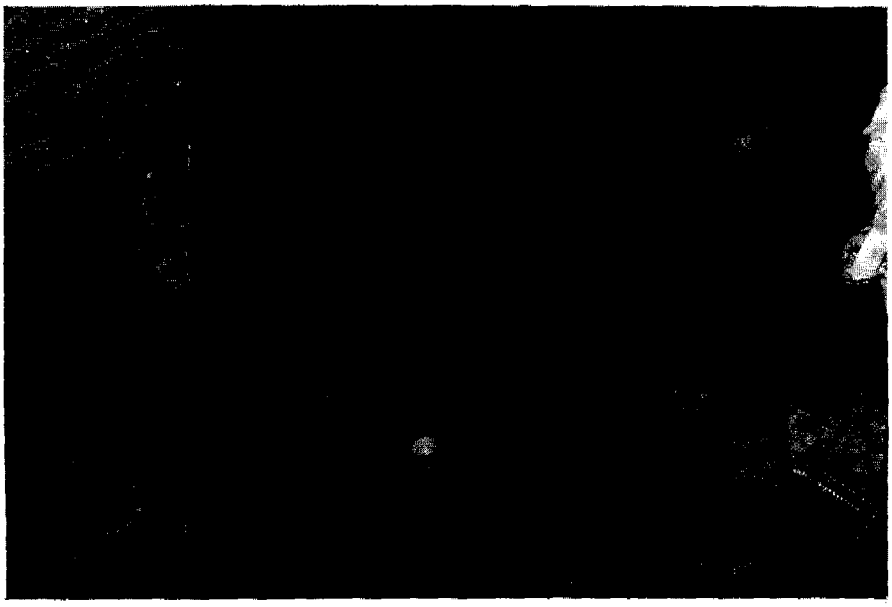
RUNNING RAIL LYING OUTSIDE NEAR OHE MAST 508/21



RUNNING RAIL LYING OUTSIDE NEAR OHE MAST 508/21

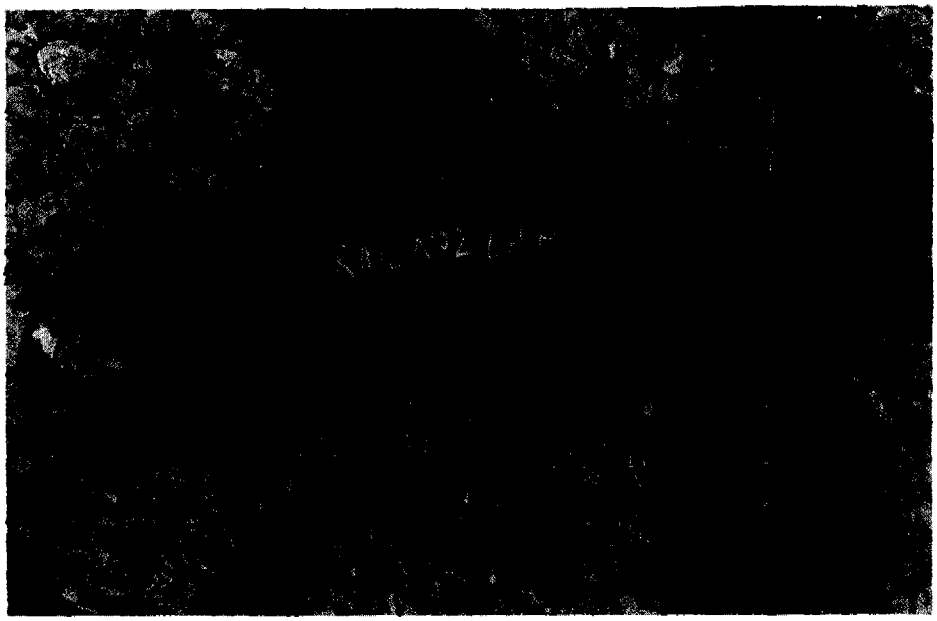
COACHES HANGING IN SPAN NO. 1 (HOWRAH END)

STAFF INSPECTING THE SITE AFTER DERAILMENT
(LAST COACH ON HOWRAH END)



FRACTURED RIGHT RAIL

PASSENGERS OF THE DERAILED TRAIN WAITING FOR RELIEF



VIEW OF BATTTERED FACE OF LANDING RAIL (GAUGE FACE)

VIEW OF BATTERED FACE OF LANDING RAIL (NON GAUGE FACE)

ADDITIONAL DOCUMENTS

CONTENTS

1. Final Note of Chief Commissioner of Railway Safety on CRS report dated 20.11.2002 1

2. Office Memorandum issued by Railway Board dated 5.12.2002 22

3. Chief Commissioner of Railway Safety's letter no. T.12012/2002-RS(Pt) dated 20.1.2003 to Ministry of Railways. 48

4. Ministry of Civil Aviation's letter No. T.12012/2002-RS dated 28.2.2003 to Ministry of Railways 52

5. Railway Board's (Ministry of Railways) letter No. 2002/Safety(A & R)/1/26 (pt), dated 27.3.2003 to Ministry of Civil Aviation 54

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7. Railway Board's (Ministry of Railways) letter No. 2002/Safety (A & R)/1/26 (pt), dated 18.6.2003 to Ministry of Civil Aviation. 64

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No-T.12012/ 3/2002-RS
Government of India
Ministry of Civil Aviation
(Commission of Railway Safety

-:NOTE:-

ON

The Report of Shri Mahesh Chand, Commissioner of Railway Safety, Eastern Circle, on the derailment of 2301 up Howrah - New Delhi Rajdhani Express between Rafiganj and Deo Road stations on Mughalsarai Division of Eastern Railway on 09/09/2002.

I. PREAMBLE

1.1 **THE ACCIDENT** :-2301 Up Rajdhani Express left Gaya at 22.16 hours on 09-09-2002 and passed Rafiganj Station at 22:37:30 hrs uninterrupted. As the loco of the train was approaching bridge No.445 (3x60'+1x62'+1x40' plate girders) over river Dhawa, en route to Deo Road, the next station, the driver felt a heavy jerk. Within no time 14 coaches of the train derailed and capsized, 4 of them piling up over one another in the river bed in span no. 5 of the bridge.

1.2 The speed of the train at the time of accident was 126 kmph.

1.3 The weather was Cloudy and visibility was Good under loco headlight.

1.4 As a result of the accident 107 passengers were killed and 175 injured, 60 of them grievously.

1.5 The total cost of damage to Railway assets was assessed at Rs 942.18 lakhs.

II CAUSE OF THE ACCIDENT & RESPONSIBILITY

2.1 Having carefully considered the factual, material and circumstantial evidence Shri Mahesh Chand has concluded as under :-

2.1.1 **CAUSE** :- The train derailed due to opening of fish plates and elastic rail clips of the cess side single rail in Howrah end approach of bridge no. 445 by miscreants.

2.1.2 **RESPONSIBILITY**

PRIMARY

1. Unknown person (s)

SECONDARY

1. Authorities responsible for ensuring Law & Order.
2. Security, operating and engineering departments of eastern railway and security & engineering branches of Mughalsarai Division.

BLAMEWORTHY

1. S/Shri Kuldeep & Ganpat, Gangmen of unit no.5 Deo Road, working as Patrolmen.
2. Shri B. Naskar, Section Engineer/P.Way/Rafiganj.
3. Shri Mukesh Gupta, Assistant Engineer/Gaya
4. Shri Abhay Kumar, Divisional Engineer/II/Mughalsarai
5. Finance Department of Mughalsarai Division.
6. Track Directorate of RDSO.

2.2 General Manager, Eastern Railway vide his letters no. TA.5/252/2002 dated 15th Nov'2002 and TA.5/252/2002 dated Nov' 18, 2002 (supplementary remarks received by fax), has agreed with the findings of Shri Mahesh Chand, Commissioner of Railway Safety, Eastern Circle, Kolkata in respect of **"Cause and the Primary Responsibility"**. He has, however, not agreed with the CRS in respect of secondary responsibility and the blameworthiness due to the following reasons:

(I) As per Ministry of Home Affairs, Secret/Most Immediate telegram no. U 2-65/X dated 13.9.1965 to all Chief Secretaries of State Governments and Union Territories, the responsibility of safe-guarding of Track and Bridges rests with the respective State Governments. As far as the role of the RPF is concerned, it may be mentioned that a constant liaison is kept by the RPF with the respective State Governments.

(II) (a) **Railway Administration of Eastern Railway**

Security – RPF has been regularly maintaining liaison with the state government for the prevention of criminal activities in railway area. As RPF has no statutory jurisdiction particularly in such cases, they can not be held responsible.

Operating – There has been no failure from the operational side for not taking safety measures. The precautionary measures implemented now as per Board's instructions viz., reduction of speed and running of pilot during night ahead of Rajdhani Express have been extra-ordinary emergency measures which are taken in very special circumstances and situations. These are policy issues having direct implication on freight and passenger operations affecting several zonal railways. It

is also debatable as to whether reduction of speed or running of pilots ahead of trains would have the desired results unless effective action is taken by the State Law and Order Authorities in curbing such miscreant activities. As such, Operating Branch of Eastern Railway can not even be remotely held responsible for this accident which was concluded as under category of "Sabotage" by CRS at para 8.1.

Engineering - Responsibility of Engineering Department of Eastern Railway is not accepted as existing instructions were issued and implemented on safety of track. Every case of suspected sabotage in the section was reported to Local Police of the State Govt. In terms of Ministry of Home Affairs Secret/Most Immediate telegram no. U2-65/X dated 13.9.65 it is the responsibility of State Govt. to carry out patrolling of railway track and guarding of bridges. Copy of Ministry's letter is as follows:

"A question has arisen about the relative role of the State Govts. and Railway Authorities in respect of measures for Railway Security. While patrolling of track and guarding of Railway bridges would be the responsibility of State Govt. – the guarding of other vulnerable installations would be undertaken by Railway Protection Force"

There was no apprehension of civil disturbances as stipulated in para 1.001 (5) – (a) of IRPWM. 2 Patrolmen were deputed by Mughalsarai Division to detect rail/weld failure in time to minimize detention of trains. The recommendations given by CRS after a derailment of Rajdhani Express on 20.02.1996 at Muthani regarding welding of SEJ joints were implemented. The railway thus had implemented all necessary instructions in regard to safety of track.

(b) **Mughalsarai Division** –

The responsibility on Security and Engineering Branches of the Division is not accepted due to the same reasons as mentioned in (a) above.

(III) **Blameworthy**

(a) Failure of 2 gangmen to complete the patrolling of their beat at night of 08/09.09.2002 is blameworthy. However, it can not be concluded that their completion of patrolling would have deterred miscreants to cause sabotage. These Patrolmen were patrolling track at night daily from Deo Road to Rafiganj and back from 2200 hrs to 0600 hrs. The present incidence of sabotage did not take place on the night of 08/09.09.2002 as such does not have direct relevance in this case. The accident took place between passage of a goods train at 2205 hrs and Rajdhani Express at 2242 hrs on 09.09.2002. The Patrolmen had started their duties on 09.09.2002 at 2200 hrs from Deo Road and could not have reached the site of sabotage before 0100 hrs of 10.09.2002 a distance of about 6 kms.

(b) (c) (d)

On Up line of girder bridge no. 445, only 11 nos. bridge timbers were found unserviceable by Divisional Engineer during his Bridge Inspection on 06.04.2002. Out of total 152 nos. of bridge timbers only about 7% were found unserviceable which is well below 20% and no two consecutive bridge timbers were unserviceable. This did not warrant any speed restriction. Track on bridge was periodically inspected by Sectional and In-charge PWIs, AEN and DEN and condition of track on bridge was found satisfactory and did not warrant any speed restriction. The Sectional and In-charge PWIs, AEN and DEN followed all the instructions contained in para 273 of IRPWM regarding bridge timber.

Severity of accident is in no way connected with the few unserviceable sleepers that was existing, particularly when a train had derailed at a speed of 130 kmph at the approach of bridge itself. It has also been stated by CRS at para 7.3.8.5 that the condition of the bridge timbers in any case did not play any role in the causation of derailment.

(e) Finance Department responsibility is not accepted as cross-reference between executive and the finance branch resulted in the delay in according finance concurrence. However, as brought out above the bridge no. 445 did not have any speed restriction as the condition of the bridge timbers did not warrant the same and the derailment was caused due to sabotage as concluded by CRS.

(f) Responsibility of Track Directorate of RDSO can be commented upon by Railway Board/RDSO.

(IV) Supplementary Remarks submitted by Eastern Railway vide their letter no. TA.5/252/2002 dated 18.11.2002 :

Security –

As mentioned in para 7.5.4 of the CRS's Report, there was an intelligence report from Danapur SIB on 2.9.2002 that the arrest of a PWG leader, area commander, may lead to greater agitational programme like damage and destruction of railway property, rail chakka jam agitation etc. over Jharkhand and Bihar portion of Eastern Railway. It may be clarified here that this intelligence report was not from Danapur SIB but received from a casual source by ASC/SIB/HQ/E.Rly., Kolkata. On receipt of this information both Bihar and Jharkhand State Govts. were immediately alerted vide Chief Security Commissioner, Eastern railway's letter No. SC.47/TA/INT/2002 dated 02.09.2002 (copy enclosed) addressed to addl. DG(Rlys.), Bihar and copied to addl. DG(Rlys.), Jharkhand who were requested to take necessary precautionary measures. Thus the RPF had promptly coordinated with the State Govts. The concerned State Govt. should have taken necessary action as per Ministry of Home Affairs instructions vide their letter No. U2-65/X dated 13.09.1965 which were reiterated by MHA vide letter No. 27/1/72-Pt.II dated

11.02.1972 (copy of letters enclosed) laying down the responsibility of security and safety of track and guarding of railway bridges exclusively on State Govts.

Engineering - Ministry of Home Affairs had reiterated the responsibility of State Government on Security of railway Track and Bridges to all Chief Secretaries of State Governments vide MHA's letter No. 27/1/72-Pt. Dated 11.02.1972 with a detailed clarification indicating State Govt.'s responsibility on security and patrolling of track and guarding of Railway Bridges by State Govt. Copy of Ministry of Home Affairs letters dated 13.09.1965 and 11.02.1972 are enclosed for ready reference.

