(No.T.15029/37/SEC/2011-12)
GOVERNMENT OF INDIA
MINISTRY OF CIVIL AVIATION
(COMMISSION OF RAILWAY SAFETY)

Dated, 12.12.2011

From: Commissioner of Railway Safety,
South Eastern Circle,
14, Strand Road, 12th Floor,
Kolkata – 700 001.

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

Sir,

Subject: Side collision between Train No. 18006 Dn KRPU-HWH Exp. and goods train E/BRN/TATA at Km 513/15 of JSG Station yard on JSG-ROU Section of Chakradharpur Division of South Eastern Railway at about 0200 hours of 23.11.2011

I. INTRODUCTION

1.1 Preamble

In accordance with Rule 3 of "Statutory Investigation into Railway Accidents Rules, 1998" published by the Ministry of Civil Aviation, I have the honour to submit a Brief Preliminary Report of my Statutory Inquiry into the Side collision between Train No. 18006 Dn KRPU-HWH Exp. and goods train E/BRN/TATA in Jharsuguda Station yard of JSG-ROU Section of Chakradharpur Division of South Eastern Railway at about 0200 hours of 23.11.2011

1.2 Inspection and Inquiry

1.2.1 At about 0240 hours of 23.11.2011, Sr. Safety Officer/Traffic/South Eastern Railway informed me regarding the accident, when I was at my residence. He gave brief details of the side collision and confirmed that there were no causalities. He further informed that Train No. 18006 Exp. had arrived at JSG at about 00.40 hours and was waiting on PF No.3 (Line No.4) for departure at schedule time. Starter signal S-22 of Line No.5 was taken off for despatch of E/BRN/Tata which was just received. The goods train started from Line No.5 accordingly. Meanwhile, 18006 Dn also started from line No.4, passed the starter signal No. S-20 at danger and side collided with the leading locomotive of E/BRN/Tata at East end of the JSG station yard resulting damage to 10 coaches (3rd to 12th) from the front. There was no derailment of coaches or locomotives.

However, the information regarding passenger's injury was not received from the site. SSO/Traffic/SE Railway was advised to keep me informed at regular interval regarding

the passenger's injury as well as progress of rescue and relief. CSO/SE Railway, who was at Bangaluru, also spoke to me at about 0300 hours. SSO/Traffic/GRC informed me at about 0330 hours that 3 (three) passengers had sustained simple injuries, out of whom two passengers were discharged from site after first aid and one passenger with knee injury was shifted to local State Govt. hospital for X-ray for further treatment.

Immediately, I decided to conduct the statutory inquiry. My intention was conveyed to Railways through CSO/SE Railway who was also asked to make necessary arrangement for my movement. SSO/T and Dy. CSO/Mech were in constant touch with me giving regular feedback regarding progress of rescue and relief and also informed me about the arrangement of my movement to JSG by 12860 Up Exp.

Letter for holding of my inquiry was issued to Railways in the forenoon of 23.11.2011 after receipt of accident message over fax. I informed CRS/NF Circle (who was looking after the charge of CCRS) at 0900 hours and gave him the details of the accident. I also informed CCRS who was on leave, regarding the accident and my intention of holding the statutory inquiry.

1.2.2 I left HWH by 12860 UP at 0150 hours on the same day i.e. on 23.11.2011 and reached JSG at about 2140 hours. Addl Divisional Railway Manager / CKP accompanied me from CKP.

1.2.3 On arrival at JSG, I decided to conduct visibility test of signals simulating the exact condition of the day of accident i.e. at the same time (at 0155 hours of 24.11.2011) and by the same train. Sr.DSO/CKP was advised to make necessary arrangement. From 1230 AM (24.11.2011) to 0330 AM (24.11.2011) I conducted signal visibility test and other field inspections. CMPE/SER, ADRM/CKP, AEN & ASTE/JSG and Sr. Subordinate (who had prepared joint note of the accident) were also present during my inspection and simulation tests..

On 24.11.2011, I again conducted site inspection, checked the damaged coaches and JSG Passenger yard Cabin/JSG. CMPE/SER, ADRM, Sr.DSTE, Sr.DSO, DOM, Sr.DEN/CKP, Sr.DME of CKP Division and other Asstt. Officers were present during the inspection. Sr.DME, Sr.DEN & Sr.DSTE of CKP Division were asked to make detailed analysis of the movement of both the trains taking reference from event recorder and speedometer of both locomotives. Sr.DEN and Sr.DSTE were also asked to make various measurement e.g. location of signals, measurement of implantation of signal mast, Track Centres, measurement of points and crossings, location of fouling mark, Curves, PF location etc. in my presence. The above inspection was conducted between 0900 hours and 1100 hours.

1.2.4 The following were the observations during signal visibility test conducted by me on 24.11.2011 :

(i) On the day of accident, 18006 Dn KRPU-HWH Exp was hauled by a WDM3A loco with long hood driving. Incidentally, on 24.11.2011, the train was also hauled by same type of loco with long hood driving and was admitted on PF3 (Line No.4). In this type loco with long hood driving, LP seat was on right side and ALP seat was on left side.

(ii) Starter signal No. S-20 of Line No.4 is located on the right side of the track. As a part of testing the signal was lowered. From the LP seat, the signal was clearly visible while from ALP side, the signal was not visible.

(iii) Subsequently, the starter signal No.S-22 of Line No.5 was lowered. The signal is located in the left side of Line No.5. It was visible from ALP side and not visible from LP side.

(iv) S-20 was not visible from all locations of PF No. 3 where the locomotive normally halts.

(v) Neither S-20 or S-22 i.e. starter signal of Line No.4 and Line No.5 were visible from SLR.

(vi) The distance of S-20 from PF-3 is approximately 271.5 m.

(vii) S-22 the starter signal of Line No.5 was lowered. While S-22 was clearly visible from the ALP seat, it was not visible from LP seat. S-22, being located on the left hand side of Line No.5, appeared as the starter signal for Line No.4 from the locomotive (ALP seat). There is every possibility that crew, who momentarily misses that the starter signal for Line No.4 (S-20) is on the right hand side of the track and not on the left side, could assume S-22 as the starter signal of Line No.4.

