

Appendix I (Para no. 1.2)								
Track maintenance activities (preventive and others) along with the periodicity and responsibility centre								
S.no.	Groups	Activities	Items	Periodicity / Frequency			Responsibility Centre	
				Sectional JE/P. Way	SSE/P. Way In-charge	Sectional ADEN/DEN		
1	Inspection of Track	Patrolling by Track maintainers (Gang man, Track man, Key Man), Inspection by Junior Engineer, Inspection by Sectional Engineer, Inspection by Assistant Divisional Engineer, Inspection by Divisional Engineer	Gang Inspection	Once in a month (all gangs)	Once in a month one gang per JE/ P. way	Work of minimum one gang in each SSE's jurisdiction every quarter	Minimum one gang per SSE / P.Way Incharge three month	Divisional and Field formations of Zonal Railways
			Push Trolley Inspection	Once in a fortnight	Once in a month	Entire sub division once in two month	Once in three month	
			Footplate Inspection	Once in a month	Once in a month	Once in a month	Once in three month	
			Night Inspection	Once in a fortnight	Once in a month	Once in a month	Once in a month	
			On Foot Inspection	Once in Six months on pro-rata basis so as to cover entire section	Once a year on pro-rata basis so as to cover entire section	-	-	
			Curve	Once in Six months by rotation with SSE / Permanent Way In-charge	Once in Six month by rotation with sectional JE/P. Way	One curve every quarter under each SSE/ P. Way In-charge	Minimum one curve in each ADEN section in every three months.	

S.no.	Groups	Activities	Items	Periodicity / Frequency				Responsibility Centre
				Sectional JE/P. Way	SSE/P. Way In-charge	Sectional ADEN/DEN	Sr. DEN	
Inspection of Track			Points and crossings of Pass. & running lines	Once in three months by rotation with SSE/P. Way Incharge	Once in three months by rotation with sectional JE/P. Way	Once in a year	As often as possible during trolley inspection at least one important points and crossing on Pass and running lines.	Divisional and Field formations of Zonal Railways
			Points and crossings of other lines & Yards	Once in 6 months by rotation with SSE/P. Way Incharge	Once in 6 months by rotation with JE/P. Way	1/10 th of total T/outs every year on Programme basis	-	
			LWR/CWR & SE	Once in fortnight during two coldest and two hottest months min max temperature, otherwise once in two months by rotation with SSE/P. Way Incharge	Once in fortnight during two coldest and two hottest months at min and max temperature, otherwise once in two months by rotation with sectional JE/P. Way	Once in six months preferably hottest & coldest months	-	

S.no.	Groups	Activities	Items	Periodicity / Frequency				Responsibility Centre
				Sectional JE/P. Way	SSE/P. Way In-charge	Sectional ADEN/DEN	Sr. DEN	
	Inspection of Track		Level Crossing	Once in a month	Once in a month	Once in Six months	Minimum One LC per SSE/ P. Way In-charge in three months	Divisional and Field formations of Zonal Railways
			Small Track machines	-	Once a fortnight	Once in Six months	-	
			Patrolling (hot weather / cold weather / Monsoon)	Check the night patrolling once a fortnight	Arrange for patrolling of track by deputing suitably selected men, check the night patrolman once a month	Check the work of patrolman at night once in a month	-	
		Daily inspection	The key man shall inspect by foot his entire beat once a day, both the tracks and bridges, and return along the opposite rail to that taken on his outward journey in case of single line. On double line, key man will carry out one round of inspection in morning hours by going along, UP line and then returning along DN line or vice – versa. Key man looks for defects, broken rail, fittings, greasing, lubrication, buckling, unauthorized structures etc. in his beat.					Key man, SSE of Divisional and field formations of Zonal Railways

2	USFD testing	USFD testing of weld	Type of welds	Type of testing	Testing Schedule	Responsibility Centre
	USFD testing of welds	Type of Welds	Type of Testing	Testing Schedule		SSE / USFD team, ADEN and DEN, Track
		Conventional AT weld	Periodic Tests	Every 40 GMT or 5 year, whichever is earlier		
		SKV weld	Acceptance Test	Immediately after welding		
			First Periodic Test	1 year		
		Further tests based on route GMT		Routes having GMT	Frequency	
				>45	2 years	
				>30 ≤45	3 years	
				>15≤30	4 years	
				0-15	5 years	
		Routes having GMT		Testing frequency Once in		
USFD testing of Rails (Rail head center and gauge face corner / non – gauge face corner / non – gauge face corner testing)	≤5		2 years			
	>5≤8		12 months			
	>8≤12		9 months			
	>12≤16		6 months			
	>16≤24		4 months			
	>24≤40		3 months			
	>40≤60		2 months			
	>60≤80		1 and 1/2 months			
	>80		1month			
3	Track monitoring	Rail Profile Measurement by Track Recording Cars (TRC)	Types of Routes		Frequency	Responsibility Centre
	Track Recording Cars (TRC)		Routes with existing speeds above 120 kmph	Once in 2 months	Track Machines and Monitoring Directorate of RDSO for deployment of TRC and AEN should accompany the TRC in his	
			Routes with existing speeds above 110 Kmph and up to 130 kmph	Once in 3 months		
			Other Group 'A' and 'B' routes	Once in 4 months		