It is further mentioned that imposition of Speed Restriction for existence of unserviceable sleeper on track was deliberated by Track Standard Committee vide item 793 in January 1985 and it was recommended that if percentage of unserviceable sleeper per rail length is less than 25% and number of consecutive unserviceable sleepers is maximum one, no speed restriction is called for. The TSC however recommended that it was not desirable to lay any guideline for imposing speed restriction on account of unserviceable sleeper. This may be left to the discretion of field official. This was accepted by the Railway Board.

Eastern Railway has been following the practice based on the TSC recommendation limiting U/S sleeper to 20%. As such only 7% unserviceable sleepers on Bridge No. 445 (Dhawa Bridge) with no two consecutive sleepers being unserviceable did not call for any speed restriction. Copy of TSC Minutes of item 793 of 1985 is enclosed.

Clear cut instruction exists on security of Railway Track and guarding of Bridges vide Ministry of Home Affairs Telegram No. U 2-65/X dated 13.09.1965 and again reiterated vide letter no. 27/1/72-Pt.II dated 11.02.1972 (copy enclosed)

Protection of track and bridges from miscreants has to be ensured by State Govt. concerned.

(V) D.G./RDSO vide letter no. CT/ACC dated 15.11.2002 has also sent his remarks as under:

Commissioner of Railway Safety, Eastern Circle has held Track Directorate of RDSO blameworthy vide para 19 of the summary of the enquiry report and the detailed reasons for the same have been mentioned in para 7.5.10 of the enquiry report. It has been stated that RDSO failed to meet the requirement of Railways in respect of development of anti-sabotage Elastic Rail Clip and if it was not possible to design such a ERC, some other measures to make concrete sleeper useful for sabotage prone area must have been thought of by RDSO.

With reference to the above observations made by the Commissioner of Railway Safety, it is submitted that Track Directorate of RDSO has been making concerted

efforts to develop anti-sabotage elastic rail clip since 1985. As a matter of fact, various alternatives conceptualized by RDSO were tried in the field and opinion of the Chief Track Engineers was obtained in different meetings of Track Standard Committee held from time to time. However, due to the difficulty in removing and replacement of such clips during various maintenance operations like destressing of LWR, repair to rail / weld fractures and derailment etc., none of the designs could be implemented in the field. RDSO has always acted as per the directives of the Railway Board and there has not been any lapse on the part of Track Directorate in this regard. The detail of the action taken by RDSO for development of anti-sabotage clip is summarized as under: -

i) Two different drawings for pilfer proof elastic rail clip assembly on concrete sleepers were developed by RDSO and on the basis of discussion held in 60th Track Standards Committee vide item no. 788 in Jan. 1985, it was decided to conduct trials of anti sabotage ERC in theft prone area of Eastern & South Eastern Railways. A copy of the extract of the minutes and Railway Board's Order thereupon is enclosed as Annexure-I

ii) This issue was also discussed vide item no. 796 of 61st TSC meeting held in Feb. 1986 wherein Railway Board ordered for conducting trials on Eastern, South Eastern, Northern & Southern Railways. A copy of the extract of the minutes of the meeting and Railway Board's order thereupon is enclosed as Annexure-II. Subsequently, the item was also discussed in 62nd and 63rd TSC meetings and progress of the trials was reviewed.

iii) In the 64th TSC meeting held in March 1990, it was recommended that anti sabotage design of elastic rail clip had not served the desired purpose and therefore Railway Board finally decided to close the item, as there was no likelihood of development of such clip. An extract of the minutes of 64th TSC meeting and Railway Board's orders thereupon are enclosed as Annexure-III.

iv) After the derailment of 8033 DN Ahmedabad – Howrah Express between Dhamangaon and Talni on 09.7.92, efforts were revived to improve upon the design of anti sabotage ERC with 'circlip' by using the thicker plate and increasing the radius of corners to reduce the stress concentration but no fruitful results could be achieved. In this connection, a copy of the RDSO's letter No. CT/FD/2 dated 11.10.1993 addressed to EDCE(P), Railway Board is enclosed as Annexure-IV.

v) Further, CRS recommendations of the enquiry report of derailment of 2301 Rajdhani Express on Eastern Railway on 20.2.1996, as mentioned in para 7.5.10.1 of the present report, were received in RDSO and the issue was replied to vide letter No. CT/FD/2 /PP-ERC dated 24.9.1996 (copy enclosed as Annexure-V). It was emphasized by RDSO in this letter that while all efforts were made to evolve a modified design of the ERC as suggested by TSC, the revised version did not come up to the expectations of the user railways. This was basically due to the difficulty faced by field people in removing and replacing such clips during destressing of

LWR, derailment / accident, rail fractures and other maintenance operations. The contention of RDSO was accepted by Railway Board and final reply was sent to the Commissioner of Railway Safety vide Railway Board's letter No. 96/Safety (A&R)/1/5 dated 31.5.1999. This has also been mentioned in para 7.5.10.2 in the present report of CRS.

vi) It is pertinent to mention here that Indian Railways has been trying to replace ERC with better fastening system presently in use on advanced railway systems of the world. In this connection, Railway Board has already finalized the contract for procurement of modern fastening systems from M/s Pandrol, U.K.; M/s Vossloh Fastenings of Germany; M/s Allevard Stedef of France; M/s Rex-lok of Australia and M/s Daya Engg. Works of India for conducting field trials. The details of trial stretches are enclosed as Annexure-VI. Most of these fastenings have anti-sabotage features and due weightage will be given to this aspect at the time of final selection of the suitable fastening for Indian Railways, after completion of the trials. Track Directorate of RDSO is fully involved in monitoring the progress of this item.

vii) As regards the suggestions given in para 7.5.10.5 of the report, the concept has to be examined in detail as the same involves designing a new SGCI insert. The difficulties in replacing the 4 sleepers per rail length on large number of locations as suggested in the report and problems in maintenance operations arising out of using such sleepers are also to be taken into account. Perhaps, the concept of reverse jaw used in CST-9 sleeper can not straightway be used in case of PSC sleeper as there is no key in PSC sleeper like that in CST-9 sleeper to prevent lateral shifting of the sleeper. In fact, PSC sleeper can be shifted laterally with much lesser efforts. Due to the heavy weight of PSC sleeper, the fixing of rail with modified PSC sleeper will also be more difficult and time consuming.

viii) Recently, RDSO has developed 3 different designs of anti sabotage ERC clips. These have been discussed vide item no. 983 of the 7th Extra Ordinary TSC held on 25th Oct. 2002 at IRICEN, Pune and after the detailed discussions in the meeting, one particular design has been recommended for introduction in the field on trial basis. The recommendations in this connection have been sent to Railway Board for approval of the competent authority vide RDSO's letter No. CT/C-extraordinary/02 dated 01.11.2002 (copy enclosed as Annexure-VII). Thus, RDSO has been continuously trying to evolve a suitable design for Elastic Rail Clip having anti-sabotage features but the none of the design could find favour with the fieldmen due to additional efforts needed in various track maintenance operations, as explained above.

In view of the facts explained above, it is requested that Track Directorate of RDSO may kindly not be held blameworthy since Track Directorate has continuously been pursuing the R&D efforts and these are being further progressed.

2.2.1 **CCRS remarks :** I have carefully scrutinized the CRS report and gone through the remarks of General Manager, Eastern Railway as well as Director General/RDSO and would like to state the following:

(A) I consider that the conclusions arrived at by Shri Mahesh Chand in respect of cause, primary responsibility and secondary responsibility of authorities responsible for ensuring Law & Order are acceptable.

(B) **Secondary responsibility** – Railway Administration of Eastern Railway (security, operating and engineering departments) and Mughalsarai Division (Security and Engineering Branches)

(i) While it is agreed that the primary responsibility of guarding of railway track and bridges is that of State Govt. in terms of Ministry of Home Affairs's secret instructions of 1965 and 1972, now made available to the undersigned, Railway Administration can not take any intelligence report pertaining to the damage and destruction of railway property, railway chakka jam, agitation etc. lightly. Details brought out in para 7.5.1, 7.5.2 and 7.5.3 clearly indicate that the area was sabotage-prone which the railway administration was well aware of. In case, State Govt. does not act as per the laid down instructions, then either the railway will have to make other arrangements for the protection of the property and the precious lives of the passengers like introduction of security patrolling; or running of train service may have to be suspended in such areas. In this connection, GR 2.05 and 2.11 may please be referred to according to which it is the duty of every railway servant to make every exertion for ensuring the safety of the public.

(ii) **Security** – According to the General Manager (para7.5.5 of the report), Daily Intelligence Reports are received from Chief Security Commissioner regularly. This is treated as information to the management for gearing up in case of any eventuality. Action on security matters like these is taken by the RPF organization which is headed by Chief Security Commissioner. In reply to CRS queries, the COM has also informed that the responsibility of safeguarding the railway properties rests with the RPF organization in coordination with the respective State Govts. The General Manager has informed that RPF has been regularly maintaining liaison with the State Govt. for prevention of criminal activities in railway area. **In reference to the Intelligence Report collected on 2.9.2002, initially the CSC informed the CRS that the two Intelligence Reports were received from Danapur SIB and the same were passed on to the ADG/Railways/Bihar and Jharkhand. Now the General Manager in his supplementary remarks sent vide his letter dated 18.11.2002 has informed that the second Intelligence Report of 2.9.2002 regarding arrest of PWG Leader and the likely fallout, was not from Danapur SIB but was received from a casual source by ASC/SIB/HQ/Eastern Railway/Kolkata. Thus, the two versions are at variance.**

In my view, the so-called liaison of RPF with the State Govt. has failed resulting into this accident. This needs to be strengthened and can not be limited to only passing the information to State Govt. concerned.

(iii) **Operating**

As already mentioned above, any Intelligence Report can not be taken as information only. It warrants some concrete action. While it is true that desired results in curbing the miscreants activities would not be achieved unless the effective action is taken by the State Law & Order enforcing authorities, **the defensive action on the part of the railway would have reduced the gravity of the consequences, which was lacking.**

(iv) **Engineering**

It is not so far clear as to what type of track patrolling was being carried out and for what purpose. The different engineering officials have given different versions about this patrolling. It can not be classified as cold weather patrolling, firstly because month of September is not a cold month and secondly, the track length (beat) allotted to the Patrolman was much longer than provided in LWR Manual as brought out in Para 7.6.2 of the report. This patrolling was much less intensive than the monsoon patrolling. September was a monsoon month. However, neither the patrol charts were produced by the railway, nor was the beat commensurate with any of the existing provisions. **The railway's contention that the patrolling was for detection of rail/weld failure in time to minimize detention of train is not acceptable. This kind of patrolling during night with such a long beat is neither provided in the existing rules nor does it serve any useful purpose. Chief Engineer would do well if he reviews the efficacy of the patrolling in force and put it on proper footings.**

Principal Chief Engineer had informed the CRS (para 7.5.1 of the report) that Gaya-Mughalsarai Section is noted for sabotage/miscreant activities. Thus, the Railway Administration was very well aware of the vulnerability of the section. Although the primary responsibility of patrolling of track and guarding of railway bridges is that of the State Govts. in terms of Home Ministry's directives of 1965 and 1972, now made available by the railway to the undersigned, **the Railway Administration has also to take necessary preventive measures to ensure safety of the traveling public on track/bridges.**

In view of above, it is my considered view that at least security and engineering departments of Eastern Railway Hq and Mughalsarai Division have to share the blame and accordingly they are considered "Blameworthy".

(C) **Blameworthy**

(a) Though Eastern Railway has accepted the failure of Patrolmen in completing the patrolling on the night of 08/09/9.02 as blameworthy, it has expressed doubt that the patrolling would have deterred the miscreants to cause sabotage. If one goes by the argument put forward by the Railway Administration, then even the security patrolling would be of no avail. This is not considered acceptable. If the miscreants know that the proper patrolling is in force and important trains are being covered in the patrolling, it would in all probability deter them.

(b), (c), (d)

Basically, the track structure on a bridge is designed to pass a derailed train. But in this case, it passed partially. Though the percentage of unserviceable sleeper on the bridge is stated to be 7%, no span-wise or location-wise details were given in the Bridge Register to show that no two consecutive sleepers were unserviceable. The Section Engineer/P.Way did not maintain any record containing condition of track on the bridge as required in para 245(2)(a) of IRPWM, for sleeper replacement/reconditioning. No entry was found made even in the AEN's Bridge Register to show that the unserviceable bridge sleepers were replaced. The Divisional Engineer had deposed that the track over the bridge was completely destroyed after the accident. The Division also failed to preserve the pieces of bridge timber damaged in the accident, which deprived the CRS of making his own assessment about their condition/residual life.

(e) The Railway Administration has tried to justify that 4 and a half month's time taken in vetting of the detailed estimate was due to cross-reference between the executive and the finance branch. Perhaps this cross-referencing would have continued still longer but for the occurrence of this accident. If the vetting of detailed estimate of such a small work has taken so much time, how will the Indian Railways execute safety works costing Rs. 17,000 crores in a limited period of five years, is anybody's guess.

It may be mentioned here that the work was already included in FWP 2002-03 and must have been scrutinized by the Divisional and Hqs finance at that stage. Therefore, there should be no reason for the vetting of detailed estimate to take such a long time, particularly when out of the 12 bridges included in the estimate, 05 had speed restrictions and the Railway would have been keen to remove these restrictions. This shows that Finance Branch of the Division had not accorded the required priority to the work of timber renewal on the bridges of important Rajdhani route.

After considering the detailed discussion by the CRS in his report and the Railway's views and the fact that the condition of the bridge timbers of Bridge No. 445 was not the cause of the accident, I take out the names of Sarva Shri B. Naskar, Section Engineer P. Way, Mukesh Gupta, Assistant engineer/Gaya, Abhay Kumar, Divisional Engineer-II/MGS and Finance Branch of Mughalsarai Division from para 8.2.3 of the Report.

However, for the various reasons brought out in my above discussion, the Railway Administration may be directed to take suitable corrective action against the three engineering officials and also pin point the responsibility in the Finance Branch of Mughalsarai Division for causing delay to the sanction of detailed estimate.