(viii) The arrow indication on the starter signals was not visible from the locomotive on platform.

(ix) Line No.4 and Line No.5 beyond the platform have curves varying between 2° to 3° at different locations.

1.2.5 Implantation of signals and inter track distances in JSG Passenger Yard (East end)

Sl. No.	Distance between	Distance
1	Line –3 to Line-4 (Centre to Centre)	4.831 mtrs
2	Line-4 to Line-5 (Centre to Centre)	4.686 mtrs
3	Line-5 to Line-6 (Centre to Centre)	5,300 mtrs.
4	Implantation of S-20 w.r.t. L-3	2.348 mtrs
5	Implantation of S-20 w.r.t. L-4	2.278 mtrs
6	Implantation of S-22 w.r.t. L-5	2.388 mtrs
7	Implantation of S-22 w.r.t. L-6	2.358
8	Longitudinal/staggering distan between S-20 and S-22	14.07 mtrs

1.2.6 The following coaches were detached from the formation of 18006 Dn. due to damage in the coach body :

SE	988705	SLRD	10th from engine
SE	998107	ACCN	11th from engine
SE	078102	ACCN	12th from engine

The coach bodies were found pressed and having surface damage due to side collision. The average height of hitting marks on the coaches from the rail table was found to be at 1.65 mtr.

1.2.7 In the Station diary of JSG there was no mention of the 'Control Order' for splitting of the long haul train.

1.2.8 The following salient observations were made from the data unloaded from event recorder of SSI :

- The long haul train occupied Line No.5 (L-5T2PR) at 1:48:36.1 hour
- The train occupied L5T3PR at 1:50:46 hours
- Starter signal No. S-22 of L5 was cleared at 1:57:21 hours
- 18006 DN occupied L4T3PR at 1:58:47 hours
- The same train occupied 20T i.e. starter replacement track at 1:59:46:3 hours
- Point 58 A reverse detection started flashing at 2:00:13.5 hours
- The train further occupied 52BT at 2:00:48.3 hours and 52AT at 2:01:09.2 hours and stopped within the 52AT track circuit zone.

1.2.9 A number of tests were conducted at JSG passenger yard by CSE / SE Railway and a team of signalling officers of CKP Division as per my direction on 24.11.2011. The following were the observations :

i. Starter signal for Line No.5, S22 was taken off and conflicting signal S-20 was tried to be taken off and found that the same could not be taken off which indicated interlocking between two signals was ok.
ii. Time for route cancellation of signal No.S-22 was checked and was found to be 120 Sec.
iii. Starter Signal S18 was taken off and Conflicting Signal S20 , S22, S24, S26 and S28 were operated and found that they were not getting initiated. This indicated, the starter was correctly interlocked with other conflicting signals.
iv. When starter S18 was operated without slot No. 36 from JSG goods cabin, it did not lowered. When the slot 36 was given from JSG goods cabin, the signal was lowered. This indicated that inter slot arrangement between JSG Passenger yard cabin and JSG goods yard cabin was ok.
v. Dn. Home signal S2 was taken off for the line No.5 and conflicting signal S21, S25, S27, S29 and S23 were tried to be operated and found those were not getting initiated. Starter signal S-20(Line No.4) tried to be operated and found this was not getting initiated. It confirmed interlocking of conflicting signal was ok.
vi. S18 Signal was lowered. Then Points on its route i.e. 51, 52, 53 were operated from panel but they did not move. This indicated that the points were locked when signal was lowered.
vii. S18 signal was lowered. Crank handle No. CH1 and CH2 was tried to be released. It could not be released. This confirmed that the crank handles were also properly locked when the signal was lowered.
viii. Starter signal S-17A was taken off and conflicting signal S15, S19, SH6 were tried to be operated and found those were not getting initiated. It confirmed interlocking of conflicting signal was ok.

CSO/SER was advised to conduct an intensive check of signal at JSG station independently and submit a detailed report.

1.3 Press Notification regarding the statutory inquiry on 24.11.2011 at SM's office at JSG and on 25.11.2011 at DRM's Conference room at CKP was issued on 24.11.2011 in leading News Papers of the area (in English, Hindi and in Regional Languages) inviting members of public, local people and passengers having knowledge relating to the incident to tender evidence at the inquiry or write to my office at 14, Strand Road, 12th Floor, Kolkata - 700 001.

1.4 I commenced my inquiry In AEN/JSG's office at JSG at about 1130 hours which was continued till 1930 hours. On 25.11.2011, the inquiry started in DRM/CKP's Conference Room at 0930 hours and continued till 1600 hours. The Statutory Inquiry on both the days was attended by the following officers of South Eastern Railway:

I. Shri S. Ganguly CSO / South Eastern Railway, Garden Reach
II. Shri A. Khare, DRM / CKP Division / SE Railway (only on 25.11.2011)
III. Shri A. K. Behera, CMPE / SE Railway / Garden Reach
IV. Shri Kishore Kumar, CELE, SE Railway, Garden Reach
V. Shri Anil Mittal, CTE, SE Railway, Garden Reach
VI. Shri Ajoy Kumar, CSE, SE Railway, Garden Reach

ADRM/CKP and other Branch Officers of CKP Division also attended the inquiry on both the days. Dy. CRS/S&T/Kolkata attended the inquiry on 25.11.2011 at CKP and assisted me in the inquiry.

1.5 In all, 36 persons had registered their statement during inquiry, out of which 26 persons (including four Divisional Officers) were cross-examined on both the days. The Sr. Subordinates who had prepared their joint note were also cross examined jointly. Neither any public, nor any witnesses from Civil Administration or from Police authorities appeared before the Commission.