			Group 'C', 'D'D' and 'D Special' Routes Group 'E' and 'E Special' Routes	Once in 6 months Once in 12 months	jurisdiction and take down notes regarding the spots needing attention
4	WILD	Monitoring of impact load on track by 'Wayside detection system' through Wheel Impact Load Detector (WILD) system			Zonal Railway
5	Preventive and periodic maintenance activities	Deep Screening	Deep screening should be carried out in the following situations by providing full ballast cushion: 1. Prior to complete track renewal 2. Prior to through sleeper renewal 3. Where the caking of ballast has resulted in unsatisfactory riding 4. Before converting existing track into L.W.R. or C.W.R; or before introduction of machine maintenance, unless the ballast was screened in recent past. 5. The entire track must be deep screened at least once in ten years.		Divisional and Sub – divisional formations of Zonal Railways
		De-stressing	Abnormal behavior of LWR/CWR whenever gets manifested in one or more of the Following, de-stressing shall be undertaken i) When the gap observed at SEJ (a) differs beyond limits specified; (b) exceeds the maximum designed gag of SEJ; (c) When stock/tongue rail crosses the mean position. ii) After special maintenance operations iii) After restoration of track following an unusual occurrence iv) If number of locations where temporary repairs have been done exceed three per km.		Divisional and Sub – divisional formations of Zonal Railways
		Others	1. Overhauling of points and Crossing 2. Renewal of crossings 3. Changing of sleepers 4. Lubricating and adjusting switches 5. Tamping 6. Welding		SSE (in overall charge)

6	Training	Arrangements for training of all Permanent Way Staff working on LWR/CWR sections shall be made/by Chief Engineer by holding special/regular Courses in Zonal Training centers and Sr. DEN / DEN in Divisional Training Centers.	PCE and Sr. DEN
7	Co-ordination with other Departments	The Assistant Engineer should co-operate effectively with officers and staff of other departments in matters that warrant co-ordination	AEN
8	Track on Bridges	The track on Bridges should be inspected as a part of the annual Bridge inspection, besides normal track inspections.	AEN
9	Ballast	Measure and record the measurements of ballast or carry out 100 per cent check on quality and quantity of the ballast, if the measurements are recorded by SSE	AEN

Appendix II (Para no. 2.3.2)

On account of reasons attributed to track condition or deficient track maintenance such as rail fracture, weld fracture, track defects, defects in points, track buckling etc., 14 accidents occurred in the five selected Zonal Railways NCR, ECR, SER, SR and SWR, during the review period 2014-15 to 2016-17. Of these ten accidents were of trains carrying passengers and four accidents were that of goods trains. In addition, three accidents of passenger carrying trains occurred in NCR during 2016-17, for which causes of accidents were still under investigation.

In respect of the following five selected passenger train accidents out of the 17 accidents mentioned above, Audit checked the track maintenance practices and track conditions in the sections where these accidents took place:

1. Train no. 19321, Indore - Rajendra Nagar Patna Express on 20 November 2016
2. Train no. 12987, Ajmer Sealdah Express on 28 December 2016
3. Train no. 12189, Jablapur- Nizamuddin Mahakaushal Express on 30 March 2017
4. Train no. 18101, Tata-Jammu Tawi Express on 25 March 2015
5. Train no. 53342 DN, Muri-Dhanbad Passenger on 22 June 2014

The track maintenance practices in these sections were reviewed and Audit noticed deficiencies in inspections and maintenance of tracks against the norms/schedules. These are tabulated below:

Review of major passenger train accidents	
1. Accident of Train no. 19321, Indore - Rajendra Nagar Patna Express on 20 November 2016	
<i>Train no. and name</i>	Train no. 19321 - Indore - Rajendra Nagar Patna Express
<i>Date of Accident</i>	20 November 2016 at 3:03 hrs
<i>Spot of Accident</i>	Between Pokhrayan – Malasastation section, Pole no. 1290/2 – 1290/16
<i>Zonal Railway</i>	North Central Railway
<i>Division</i>	Jhansi
<i>Name of the Section</i>	Ait – Bhimsen
<i>Jurisdiction of SSE</i>	Sr. Section Engineer (SSE) /Juhi
<i>Jurisdiction of ADEN</i>	Assistant Divisional Engineer (ADEN), Kanpur, Jhansi Division
<i>Loss of life/ railway property</i>	Death of 150 passengers Estimated loss of C&W – ₹ 6 crore
<i>Cause of accident as per supervisor's joint note</i>	Rail failure due to old flaw in rail
<i>Report of the Commissioner of Railway Safety (CRS)</i>	Preliminary Report of CRS which should be given within one month of the accident and Final report of CRS enquiry which is due within six months of the accident are still awaited.
<i>Audit findings regarding track maintenance activities of the section where an accident of passenger train took place on 20 November 2016</i>	