It is also felt that the system of finance vetting at numerous stages of a work needs a review in the interest of fast execution of safety related works.

(f) **Track Directorate of RDSO/Lucknow**

It is a fact that RDSO has not been able to finalize the design of Anti Sabotage Fastenings for concrete sleepers during the last 17 years, though, Commission had been pointing out the urgent need for the same. This indicates that the required importance is not being attached to the subject, although, many hundred kilometers of concrete sleeper track is being added every year including the areas affected by miscreant activities. Had the Anti Sabotage Fastenings been timely developed and used, perhaps this accident could have been averted. **I am, therefore, inclined to agree with the CRS in classifying the Track Directorate of RDSO as "Blameworthy".**

III. REMARKS AND RECOMMENDATIONS

3.1 The Remarks and Recommendations made by Shri Mahesh Chand and the Comments of the General Manager, vide his letter referred to above, are reproduced below along with my Remarks thereon :-

3.2 (a) **Para 9.1.1 of the Report** :- Detailed and clear cut instructions should be issued over Security Patrolling.

(b) **G.M.'s COMMENTS** - The primary responsibility of guarding of railway track and bridges is that of the State Govt. as already mentioned in 8.2.2 (i) above. The security patrolling has, therefore, to be undertaken by the respective State Govts. However, instructions on "security patrolling during civil disturbance has been incorporated in para 5 of Chapter X of IRPWM.

(c) **REMARKS** - While it is agreed that the primary responsibility of guarding of railway track and bridges is that of State Govt. in terms of Ministry of Home Affairs's secret instructions of 1965 and 1972, railway administration can not take any intelligence report pertaining to the damage and destruction of railway property, railway chakka jam, agitation etc. lightly. It is in this context that the CRS has made this recommendation as per the details in para 7.5.7 and 7.5.8 of the report. Railway Board may issue clear directions to the zonal railways in regard to action to be taken for protection of the railway property and safety of the traveling public in the areas identified for miscreant activities.

3.3 (a) **Para 9.1.2 of the report** :- There is need for further reduction of speed in Gaya -Dehri-on-sone section to 75 Km/h at night as discussed in para 7.5.1 to 7.5.3 and 7.5.8. Similar review should be made for other sections affected by miscreant activities.

(b) **G.M.'s COMMENTS**- This is a policy matter to be decided by Railway Board. However, it is doubtful whether reduction of speed in the section will effectively retard sabotage activities. A time study has been conducted regarding time required to remove fish plate and ERC clip of 9 mtr. long rail which indicates that 1 person can remove the fish plate at both ends including ERC clip in 7-3/4 minutes, 2 persons can do it in 3-1/2 minutes and 4 persons can do it in 2-3/4 minutes. As such reduction of speed of train may not be an effective solution.

(c) **REMARKS**- Railway's remarks further strengthen the views of the CRS that Railway should not be contented simply by passing the Intelligence Report on to the State Govt. Railway would have to make all round effort for the safety of the traveling public. Though the reduction in the speed of the trains may not reduce the number of accidents caused due to tampering of the track but it would certainly reduce the consequential damage and the casualties to a considerable extant. In view of this, CRS has made the recommendation and merits consideration.

3.4 (a) **Para 9.1.3 of the report** :- Security patrolling should be done in sabotage prone areas.

(b) **G.M.'s COMMENTS**- As has already been mentioned in para 9.1.1 regarding role of State Govt. and Railway authorities in respect of measure for railway security of railway track and bridges, patrolling of track and guarding of rail bridge are responsibility of State Govt. However, para 1001(5) (b) of IRPWM specify instruction regarding security patrolling during civil disturbances and on special occasion.

(c) **REMARKS**- Details brought out in para 7.5.1, 7.5.2 and 7.5.3 clearly indicate that the area was sabotage-prone which the railway administration was well aware of. In case, State Govt. does not act as per the laid down instructions, then either the railway will have to make other arrangements for the protection of the railway property and the precious lives of the passengers, like introduction of security patrolling; or the train service may have to be suspended in such areas. In this connection, GR 2.05 and 2.11 may please be referred to according to which it is the duty of every railway servant to make every exertion for ensuring the safety of the public. In view of this, CRS recommendation merits serious consideration.

3.5(a) **Para 9.1.4 of the report** :- In sabotage prone area anti-sabotage design of fittings on concrete sleepers should be evolved and put in place within one year.

(b) **G.M.'s COMMENTS**- Policy matter, to be decided by railway Board/RDSO.

(c) **REMARKS**- As the concrete sleeper with elastic rail clip is now the standard of track on Indian Railways and every year several hundred kms of concrete sleeper track is added, there is an urgency for the design of anti-sabotage fastening for this type of track. The efforts made by RDSO during last 17 years or so have not met with any success. The design suggested by the CRS in Annexure-XIX of the report needs to be quickly examined by the RDSO/Railway Board.

3.6 (a) **Para 9.1.5 of the report** :- No track material - surplus/released/maintenance reserve be left unguarded near the track particularly in areas known for miscreant activities.

(b) **G.M.'s COMMENTS** - This is not considered fully implementable in practice as it will be necessary to keep some track materials like rails and sleepers at suitable locations for day to day maintenance and repair to track. However, instructions have been issued not to leave any stray rail pieces at the approach of bridge/level crossings in critical areas.

(c) **REMARKS** - The remarks given by Eastern Railway are not considered satisfactory. The CRS recommendation is for not leaving released/surplus material/maintenance reserve **UNGUARDED** particularly in areas known for miscreant activities. Suitable instructions to the zonal railways in this regard may be issued by Railway Board.

3.7 (a) **Para 9.1.6 of the report** -: Single cut rails and buffer rails at vulnerable locations like high embankment, sharp curves, bridge approaches and on major bridges should be eliminated.

(b) **G.M.'s COMMENTS** - Single cut rail and buffer rails at vulnerable locations like high embankment, sharp curve, bridge approaches and on major bridges should be eliminated. As per para 256 of IRPWM permanent rail closures in running lines should not be less than 5.5 mtr. in length. As such rails below 5.5 mtr. are considered as cut rail. It is accepted that single cut rail and buffer rails should be eliminated at vulnerable locations like high embankment, sharp curve, bridge approaches and on major bridges. Wherever buffer rails and single rails are unavoidable in these vulnerable locations, fish bolts will be burred. However, this is a policy matter and Railway Board may like to consider.

(c) **REMARKS**- On perusal of para 7.8.4 of the report, it would be seen that CRS has taken any rail length less than 13m as cut rail and his recommendation is to eliminate any such rail from the track at vulnerable locations. If the rail length is less than 13m, it can be welded with the adjacent rail. This merits consideration as the shorter rail length is more prone to be tampered with.

3.8(a) **Para 9.2.1 of the report** :- Hammers should be provided in AC coaches so that passengers break open the glasses in case of accidents/emergencies.

(b) **G.M.'s COMMENTS** - It is a policy matter, to be decided by Railway Board.

(c) **REMARKS** - CRS recommendation needs serious consideration as the availability of hammer or any other such tool would help in breaking the glasses of the windows of AC coaches, which would avoid deaths due to suffocation.

3.9(a) **Para 9.2.2 of the report** :- Emergency lights at a number of places should be provided in coaches which shall automatically switch on in case of emergency.

(b) **G.M.'s COMMENTS** - This provision of emergency light exist on the new design of EOG Rajdhani coaches. However, the Board may like to consider the matter further.

(c) **REMARKS** - The railway has not elaborated on the kind of emergency light provided in the new design of EOG Rajdhani Coaches. Whether it is through chargeable dry cells?. The suggestion of the CRS is for the emergency lights with chargeable dry batteries to be provided in adequate numbers in each AC coach so that if the normal power supply of the coach fails due to accident, emergency light automatically gets illuminated. Railway Board may like to consider the recommendation to facilitate evacuation of trapped passengers.

3.10(a) **Para 9.2.3 of the report** :- Emergency Exits should be provided in all coaches for escape of passengers in case of fire, accidents, etc. Although Railway Board issued instructions on this subject way back in 1999, the same are yet to be implemented.

(b) **G.M.'s COMMENTS** - Necessary instructions are already in force. The progress of provision of Emergency windows in coaches is being further expedited. The required modification is being carried on coaches during POH in W/Shops.

(c) REMARKS - It is felt that too much time is being taken in providing emergency exits in the coaches, which is clear from the extensions being given from time to time as mentioned in para 7.7.1 of the report. Though the Railway Board had directed that this will become NTXR monitored item w.e.f. 1.4.2002, the same was extended to 1.4.2003. Railway Board may kindly ensure implementation of their directives.

3.11 (a)**Para 9.2.4 of the report :-** Mouldable and shock absorbing materials with round edges should be used in internal furnishing of coaches. The seats/berths to be made such that the passengers are not thrown out of their positions in case of an accident.

(b) **G.M.'s COMMENTS** - This is a suggested design feature for the internal furnishing of coaches. This may be decided by Railway Board as a part of the ongoing project for evolving an improved design of coaches.

(c) REMARKS - CRS recommendation merits serious consideration.

3.12(a)**Para 9.2.5 of the report** :- Riding quality of coaches of high speed trains should be checked periodically by an objective system of evaluation by instrumentation.

(b) **G.M.'s COMMENTS** - Policy matter to be decided by railway Board/RDSO. However, speed potential of coaches/rolling stock is decided after detailed oscillation trials by RDSO and approved by CRS.

(c) REMARKS - The railway's remarks do not cover the points raised by the CRS in his recommendation. The detailed oscillation trial by RDSO is carried out only on one or two coaches of the new design before adoption. The recommendation of the CRS pertains to the in-service riding quality of the coaches of high speed trains. It is suggested that a system should be introduced that the coaches of high speed trains after IOH and POH, should be subjected to field trials with the help of portable accelerometer/OMS before they are put in service. Similar action needs to be taken whenever a complaint of bad riding of a coach is received either from public or from railway staff traveling in the train.

3.13(a)**Para 9.2.6 of the report** :- Dash pot oil should be checked after every trip for Rajdhani express coaches. A friction type snubber or any better alternative should be used in place of the present system of dash pot oil arrangement to have maintenance free service.

(b) **G.M.'s COMMENTS**- Board's/RDSO instruction on checking of dash Pot oil for Rajdhani express is being followed. This is a suggested design improvement which has to

be examined by RDSO & Railway Board. However, the level of Dash Pot oil is in no way connected with this derailment.

(c) **REMARKS** - It is agreed that level of dash pot oil is in no way connected with this derailment. However, the accident investigation is not limited to finding out the cause and its remedy but to suggest the design improvements as well as to point out the system failures/non-observance of laid down rules which come to the notice during the investigation. Railway Board may kindly issue the instructions for checking the dash pot oil level during the primary maintenance of Rajdhani/Shatabdi Express trains, till a better design is evolved.

3.14(a)**Para 9.2.7 of the report** :- Compliance to R.P.C. No. 4 be certified and sent to Commissioner of Railway Safety for information before introduction of new trains.

(b) **G.M.'s COMMENTS** - Accepted.

(c) **REMARKS** - Noted. Railway Board may kindly issue instructions to all the Zonal Railways for compliance.

3.15(a)**Para 9.3 of the report** :- Facility for retrieving data from Memotel type speedometer should be provided in Trip Sheds.

(b) **G.M.'s COMMENTS** - Accepted.

(c) **REMARKS** - . Noted. The Railway Board may issue similar instructions to all the Zonal Railways.

3.16(a) **Para 9.4.1 of the report** :- Safety precautions for passengers travelling in coaches should be prominently displayed in coaches and on the back of tickets.

(b) **G.M.'s COMMENTS** - Policy issues. To be considered by Railway Board.

(c) **REMARKS** - Recommendations of the CRS merit consideration.

3.17(a)**Para 9.4.2 of the report** :- Apart from existing insurance system available for rail passengers, they should be allowed to be additionally insured by insurance companies.

(b) **G.M.'s COMMENTS** - Policy issues. To be considered by Railway Board.

(c) **REMARKS** - Recommendations of the CRS merit serious consideration.

3.18(a)**Para 9.4.3 of the report** :- Doctors travelling as passengers may be encouraged to disclose their identity by issuing them confessional tickets on the condition that those doctors will attend to passengers in case of emergencies/accidents.

(b) **G.M.'s COMMENTS** - Policy issues. To be considered by Railway Board.

(c) **REMARKS** - Recommendations of the CRS merit consideration.

3.19(a) **Para 9.5.1 of the report** :- Track structure on bridges with open deck should be modified and strengthened.

(b) **G.M.'s COMMENTS** - Policy matter to be decided by the Board/RDSO.

(c) **REMARKS** - Railway Board may consider the recommendation of the CRS in respect of track structure on open deck bridges. It is also for consideration that the new bridges, whether open deck or ballasted deck, should be designed for LWR track.

3.20(a) **Para 9.5.2 of the report** :- The renewal of bridge timbers and wooden layout under points & crossings and special layouts should be completed at the earliest. Till then speeds should be reduced wherever required.

(b) **G.M.'s COMMENTS** - Accepted. Renewal of bridge timbers and wooden layout under points & crossings have been taken up on a programmed basis and will be completed at the earliest.

(c) **REMARKS** - Railway Board may like to decide the time frame and monitor the progress on all zonal railways. The progress on Eastern Railway is very slow as is evident from para 7.4.3 of the Report.

3.21(a) **Para 9.5.3 of the report** :- In new constructions, open deck plate girders and underslung girders should be discouraged.

(b) **G.M.'s COMMENTS** - Policy decision to be taken by Railway Board.

(c) **REMARKS** - Railway Board may consider withdrawing the drawings of plate girders as well as under slung girders. New Bridges should be designed to carry the LWR track.

3.22(a) **Para 9.6.1 of the report** :- At least 6 to 10 satellite phones may be kept at a central place and moved to the site of accident whenever such emergencies arise.

(b) **G.M.'s COMMENTS** - This is a policy matter to be decided by the Board.

(c) **REMARKS** - The railway has indicated that only one satellite phone is available in each division, which was commissioned only after arrival of the Mughalsarai ARME, whereas ARME of Gaya was first to reach the site. In view of the problem of communication faced by the injured passengers as brought out in para 8.3.5 of the report, 02 satellite phones should be kept in each ARME. These should be checked by the S&T officials periodically to ensure that they remain in working order.