1.6 **Preservation of clues**

Photographs of the site relevant to the cause of the accident were arranged by the Railway Administration. Observations of the site were also recorded by Railway Administration. Speedometer charts, data logger records, Control Charts, Voice recordings of Control room and event recorder data were preserved and produced during the inquiry,

1.7 **The Accident**

On 23.11.2011, the train No. 18006 Dn KRPU-HWH Exp, hauled by Diesel Loco No. 16439 WDM 3A/BNDM arrived at JSG station and was received on PF-3 (Line no. 4) at about 0040 hours, much ahead of its scheduled arrival time of 01:40 hours. Due to night restriction on movement of coaching trains in ROU-CKP section, the revised timings of arrival and departure of the train at JSG are 01:40 – 01:50 hours. As the train had arrived almost an hour earlier than its schedule arrival, the train was controlled on PF No. 3. JSG was the crew changing point for the train No.18006 Dn. Exp. The time of Train Ordering (TO) for the crew was at 01:20 hours and accordingly, the crew took over the charge of the train. 'Caution Order' was also served to the crew by station staff. The train was kept ready for departure at the schedule departure time at 01:50 hours.

At about 01:10 hours, on duty Dy. SS/ JSG granted line clear to IB station, for the long haul freight train which was a combined formation of two trains i.e. No. E/BRN/TATA and FD/SSYS/DSEY. The freight train left IB at about 01:30 hours and arrived at JSG at about 01:50 hours on line No. 5. As per the order of Section Controller, the long haul freight train was splitted into two trains. The rear train FD/SSYS/DSEY was detached

and starter signal S-22 was taken off at about 01:57 hours for the despatch of the leading train No E/BRN/TATA from line No.5. In the mean while, LP of 18006 Exp train also started his train from line no. 4 assuming that the starter signal had been given for his train. The Starter signal for Line No. 4 (S-20) is located on the right side of the track while the starter signal of line No. 5 (S-22) is located on the left side of the track. The train No.18006 Dn. passed the starter signal S-20 at danger, trailed through the point no. 58A and continued its running. At the same time, E/ BRN/TATA, for which Starter signal S-22 was lowered, had started from line no. 5. Crew of E/BRN/TATA, on seeing that Train No. 18006 Exp, was moving ahead on the same route, immediately applied emergency brake to stop his train. The train stopped within few meters. However, the leading locomotive partially infringed the line no 4 on which 18006 express was on move thus resulting in a side collision with coaches of Train No. 18006 Dn. starting from 3 rd to 12th of the train formation. The train 18006 Dn. subsequently stopped due to ACP apparatus of one of the coach getting operated during the side collision. All the 10 coaches (3 rd to 12th from the locomotive) were partially damaged from outside. In the accident, three person suffered simple injury, while two passengers were released from the spot after being given necessary medical aid, one passenger was sent to Govt. Hospital / JSG for further treatment.

1.8 The weather was clear and visibility was normal under headlight.

1.9 **Casualties**

1.9.1 As a result of the accident, there was no casualty. Only one passenger had sustained simple injury.

II. RELIEF MEASURES

2.1 **Intimation**

2.1.1 First information of the accident was conveyed by on duty TTE/ROU at 0205 hours of 23.11.2011 to CHC/CKP through Commercial Controller/CKP.

2.1.2 DRM/CKP, accompanied by Divisional Officers, arrived at site at 0725 hours by Electric Light Goods.

2.2 Medical attention

2.2.1 Since there was no casualty and the number of passengers injured was very less, ARME was not required to be ordered. The doctor with para medical staff was deputed to attend the injured. ART / JSG was ordered at 0218 hours and was ready for departure at 0240 hours. It was stationed within 100 meters of the accident site.

2.2.2 Only one passenger Bikash Nayak, male- 24 years old, S/O Sri Shiv Shankar Nayak / Sambalpur sustained simple injury (Blunt injury in left foot) and was attended to by Sr.DMO/JSG at the site itself. He was subsequently sent to Govt. Hospital for X-ray. The

other passengers were despatched by the same train after detaching three affected coaches.

2.2.2 The Railway Administration disbursed ex-gratia payment of Rs. 500/- to the passenger who received simple injury.

2.3. Restoration and interruption to traffic

2.3.1 Log of various activities undertaken by the Railway Administration for rescue, relief and restoration are as follows:

Time	:	Activities
02.18 hrs	:	ART/JSG ordered.
02.20 hrs	:	Hooter blown.
02.40 hrs	:	ART ready.
02.40 hrs	:	DMO/JSG attended to the injured.
03.30 hrs	:	Backed FD/SSYS/DSEY from line no.5 to line no.7.
04.40 hrs	:	Front portion of 18006 Dn allowed to JSG Relief Yard line no.6.
05.05 hrs	:	Point no.52 route released.
05.10 hrs	:	Rear portion of 18006 Dn backed on line no.4.
05.25 hrs	:	First Dn train (18029 Express) despatched from line no.3.
06.10 hrs	:	Rear portion of 18006 Dn despatched from JSG Passenger yard to JSG Relief yard.
06.25 hrs	:	Rear portion of 18006 Dn arrived Relief yard.
6.30 hrs	:	Front and rear portions amalgamated.
7.05 hrs	:	18006 Dn left JSG.

2.3.2 The SMR JSG was advised to detach the front portion consisting of 09 coaches and pull the same to JSG R/yd. Then he was also advised to push back the rear portion consisting of 07 coaches towards BSP end and move the same to R/Yard through line No. 3. After this, it was advised to push back the rear portion of long haul, towards IB end and back the same on line no. 7, to clear path for subsequent down trains arriving from IB side. Front portion was detached and pulled to R/yd at 04:35 hrs. Rear train of long haul was pushed back and pulled on line no. 7 at 05:10 hrs. Line clear was granted to IB, for 18029 exp which passed JSG at 05:20 – 05:25 hrs. Then line clear was granted for 12101 exp, which passed through JSG at 05:37 hrs. Thereafter the rear portion of 18006 exp consisting of 07 coaches was pushed back towards IB and was sent to R/yd at 06:05 hrs, for amalgamation with the front portion. The rear portion was brought to R/yd at 06:25 hrs and was amalgamated with the front portion at 06:30 hrs. After that, E/BRN TATA was pushed back and coach no. 078102 ACCN (12th from loco), which was partially lifted was released and settled on the track again.