Perspective Plan for manual track maintenance by the sectional officials	<ul style="list-style-type: none">Advance perspective maintenance plans were not prepared.Advance planning for realignment of curves, deep screening, casual renewal of points and crossing, welding, de-stressing etc. were not planned.																																																	
Plan for mechanised maintenance through Track Machines (Zonal Headquarters)	<ul style="list-style-type: none">Annual plan for deployment of various track machines was intimated to Sr. Divisional Engineer (Coordination), Allahabad on 29 April 2016, i.e. after 29 days from the start of the year.Deployment plan of various track machines was not intimated to concerned ADEN and SSE of Juhi.																																																	
TMS reports of Jhansi Division during 2016-17	<ul style="list-style-type: none">Advance planning for smooth shifting and functioning of machines was not made.3246 machine days out of 7641 machine were not utilised / wasted over Jhansi Division on account of non-availability of block, deport work, repairs, shifting, staff rest, site not ready etc.																																																	
Utilisation of track machines in Jhansi Division	<ul style="list-style-type: none">Average shortfall in achievement of target over Jhansi Division was 57 per cent with minimum value of 14 per cent and maximum value of 87.5 per cent.Shortfall in targets of ballast cleaning machine (87 per cent) , ballast regulation machine (57 per cent), Tamping, lifting, slewing and deep screening of track (59per cent),Tamping, aligning and labelling of track (56 per cent) and Lining, labelling and tamping of track (68 per cent).																																																	
Welding of rail joints	<ul style="list-style-type: none">Use of AT welds, due to which tracks are prone to frequent weld failures, still widespread. Comparison of defect reported in AT welt and Mobile flash butt weld revealed that defects in AT weld was 9.2per cent and FB weld is 0.58per cent i.e. failure in FB weld was negligible. <table><tr><th>Name of the Section</th><th>AT weld population</th><th>Defects noticed in USFD testing</th><th>Percentage</th><th>Flash butt weld population</th><th>Defects noticed in USFD testing</th><th>Percentage</th></tr><tr><td>Ait-Bhimsen (up)</td><td>141</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Ait-Bhimsen (Dn.)</td><td>114</td><td>03</td><td>2.63</td><td>61</td><td>0</td><td>0</td></tr><tr><td>Ait-Bhimsen (SL)</td><td>4130</td><td>413</td><td>10</td><td>6633</td><td>45</td><td>0.68</td></tr><tr><td>Bhimsen - Govindpuri (up)</td><td>146</td><td>05</td><td>3.42</td><td>1088</td><td>04</td><td>0.37</td></tr><tr><td>Bhimsen - Govindpuri (Dn.)</td><td>152</td><td>10</td><td>6.58</td><td>777</td><td>01</td><td>0.13</td></tr><tr><td>Total</td><td>4683</td><td>431</td><td>9.2</td><td>8559</td><td>50</td><td>0.58</td></tr></table> <ul style="list-style-type: none">In SSE / Juhi, single shot crucible was not initiated in AT welding after 01 April 2015 due to non-supply of single shot crucible welding portion. In some cases single shot crucible was sued only after January 2017.	Name of the Section	AT weld population	Defects noticed in USFD testing	Percentage	Flash butt weld population	Defects noticed in USFD testing	Percentage	Ait-Bhimsen (up)	141	0	0	0	0	0	Ait-Bhimsen (Dn.)	114	03	2.63	61	0	0	Ait-Bhimsen (SL)	4130	413	10	6633	45	0.68	Bhimsen - Govindpuri (up)	146	05	3.42	1088	04	0.37	Bhimsen - Govindpuri (Dn.)	152	10	6.58	777	01	0.13	Total	4683	431	9.2	8559	50	0.58
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USFD testing	<ul style="list-style-type: none">USFD was done by the Departmental Team 7 of Kanpur on 18 October 2016. No major deficiencies were reported in USFD testing.Training and Workshop for training of ADEN and SSE to handle USFD machines independently was not conducted in Jhansi Division of North Central Railway. SSE, Juhi was not trained in USFD testing.Test check of 5 per cent was not conducted by ADEN in the section where the USFD testing was actually carried out by the Contractor.Scanned images / peak patterns was not saved by the USFD team. Thus in successive USFD test scrutiny / analysis by concerned supervisors / officers were not possible.																																																	