3.23(a) **Para 9.6.2 of the report** :- Some 10 coffins (after anti termite treatment) be kept in each Accident Relief Medical Equipment van and some more at a central place. These can be moved whenever required.

(b) **G.M.'s COMMENTS** - As per Annexure I of Chapter VII of IRMM, 40 shrouds have been kept in ARME Scale I. However, this is a policy matter to be decided by Railway Board.

(c) **REMARKS** - CRS recommendation is for keeping the caskets in the ARMEs for handling dead bodies in this kind of gruesome accident. This suggestion is based on the points raised by the Commissioner Magadh Range, Govt. of Bihar. If it is difficult to accommodate them in the ARMEs, these can be kept in the ARTs.

3.24(a)**Para 9.6.3 of the report** :- Prima facie cause of accidents where Commissioner of Railway Safety is likely to conduct the inquiry should not be announced by Railway Authorities.

(b) **G.M.'s COMMENTS** - Policy issue to be decided by Railway Board.

(c) **REMARKS** - The CRS recommendation is essential to be implemented in letter and spirit. It may be mentioned that preliminary report submitted by the CRS within 10 to 15 days of occurrence of the accident, brings out the most probable cause of the accident after taking almost all the aspects into consideration.

3.25(a)**Para 9.6.4 of the report** :- All technical circulars, letters, policy guidelines pertaining to safety shall be made available to the Commission of Railway Safety by the Railway Board as well as Zonal Railways.

(b) **G.M.'s COMMENTS** - Board's guidelines on the subject will be followed.

(c) **REMARKS** - Though Railway Board have already issued certain instructions for keeping the CCRS on the mailing list of the Railway Board, the implementation is still lacking. As suggested in para 7.8.13 of the report, a Pivot Cell can be opened in the Railway Board as well as in the zonal railways to ensure that the circulars relating to safety are endorsed to CCRS and CsRS respectively.

3.26(a)**Para 9.6.5 of the report** :- Mobile telephones with roaming facilities should be made available by the Railway Administration to all the technical officers of the Commission i.e Chief Commissioner of Railway Safety, Commissioner of Railway Safety and Deputy Commissioner of Railway Safety.

(b) **G.M.'s COMMENTS** - Policy matter to be decided by Railway Board.

(c) **REMARKS** - This was agreed to by the then CRB in a meeting with Secretary, Ministry of Civil Aviation held on 28.11.2001. However, the commitment has still not been implemented. Railway Board are requested to kindly provide the required facility to the officers of the Commission, for efficient discharge of their duties, in terms of Section-9 of the Indian Railways Act, 1989.

4. **Relief Measures** -

(a) According to Shri Mahesh Chand, the relief arrangements from Railway side were late. There was delay in transportation of injured passengers to major hospitals and the communication facility for the passengers were inadequate initially as brought out in paras 8.3.1 to 8.3.5 of the Report. Vide para 8.3.6 of his Report, he has recommended for setting up a high level committee to go into these issues and suggest remedial measures.

(b) **G.M.'s COMMENTS** -

(i) The rescue operation of passengers from the derailed coaches started immediately on arrival of ARME & ART from Gaya at 0140 hrs. on 10.9.02 and not at 4 AM on 10.9.02 as indicated in the para. This was further augmented on arrival of ARME/MGS at 0300 hrs. DRM and other senior officers of MGS Division also arrived by this ARME. Prior to 0140 hrs. the railway officials traveling on train had already started rescuing passengers from coaches immediately after the accident took place.

(ii) 5 Railway Doctors were available at Rafiganj Govt. Hospital who were attending to the injured passengers from the early hours of 10.09.2002. At 1400 hrs. 29 patients were shifted from Rafiganj to Gaya by Special Train escorted by CMD and 3 Railway Doctors. The other 2 Railway Doctors remained available at Rafiganj Railway Hospital through out the day and night of 10.09.2002.

While it is true that the Jawans of BMP particularly have done a good assisting job in rescue of passengers and dead bodies, it may be mentioned that the railways were bearing the complete responsibility at site and organizing all the rescue and relief work including taking care of injured passengers who were admitted in various hospitals at different places and in a number of cities like Gaya, Sasaram, Aurangabad, Mughalsarai etc. In addition to that, all the coordination and decision making responsibility regarding the most appropriate manner in which the patient needed to be transferred to bigger hospitals and their transportation was also fully undertaken by the railways under the personal supervision of the senior railway doctors including the Chief Medical Director, Eastern Railway. This will be amply evident from the following account:

I. Initial first aid was rendered at accident site.

II. (a) 50 injured were dispatched at 1030 hrs on 10.9.2002 by special train accompanied by railway doctors, reaching MGS at 1605 hrs wherein the patients were attended by railway doctors at MGS and NE Railway, Varanasi at RS/MGS.

(b) 34 patients, after receiving medical aid at RS/MGS, proceeded to New Delhi by 2313 Rajdhani Express.

(c) On arrival at New Delhi, the injured were attended by railway doctors of Northern Railway.

(d) 10 patients after receiving medical aid at RS/MGS proceeded by JU-HWH Express to HWH, where the patients were attended by railway doctors at Howrah Station on 11.9.02.

(e) 6 patients were admitted at RS/MGS on 10.9.02.

III. (a) The injured were taken from the accident site to the nearest Govt. hospital at Rafiganj.

(b) After rendering medical aid at GH/Rafiganj, the injured were transported by road vehicle from GH/Rafiganj to RS/Rafiganj, from where they were shifted to Gaya by special train. First special train left RS/Rafiganj at 0830 hrs on 10.9.02 and reached Gaya at 1010 hrs on same day.

(c) The 2nd special train left Rafiganj at 1400 hrs on 10.9.02 and reached Gaya at 1515 hrs on the same day.

(d) No. of patients admitted at -

(i)	GH/Gaya	-	52
(ii)	Military Hospital/Gaya	-	03
(iii)	RH/Gaya	-	29

All the injured were accompanied by railway doctors under supervision of CMD/ER.

(e) No. of patients were later shifted from GH/Gaya to RH/Gaya

(f) 30 most serious patients admitted at RH/Gaya were later shifted from Gaya by special train to Howrah accompanied by railway doctors under supervision of CMD/ER.

(g)

(i)	No. of patients were admitted at RH/HWH	-	29
(ii)	No. of patients were admitted at B.R. Singh Hospital, Sealdah	-	09

No. of patients were admitted in different non-railway hospitals and nursing homes in Kolkata area - 13.

GAS CUTTING OPERATION

A total of 12 sets of gas cutters were used. Their time of reaching the site as well as utilization is as under:

GYA - 03	(arrived with ARME/ART-GYA at 0140 hrs on 10.9.2002).
MGS - 07	(2 nos. arrived with ARME/MGS at site at around 0250 hrs, 2 nos. arrived by road at around 1100 hrs and 3 nos. arrived with ART/MGS around 0555 hrs on 10.9.02).
DNR - 01	(arrived with ARME/ART, DNR at 0640 hrs on 10.9.02).
DOS - 01	(arrived by MR Special at 0630 hrs on 10.9.02).
12	

Besides this, 03 sets of cold cutting equipments (one set consists of one cutter and one spreader) were also used. The details are as under:

MGS – 1 (arrived with ARME/MGS at site at around 0205 hrs on 10.9.02).
GYA – 1 (arrived with ARME/ART/GYA at 0140 hrs on 10.9.02).
DNR - 1 (arrived with ARME/ART/DNR at 0640 hrs on 10.9.02).
3

140 Tonnes Cranes

2 cranes of 140t capacity were utilized in relief and rescue operation – one at each end of the bridge. The cranes worked in abnormal condition with great care as the coaches were lying all over including the bridge. In fact, in making efforts to lift a high resting coach at site, the MGS end crane rope came off on 10th Sept. night. This was, however, set right at site itself within a short time. All these activities were being closely monitored by the respective departments of the site office (at MGS end of the bridge), which was in operation from 0300 hrs of 10.9.02 immediately after arrival of DRM/MGS and other senior officers of the Division.

Para-medical Staff

29 para-medical staff were available at site throughout till the rescue work was complete. They were supplemented by other departmental staff of railways, Bihar Military Police and other NGOs.

Life-saving drugs and other medicines in ARMEs

There was no shortage of life saving drugs in the ARMEs which were available as per the stipulation laid in Annexure-I of Chapter VII of Indian Railway Medical Manual.

Co-ordination with State Govt. doctors

Dr. D.K. Sahay, Sr. DMO/Gaya was nominated by CMD to coordinate with the State Govt. doctors of different hospitals and there was no problem of this nature.

Hiring of Helicopters/Aeroplanes

The Airport at Gaya is very small with no commercial flights. Depending on the condition of the patients, they were admitted in Railway hospital, Military Hospital and Govt. Hospital at Gaya and later shifter to major hospitals in Howrah and B.R. Singh Hospital/Sealdah. Some patients were admitted in nearby hospitals like Rafiganj, Sasaram, Aurangabad and Mughalsarai and later shifted to Delhi, Lucknow, Chandigarh and Varanasi as per the choice of the patients Keeping in view non-existent air transport in nearby area as also poor road condition in between Gaya and accident site, rail transportation was found to be the quickest mode.

The medical relief train of Gaya was the first to reach site. It was ordered at 2300 hrs on 9.9.02 and left Gaya within one hour along with 5 railway doctors on 10.9.02. However, some delay took place (22 minutes) on way due to vacuum problem. Medical Relief Train of MGS reached site at 0258 hrs on 10.9.02 without any detention en route.

The location at which the accident has occurred is not readily accessible for BSNL to provide public communication. As per Railway Board's directives, only one satellite phone is available in each Division. The Mughalsarai Division Satellite phone was commissioned at 0330 AM of 10.9.02 after arrival at ARME/MGS. Later, by providing temporary cabling by both BSNL and railways, additional 07 BSNL STD phones were provided between 1200 hrs and 1730 hrs.

It would, therefore, be seen from above that the railways had done their best in handling the tragedy of such enormous magnitude within the resources available. The difficult conditions of the site and the involvement of rescue and relief operations on a bridge were creditably encountered by the Railwaymen. It is, however, true that the quantum of relief arrangements required for a tragedy of this magnitude have to be very large. With this objective in view, Railway Board have already appointed a High Power Committee to suggest measures for enhancing the existing capabilities of the system in this respect.

(c) **REMARKS** - It would be noted that the Gaya ARME turned out after one hour of the ordering and took one hour 40 minutes to travel a distance of 38 kms on a double line section. Even Mughalsarai ARME took long three hours and twenty minutes to cover a distance of 164 kms on double line section. There are no two opinions to the fact that the relief and medical help to the injured passengers has to be provided on top most priority and with utmost urgency. The seriously injured passengers should therefore be transported to specialist hospitals by quickest possible means. The CRS's suggestion of hiring aeroplane/helicopters to air lift the injured passengers is quite relevant and needs a serious thinking by the Railway Board.

The General Manager has advised that the Railway Board have already appointed a High Power Committee to suggest measures for enhancing the existing capabilities of the system in this respect. I hope the terms of reference of this Committee include all the issues raised by the CRS in para 8.3 of his Report.

5. It is proposed to publish the Report after completion of all formalities, legal or otherwise, as per the extant procedure. .

Sd/-
(G.P. GARG)
Chief Commissioner of Railway Safety

20.11.2003

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
(Railway Board)

No 2002/Safety (A&R)/1/26 New Delhi ,dated 05.12.2002

OFFICE MEMORANDUM

Sub: Derailment of 2301 Up Rajdhani Express between Rafiganj & Deo road stations of Mughalsarai Division of Eastern Railway on 09.09.2002.

The undersigned is directed to invite a reference to the Commission of Railway Safety's letter No T.12012/3/2002-RS dated 20.11.2002 forwarding a copy of Chief Commissioner of Railway Safety's note on the captioned accident and to state that the comments of Ministry of Railways thereon are furnished in the Annexure.

Sd/-

Director/Safety-II

D.A : Above.

The Commission of Railway Safety
Ministry of Civil Aviation,
16-A,Ashok Marg,
Lucknow.

ANNEXURE

(to Railway Board's O.M No 2002/safety (A&R)/1/26)

Brief Para-wise comments on the Note of CCRS are as under :

CCRS's observations	Remarks of Railway Board
Cause : **2.1.1** . " The train derailed due to opening of fish plates and elastic rail clips of the cess side single rail in Howrah end approach of bridge No 445 by miscreants."	**Accepted**
Responsibility : **2.1.2 Primary** : Unknown person(s) **Secondary :** Authorities responsible for ensuring Law & order	**Accepted** **For State Govt. to accept.**
2.2.1(B): Security and engineering departments of Eastern railway Hqrs and Mughalsasari Division have to share the blame and accordingly they are considered "Blameworthy".	**Accepted** with following observations: As per Constitution and Home Ministry's letter No. U 2-65/X dated 13.9.1965 & letter No 27/4/72/-Poll II dated 11.02.1972., law & order, security patrolling, protection of track and guarding of bridges is the responsibility of state government and existing Railway rules / manuals do not provide for security patrolling in sabotage prone sections, unless advised by civil administration (Rule under GR 2.05 and 2.11 quoted by CCRS were meant for maintenance and operation of Railways and not making a Railway servant liable in respect of crime etc.) While Railways are already facing tremendous challenges, however, taking into consideration, country's expectations and CCRS's views, Railway accepts (i) with all humility the blame worthiness as attributed in respect of Engineering and security branches and particularly of

	Mughalsarai Division and (ii) the new task of identifying vulnerable sections independent of state government also and carrying out security patrolling of such vulnerable sections to the extent practical even independently (even if the state government does not participate in such patrolling) as an interim measure by issuing internal confidential instructions. For final instruction, Ministry of Home Affairs will have to be consulted. This shall, however, in no way dilute the basic responsibilities of State governments as per the Constitution. The size of problem being huge, it may take time for Railways to organize the new arrangement all over the country. Railways will, however, make the best efforts. This being a new domain, it may also need augmentation of manpower and equipments. Further details and observations are given in Appendix A.
2.2.1(C) (a) Responsibility of Patrolman.	**Accepted .** Details with observations are given in AppendixA1.
2.2.1(C) (b),(c),(d),(e) : After considering the detailed discussion by the CRS in his report and the Railways' views and the fact that the condition of the bridge timbers of Bridge No 445 was not the cause of the accident. I take out the names of Shri B.Naskar, SE,P.Way, Mukesh Gupta,AEN/Gaya, Abhay Kumar/DEN-II/MGS and Finance Branch of Mughalsarai Division . However, for the various reasons brought out , the Railway Administration may be directed to take suitable corrective action against the three engineering officials and also pin point the responsibility in the Finance Branch of	**Accepted** . Corrective action, however, will be taken. The recommendation for system of finance vetting is accepted and the review as suggested will be done and action as required will be taken.