2.3.3 Due to the accident no passenger train was diverted, terminated, rescheduled. However, the following coaching trains were delayed:

12859 Dn by 23 minutes
18452 Dn by 20 minutes
18108 Dn by 25 minutes

08114 Dn by 6 hrs 20 minutes
58162 Dn by 2 hrs 05 minutes
58117 Dn by 2 hrs 05 minutes.

2.3.4 Previous movements of three trains were as under:

Line no. 4 1. N/ROU – 14.40
2. 12890 - 15.15
3. N/BTMT – 20.05
Line no. 5 1 18478 - 15.55
2. RDSO/HWH – 17.58
3. N/JCP Coal – 21.40

2.3.5 The time of departure and arrival of ill-fated train at the last 3 stations and at last stopping station were as under :

Stn	arrival	departure
SBP	21.40	23.00
RGL	23.32	23.53
BXQ	00.24	00.26

III. THE TRAIN

3.0 Composition and marshalling order of the train

3.1 Train No. 18006 Dn KRPU-HWH express hauled by Engine No. 16439 WDM3A/BNDM comprised of 19 ICF coaches. The marshalling order of the train was as under:

Sl. No.	Owning Railway	Coach no.	Type	Position
1	SE	118704	SLR	1st
2	SE	048027	FACCW	2nd
3	SE	048055	ACCW	3rd
4	SE	928210	GSCN	4th
5	SE	108205	GSCN	5th
6	SE	118215	GSCN	6th
7	SE	898232	GSCN	7th
8	SE	928264	GSCN	8th
9	SE	088419	GS	9th
10	SE	988705	SLRD	10th
11	SE	998107	ACCN	11th
12	SE	078102	ACCN	12th
13	SE	968252	GSCN	13th
14	SE	958216	GSCN	14th
15	SE	968270	GSCN	15th

16	SE	108459	GS	16th
17	SE	108428	GS	17th
18	SE	098429	GS	18th
19	SE	058704	SLR	19th

3.1.1 Total length and weight excluding loco was 423.643m and 759.97t respectively. The actual capacity of the train was 750 while its actual estimated occupation was 236.

3.1.2 Brake Power Certificate of Train No. 18006 Dn was issued by SRC on 21.11.2011. The train was having air brake system with 100% brake power. Air pressure continuity was done at SBP on 22.11.2011.

Air pressure ready at 0635 hours

Air pressure on departure

In engine		In Brake Van	
FP	BP	FP	BP
6.0kg /sq.cm	5.0kg /sq.cm	5 kg sqcm	4.9kg /sq.cm

Total no of Cylinders 74

Total no. of Operative Cylinders 74

3.2 Goods Train No. E/BRN/TATA comprising of 41 BRN (load) + 1 BVZI wagon. The marshalling order of the train was as below:

No.	Wagon No.	Body type
1.	SE 160124	BRN (Load)
2.	ECR 56100869047	BRN (Load)
3.	ECR 56110871146	BRN (Load)
4.	ECR 56100639695	BRN (Load)
5.	NR 112153	BRN (Load)
6.	SWR 56150835986	BRN (Load)
7.	NR 112050	BRN (Load)
8.	SE 111221	BRN (Load)
9.	SWR 561085608	BRN (Load)
10.	NWR 56110755385	BRN (Load)
11.	SC 17382	BRN (Load)
12.	SCR 56070511571	BRN (Load)
13.	ECR 561100437420	BRN (Load)
14.	SE 160432	BRN (Load)
15.	SWR 56150854482	BRN (Load)
16.	SE 111295	BRN (Load)
17.	ECR 56100857495	BRN (Load)
18.	SER 56070511557	BRN (Load)
19.	SE 160597	BRN (Load)
20.	ECR 56100754329	BRN (Load)
21.	ECR 56100857785	BRN (Load)
22.	54329NR 112178	BRN (Load)

23.	ECR 5610095342	BRN (Load)
24.	NWR 56110755507	BRN (Load)
25.	ECO 5120314407	BRN (Load)
26.	SWR 56150955284	BRN (Load)
27.	SR 111472	BRN (Load)
28.	NWR 56110875267	BRN (Load)
29.	ECR 56100857433	BRN (Load)
30.	SECR 57140321557	BRN (Load)
31.	SE 57437	BRN (Load)
32.	SE 21557	BRN (Load)
33.	SE 111491	BRN (Load)
34.	ECOR 56120423717	BRN (Load)
35.	SER 56070511496	BRN (Load)
36.	SWR 5615644687	BRN (Load)
37.	SWR 56150955318	BRN (Load)
38.	WCR 56160638317	BRN (Load)
39.	ECR 56100858096	BRN (Load)
40	NR 112087	BRN (Load)
41.	ER 112001	BRN (Load)
42.	SE 111437	BRN (Load)
43.	ER 121044	BRN (Load)
44.	WCR 86160976447	BRN (Load)

The brake power of E/BRN/TATA hauled by Locos No. 23197 & 23179 WAG5 ASN, was jointly checked by SSE/C&W/JSG, CLI/ROU and CDTI/JSG on 23.11.2011. The following were the observations:

Brake Power : 75%
The rear train was FD/SSYS/DSEY Ł 43½ hauled by electric loco WAG7 No. 27622. The long haul was formed at BIA of SECR and was splitted at JSG

3.3 **Locomotives**

3.3.1 Electric Locomotives of Train No. 18006 Dn Exp

(a) Loco No. 16439 WDM-3A/BNDM,

(i) Year and Place of Manufacture – October 1992 at VSKP
(ii) Date of Commissioning - November 1992 at VSKP
(iii) Date of Off RPP at DMW/PTA – 27.02.2010
(iv) KM earned after RPP - 2,34,892
(v) VCD – Working
(vi) Braking type – Air brake
(vii) Length of loco – 17120 mm

The loco was not due for any schedule attention. The headlight, speedometer, and speed recorder was in working condition. All safety items were intact with the loco. The loco did not suffer any damages during the accident.