	<ul style="list-style-type: none">Due to irregularities in test check new flaw left out by the contractor / USFD team could not be detected. In reply to audit observation ADEN, Kanpur remarked that test check details were recorded by him on Measurement book. No record could be provided by ADEN, Kanpur, Jhansi Division to Audit in support of test check.																																																																																																		
Preparation of location wise stock of USFD tested rails	<ul style="list-style-type: none">Instructions for preparation of location wise stock was issued by NCR. However, location wise stock of USFD tested rails was not made and certification from USFD operator before use in replacement / change of rail work was not ensured. No system existed to ensure that the only USFD tested rails was used for repair and casual renewal work.Check of rail / weld failure during 2016-17 in the jurisdiction of SSE / Juhi revealed that 13 number of failure took place but, in order to establish whether the fracture was detectable and missed by USFD machine spot of fracture/ was not inspected by ADEN, Kanpur, Jhansi Division. Details are as under:<table><tr><th>S.no.</th><th>Location</th><th>Date of Failure</th><th>Type of failure</th><th>Date of USFD testing</th><th>Result of USFD test</th><th>Responsibility</th></tr><tr><td>1</td><td>1284/14-16</td><td>17.05.2016</td><td>Weld failure</td><td>20.01.2016</td><td>Good</td><td>M/s Khemchand</td></tr><tr><td>2</td><td>1299/30 to 1300/2</td><td>15.10.2016</td><td>Weld failure</td><td>18.03.2015</td><td>Good</td><td>Sudden failure responsibility not fixed.</td></tr><tr><td>3</td><td>1320/8-10</td><td>24.10.2016</td><td>Mid rail fracture</td><td>23.07.2016</td><td>Good</td><td>M/s Khemchand</td></tr><tr><td>4</td><td>1289/4-6</td><td>10.11.2016</td><td>Rail fracture</td><td>18.10.2016</td><td>OBS Rail</td><td>Sudden failure responsibility not fixed.</td></tr><tr><td>5</td><td>1310/14-16</td><td>18.12.2016</td><td>Rail fracture</td><td>15.12.2016</td><td>Good</td><td>Sudden failure responsibility not fixed.</td></tr><tr><td>6</td><td>1291/4-6</td><td>27.12.2016</td><td>Rail fracture</td><td>15.12.2016</td><td>No flaw</td><td>Avoidable, detected by patrolmen on duty.</td></tr><tr><td>7</td><td>1289/4-6</td><td>10.01.2017</td><td>Rail fracture</td><td>13.12.2016</td><td>Nil</td><td>Sudden failure responsibility not fixed.</td></tr><tr><td>8</td><td>1297/26-28</td><td>11.01.2017</td><td>Weld failure</td><td>12.02.2014</td><td>No flaw</td><td>Last USFD testing about 03 years ago.</td></tr><tr><td>9</td><td>1326/30-32</td><td>14.01.2017</td><td>Sudden failure</td><td>13.12.2016</td><td>Good</td><td>Nil</td></tr><tr><td>10</td><td>1305/18-20</td><td>12.02.2017</td><td>Weld failure</td><td>29.11.2016</td><td>DFWO</td><td>Nil</td></tr><tr><td>11</td><td>1314/12-14</td><td>25.02.2017</td><td>Rail failure</td><td>14.12.2016</td><td>OBS</td><td>NIL</td></tr><tr><td>12</td><td>1285/14-16</td><td>25.02.2017</td><td>Weld Failure</td><td>23.01.2016</td><td>Good</td><td>Nil</td></tr><tr><td>13</td><td>1310/12-14</td><td>12.03.2017</td><td>Weld failure</td><td>06.04.2015</td><td>Nil</td><td>Last USFD testing about 02 years ago.</td></tr></table>In two out of 13 cases last USFD test of weld was carried out 2 to 3 years ago.	S.no.	Location	Date of Failure	Type of failure	Date of USFD testing	Result of USFD test	Responsibility	1	1284/14-16	17.05.2016	Weld failure	20.01.2016	Good	M/s Khemchand	2	1299/30 to 1300/2	15.10.2016	Weld failure	18.03.2015	Good	Sudden failure responsibility not fixed.	3	1320/8-10	24.10.2016	Mid rail fracture	23.07.2016	Good	M/s Khemchand	4	1289/4-6	10.11.2016	Rail fracture	18.10.2016	OBS Rail	Sudden failure responsibility not fixed.	5	1310/14-16	18.12.2016	Rail fracture	15.12.2016	Good	Sudden failure responsibility not fixed.	6	1291/4-6	27.12.2016	Rail fracture	15.12.2016	No flaw	Avoidable, detected by patrolmen on duty.	7	1289/4-6	10.01.2017	Rail fracture	13.12.2016	Nil	Sudden failure responsibility not fixed.	8	1297/26-28	11.01.2017	Weld failure	12.02.2014	No flaw	Last USFD testing about 03 years ago.	9	1326/30-32	14.01.2017	Sudden failure	13.12.2016	Good	Nil	10	1305/18-20	12.02.2017	Weld failure	29.11.2016	DFWO	Nil	11	1314/12-14	25.02.2017	Rail failure	14.12.2016	OBS	NIL	12	1285/14-16	25.02.2017	Weld Failure	23.01.2016	Good	Nil	13	1310/12-14	12.03.2017	Weld failure	06.04.2015	Nil	Last USFD testing about 02 years ago.
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Track recording	<p>Check of register of TRC results of track in the office of SSE, Juhi revealed that:</p> <ul style="list-style-type: none">Jhansi – Kanpur route of Indian Railway comes under ‘D’ routes i.e. monitoring frequency of TRC was once in six months.Track recording was not conducted during 2016-17. Last track recording was carried in																																																																																																		