Mughalsarai Division for causing delay to the sanction of detailed estimates. It is also felt that the system of finance vetting at numerous stages of a work needs a review in the interest of fast execution of safety related works.	
2.2.1(C) (f) : Track directorate of RDSO as blameworthy.	**Not accepted** . Details with observations given are given in Appendix B.
Recommendations : 3.2. (c) : **(Para 9.1.1 of CRS's Report)** Detailed and clear cut instructions should be issued over Security Patrolling. 3.4 (c) : **(Para 9.1.3 of CRS's Report)** Security patrolling should be done in sabotage prone areas.	**Accepted** with remarks given in Appendix C.
3.3.(c) : **(Para 9.1.2 of CRS's Report)** There is a need for further reduction of speed in Gaya-Dehri-on-Sone section to 75 km/hrs at night . Similar review should be made for other sections affected by miscreant activities.	**Accepted**. Details with observations given in Appendix D.
3.5.(c) : **(Para 9.1.4 of CRS's Report)** In sabotage prone area anti –sabotage design of fittings on concrete sleepers should be evolved and put in place within one year .	**Accepted**. Details with observations are given in Appendix E.
3.6.(c) : **(Para 9.1.5 of CRS's Report)** No track material - surplus/released/maintenance reserve be left unguarded near the track particularly in areas known for miscreant activities.	**Accepted** in principle. Details with observations are given in Appendix F.
3.7.(c) : **(Para 9.1.6 of CRS's Report)** Single cut rails and buffer rails at vulnerable locations like high embankment, sharp curves, bridge approaches and on	**Accepted** for examination.

major bridges should be eliminated.	
3.8 (c) : **(Para 9.2.1 of CRS's Report)** Hammers should be provided in AC coaches so that passengers can break open the glasses in case of accidents/emergencies.	**Accepted**
3.9 (c): **(Para 9.2.2 of CRS's Report)** Emergency lights at a number of places a should be provided in coaches which shall automatically switch on in case of emergency	**Accepted**
3.10 (c) : **(Para 9.2.3 of CRS's Report)** Emergency Exits should be provided in all coaches for escape of passengers in case of fire, accidents etc. Although Railway Board issued instructions on this subject way back in 1999, the same are yet to be implemented.	**Accepted** Details given in Appendix G.
3.11 (c): **(Para 9.2.4 of CRS's Report)** Mouldable and shock absorbing materials with round edges should be used in internal furnishing of coaches. The seats/berths to be made such that the passengers are not thrown out of their positions in case of an accident.	**Accepted**. Details given in Appendix H .
3.12 (c): **(Para 9.2.5 of CRS's Report)** Riding quality of coaches of high speed trains should be checked periodically by an objective system of evaluation by instrumentation.	**Accepted** subject to evolving an objective system to determine the "absolute" riding quality of the coach in a reliable manner.
3.13 (c) : **(Para 9.2.6 of CRS's Report)** Dash pot oil should be checked after every trip by Rajdhani Express coaches. A friction type snubber or any better alternative should be used in place of the present system of dash pot oil arrangement to have maintenance free service.	**Accepted.** Details with observations given in Appendix I.
3.14 (c) : **(Para 9.2.7 of CRS's Report)** Compliance to R.P.C. No.4 be certified and	**Not accepted** Details with observation given in Appendix J.

sent to Commissioner of Railway Safety for information before introduction of new trains.	
3.15(c) : **(Para 9.3 of CRS's Report)** Facility for retrieving data from Memotel type speedometer should be provided in Trip Sheds.	**Accepted**. Instructions issued to zonal railways vide letter No.2002/Elect(TRS)/113/13 dated 25.11.2002 for arranging the facility
3.16(c) : **(Para 9.4.1 of CRS's Report) :** Safety precautions for passengers travelling in coaches should be prominently displayed in coaches and on the back of tickets.	**Partially Accepted.** Details are given in Appendix K.
3.17(c) **(Para 9.4.2 of CRS's Report)** Apart from existing insurance system available for rail passengers, they should be allowed to be additionally insured by insurance companies.	**No objection.** Details are given in Appendix L.
3.18(c): **(Para 9.4.3 of CRS's Report)** Doctors travelling as passengers may be encouraged to disclose their identity by issuing them concessional tickets on the condition that those doctors will attend to passengers in case of emergencies/accidents.	**Accepted**
3.19(c) **(Para 9.5.1 of CRS's Report)** Track structure on bridges with open deck should be modified and strengthened.	**Accepted** for examination.
3.20(c) : **(Para 9.5.2 of CRS's Report)** The renewal of bridge timbers and wooden layout under points & crossings and special layouts should be completed at the earliest. Till then speeds should be reduced wherever required.	**Accepted .**
3.21(c) : **(Para 9.5.3 of CRS's Report)** In new constructions, open deck plate girders and under slung girders should be discouraged.	**Accepted** for examination.
3.22(c): **(Para 9.6.1 of CRS's Report)** : At least 6 to 10 satellite phones may be	**Accepted .** Details with observation given in Appendix M .

kept at central place and moved to the site of accident whenever such emergencies arise.	
3.23(c) : **(Para 9.6.2 of CRS's Report)** _Some 10 coffins (after anti termite treatment)be kept in each Accident Relief Medical Equipment van and some more at a central place. These can be moved whenever required.	**Accepted .** Details with observations given in Appendix N.
3.24(c) **(Para 9.6.3 of CRS's Report)** : Prima facie cause of accidents where Commissioner of Railway Safety is likely to conduct the inquiry should not be announced by Railway Authorities.	**Not accepted.** Details with observations given in Appendix O.
3.25(c) : **(Para 9.6.4 of CRS's Report)** All technical circulars, letters, policy guidelines pertaining to safety shall be made available to the Commission of Railway Safety by the Railway Board as well as Zonal Railways.	**Accepted.** Instructions already exist.
3.26(c) : **(Para 9.6.5 of CRS's Report)** Mobile telephones with roaming facilities should be made available by the Railway Administration to all the technical officers of the Commission i.e. Chief Commissioner of Railway Safety, Commissioners of Railway Safety and Deputy Commissioner of Railway Safety.	**Accepted .** Proposal initiated.
4.0 (C) : Relief measures	**Accepted.** Task force will look into this aspect.
5.0 : Proposal to publish the Report after completion of all formalities, legal or otherwise, as per extant procedure.	**Accepted .**

Note : Following points are brought to the notice of the Commission :

A) While the Final Report mentioned about the derailment of 16 coaches the Final Note on the Report of the CRS clarifies about the derailment of 14 coaches only.

B) As a result of this accident, 108 persons lost their lives and 59 grievously injured and 105 simple injured.

C) Although Commission has not held Shri Sagar. Singh, Chief Works Manager/Mughalsarai who left site of accident without taking charge of site of accident and organizing relief & rescue operations as blameworthy, Ministry of Railways feels this a serious lapse on the part of such a senior officer at the time of emergency, when he should have shown exemplary qualities of responsibility and leadership and holds "Blameworthy".

****

Appendix A
(to para 2.2.1(B)

Law and order is a statutory responsibility given to the State Government as per the Constitution of India. Attention is drawn to Min of Home Affair's telegram No.U 2-65/X dated 13.9.1965 to all Chief Secretaries of State Government and Union Territories . It was specified therein that as regards the relative role of State Govt. and Rly. Admn, in respect of measures for railway security, the patrolling of track and guarding of railway bridge would be the responsibility of State Government and the guarding of other vulnerable installations would be undertaken by RPF. Since some further problems were still noted, a detailed clarification, on these lines, was again circulated to all State Govt. vide MHA's letter No.27/4/72-Poll II, dated 11.02.72. It can be appreciated that security patrolling of track , protection of track and guarding of bridges has to be ensured by State Govt. concerned.

Every case of suspected sabotage in the section was reported by Eastern Railway to Local Police of the State Govt. (Para 2.2 (II) (a) Engineering, page 3 of the CCRS report). Subsequent action is required to be taken by the State Govt.

The Eastern Railway had implemented all necessary instructions in regards to safety of track/bridges.

Security patrolling is required to be arranged only in case of Civil Disturbances and on Special Occasions, according to the special instructions as provided in IRPWM Para 1001 (5) (a) to (c). Since there was no such alert, which warranted introduction of Security patrolling, the same was not in force.

The existing railway rules/manuals do not provide for security patrolling in sabotage prone sections, unless advised by Civil Administration. Nor do the railways have adequate manpower etc. to take upon themselves, this responsibility of security patrolling of track (which is likely to continue for prolonged periods).

"Patrolling by railways in sabotage prone areas", however, being a new domain for the Railways, Ministry of Home Affairs will have to be consulted for issue of directives in addition to MHA's existing instructions dated 13.09.1965 and 11.02.1972 to all State Government referred above.

CCRS has mentioned that in accordance with Para GR 2.05 and 2.11, it is the duty of every Railway servant to make very exertion for ensuring the safety of the public. In this connection it is mentioned that these Paras are in respect of discharge of duties assigned to various railway staff for operation and maintenance of the Railways for which duties have been assigned to all railway staff. These duties and responsibilities oblige a railway servant to report to the railway Administration only if

he gets any information about any crime being committed or likely to be committed concerning railway property . These provisions cannot be stretched to make a railway servant liable in respect of crime or incident, if he is not in the know of it or it is not. Forming part of the assigned duties and responsibilities.

However, as an interim measure to tackle such unforeseen situations, internal confidential instructions, on Railway's own initiative, will be issued for undertaking "Patrolling in sabotage prone areas", by setting up a suitable machinery at the divisional level.

****

Appendix A 1

(to 2.2.1(C)(a))

The failure of the two gangmen to complete the patrolling of their beat on the night of 8/9..9.02 is **accepted.**

However their non-completion of patrolling duty on the night of 8/9.9.02, was no reason for the miscreants to cause sabotage on the next day i.e. in the night of 9/10.9.02. The patrollers did complete their assigned patrolling duty in the night of 9/10.9.02. However, the accident took place prior to their assigned time of arrival at the site of accident.

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Appendix B

(to 2.2.1(C) (f)

The subject of developing anti-pilfer ERC has been under consideration since long. The 60th TSC discussed and decided to conduct trials in theft prone areas of ER & SER vide Item Nos. 788 in January, 1985. The issue continued to be discussed in subsequent TSCs. However, the 64th TSC held in 1990 recommended that anti-pilfer design of ERC had not served the desired purpose and therefore, Rly Bd decided to close the item as there was no likelihood of development in this field and also keeping in view the possible adoption of HM fastening in near future.

After the derailment of 8033 Dn. Ahmedabad - Howrah Exp on 09.07.92 efforts were revived to improve upon the design of anti-pilfer ERC with "circlip" by using a thicker plate and increasing the radius of corners to reduce the stress concentration but no fruitful results could be achieved. This was advised to Railway Board vide RDSO's letter No.CT/FD/2 dated 11.10.93. Further, as per CRS's recommendations after derailment of 2301 Rajdhani Express on ER on 20.02.96, the RDSO advised that the revised version of anti-pilfer ERC did not come up to the expectation of the railways on account of the difficulties faced in removal and replacement of such clips during destressing, accident/fracture restoration and other maintenance operations. This contention was accepted by the Board and RDSO advised in May 1999.

It can, thus, be appreciated that efforts to develop anti-pilfer fastening have been continuing and after the Rafiganj accident also, a special TSC was also held on 24th and 25th of October ,02 at IRICEN to discuss a new design. The TSC has recommended trial for a design with extended central leg of ERC with 1.35 mm deep groove at 7mm distance from the free end where a strengthened circlip 4mm thick made out of spring steel shall be used. This recommendation is presently under consideration of the Bd.

The development from dog spikes and fish plated rails, to elastic rail clip, welded joints, LWR, trials for anti-pilfer ERC etc. are indicative of continuous efforts on the part of RDSO for making the track structure safer and as such there has been no lapse in this regard.

From the above it is clear that RDSO had not left any stone unturned to develop the anti-theft ERC and, therefore, the observations indicating blameworthiness of RDSO in this regard cannot be accepted.

****

Appendix C

(To 3.2. (c) & 3.4 (c))

Law and order is a statutory responsibility given to the State Government as per the Constitution of India. Attention is drawn to Min of Home Affair's telegram No.U 2 – 65/X dated 13.9.1965 to all Chief Secretaries of State Government and Union Territories. It was specified therein that as regards the relative role of State Govt. and Rly. Admn, in respect of measures for railway security, the patrolling of track and guarding of railway bridge would be the responsibility of State Government and the guarding of other vulnerable installations would be undertaken by RPF. Since some further problems were still noted, a detailed clarification, on these lines, was again circulated to all State Govt. vide MHA's letter No.27/4/72-Poll II, dated 11.02.72. It can be appreciated that security patrolling of track and protection of track and guarding of bridges from miscreants has to be ensured by State Govt. concerned.

As per the stipulations of Para 1001 (5)(a) to (c) of IRPWM, Security Patrolling is to be introduced in case of apprehension of Civil Disturbances and on special occasions only.

Joint patrolling (by RPF and Gang men), in the sections identified by State Govt, is undertaken by the railway for a limited period, on the specific request of State Govt. whenever received.

CCRS has mentioned that in accordance with Para GR 2.05 and 2.11, it is the duty of every railway servant to make every exertion for ensuring the safety of the public. In this connection, it is mentioned that these Paras are in respect of discharge of the responsibilities assigned to various railway staff for operation and maintenance of the railway for which duties have been assigned to all railway staff. These duties and responsibilities oblige a railway servant to report to the Rly. Admn., only if he gets any information about any crime being committed or likely to be committed concerning railway property. These provisions cannot be stretched to make a railway servant liable, in respect of a crime or incident, if he is not in the know of it or if it is not forming part of his assigned duties and responsibilities.