3.3.2 Electric Locomotives No. 23197 hauling E/BRN/TATA

(i) Year and Place of Manufacture – 1987 at CLW
(ii) Date of Commissioning - 01.10.1987
(iii) Length and weight - 19.97 mtrs & 120T respective
(iv) Braking force – 20.16T
(v) Date and Place of last trip inspection – 25.10.2011 at ELS/ASN

The loco was not due for any schedule inspection. All necessary safety items were provided in the loco and were intact. Loco side body was partially pressed and scratched.

3.3.3 Air pressure continuity memo for Super Long Haul Rake

Train No. - Super Long Haul
Issued Station RYD BMY
Date of Issue - 22.11.2011
Line No. - Dn
Total Load - 88 = 87 ½
Air Pressure on Loco – 5.0 kg
Air Pressure on Bk/Van – 4.7
EOT at 9/40, P/Ready at 10/30

BPC particulars

Train No. 1 – BRN/TATA	Train No.2 – FD/SSYS/DSEY
BPC No.– 07390 STN Ex-Yd B Date 22/11/11 Bk/Power - 90%	BPC No. 017598 STN - ET/BPL/WCR Date : 16.11.11 Bk/Power- 90%
44 : 44	44: 43 ½

3.4 **Damages and disposition**

3.4.1 Damages to coaches -

Following are the details of damages to coaches:

Sl No. from the engine	Railways	Coach No.	Details of damages
3	SE	048055	Side wall sheet scratched and pressed, Foot Board, Door Handle were Damaged
4	SE	928210	-do-
5	SE	108205	-do-
6	SE	118215	-do-
7	SE	898232	-do-
8	SE	928264	-do-
9	SE	088419	-do-

10	SE	988705	-do-
11	SE	998107	-do-
12	SE	078102	-do-

3.4.2 Damages to Loco

3.4.2.1 Loco No. 16439 WDM3A hauling 18006 DN Exp did not suffer any damages.
3.4.2.2 Loco No. 23197 hauling E/BRN/TATA

The loco suffered the following damages–

1. Leading Cab-1 ALP side BC-2 broken and deficient
2. Foot step ALP side deficient Foot rest bend
3. Leading Cab-1 ALP side both climbing handle deficient
4. Leading Cab-1 ALP side body pressed approx. 10 feet
5. Leading Cab-1 ALP side Main door out of working due body pressed
6. Bogie-1 COC isolated due BC-2 deficient

3.4.3 Damages to Permanent Way

Right Hand tongue rail of Point No. 58A was bent and chipped off due to wrong movement over the point.

3.4.4 Damages to OHE

Nil.

3.4.5 Damages to S&T equipments

(i) Shackle bearing of point machine No. 58 A broken
(ii) Ground connection detection rod bend

3.5 Cost of damages

P.Way	:	Rs. 2,000/-
Loco (Elec)	:	Rs. 75,000/-
Rolling stock	:	Rs. 6,00,000/-
S&T	:	Rs. 1500/-
Total		Rs. 6,78,500/-

IV. LOCAL CONDITIONS

4.1 Section and the site

4.1.1 The accident occurred at Km. 513/15 of Jharsuguda (JSG) station yard on JSG-ROU BG double Line Electrified section of Chakradharpur Division of South Eastern Railway.

4.1.2 The Dn. direction of the Railway track is from West to East. The site of side collision is straight. However, the track is having curve ahead and the gradient is level.

4.1.3 The track was laid with 60 kg rail in the year 2004. The density of PSC sleeper is 1660m.

4.2 Control

Control office is located at Chakradharpur which is the headquarters of the Division. One Section Controller is entrusted with the responsibility of train operation in this section (JSG-ROU).

4.3 Permanent Way

In charge of the maintenance of the P.Way are:

Sr. DEN/West/CKP
ADEN/JSG (Km. 417/21 to Km. 515/03)
SSE/P.Way/JSG (Km.473/01 to Km. 515/03)
JE/P.Way/JSG (Km. 498/35 to Km. 515/03)

4.4 Signalling and system of train working at JSG

JSG is a B' class station with Standard-III interlocking.

The Section is a MACLS territory with all the stations having panel interlocking arrangement. JSG passenger yard cabin is having electronic interlocking (SSI) whereas the JSG goods yard cabin is having route relay interlocking (RRI). There is inter slot arrangement between the two cabins for movement of train.

The SSI equipment is of M/S. ANSALDO make, commissioned during February 2010. A total 7 nos. distributed type microlok units have been installed. External data logger of M/S. EFFTRONICS was commissioned along with the SSI. However, the same was found lying defective since last 3 months as per Sr.DSTE/CKP. Data logger net working has not been done. The data pertaining to various points and signals, track circuits, slots etc. were retrieved from the Event Logger of the SSI system.

4.5 Speed

Sectional speed of the section is 110 kmph on main line. The speed limits over Line No. 4 and line No. 5 were 30 and 15 kmph respectively. There is a permanent speed restriction of 50 kmph from Km. 513/30 to 512/26 due to points and crossing taking off from 3° curve (ahead of accident spot). There was no temporary speed restriction enforced on the day of the accident at the location of accident.

4.6 Kilometerages

The kilometerages of the various points mentioned in the report reckoned from Howrah are as under :

Station	Kms.
Howrah	0
Clhakradharpur	311.8
Rourkela	412.8
Spot of accident	**513/15**
Jharsuguda Jn	514.2
Brundamal	520.6
RGL	540.2
Sambalpur	562.9

4.7 The dates of last inspection of the track prior to the unusual occurrence are as under –

CPWI - On 16.08.2011
ADEN - On 19.11.2011
Sr.DEN(N)- On 13.11.2011

The track was last attended by Gang No. 86 on 07.11.2011 and slack packing as done at Point No. 58A.