	<p>2015-16 on 05 March 2016.</p> <ul style="list-style-type: none">Track recording car did not have an uninterrupted run over Jhansi – Kanpur sections of NCR and speed of TRC was also not uniform. Thus, comparable results between successive recordings were not produced by TRC unit.The prescribed recording speed range of a BroadGauge car is 70 - 80 kmph and the recording done below these speeds are taken as ‘Non-recorded’. Check of TGI of accident location showed that from km 1289-1291 TGI of the track was not recorded by TRC unit on 05 March 2016 due to running of TRC below the prescribed speed range of 70-80 kmph. Speed of TRC was also not recorded by the officer accompanying the Track Recording run.																																																																								
Inspection	<ul style="list-style-type: none">GPS based foot plate inspection device was not procured by NCR and inspection of track was carried out traditionally.Track maintainers were not equipped with communication equipment to report any failure, fracture or damage immediately from the section where short comings / defects in track was observed.																																																																								
Deep screening of ballast	<p>In the jurisdiction of SSE, Juhi, Deep screening was overdue in main line section at 10 locations for length of 16264 meter between one to 19 years, as detailed below:</p> <table><tr><th>S.no.</th><th>Section</th><th>Line</th><th>Deep Screening month & year</th><th>Location from km/m to Km/m</th><th>Length</th></tr><tr><td>1</td><td>Ait-Bhimsen</td><td>Single Line</td><td>March 1999</td><td>1272/0 to 1274/300</td><td>2264 m</td></tr><tr><td>2</td><td>Ait Bhimsen</td><td>Single Line</td><td>Jan. 1999</td><td>1275/275 to 1275/655</td><td>380 m</td></tr><tr><td>3</td><td>Ait Bhimsen</td><td>Single Line</td><td>March 1998</td><td>1276/472 to 1280/285</td><td>3839 m</td></tr><tr><td>4</td><td>Ait Bhimsen</td><td>Single Line</td><td>March 1998</td><td>1281/330 to 1281/375</td><td>45 m</td></tr><tr><td>5</td><td>Ait Bhimsen</td><td>Single Line</td><td>April 2007</td><td>1315/0 to 1317/580</td><td>2582 m</td></tr><tr><td>6</td><td>Ait Bhimsen</td><td>Single Line</td><td>March 2007</td><td>1318/775 to 1319/0</td><td>266 m</td></tr><tr><td>7</td><td>Ait Bhimsen</td><td>Single Line</td><td>March 2007</td><td>1319/0 to 1324/0</td><td>4991 m</td></tr><tr><td>8</td><td>Ait Bhimsen</td><td>Single Line</td><td>March 2007</td><td>1324/0 to 1325/0</td><td>997 m</td></tr><tr><td>9</td><td>Bhimsen-Govindpuri</td><td>Up Line</td><td>Jan. 2002</td><td>1332/850 to 1333/580</td><td>730 m</td></tr><tr><td>10</td><td>Bhimsen-Govindpuri</td><td>Up Line</td><td>Jan. 2002</td><td>1333/580 to 1333/750</td><td>170 m</td></tr><tr><td colspan="5"></td><td>16264 m</td></tr></table>	S.no.	Section	Line	Deep Screening month & year	Location from km/m to Km/m	Length	1	Ait-Bhimsen	Single Line	March 1999	1272/0 to 1274/300	2264 m	2	Ait Bhimsen	Single Line	Jan. 1999	1275/275 to 1275/655	380 m	3	Ait Bhimsen	Single Line	March 1998	1276/472 to 1280/285	3839 m	4	Ait Bhimsen	Single Line	March 1998	1281/330 to 1281/375	45 m	5	Ait Bhimsen	Single Line	April 2007	1315/0 to 1317/580	2582 m	6	Ait Bhimsen	Single Line	March 2007	1318/775 to 1319/0	266 m	7	Ait Bhimsen	Single Line	March 2007	1319/0 to 1324/0	4991 m	8	Ait Bhimsen	Single Line	March 2007	1324/0 to 1325/0	997 m	9	Bhimsen-Govindpuri	Up Line	Jan. 2002	1332/850 to 1333/580	730 m	10	Bhimsen-Govindpuri	Up Line	Jan. 2002	1333/580 to 1333/750	170 m						16264 m
S.no.	Section	Line	Deep Screening month & year	Location from km/m to Km/m	Length																																																																				
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2	Ait Bhimsen	Single Line	Jan. 1999	1275/275 to 1275/655	380 m																																																																				
3	Ait Bhimsen	Single Line	March 1998	1276/472 to 1280/285	3839 m																																																																				
4	Ait Bhimsen	Single Line	March 1998	1281/330 to 1281/375	45 m																																																																				
5	Ait Bhimsen	Single Line	April 2007	1315/0 to 1317/580	2582 m																																																																				
6	Ait Bhimsen	Single Line	March 2007	1318/775 to 1319/0	266 m																																																																				
7	Ait Bhimsen	Single Line	March 2007	1319/0 to 1324/0	4991 m																																																																				
8	Ait Bhimsen	Single Line	March 2007	1324/0 to 1325/0	997 m																																																																				
9	Bhimsen-Govindpuri	Up Line	Jan. 2002	1332/850 to 1333/580	730 m																																																																				
10	Bhimsen-Govindpuri	Up Line	Jan. 2002	1333/580 to 1333/750	170 m																																																																				
					16264 m																																																																				
De-stressing of LWR/CWR	<p>In the sections of SSE, Juhi,during 2016-17,</p> <ol style="list-style-type: none">De-stressing was done without rail tensors and done manually by contractual labours in<ul style="list-style-type: none">8175 meter out in LWR number 33 (1289 km 696m to 1297 km to 970 m)800 meter in LWR number 34 (1298 km 115 m to 1298 km to 915 m)796 meter was carried out in LWR number 32 (1288 km 776 m to 1289 km to 570 m)De-stressing was done without rail tensors and done manually by departmental labours in																																																																								