Notwithstanding the above,, as an interim measure to tackle such unforeseen situations, internal confidential instructions, on Railway's own initiative, will be issued for undertaking "Patrolling in sabotage prone areas", by setting up a suitable machinery at the divisional level.

****

Appendix D

(To 3.3.(c)

Speed restriction of 75 kmph has already been imposed on the Gaya-Dehri on Sone section at night between 2000 hours and 0500 hours. The need for continuing this restriction or otherwise over this section will be reviewed. The desirability of imposition of restrictions in other areas will be examined on need basis.

****

Appendix E

(To 3.5.(c)

It is however mentioned that efforts are continuing to develop an anti-sabotage fitting for concrete sleepers and its laying in the field shall depend on satisfactory completion of the trials.

As mentioned by CCRS, the suggestion by CRS (ref. Para 7.5.10.5 of final report of CRS) for anti-sabotage PRC sleeper, shall be examined in detail as the same involves designing a new insert and casting process etc. RDSO has already been instructed to take necessary follow up action.

It is, however, mentioned that anti-sabotage fittings or anti-sabotage PRC sleepers, when developed, shall be provided on three sleepers per rail length in fish-plated and SWR territory only, as the provision of these of fittings/sleepers on LWR/CWR, shall lead to a very serious maintenance problem during de-stressing.

****

Appendix F

(To **3.6.(c) :**

Stray and scattered rails, cut rail pieces, PRC sleepers etc. should not be lying in the block section or at isolated locations and more so, in the locations considered vulnerable. The P.Way material should be kept either at manned Level Crossing gates having gate-lodge or in Station Yards. The instructions for the same already exist vide paras 155 , 310 (6), 314 (4) (f), 323 (1) of IRPWM.

However, consolidated instructions will be issued to all Railways to keep the P.Way material in stacks at manned Level Crossing gates or in Station Yards, as far as possible, and to monitor that scattered P. Way material is not left at vulnerable locations without a Watchman, to guard against any attempt of sabotage.

****

Appendix G

(To 3.10 (c) :

Provision for emergency windows while enhancing Safety is compromising on Security. Developing a proper design of the emergency window has been an evolutionary process and perfect solution is still not in sight for all types of coaches. Provision of emergency windows will be implemented expeditiously.

****

Appendix H

(To 3.11 (c):

Action has already been taken for rounding off edges and use of shock absorbing material Regarding modification of seats/berths, the recommendation has been **accepted**, subject to evolving a suitable design for restricting mobility of passengers in seats/berths and for the luggage in overhead racks without inviting adverse public reaction.

****

Appendix I

(To 3.13 (c)

Base depots will be asked to check dashpot oil level after every round trip. Regarding development of a better alternative in place of the present system of dashpots, the recommendation has been accepted. A series of alternative to dashpot design have such as clouth rubber rolling springs , dry friction shoe dampers , shock absorbers similar to those commercially available etc have tried out and not proved successful. Fiat bogies has therefore been brought in as the ultimate solution, which is already introduced.

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Appendix J

(To 3.14 (c)

Policy Circular No.4 (Revision October, 2001) issued vide Board's letter No.95/M©/41/1 dated 29.10.2001 certain instructions regarding maintenance pattern of coaching trains. This circular is in supercession of all previous instructions in this regard. The revised policy for maintenance pattern for coaching trains with mandatory provisions have been approved by Board (MT & MM). Item No.1 of this circular, which deals with new trains, lays down as under :

"Before introduction of any new train, compliance with the RPC No.4 (Revised) will be certified jointly by CPTM and CRSE of the originating Railways duly consulting the terminating Railway."

A copy of these instructions have been marked to all Chief Operation Managers and General Managers of Indian Railways, Director General/RDSO, Director CAMTECH/Gwalior and Chief Commissioner of Raiwlay Safety/Lucknow.

From the aforesaid, it would be seen that the practices to be followed for maintenance of coaching stock have the joint approval of MT & MM. In addition, in case of introduction of new trains, the maintenance pattern is to be in compliance with the RPC No.4(Revised) and this is to be certified jointed by the CPTM and CRSE of the originating Railways in consultation with terminating Railway. With this provision, adequate safeguards are there inasmuch as 2 Joint Secretary level officers, viz. CPTM and CRSE, certify that the mandatory provisions laid down by the Board are being followed in case of introduction of a new train. These are adequate safeguards. In view of this, it is not considered necessary to send a certificate reaffirming compliance of RPC No.4 to Commissioner of Railway Safety for information each time before introduction of new trains.

****

Appendix K

(To 3.16(c)

A number of unusual incidents can cause injury or death to an intending passenger of a train. He or she may slip down while boarding the train or alighting from the train. However, while the train is on run, a part of luggage may fall down from the racks and thereby can cause injury. While the train is on run, it may encounter other unusual incidents some of which may be accidents. These incidents/accidents may range from running into a road-vehicle at an unmanned level crossing, train hitting a cattle while on run, derailment and collision. Some of the accidents may be such that even a passenger traveling himself may be involved, for example while crossing a running line.

As would be seen, the unusual incidents/accidents are of different types and no uniform set of instructions can deal with all of them. Further, printing instructions on the reverse of a ticket, which, firstly is not possible, and secondly there cannot be any omnibus set of instructions for catering to al possibilities, will create panic among the passengers. All transport organization wish their passengers a very happy and safe journey. And such a wish is printed on the Tickets also. Incidentally, it may be mentioned that precautions to be taken in case of an accident are not printed even on airline's ticket. Such a practice is not in vogue in other countries, either.

However, safety precautions for passengers traveling in coaches would be prominently displayed in the coaches.

****

Appendix L

(To 3.17(c)

Indian Railways, at present, provide insurance cover to a passenger upto Rs.4 lakhs. In case a passenger desires to cover himself for a higher amount, he/she can do so and insure against personal accidents through various insurance agencies/schemes for higher amount also, for which schemes are already available.

****

Appendix M

(To 3.22(c)

The present policy is to keep one satellite phone in each division and one in Headquarter. It is now proposed to keep two telephones on each division and two in headquarters. With this arrangement, in the case of any accident, 8 satellite phones can reach to the site – 2 from the concerned division, 4 from the adjoining two divisions and 2 from headquarters.

****

Appendix N

(To 3.23(c)

A decision has been taken that 10 coffins will be kept on each Accident Relief Medical Equipment Vans. Some more will be kept in near by hospitals /health Units for moving them in cases of need. A model collapsible coffin of water proof material having a wooden base has been made by Mechanical Department of Southeastern railway. The model is under observation and once the model is approved all Zones will be advised later to get such coffins of termite /water proof material and place them in ARME/ART as suggested. scheme is under finalization.

****

Appendix O

(to 3.24(c)

The country wants to know almost instantaneously, rather than waiting for week or two, as well as it is the Railway's responsibility to inform at least prima facie cause in cases where the prima facie cause is clear, or at least the railways observation. This becomes all the more important when there is misinformation by media based on other's observations . CRS has also accepted indirectly, that in some cases , it is not practical to know prima facie cause meaning thereby that it is practical to know prima facie causes in some/other cases.

****

Government of India
Ministry of Railways
(Railway Board)

No.2002/Elect(TRS)/113/13 Pt. New Delhi, dt. 25-11-2002

General Manager,
Central Railway, Mumbai
East Central Railway, Hajipur
Southern Railway, Chennai.
South Eastern Railway, Kolkata.
Eastern Railway, Kolkata.
Northern Railway, New Delhi
South Central Railway, Secunderabad.
Western Railway, Mumbai.

Sub : Retrieval of data from microprocessor based Speed Monitoring System.

Ref CRS/Eastern Circle's recommendation on derailment of 2301 Up Rajdhani Express on 9-9-2002.

In pursuance of CRS/Eastern Circle's recommendation made vide para 9.3 of the report, it has been decided by the Ministry of Railways that all trip sheds and homing sheds should be equipped with required tools for retrieval of captured data from Memotel/Energy cum Speed Monitoring System/Memory Module type Speedometers provided on electric locos.

2.0 Necessary action may please be taken for arranging Personal Computer/Laptop, Data Extraction Units and required software to retrieve the required information for timely evaluation of driving techniques by respective zonal railways. Facilities may be arranged within three months.

3.0 Feed back on action taken may please be advised to Railway Board.

(Sudheer Kumar)
Director, Electrical Engineering(RS)
Railway Board
E-Mail : deers@rb.railnet.gov.in

Copy to : Chief Electrical Engineers,
Central, Eastern, East Central, Northern, Southern,
South Central, South Eastern & Western Railways.

भारत सरकार
GOVERNMENT OF INDIA
नागर विमानन मंत्रालय
MINISTRY OF CIVIL AVIATION
(रेल संरक्षा आयोग)
(COMMISSION OF RAILWAY SAFETY)

सत्यमेव जयते

अशोक मार्ग, लखनऊ-226 001.
Ashok Marg, Lucknow-226 001.

संख्या/No. T.12012/2/2002-RS.Pt.

दिनांक/Date 20.01.2003

The Secretary (Safety),
Railway Board,
Rail Bhavan,
New Delhi-110001

Sub: Derailment of 2301 UP Howrah-New Delhi Rajdhani Express train between Rafiganj and Deo Road Stations of Mughalsarai Division of Eastern Railway on 09.09.2002.

Ref: Your letter No. 2002/Safety (A&R)/1/26 Dated 05.12.2002

On going through the comments of Ministry of Railways received vide reference cited above, Commission would wish to offer further Comments on some of those issues as follows:-

1.1 **Para 2.2.1 (C)(f) – Para 7.5.10 of CRS's report :-**

The Railway Board have not accepted that Track Directorate of RDSO is blame worthy.

It is noted that inspite of the subject being dealt by the RDSO for the last 17 years and inspite of the repeated emphasis by the Commission through accident inquiry reports in the past, not much head way has been made in arriving at an effective anti sabotage feature for Concrete Sleepers. On the other hand it is alarming that every year more than a 1000 Kms. of Concrete sleepers track without any anti sabotage feature are added on. Hence urgency is required to be displayed to come out with concrete sleepers with Anti Sabotage feature which are practicable.

: चीफकाम
n : CHEFCOM
फोन/Phone - 229743 (P&T)
फैक्स/Fax - 214507
N.E. Rly. 31 - 264
N. Rly. 83 - 292

1.2 **Para 3.2 (c) and 3.4 (c) - Para 9.1.1 and 9.1.3 of CRS's Report :-**

The action being taken by the Ministry regarding issue of instructions for under taking "Patrolling in sabotage areas" is noted. The patrolling of such sections and posting of stationery patrolman in vulnerable locations (including bridges) should be done jointly by Engineering and Security Staff to take care of any untoward incident.

Further, since men from permanent way gangs will be diverted for such patrolling activities, it is absolutely necessary that the lost mandays are made good by appropriate means, so that safety of track maintenance does not suffer.

1.3 **Para 3.7 (c)- Para 9.1.6 of CRS's report :-**

Since shorter rails are tamper prone, there is urgency to remove such single cut rails and buffer rails at vulnerable locations like high embankments, sharp curves, bridge approaches and on major bridges.

1.4 **Para 3.10 (c) – Para 9.2.3 of CRS's report :-**

Since the Railway Board had already directed vide their letter nos.97/M(c) /137/12 dated 08.02.1999 and 24.07.2001 that emergency openable windows should be provided in both new as well as in existing coaches, the Railway Board's stand that "developing a proper design of an emergency window has been evolutionary process and perfect solution is not in sight for all types of coaches" is not appreciated.

1.5 **Para 3.12 (c) – Para 9.2.5 of CRS's report** :-

It is time that this recommendation is implemented because such Objective System to determine absolute quality of riding Coaches should already be available elsewhere in the world.

1.6 **Para 3.13 (c) – Para 9.2.6 of CRS's report** :-

Whereas FIAT bogie is a solution for coaches to be procured henceforth, these are a large number of coaches on the Indian Railways with dashpots and for these existing stocks there is urgency to find a better alternative in place of the existing dashpot assembly to have it maintenance free.

1.7 **Para 3.14 (c) – Para 9.27 of CRS's report** :-

New trains are being introduced frequently on already saturated routes, eating into the maintenance slot for track, OHE, Signal and Interlocking and the rolling stock, with no perceptible additional Maintenance facilities being created. It is not

understood why Railway Board should have any objection on the Zonal Railways being asked to send the Copy of Certificate Signed by CPTM and CRSE, if they are sure that the mandatory provisions are being followed in case of introduction of a new train. Even otherwise, in terms of Section 7 (c), of the Railways Act, 1989, CRS can ask the Railway Administration to produce any book, document or material object of the Railway, which appears to him to be necessary to inspect. Hence Railway Board may direct the Zonal Railways to ensure complaince.

Further, the full set of check list which the Zonal Railways should issue before introduction of new passenger train services (refer item no. 1 of the Minutes of the meeting, the Commissioner of Railway Safety held with the Railway Board on 28.11.2001) has still not been sent to the Commission. The same may also be ensured without delay.

1.8 **Para 3.25 (c) – Para 9.6.4 of CRS's report** :-

Since it is noted that inspite of instructions existing from the Railway Board, the required information on technical circulars, letters, policy guidelines pertaining to safety are not made available to the Commission of Railway Safety by the Railway Board as well as Zonal Railways, a "Pivot Cell" should be created in the Railway Board and in Zonal Railways (on the lines of Official Language Implementation Measures) through which all such information has to be channeled and the cell would ensure that all such information is invariably sent to the Commission of Railway Safety.

1.9 **Para 3.26 (c) – Para 9.6.5 of CRS's report** :-

In the Railway Board a decision has already been taken to provide Mobile Telephone with roaming facility to the Chief Commissioner of Railway Safety, Commissioner of Railway Safety and Dy.Commissioners of Railway Safety. However, orders to this effect are required to be immediately issued by the Railway Board, and all the Officers of the Commission of Railway Safety provided with Mobile Telephones with roaming facility without further delay.