4.8 Record of rainfall during 7 (seven) days prior to the incidence was nil.

4.9 Description of station

JSG is a 'B' class junction station on the HWH-NGP Double line Section provided with Manually Operated Multiple Aspect Colour Light Signals (MACL). The goods yard is having standard-III route relay interlocking where as the Passenger yard having electronic interlocking. JSG-TLGR Branch Single Line takes 'off' from this station at the West End. Trains on the single line are worked under Absolute Block System in accordance with GR and Block Working Manual. JSG station is situated at Km. 514.244 from HWH on the HWH-NGP Main line.

4.10 The JSG station yard consists of 08 running lines, 01 bay line, 12 non running lines.

4.11 The block section on either sides and their distance :

i) IB at NGP end is 10.260km from JSG
ii) JSG Road on JSG-TIG branch line at TIG end and is1.925 km from JSG.
iii) JSG East Goods Cabin / DTV West Panel at HWH end.

4.12 Direction of traffic:

Howrah - JSG- Nagpur – Up direction
Nagpur –JSG - Howrah – Dn Directon

4.13 The main line section between HWH-NGP is electrified. However, the section between JSG-TLG is non-electrified. Traffic is moved on mixed traction in section JSG-ROU.

4.14 CSL of line No.4 – 772 m.
CSL of line No.5 – 688 m
Line No.4 is fit for 30 kmph and Line No.5 is fit for 15 kmph.
No. of track circuit on line No.4 – 3 (L4T1, L4T2, L4T3)
No. of track circuit on line No. 5 - 3 (L5T1, L5T2, L5T3)

4.15 Starter signal of Line No.4 - S-20 is installed on Right Hand side of Line No.4 between Line No. 3 and 4. Starter signal of Line No. 5 - S-22 is installed on Left Hand side of Line No. 5 between Line No. 5 & 6. Both the signals are erected in a staggered manner with a distance of 14.07 m.

4.16 Both Line No. 4 and 5 are having right hand side curve beyond the platform. Line No. 4 and 5 are both common loops fit for passenger trains.

4.17 Point No. 58A is trailing direction for movement from line No. 4 and line No. 5 towards JSG goods yard. For trains moving towards main line, cross over points 52 (R), 51 (N), 53 (N), 57 (N) to be negotiated beyond the point No. 58(A). Point No. 58(B) is a trap point on line No.5 for isolation of line No.5. During movement on line No.5 through Point No. 58 (R), there is no isolation from line No.4. However Line No. 4 is isolated from Dn. Main line through point No. 52(N).

4.18 Working of station

(i) Trains on the main line between JSG East goods cabin – DTV West panel are worked under Absolute Block System by means of (SGE type) double line lock and block instruments.

(ii) Block proving axle counters are provided between JSG passenger yard central panel and IB. Trains are worked on absolute block system between these stations.

(iii) Trains between JSG-JSG Road Single lines are worked under Absolute block system by means of Single Line Block Token Instruments. The

instrument is installed in the JSG passenger yard central panel and operated by SM on duty.

(iv) Trains are worked on inter cabin slotting arrangement between JSG Central Panel and JSG West goods Cabin and JSG West goods cabin and JSG East goods Cabin.

V SALIENT FEATURES

5.1 Train No. 18006 Dn arrived JSG at about 00:40 hours and was received on plat form No. 3 (Line No. 4).

5.2 The train was controlled as the departure time was 01:50 hours.

5.3 Fresh crew from JSG took over the charge of train at 01:20 hours.

5.4 Caution order was served to the crew. The train was kept ready for departure at schedule time.

5.5 Line clear for long haul freight train was given at about 01:10 hours.

5.6 Train was received on Line No.5 at about 01:50 hours.

5.7 The long haul train was splitted into two trains at about 01:57 hours.

5.8 The station porter was deputed in advance to uncouple the rear train from the leading train.

5.9 After completing the detachment, he reported this to SM/JSG passenger yard with the help of walkie-talkie of the Guard of the leading freight train No. E/BRN/TATA.

5.10 The starter signal of Line No.5 i.e. S-22 was lowered at about 01:57 hours for dispatch of leading train No. E/BRN/TATA.

5.11 At the same time train No. 18006 DN started from Line No.4 (PF-3).

5.12 Starter signal for line No.4 i.e. S-20 was Danger.

5.13 The train No. 18006DN passed starter signal S-20 at Danger and continued its running.

5.14 The train trailed through Point No. 58A at about 02:00 hours.

5.15 The freight train E/BRN/TATA also had started after starter signal S-22 was lowered.

5.16 The crew of E/BRN/TATA saw train No. 18006 DN running in the same route and immediately applied emergency brake.

5.17 The train stopped after running approximately 7 meters from the time of application of Emergency brake.

5.18 The front loco of E/BRN/TATA, however, stopped partially obstructing the moving dimension for the coaching train on line No.4.

5.19 Thus, the side collision took place between the leading locomotive of E/BRN/TATA and coaches (from 3rd coach to 12th coach) of 18006Dn.

5.20 Train No. 18006 Dn subsequently stopped due to ACP apparatus of one of the coach being operated during side collision.

5.21 The train finally stopped on track circuit 52AT at about 02:01 hours after covering a total distance of 604 m (approx.) from starting and 200m (approx.) after side collision.

5.22 Speed of the trains

The following are the extract of SPM chart of Loco No. 16439 hauling 18006 Dn. Express at an interval of 20 secs. from start along with second-wise speed during last 10 secs. SPM clock was slower by approximately 2 minutes 38 secs in comparison to Control clock.

Time		Speed (in kmph)
1:55:27	-	1
1:55:47	-	5
1:56:07	-	9
1:56:27	-	11
1:56:47	-	13
1:57:07	-	16
1:57:27	-	14
1:57:47	-	12
1:58:07	-	8
1:58:27	-	8
1:58:47	-	7
1:58:48	-	7
1:58:49	-	8
1:58:50	-	7
1:58:51	-	6
1:58:52	-	5
1:58:53	-	3
1:58:54	-	1
1:58:54	-	0

The following are the extract of SPM chart of Loco No. 23197 hauling E/BRN/TATA at an interval of 10 secs. from start along with second-wise speed

during last 10 secs. SPM clock was slower by approximately 2 minutes 58 sec in comparison to Control clock.