	<ul style="list-style-type: none">• 834 meter in LWR number 30 (1280 km 375 m to 1281 km to 193 m)• 7285 meter in LWR number 43 (1325 km 328 m to 1332 km to 613 m)																																																
Standardisation of Track structure	<p>Track structure was not standardised with 60 Kg, 90 UTS rails. As per rail change report during 2016-17, both 52 Kg and 60 Kg rails were still in use. During 2016-17 in 367 instances rail were replaced due to defects. Of these,</p> <ul style="list-style-type: none">• 45 instances were caused by defects in welds at joints viz. defective weld, IMR weld (where immediate rail removal is required), weld failure.• In 16 cases, premature renewal of rail was carried out due to SEJ failure.• In 143 cases rails was changed due to pitted rail.																																																
Use of Small Track Machines for mechanized track maintenance	<p>In Jhansi – Kanpur section all maintenance activities are being done through manually as well as through machines. Track maintenance work such as de-stressing, reconditioning, toe load measuring, lifting, trolling and screening of ballast was impacted due to the following constraints:</p> <ul style="list-style-type: none">• Number of small track machines was not adequate• Arrangement for transport of these machines was not proper• Spares for small track machines were not available in local market• For emergency repairs of small track machines imprest was not sanctioned.• Staff deputed on deployment / operation of small track machines were not trained. <p>Check of records of SSE, Juhi and ADEN, Kanpur revealed that there was huge shortage of small track machines. During January 2017,</p> <ul style="list-style-type: none">- 17 out of 44 Abrasive rail cutters were out of order- 12 out of 52 Rail drilling machines were out of order- One out of four rail tensors were out of order- Both the Rail profile weld grinders were out of order- One out of 8 Double action trimmer for AT welding were not working- Generator for running these machines was also not working																																																
Manpower for track maintenance	<p>As on 1 April 2016, the staff position in under the SSE/Juhi was as follows:</p> <table><tr><th>Category</th><th>Sanction</th><th>Actual Men on roll</th><th>Shortage</th></tr><tr><td>Blacksmith</td><td>02</td><td>01</td><td>-01</td></tr><tr><td>H/Man</td><td>0</td><td>01</td><td>+1</td></tr><tr><td>Welder</td><td>02</td><td>01</td><td>-01</td></tr><tr><td>MSN</td><td>2</td><td>0</td><td>-02</td></tr><tr><td>ART/Khalasi</td><td>02</td><td>01</td><td>-01</td></tr><tr><td>Non ART / Khalasi</td><td>01</td><td>0</td><td>-01</td></tr><tr><td>T.M - I</td><td>14</td><td>5</td><td>-9</td></tr><tr><td>T.M. II</td><td>27</td><td>8</td><td>-19</td></tr><tr><td>T.M. III</td><td>51</td><td>71</td><td>+20</td></tr><tr><td>T.M. IV</td><td>148</td><td>108</td><td>-40</td></tr><tr><td>Total</td><td>249</td><td>196</td><td>-53</td></tr></table> <p>Out of 196 staff on roll, 32 staff were absent from the duty without any intimation to office establishment between 01 April 2016 to 31 March 2017 for more than 15 days.Though shortages of staff was communicated by SSE in the monthly reports, no action was taken so far for filling of vacancies.</p> <p>As such, actual man power of SSE’s after rest, leave, sick, absent and training was being used in maintenance activities. Thus work of regular maintenance in jurisdiction of SSE, Juhi was hampered.</p>	Category	Sanction	Actual Men on roll	Shortage	Blacksmith	02	01	-01	H/Man	0	01	+1	Welder	02	01	-01	MSN	2	0	-02	ART/Khalasi	02	01	-01	Non ART / Khalasi	01	0	-01	T.M - I	14	5	-9	T.M. II	27	8	-19	T.M. III	51	71	+20	T.M. IV	148	108	-40	Total	249	196	-53
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Training for permanent way staff	<p>In NCR, Check of competency certificate in selected sections showed that no system existed to ensure that only trained staffs were posted in LWR / CWR section. It was seen that</p> <ul style="list-style-type: none"> 15 Track maintainers were posted in the section of SSE, Juhi without imparting initial training of track maintenance. Records of refresher courses were not maintained and Competency certificate for working on LWR section was also not obtained for Keyman, Gangmate. TMS report of training of staff was also not updated as a result monitoring of training programme at higher level was not carried out.
2. Accident of Train no. 12987, Ajmer Sealdah Express on 28 December 2016	
<i>Train no. and name</i>	12987 (Sealdah Ajmer express)
<i>Date of Accident</i>	28 December 2016 at 05:11
<i>Spot of Accident</i>	Near KM-1061/26 UP Line
<i>Zonal Railway</i>	North Central Railway
<i>Division</i>	Allahabad
<i>Name of the Section</i>	Maitha-Rura
<i>Jurisdiction of SSE</i>	SSE – II, Kanpur, Allahabad Division
<i>Jurisdiction of ADEN</i>	ADEN, Line Kanpur
<i>Loss of life/ railway property</i>	16 coaches derailed, 50 persons were injured and estimated loss of Rs. 4.67 crore occurred to Railways for damages to assets
<i>Cause of accident as per supervisor's joint note</i>	Rail fracture
<i>Report of the Commissioner of Railway Safety (CRS)</i>	Preliminary Report of CRS which should be given within one month of the accident and Final report of CRS enquiry which is due within six months of the accident are still awaited.
Audit findings regarding track maintenance activities of the section where an accident of passenger train took place on 28 December 2016	
<i>Preparation of Perspective Plan for manual track maintenance by the sectional officials</i>	<ul style="list-style-type: none"> Advance perspective monthly planning for realignment of curves, deep screening, casual renewal of points and crossing, welding, de-stressing etc. were not made. Activities of maintenance were not executed as per Annual plan of TMS.
<i>Plan for mechanised maintenance through Track Machines (Zonal Headquarters)</i>	<ul style="list-style-type: none"> Annual plan for deployment of various track machines was intimated to Sr. Divisional Engineer (Coordination), Allahabad on 29 April 2016, i.e. after 29 days from the start of the year. Deployment plan of various track machines was not intimated to concerned ADEN and SSE of Kanpur - II.