2.0 Railway Board has appended a note with its comments bringing out three points. The comments on these as under:-

(a)While the Final Report mentioned about the derailment of 16 coaches the Final Note on the Report of the CRS clarifies about the derailment of 14 coaches only.

CCRS Comments:- It is a typographical error. The no. of derailed coaches were sixteen and not 14.

(b)As a result of this accident 108 persons lost their lives and 59 grievously injured and 105 simple injured.

CCRS Comments:- The casualty figures given in the Final report are based on the information furnished by the Zonal Railway. It is for the Zonal Railway to supply the latest information to the CRS, before he issues his final report.

(c) Although Commission has not held Shri Sagar Singh, Chief Works Manager/Mugalsarai who left site of accident without taking charge of site of accident and organising relief and rescue operations as blameworthy, Ministry of Railways feels this a serious lapse on the part of such a senior officer at the time of emergency when he should have shown exemplary qualities of responsibility and leadership and holds "Blameworthy".

CCRS Comments:- It is left for the Railway Administration to take such action against Shri Sagar Singh as it deems fit.

(R.Rajamani)
Chief Commissioner of Railway Safety.

No. I-12012/2/2001-RS
Government of India
Ministry of Civil Aviation
****

Rajiv Gandhi Bhavan, B-Block
Safdarjung Airport
New Delhi-110 003, dated: 28.2.2003

The Secretary
Ministry of Railways
Railway Board
New Delhi

Subject:- Derailment of 2301 Up Howrah-New Delhi Rajdhani Express train between Rafiganj and Deo Road stations of Mughalsarai Division of Eastern Railway on 09.09.2002.

Ref.:- (i) Your letter No.2002/Safety(A&R)/1/26 dated 05.12.2002.
(ii) This office letter of even No. dated 20.01.2003.

***

Sir,

On going through the comments of Ministry of Railways received vide reference (i) above, Ministry of Railways, Railway Board are requested to clarify their comments on the following Paras:-

Para 2.1.2 of CCRS Note:- Secondary responsibility to be accepted by State Government. Board are requested to take up the matter with State Government and action taken may be advised to this office.

3.6(C) Para 9.1.5 of CRS Report:- "No track material surplus/released maintenance reserve be left underground near the track particularly in areas known for miscreant activities – Accepted in principle." However, the consolidated instructions issued to Zonal Railways may also be sent to Ministry of Civil Aviation and to the Commission for information and record.

3.16(C) Para 9.4.1 of CRS Report:- Safety precautions for passenger traveling in coaches should be prominently displayed in coaches. The instruction issued to the Zonal Railways on the subject may be endorsed to the Ministry of Civil Aviation and to the Commission also for information and record.

3.19 Para 9.5.1 of CRS Report:- "Track structure on bridges with open deck should be modified and strengthened – Accepted for examination." What are the final views of the Ministry of Railways?

3.21(C) Para 9.5.3 of the Report:- "In new construction, open deck plate girders and under slung girders should be discouraged. Accepted for examination." What are the final views of the Ministry of Railways?

3.24(C) Para 9.6.3 of CRS Report:- "Prima facie cause of accidents where CRS is likely to conduct the inquiry should not be announced by Railway Authorities." – Railway Board may like to reconsider their remarks on this para and advice this Ministry.

Yours faithfully,

(Dr. S.N.A. Zaidi)
Joint Secretary to the Govt. of India

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
(RAILWAY BOARD)

No.2002/Safety(A&R)/1/26 Pt. New Delhi, dt. 27.03.2003

The Secretary,
Ministry of Civil Aviation,
Rajiv Gandhi Bhavan, B-Block,
Safdarjung Airport,
New Delhi- 110 003.

Sub: Derailment of 2301 Up Howrah-New Delhi Rajdhani Express train between Rafiganj and Deo Road stations of Mughalsarai Division of Eastern Railway on 09.09.2002.

Kindly refer to your letter No. T.12012/2/2002-RS dated 28.02.2003 on the subject. The undersigned has been directed to send the following clarifications on the paras mentioned in the letter referred above:-

Para 2.1.2 of CCRS Note: State Government has been asked to take necessary action. A copy of the letter is attached.

Para 3.6 (C) Para 9.1.5 of CRS Report: Instructions have been issued vide Board's letter No.2002/CE-II/PRA/9(CRS) Pt. dated 4.12.2002. A copy is enclosed. A copy has already been sent to the Commission of Railway Safety.

Para 3.16(C) Para 9.4.1 of CRS Report: Instructions already stand issued to Railways vide letters No. 87/M (C)/202/10 dated 15.10.96 and 13.8.01 (copies enclosed) for notices on safety, security and passenger amenities to be displayed in the coaches. (However, in the main Para 7.7.1 of CRS Report, no basis of the recommendation has been enunciated, but it finds a mention in para 9.4.1 without giving specific reasons and details).

Para 3.19 Para 9.5.1 of CRS Report: The CRS in this para has recommended that the track structure on bridges with open deck should be modified in para 7.8.5 the CRS has suggested a need to look

on the loading prescribed by RDSO for longitudinal force on bridges for air braked train In this context it is mentioned that IR had revised its loading standards in 1987 (MBG loading standard) where the future powerful locomotives and air braked stock has been considered. The maximum Tractive Effort under MBG loading is 100 tonnes. It is considered that a further revision of loading standard is not called for.

It has also been contended in para 7.8.6 of the Final Report, that there has been no change in the track structure on bridges over last more than 100 years. In this context it may be mentioned that considerable development in design of steel channel sleepers have taken place over the years and now about one lakh design of steel channel sleepers are being laid annually which have a better resistance against bunching. In these designs the guard rails are bolted to channel sleepers and an angle runner with bolting to channel sleepers which will give adequate resistance against bunching. The suggestion of CRS to fabricate a group of 4-5 channel sleepers in an assembly has been examined and not found practicable, because of excessive weight of such an assembly, since their laying in field would involve serious problems in handling the assembly, over the girders on safety considerations.

Railway have however taken up revision of Bridge Codes to incorporate consideration of thermal forces on account of LWRs, which requires literature survey and actual experimentation in field before the codes are revised.

Para 3.21 (C) Para 9.5.3 of the Report: Instructions already exist vide Board's letter No. 90/CE-I/BR-I/57 dated 10.4.97, for replacing existing steel girder bridges superstructure up to 30 m span whenever due for replacement with RCC/PSC having ballasted decks. These instructions are generally being followed in new constructions.

However, for existing working lines, there could be some difficulty of adjustment of levels of bed blocks & approaches for adopting RCC/PSC girders universally, due to differences in depth of construction. Hence, the replacement of the existing girders are to be examined on case to case basis.

However, the instructions dated 10.04.97, have been reiterated vide letter of even number dated 12.3.2003 (copy enclosed) for guidance and strict adoption on new constructions.

Para 3.24(C) Para 9.6.3 of CRS Report: The matter has been reviewed and the stand taken earlier holds good.

Sd/-

Executive Director/Safety
Railway Board

Encl: As above.

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
(RAILWAY BOARD)

No. 2002/CE-II/PRA/9(CRS) Pt. **Dated 4 .12.2002**

The General Managers,
CR, ER, ECR, NR, NER, NFR, NWR, SR, SCR, SER, WR.

Sub: Measures for prevention of sabotage – Not leaving stray P. Way material unguarded.

In one of the recent accidents, where the cause of accident was established as Sabotage, the Chief Commissioner of Railway Safety had recommended that "*Suitable instructions to the zonal railways, for not leaving track material –surplus/released/maintenance reserve unguarded particularly in areas known for miscreant activities*" may be issued by the Railway Board.

The matter has been considered by the Board and this recommendation has been accepted in principle. In this connection, the attention of the zonal Railways is drawn towards IRPWM paras 155, 310 (6), 314 (4) (f) and 323 (1), wherein relevant instructions are already stated.

The zonal railways are once again directed to keep the P. Way material in stacks at manned Level Crossing gates or in Station Yards, as far as possible, and to monitor that scattered P. Way material is not left at vulnerable locations without a Watchman, to guard against any attempt of sabotage.

A drive should be immediately launched to remove such scattered material. DRMs may be directed to ensure adequate availability of blocks for removal of such released materials. Wherever track renewals are done through contract, it should be ensured that the contractor removes the released materials from site almost simultaneously along with the renewal.

The above may be brought to the notice of all concerned for information and compliance.

Receipt of this letter may please be acknowledged.

Sd/-
Joint Director Civil Engg. (P),
Railway Board.

Copy to the Principal Chief Engineers, CR, ER, ECR, NR, NER, NFR, NWR, SR, SCR, SER, WR.
Copy to the Chief Engineers, ECR & NWR.

GOVERNMENT OF INDIA
MINISTRY OF RAILWAY
(RAILWAY BOARD)

No.87/M(C)/202/10 New Delhi, dt. 13.8..01

The Executive Director Std (Carr)
RDSO,
Lucknow

SUB: NOTICES INSIDE COACHES

Cases have been brought to notice in which some passengers have been injured on account of travelling on foot board, roof or inside the vestibules. In order to increase passenger awareness about the hazards involved in travelling on trains at such locations, it is desired that the following notice may be included in Sketch No.96025 (in upper class coaches) and Sketch No.96012 (for lower class coaches) and zonal railways and Pus may be advised to implement the same at existing as well as new coaches with immediate effect. The messages may be made in bilingual form:

DO NOT TRAVEL ON FOOT BOARD, ROOF OR INSIDE THE VESTIBULE AND KEEP THE COACH DOOR LATCHED TO AVOID PERSONAL INJURIES AND ACCIDENTS."

Please ensure immediate implementation.

Sd/-

Dir. Mech. Eng. (Coaching)
Railway Board

No.87/M(C)/202/10

Director General (Carr)
R.D.S.O.,
Lucknow

SUB: RATIONALISATION OF THE NOTICES DISPLAYED IN THE COACHES

Ref: Your letter No.MC/CR/Notices dated 17.4.96

The proposal sent by you vide your above referred letter for rationalisation of Notices to be displayed inside the coaches has been approved by Board. It has been decided that the following notices will be displayed inside the coach:-

(A) UPPER CLASS COACHES

i) Sketch No.59335 : Penality Notice to pull alarm chain without reason.

ii) Sketch No.74003 : Notice to pull up backrest-cum-bed during daytime.

iii) Sketch No.74005 : Notice for lavatories.

iv) Sketch No.82115 : Notice for duties of coach attendants in upper class coaches.

v) Sketch No.92194 : Notice for fire prevention.

vi) Sketch No.96025 : General Notice for upper class of coaches

In addition, sketch No.96025 for IInd AC Sleeper, AC-3 Tier Sleeper and IInd AC Chair Car will also have "Smoking is prohibited" legend stenciled. In other upper class coaches the legent "Please do not smoke if co-passengers object" will be stenciled.

(B) LOWER CLASS COACHES

i) Sketch No.59335 : Penalty Notice to pull alarm chain without reason

ii) Sketch No.74005 : Notice for lavatories

iii) Sketch No.82115 : Notice for duties of TTEs assigned to sleeper class coaches

iv) Sketch No.92194 : Notice for fire prevention

v) Sketch No.96012 : General Notice for lower class of coaches.

Kindly acknowledge receipt of this letter

Sd/-

Director Mechanical Engg(Coaching)
Railway Board

Copy to:-

i) General Manager, RCF, Kapurthala

ii)General Manager, ICF, Madras

iii)General Manager(M), All Indian Railways

(D.K.Singh)
Director Mechanical Engg(Coaching)
Railway Board

BHARAT SARKAR/GOVERNMENT OF INDIA
RAIL MANTRALAYA/MINISTRY OF RAILWAYS
(RAILWAY BOARD)

No. 90/CE-I/BR-I/57 New Delhi, dt. 12.03.2003

General Managers
All Indian Railways & M.T.P., Kolkata

General Manager (Construction)
Northeast Frontier Railway, Guwahati

Officers on Special Duty
East Coast Railway, Bhubaneshwar
North Central Railway, Allahabad
South Western Railway, Hubli
West Central Railway, Jabalpur
New Railway Zone, Bilaspur, Chhatisgarh

Director General
R.D.S.O., Manak Nagar, Lucknow

Sub: Replacement of small span steel girders with RCC/Composite/PSC Slabs' girders

Ref: This office of even no. dt. 10.4.97

Board vide their letter of even no. dt. 10.4.97 had instructed that wherever steel girders are due replacement on age-cum-condition basis, it should be done by RCC/PSC slabs/girders upto 30m spans. It was further instructed that while planning the replacement of girders, construction of new line and doubling of sections, ballasted deck bridges may be planned as far as possible.

The Commissioner of Railway Safety in its report in connection with derailment of 2301 Up Howrah - New Delhi Rajdhani Express train between Rafiganj and Deo Road stations of Mughalsarai Division of Eastern Railway on 9.9.2002 has made certain recommendations on the issue.

Board has decided to reiterate the instructions already issued vide letter of even no. dt. 10.4.97 There could be some difficulty of adjustment of levels of bed blocks and approaches for adopting RCC/PSC girders on existing lines, due to difference in depth of construction. Hence, the replacement of the existing girders is to be examined on case to case basis. However, in construction of new line and doubling of sections, these instructions should strictly be followed.

Sd/-

Exc. Dir. Civil Engg. (B&S)

Copy to:
Chief Commissioner of Railway Safety, Ashoka Road, Lucknow
Director, IRICEN, Pune

F.No.T.12012/2/2002-RS
Government of India
Ministry of Civil Aviation
****

To

Rajiv Gandhi Bhavan, B-Block
Safdarjung Airport
New Delhi, dated: 29th April, 2003

The Secretary
Ministry of Railways
Railway Board
Rail Bhavan
New Delhi-110 011

Subject:- Derailment of 2301 UP Howrah-New Delhi Rajdhani Express Train between Rafiganj and Deo Road Stations of Mughalsarai Division of Eastern Railway on 09.09.2002.

Ref.:- (1) CCRS's letter of even no. dated 20.01.2003 on the above subject.
(2) This Ministry's letter of even no. dated 28.02.2003 on the above subject.

****

Sir,

Vide reference (1) above, the Commission of Railway Safety had written to the Railway Board offering their comments on the contents of the O.M. No.2002/Safety(A&R)/1/26 dated 05.12.2002 issued by Railway Board.