Time		Speed (in kmph)	
1:50:49	-	00	Stop
1:56:21	-	001	Start
1:56:31	-	002	
1:56:41	-	005	
1:56:51	-	006	
1:57:01	-	007	
1:57:11	-	007	
1:57:12	-	006	
1:57:13	-	005	
1:57:14	-	005	
1:57:15	-	004	
1:57:16	-	003	
1:57:17	-	004	
1:57:18	-	003	
1:57:19	-	002	
1:57:20	-	001	

5.23 Signal location

- S-20 – the starter signal of line No.4 is on right hand side
- S-22 – the starter signal of line No.5 is on left hand side
- The train No. 18006Dn was being hauled by diesel loco with long hood having driver's seat in the Right Hand side.
- S-20 is visible to LP only
- S-22 is visible to ALP only.
- The train No. 18006 Dn was standing on PF-3 at an approximate distance of 271m. from starter signal S-20.
- There is a slight curve ahead on Right Hand side beyond the platform.

5.24 Splitting of Long haul train

- There was no SCR order for splitting. However, verbal instruction was given by SCR to SM/JSG
- The train was splitted within 7 minutes of its arrival.
- JSG is not a nominated station for splitting of long haul train. In fact, no station has been nominated for splitting of long haul train over SER. The same is being done according to operational convenience.
- JPO pertaining to operation of long haul train was submitted.

5.25 Extract of event logger data

5.25.1 There are 7 nos. distributed Microlok units installed for the SSI at JSG passenger yard.

- The clock of Microlok C-7 was found matching with Control timing.
- The other clocks of Microloks were either slow or fast by few minutes.
- Microlok – C-2 and C-4 clock timings were approximately 4 minutes slower and microlok – C-5 timing was approximately 5 minutes slower in comparison to Microlok- C-7 timing.
- All the important events had been logged in Microlok- C-7. Thus, the timings recorded in Microlok C-7 could be considered real and accurate as it almost matches with Control timing.

5.25.2 Dn Home signal No. S-4 lowered for reception of 18006 Dn at 00:24:32.6 hours

- 4 HR - 00:24:31.6 (Microlok C-5)
- 4 HECR- 00:24:32.6 (yellow aspect) (Microlok C-5)

5.25.3 Train was received on PF-3 Line No.4

4 ATPR	-	Occupied	-	00:32:50.3 (Microlok C-5)
4 T1PR	-	-do-	-	00:33:11.4 -do-
4 T2PR	-	-do-	-	00:33:41.5 -do-
89BT	-	-do-	-	00:34:00.3 -do-
87 AT	-	-do-	-	00:34:22.5 -do-
86T	-	-do-	-	00:34:50.5 -do-
81TPR	-	-do-	-	00:36:22.7 (Microlok C-4)
80BT	-	-do-	-	00:36:39.1 -do-
79T	-	-do-	-	00:36:59.0 -do-
78T	-	-do-	-	00:37:07.8 -do-
72T	-	-do-	-	00:37:18.4 (Microlok C-2)
L4T1	-	-do-	-	00:37:53.1 (Microlok C-2)
L4T2	-	-do-	-	00:44:12.9 (Microlok C-7)

5.25.4 Home signal S-2 for reception of Long haul train E/BRN/TATA and E/FD/SSYS was lowered at 01:28:39:6.

2HR - 01:28:38.7 (Microlok-C-5)
2 H ECR- 01:28:39.6 -do-

5.25.5 The freight train occupied -

- 'Calling on' track 2AT at 01:38:21:7 (Microlok C-5)
- 2TI occupied at 01:38:33:8
- 2T2 occupied at 01:39:01.1
- 84AT occupied at 01:39:41.4
- 83 BT occupied at 01:41:09.7 (Microlok C-4)
- 79T occupied at 01:41:22.6 -do-
- 78T occupied at 01:41:34.7 -do-
- 72T occupied at 01:41:45.4 (Microlok C-2)
- L5T1 occupied at 01:42:25.6 –do-
- L5T2 occupied at 01:48:36.1 (Microlok C-7)
- L5T3 occupied at 01:50:46.2 -do-

The train stopped on Line No.5 occupying track circuit L5T3 at 01:50:46.2

5.25.6 Starter Signal S-22 of Line No.5 –

Lowered at 01:57:21.0 (Microlok C-7)
22HR at 01:57:20.3 -do
22HECR at 01:57:21.0 -do-

5.25.7 L4T3 occupied 18006 Dn Exp at 01:58:47:0 (18006 DN Exp. started from PF-3)

(Microlok C-7)

20T occupied at 01:59:46.3 -do-
22 RECR (S-22 assumed red aspect) at 01:59:47.2 -do-

5.25.8 Point No. 58 reverse detection failed at 02:00:11:7 (Point 58A trailed through)

- 58RW K1R at 02:00:11.7 (Microlok C-7)
- 53 AT at 02:00:13.5 -do-
- 52 BT at 02:00:48.3 –do-
- 52AT at 02:01:09.2 –do-

Train No. 18006 Dn Exp. stopped over track circuit portion 52 AT after the side collision.

5.26 Extract of Voice Recorder

01.20	NA 5904	436 KB	SCR tells coaching train time at 01.50 hours.
01.46	NA 5906	254 KB	SCR advises DTV to keep any Dn train which would leave JSG for 18006 & other Coaching train.
01.48 01.57	NA 5906 NA 5907	139 KB 112 KB	ASM/JSG tells Long haul has not arrived. JSG ASM gives arrival of long haul & tells fouling not cleared.
02.00	NA 5907	157 KB	SCR asking ASM Mr. Behera whether 18006 could leave but other side faint voice – long haul.
02.01	NA 5907	66 KB	TATA left 2.00 ASM's voice report, SCR asking whether load or empty.