TMS reports of Allahabad Division during 2016-17	<ul style="list-style-type: none">• Advance planning for smooth shifting and functioning of machines was not made.• Check of reports of TMS regarding working of Track machines over Allahabad Division revealed that during 2016-17 advance planning for smooth shifting and functioning of machines was not made and 2341 machine days out of 6878 machine days i.e. 34 per cent were not utilised / wasted over Allahabad Division on account of non-availability of block, deport work, repairs, shifting, staff rest, site not ready, bad weather, non-availability of fuel etc.																												
Utilisation of track machines in Allahabad Division	<ul style="list-style-type: none">• Average shortfall in achievement of target over Allahabad Division was 55 per cent with minimum value of 14 per cent and maximum value of 87.5 per cent.• Shortfall in targets of ballast cleaning machine (87 per cent), ballast regulation machine (57 per cent), Tamping, lifting, slewing and deep screening of track (59per cent),Tamping, aligning and labelling of track (56 per cent) and Lining, labelling and tamping of track (68 per cent).																												
Welding of rail joints	<ul style="list-style-type: none">• Use of AT welds, due to which tracks are prone to frequent weld failures, still widespread. Comparison of defect reported in AT welt and Mobile flash butt weld revealed that defects in AT weld was 33.6 per cent and FB weld is 0.92 per cent.i.e. failure in FB weld was negligible. <table><tr><th>Name of the Section</th><th>AT weld population</th><th>Defects noticed in USFD testing</th><th>Percentage</th><th>Flash butt weld population</th><th>Defects noticed in USFD testing</th><th>Percentage</th></tr><tr><td>Govindpuri - Panki</td><td>1242</td><td>435</td><td>35.02</td><td>2622</td><td>15</td><td>0.57</td></tr><tr><td>Panki - Etawah</td><td>2653</td><td>874</td><td>32.94</td><td>8217</td><td>85</td><td>1.03</td></tr><tr><td>Total</td><td>3895</td><td>1309</td><td>33.60</td><td>10839</td><td>100</td><td>0.92</td></tr></table> <ul style="list-style-type: none">• In SSE /Kanpur, single shot crucible was not initiated in AT welding.	Name of the Section	AT weld population	Defects noticed in USFD testing	Percentage	Flash butt weld population	Defects noticed in USFD testing	Percentage	Govindpuri - Panki	1242	435	35.02	2622	15	0.57	Panki - Etawah	2653	874	32.94	8217	85	1.03	Total	3895	1309	33.60	10839	100	0.92
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Total	3895	1309	33.60	10839	100	0.92																							
USFD testing	<ul style="list-style-type: none">• USFD testing results of rail joints was not recorded in welding register.• USFD was done by the Departmental and Contractual Team. As per USFD test result in jurisdiction of SSE/ II, Kanpur 14734 defective welds and 61 defective rails existed at different locations-• SSE, Kanpur II was not trained in USFD testing.• Scanned images/peak pattern was not saved by the USFD team. Thus, in successive USFD test scrutiny/analysis by concerned supervisors/officers were not possible. Test check of 5 per cent was not conducted by ADEN in the section where the USFD testing was actually carried out by the Contractor.• Due to irregularities in test check new flaw left out by the contractor /USFD team could not be detected.																												
Preparation of location wise stock of USFD tested rails	<ul style="list-style-type: none">• Instructions for preparation of location wise stock were issued by NCR. However, location wise stock of USFD tested rails was not made and certification from USFD operator before use in replacement / change of rail work was not ensured. No system existed to ensure that the only USFD tested rails was used for repair and casual renewal work.• Check of rail / weld failure during 2016-17 in the jurisdiction of SSE /Kanpur II revealed that four weld failure took place but, in order to establish whether the fracture was detectable and missed by USFD machine spot of fracture/ was not inspected by ADEN, Kanpur, Allahabad Division.																												
Date of previous TRC Run and TGI	Check of register of TRC results of track in the office of SSE, Kanpur II revealed that:																												