It is noted that vide letter No.2002/Safety(A&R)/1/26 Pt. dated 27.03.2003 the Railway Board have addressed the issues covered in the letter at reference (2) above only. However, the comments are yet to be received from Railway Board on the points raised by the Commission vide their letter at reference (1) above (reference to which was specifically made in this Ministry's letter at reference (2) above). During the meeting of Chairman Railway Board with CCRS and Joint Secretary, Ministry of Civil Aviation on 25.02.2003 as well as in the subsequent meeting of CCRS with Chairman Railway Board on 27.02.2003 in which Member Engineering and Member Mechanical were also present, it was given to understand to CCRS that remarks of Railway Board would be sent very soon including on those points which had been raised by the Commission earlier in their letter at reference (1) above. You would agree that the issues raised by the Commission need expeditious and due consideration by the Ministry of Railways in the interest of rail passengers.

....2 ..

You are once again requested to expedite the Railway Board's comments on the CCRS's letter at reference (1) above directly to the CCRS under intimation to this Ministry.

Yours faithfully,

Sd/-

Joint Secretary to the Govt. of India

GOVERNMENT OF INDIA/BHARAT SARKAR
MINISTRY OF RAILWAYS/RAIL MANTRALAYA
RAILWAY BOARD

No.2002/Safety(A&R)1/26 (Part) **New Delhi, 18th June, 2003.**

Joint Secretary,
Ministry of Civil Aviation,
Rajiv Gandhi Bhavan,
Safdarjung Airport,
New Delhi.

Sub: Points raised after issuance of O.M. on the final Note of CCRS of Final Inquiry Report of Rajdhani accident.

Ref: MCA's letter No.T.12012/2/2002/RS dt. 29.4.2003.

Kindly refer to the above-mentioned letter regarding the **further comments** made by Chief Commissioner of Railway Safety vide his letter No.T.12012/2/2002/RS dated 20th January, 2003,, which were projected after issuance of **Office Memorandum** on the subject, by the Ministry of Railways, vide their letter of even no. dated 5.12.2002.

As per the extant practice, the issues regarding **cause and responsibility** of any accident brought out in the inquiry conducted by Commission of Railway Safety, and recommendations made in his report, are examined in detail by General Manager of the concerned Railway, who sends detailed comments to Chief Commissioner of Railway Safety. CCRS, in turn, after complete scrutiny, furnishes his **final note** to the Ministry of Railways. After all this, the Ministry of Railways takes a view, and issues Office Memorandum covering all items indicating that the **proceedings are finally over.**

It needs to be appreciated that the Inquiry Report of the accident of Rajdhani Express was thoroughly examined by General Manager, Eastern Railway, and subsequently after the **final note** of CCRS, it was reviewed by the Ministry of Railways, considering all aspects of safety. It also needs to be noted that the ultimate responsibility of safety of train operation, as per the Railway Act 1989, rests with the Ministry of Railways only. In the **Office Memorandum**, only on 3 points, Ministry of Railways **disagreed** with the Chief Commissioner of Railway Safety, whereas rest of the points/recommendations were accepted without reservation.

As regards, specific details of 9 points raised by CCRS as **'further comments'**, it is intimated that as a follow-up of the meeting between CRB and CCRS on 25.2.2003, another special meeting was convened on 27.2.2003, wherein Ministry of Railways' stand on various issues was elaborated by Member (Engineering) and Member (Mechanical) to the CCRS.

(Copies of Instructions issued after issue of O.M. by the Ministry of Railways on 5.12.2002 are attached for information. Paras 3.2(c), 3.4(c) and 3.25(c)).

The **scrutiny and examination of any inquiry report** does not continue **as an unending exercise.** The Office Memorandum is treated as the final part of the proceedings as far as Ministry of Railways are concerned. If CCRS has strong reservations on certain issues, the same may be highlighted and projected in his Annual Report, which contains major issues and the comments of the Ministry of Railways as well.

DA: As above.

Sd/-

Executive Director (Safety)
Railway Board

Copy to Chief Commissioner of Railway Safety, Commission of Railway Safety, Lucknow for information.

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
(RAILWAY BOARD)

No. 2002/CE-II/PRA/9/Pt.(CRS) **New Delhi, dt. 8.5.03**

The Principal Chief Engineers,
All Railways.

Sub : Buffer Rails

Long Welded Rails are now being used extensively. It is desirable to provide SEJs at the end of Long Welded Rails to allow expansion and contraction of breathing length. However SEJ cannot be provided at certain locations and provisions of Buffer rails is envisaged for such locations in accordance with Para 1.6 of LWR Manual.

While the provisions of LWR manual regarding Buffer Rails shall continue to be in force, Zonal railways are directed that Buffer Rails should not be allowed on vulnerable locations like 500 metre length on both side approaches of tunnels, tunnel proper, major and important bridges including bridge proper, deep cuttings and high embankments.

Please treat the matter as URGENT. Acknowledgment and compliance may be sent urgently.

Sd/-

Jt. Director Civil Engg. (P)
(Railway Board)

GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS
(RAILWAY BOARD)

No. 2002/CE-II/TK/10. **Dated 20.02.2003.**

The General Managers,
CR, ER, ECR, NR, NER, NFR, NWR, SR, SCR, SER, WR.

Sub: Patrolling of track in sabotage prone areas.

1.0 In one of the recent accidents, where the cause of accident was established as "Sabotage", the Chief Commissioner of Railway Safety has recommended that Railway Board should seriously consider undertaking "*Security patrolling .....in sabotage prone areas.*"

2.0 The issue has been considered by Railway Board. The primary responsibility of guarding railway track and bridges is that of the State Government which has been reiterated in No. U 2-65/X dated 13.09.65 and 27/4/72-Poll-II dated 11.02.72 of Ministry of Home Affairs (MHA). Copy of the same, is enclosed for ready reference. However, in case of Civil Disturbances and on Special Occasions, "Security patrolling" is introduced according to the instructions as provided in IRPWM Para 1001 (5) (a) to (c).

"Patrolling in sabotage prone areas" by railways, is a new domain for the Railways. Moreover, "Patrolling in sabotage prone areas", is totally distinct and different from "Security Patrolling".

Nevertheless, taking into consideration the expectations from the railways, views expressed by CCRS and to prevent loss of life and property if any, Railway Board have decided, as an interim measure, to tackle such unforeseen situations, by undertaking a precautionary step: "Patrolling in sabotage prone areas", by setting up a suitable machinery at the Divisional level for institutionalizing the co-ordination mechanism with the State Govt. authorities to ensure safety of passengers and running trains in Sabotage prone areas.

3.0 Each division will have a Standing Committee for monitoring the situation comprising of four officers as under :

ADRM (as Presiding Officer),
Sr. DSC (as Convener)
Sr. DEN (Co-ordination), (as Member)
Sr. DOM/IC (as Member)

This Standing Committee shall be convened frequently but interval between two meetings shall not exceed two months. Such meetings shall be constant on-

going process so that a continuous watch is kept on the situation and DRM shall monitor it.

Sr. DSC will maintain close liaison with Civil Administration and on the basis of available intelligence inputs from them (both Police and GRP), as well as on his own intelligence inputs, news paper reports and other relevant information like past cases etc., apprise the committee of the areas of the Division suspected to be "sabotage prone". Sr. DEN (Co-ordination) will apprise the committee of recent cases of tampering with track, bridges including theft etc. The committee will also take into account the cases of tampering with other railway installations like S&T gears, Station etc.

Based on this information, the committee will prepare a list of areas of the Division, considered sabotage prone and Sr. DSC will put up the Committee's recommendations to DRM for approval. Once approved "Patrolling in sabotage prone areas", so identified, will be undertaken by the Division in accordance with the instructions contained in para 4.0 below.

The Committee will make recommendations in respect of the following:

(i) Identification of suspected "sabotage prone areas".

(ii) Adoption of measures such as reduction of train speed in night/day, running pilot engine ahead of certain trains, running of goods trains ahead of certain trains/group of trains.

(iii) Carrying out review about continuation or otherwise of precautionary measures in areas identified or part thereof in earlier meetings.

(iv) Any other measures considered necessary e.g. number of shifts for such measures, timings of the shifts, duration of day/night to be covered, suspension of train services, etc.

(v) The arrangements made, regarding patrolling on the division, shall be reviewed every two months, by the Standing Committee.

Sr. DSC will maintain close liaison with civil administration in the districts served by the Division, under the supervision of DRM, with a view that FIRs are lodged by respective supervisors and their staff, in all cases as required e.g. Tampering of Track/Theft of P. Way fittings/Threatening of Staff etc., and are properly followed up. The list of sections so identified, shall be advised to the Civil and police administration, by Sr. DSC, with a request, for taking necessary action at their end also because the responsibility of maintaining law and order which includes prevention of sabotage on track and bridges, shall continue to be with the

concerned State Govts. Sr. DSC will also maintain close liaison with CSC in headquarters. CSCs in headquarters, under the supervision of GM, in turn will maintain close liaison with State Govt. officials and Railway Board.

4.0 Following action shall be taken in areas identified for "Patrolling in sabotage prone areas":

(a) The Divisional Railway Administration should institutionalize the coordination mechanism with the Police and GRP authorities to ensure safety in such areas. The Civil Authorities may be requested for introducing the patrolling. Necessary infrastructural support shall be provided for patrolling purposes and thus the efforts of the State Government will be supplemented by railway administration.

(b) Stationary watchman team comprising of one or two Gang-man as per needs, shall be posted during night, at selected bridges, tunnels, deep cuttings, high embankments located in identified areas. For long bridges and tunnels, posting of these stationary watchman teams, may be necessary at both ends.

(c) The areas considered sabotage prone, may be divided in Beats of 20 to 25 km. long each. Surprise mobile patrolling Teams consisting of one Section armed RPF/RPSF staff and one nominated Gang-man attached with this team, should be deputed for each such Beat. This mobile patrol Teams shall undertake surprise night patrolling of at least one complete block section every night. This mobile Team will avail of the normal train services to reach the spot from where they have to start the patrolling and catch a suitable train at the end of patrolling. This Team will not have a pre-fixed programme and the block section to be covered on a particular night, will be chosen at random by the Team Leader, on that very day. However, at least one block section, in their assigned Beat of 20 to 25 km. shall be covered every day. Whenever necessary, any Mail /Express train may be given an unscheduled halt at the request of the Team Leader, to facilitate this surprise patrolling.

The surprise mobile patrolling in sabotage prone areas, as specified in this para, is the minimum, which must be ensured. However, if warranted, the division may conduct more intensive patrolling as per the exigencies, intelligence input and prevailing situation.

(d) Reduction of speed of the trains in identified areas and duration of the day/night for such reduction, as approved.

(e) Running pilot engine, ahead of certain important trains or for running goods trains ahead of passenger carrying trains/group of trains, as approved.

(f) Continuance or otherwise of above measures in identified areas of the Division or part thereof, as approved.

(g) Any other measures considered necessary as a precaution against sabotage including suspension of train services.

(h) The two actions as indicated at (b) and (c) above shall be taken simultaneously in the entire section identified as sabotage prone. The supervision of (b) above will be done by Engg Deptt. and that of (c) above will be done by Security department.

5.0 Utilizing the available resources, the above measures may be commenced. However, introduction of security patrolling may lead to loss of man-days for regular track maintenance activities or for RPF duties. The Standing Committee will assess the loss of man-days due to such patrolling and in due course initiate proposal for additional manpower based on the average for one year. Additional manpower on this account will again be reviewed after three years for suitable adjustment above, based on average of three years.

6.0 These instructions are issued with the concurrence of Legal Advisor, DG/RPF and approval of Board (MS, ME, FC, CRB).

7.0 Receipt of this letter may please be acknowledged.

8.0 Hindi version will follow.

Encl: One as above.

(Atul Pathak)
Director/Crime Prevention
Railway Board.

Sd/-
Joint Director Civil Engg. (P),
Railway Board.
Fax:-011-23303972.

Copy for information and necessary action to:

1. Principal Chief Engineers, all Indian Railways
2. Chief Security Commissioners, all Indian Railways.
3. Chief Operation Managers, all Indian Railways.
4. Financial Adviser and Chief Accounts Officer, all Indian Railways.

Government of India
Ministry of Railways
(Railway Board)

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Office Order No. 3 of 2003

Vide Office Order No.56 of 2002 Officers/Branches in Board's Office were advised that the copies of all policy orders/instructions/circulars/letters etc. issued by any Directorate/Officer of the Railway Board should invariably be endorsed to all Board Members/DGs, AMs, Advisors and EDs/JSs/IG/RPF as well as to all Zonal Railways/Production Units irrespective of the fact whether they are concerned with a particular subject or not. This has again been reiterated to all concerned vide Office Order No. 2 of 2003.

2. It has now been decided that a copy of all Circulars/Instructions/Orders etc. should also invariably be endorsed to Chief Commissioner of Railway Safety, Lucknow as also to ED/Safety, irrespective of the fact whether they are concerned with a particular subject or not.

Sd/-

No.2002/O&M/2/1
Dated: 20/01/2003

(BANWARI LAL)
U.S./O&M

To,

All Officers and Branches in Board's Office.

DR. A.K. PANDEY, IPS
DIRECTOR GENERAL/RPF

D.O.NO.2002/Sec(Cr)/45/69 New Delhi, dated 24 -03-2003

I would like to draw your kind attention to the derailment of 2301 Up Howrah—New Delhi, Rajdhani Express between Rafiganj and Deo Road stations of Mughalsarai Division on 9.9.2002. After receiving the report of the Commissioner of Railway Safety, Eastern Circle on the derailment, the Joint Secretary, Ministry of Civil Aviation has commented that the secondary responsibility would be accepted by State Government as the authorities responsible for ensuring Law & Order. He has requested the Ministry of Railways to take up the matter with the State Government of Bihar.

In view of the above, you are requested to accept the secondary responsibility of this accident and to convey your acceptance to this office for further transmission of the same to the Ministry of Civil Aviation.

With

Yours sincerely,

Sd/-

(Dr. A.K. Pandey)

Shri S.N. Biswas,
Chief Secretary,
Government of Bihar,
PATNA.