5.27 Schedule arrival time of 18006 DN KRPU-HWH is 0140 hours and departure time is 0150 hours. However, the train was found to be reaching JSG earlier on most of the days and being controlled.

5.28 The long haul freight train was a combination of two trains i.e. E/BRN/TATA and FD/SSYS/DSEY which had formation of 87 ½ wagons with two electric locomotives WAG5A, No. 23197 and 23179, in the front attached to E/BRN/TATA and one Electric Loco No. WAG7 27622 attached to FD/SSYS/DSEY. The train had originated from Bhilai of SECR. The Railways are operating such trains for quite some times. Copies of the JPO issued vide No. M2/W-113/PYTHON/617 dated 20.04.2011 along with corrigendum No. M2/W-113/PYTHON/784 dated

25.05.2011 on running of such trains in SE Railway were submitted during inquiry.

5.29 The following 3 coaches of Train No. 18006 Dn were detached at JSG :

SE 988705 SLR 10th from engine
SE 998107 ACCN 11th from engine
SE 078102 ACCN 12th from engine
The average height of hitting marks from rail level on these coaches was 1.65 meter.

5.30 Overall width of WAG5 loco 23197 - 3055 mm,
Overall width of ICF coach 3245 mm

VI. PROVISIONAL FINDINGS

Having carefully considered all the evidences tendered, records produced, observations made during site inspection and circumstantial evidence brought to light so far, I have come to the conclusion that Side collision between Train No. 18006 Dn KRPU-HWH Exp. and goods train E/BRN/TATA at Km 513/15 of JSG Station yard on JSG-ROU Section of Chakradharpur Division of South Eastern Railway at about 0200 hours of 23.11.2011 was caused due to crew of 18006 Dn KRPU-HWH Express, unauthorisedly starting the train from PF-3 (Line No. 4) of JSG Station and passing the starter signal No. S-20 of Line No. 4 at danger.

Accordingly, the cause of the accident is attributed to and classified as "**Failure of Railway Staff".**

VII. IMMEDIATE RECOMMENDATIONS

I make the following recommendations for immediate implementation:

7.1 Railways must provide **Starter indicator** for starter signal No. S-20.

7.2 '**Engine stop Board**' must be provided on PF-3 of JSG, ensuring clear visibility of signal No. S-20 from the cab of the locomotive at that location.

7.3 Railways must immediately assess the visibility of all signals located on Right Hand side by a specially constituted signal sighting Committee including members of crew of both traction and take appropriate corrective action to eliminate possible confusion and conflict. **Priority must be accorded for signals located in Right Hand side in station yards.**

7.4 The arrow marker on the signals provided to indicate the concerned line, must be made fluorescent type to ensure its visibility during night. **Making it illuminated similar to illuminated 'A' marker must also be explored.**

7.5 During '**Road learning'** of crew, special emphasis must be given for acclimatization with signals located in Right Hand side. **Railways must also issue the list of signals located in Right Hand side, section wise, for ready and regular reference by the crew.**

7.6 Railways must issue detailed procedure for controlling of trains at different stations due to night restrictions on running of coaching trains over various sections of SER.

7.7 Starting a goods train from a station ahead of Mail/Express trains at the schedule departure time must be prohibited. **In case it becomes inevitable, crew and guard of coaching trains must be advised in advance**.

7.8 Railways must make suitable changes in the loco link and modify procedures to ensure that **all diesel locomotives hauling mail / express trains are worked with short hood leading**.

7.9 Railways should immediately withdraw powers delegated to DRMs for approving location of signals on RH side. COM must be made the approving officer.

7.10 Railways must immediately stop operation of 'long haul train' as it's running violates GR

7.11 Signal No. S-20 must be shifted to left hand side and S-20 and S-22 must be brought to parallel location by suitable modification in yard layout.

7.12 Railways must issue instructions to restrict the unchecked use of walkie-talkies by front line staff.

(S. NAYAK)
Commissioner of Railway Safety
South Eastern Circle, Kolkata

PRESS NOTE
GOVERNMENT OF INDIA

MINISTRY OF CIVIL AVIATION
COMMISSIONER OF RAILWAY SAFETY

SHRI S. NAYAK, Commissioner of Railway Safety, South Eastern Circle, Kolkata **under Ministry of Civil Aviation held a Statutory Inquiry into the Side collision between Train No. 18006 Dn KRPU-HWH Exp. and goods train E/BRN/TATA at Km 513/15 of JSG Station yard on JSG-ROU Section of Chakradharpur Division of South Eastern Railway which occurred at about 0200 hours of 23.11.2011. As a result of the accident, one person sustained simple injury.**

According to the provisional findings of the Commissioner appended with his preliminary report, the accident occurred due to **failure of railway staff**. These findings are under the consideration of the Government.

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T.11019 / 37 / SEC / 2011-12/ 724 12.12.2011

To
The Chief Commissioner of Railway Safety,
Ashok Marg,
Lucknow.

Sir,

Sub: Side collision between Train No. 18006 Dn KRPU-HWH Exp. and goods train E/BRN/TATA at Km 513/15 of JSG Station yard on JSG-ROU Section of Chakradharpur Division of South Eastern Railway at about 0200 hours of 23.11.2011

In accordance with Rule 3 of "The Statutory Investigations into Railway Accidents Rules 1998" published by the Ministry of Civil Aviation, I have the honor to submit a Brief Preliminary Report of my Statutory Inquiry into the above accident.

DA: Preliminary Report &
a copy of Press Note

Yours faithfully,

(S. NAYAK)
Commissioner of Railway Safety
South Eastern Circle, Kolkata

Copy along with a copy of the Preliminary Report and Press Note forwarded for information to:

1. Secretary (Safety), Railway Board, New Delhi
2. General Manager, South Eastern Railway, Garden Reach, Kolkata
3. Principal Information Officer, Press Information Bureau
   Shastri Bhawan, Rajendra Prasad Road, New Delhi - 110001

(S. NAYAK)
Commissioner of Railway Safety
South Eastern Circle, Kolkata