	<ul style="list-style-type: none">Monitoring frequency of TRC was once in six months.Track recording was not conducted as per prescribed frequency as during 2016-17 track recording was carried in only one times in December'2016TGI of spot of the accident was 107 and no major irregularities were reported by TRC unit.																								
Inspection	<ul style="list-style-type: none">GPS based foot plate inspection device was not procured by NCR and inspection of track was carried out traditionally.Track maintainers were not equipped with communication equipment to report any failure, fracture or damage immediately from the section where short comings / defects in track was observed.																								
Deep screening of ballast	<p>In the jurisdiction of SSE, /II/Kanpur, Deep screening is overdue in main line section at 41 locations for length of 34.46 km, due from three to four years. Section and location wise details are as under:</p> <table><tr><th>S.no</th><th>Section</th><th>Line</th><th>Deep Screening month & year</th><th>Location from km/m to km/m</th><th>Length</th></tr><tr><td>1</td><td>Govindpuri-Panki</td><td>UP & DN</td><td>Dec2002</td><td>1022 to 1026</td><td>4.33 TKM</td></tr><tr><td>2</td><td>Panki-Etawah</td><td>UP & DN</td><td>July 2003</td><td>1027 to 1047</td><td>30.13 TKM</td></tr><tr><td colspan="5">TOTAL</td><td>34.46 TKM</td></tr></table>	S.no	Section	Line	Deep Screening month & year	Location from km/m to km/m	Length	1	Govindpuri-Panki	UP & DN	Dec2002	1022 to 1026	4.33 TKM	2	Panki-Etawah	UP & DN	July 2003	1027 to 1047	30.13 TKM	TOTAL					34.46 TKM
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2	Panki-Etawah	UP & DN	July 2003	1027 to 1047	30.13 TKM																				
TOTAL					34.46 TKM																				
De-stressing of LWR/CWR	De-stressing of LWR/CWR under SSE/II/Kanpur was not entered in TMS. No records were produced to audit regarding due de-stressing and its method.																								
Use of Small Track Machines for mechanized track maintenance	<p>Check of records of SSE/II/Kanpur revealed that:</p> <ul style="list-style-type: none">Over Govindpuri - Etawah section all these maintenance activities are being done through dual maintenance. It not only takes longer time but also affects quality of work resulting in lesser life of the work done.For emergency repairs of Small track machines imprest was not sanctioned.Staff deputed on deployment / operation of small track machines was not trained.Non-availability of imprest and shortfall of machines impacted various aspects of track maintenance like de – stressing, reconditioning, toe load measuring, lifting, trolling and screening of ballast.During March 2017, out of 13Hydraulic track Jack 10were out of order, out of 13Abrasive rail cutters, 10 were out of order and three out of fiveRail drilling machineswere out of order.																								
Manpower for track maintenance	<ul style="list-style-type: none">As on April 2017, against the sanction strength of 488 Track maintainers only 288 track maintainers were on roll.Out of 288 track maintainers 14 track maintainers were deployed in other then track maintenance work.																								
Training for permanent way staff	<p>In NCR, checks of competency certificate in selected sections showed that no system existed to ensure that only trained staffs were posted in LWR /CWR section. It was seen that</p> <ul style="list-style-type: none">44 Track maintainers were posted in the section of SSE /Kanpur-II without imparting initial training of track maintenance.Records of refresher courses were not maintained and Competency certificate for working on LWR section was also not obtained for Key man, Gang mate.TMS report of training of staff was also not updated as a result monitoring of training programme at higher level was not carried out.																								

3. Accident of Train no. 12189, Jablapur - Nizamuddin Mahakaushal Express on 30 March 2017	
<i>Train no. and name</i>	Train no. 12189 - Jablapur –Nizamuddin Mahakaushal Express
<i>Date of Accident</i>	30 March 2017 at 2:30 hrs
<i>Spot of Accident</i>	Between Mahoba and Kulpahar Stations
<i>Zonal Railway</i>	North Central Railway
<i>Division</i>	Jhansi
<i>Name of the Section</i>	Manikpur – Jhansi Section
<i>Jurisdiction of SSE</i>	SSE/Mahoba
<i>Jurisdiction of ADEN</i>	ADEN, Mahoba, Jhansi Division
<i>Loss of life / railway property</i>	Estimated loss of ₹ 25.6 lakh on account of damaged track. Eight rearmost Coaches of the Train derailed 10 passengers injured.
<i>Cause of accident as per supervisors joint note</i>	Fracture near rail joints.
<i>Report of the Commissioner of Railway Safety (CRS)</i>	NAV 
<i>Audit findings regarding track maintenance activities of the section where an accident of passenger train took place on 30 March 2017</i>	
<i>Preparation of Perspective Plan for manual track maintenance by the sectional officials</i>	<ul style="list-style-type: none"> • Advance perspective monthly planning for realignment of curves, deep screening, casual renewal of points and crossing, welding, de-stressing etc. were not made. • Activities of maintenance were not executed as per Annual plan of TMS.
<i>Plan for mechanised maintenance through Track Machines (Zonal Headquarters)</i>	<ul style="list-style-type: none"> • Annual plan for deployment of various track machines was intimated to Sr. Divisional Engineer (Coordination), Jhansi on 29 April 2016, i.e. after 29 days from the start of the year. • Deployment plan of various track machines was not intimated to concerned ADEN and SSE of Mahoba.
<i>TMS reports of Jhansi Division during 2016-17</i>	<ul style="list-style-type: none"> • Advance planning for smooth shifting and functioning of machines was not made. • 3246 machine days out of 7641 were not utilised / wasted over Jhansi Division on account of non-availability of block, deport work, repairs, shifting, staff rest, site not ready etc.
<i>Utilisation of track machines in Jhansi Division</i>	<ul style="list-style-type: none"> • Average shortfall in achievement of target over Jhansi Division was 57 per cent with minimum value of 14 per cent and maximum value of 87.5 per cent. • Shortfall in targets of ballast cleaning machine (87 per cent), ballast regulation machine (57 per cent), Tamping, lifting, slewing and deep screening of track (59 per

	cent), Tamping, aligning and labelling of track (56 per cent) and Lining, labelling and tamping of track (68 per cent).																																			
Welding of rail joints	<ul style="list-style-type: none">Use of AT welds, due to which tracks are prone to frequent weld failures, still widespread. Comparison of defect reported in AT weld and Mobile flash butt weld revealed that defects in AT weld was 3.36per cent and FB weld is 0.1per cent.i.e. failure in FB weld was negligible. <table><tr><th>Name of the Section</th><th>AT weld population</th><th>Defects noticed in USFD testing</th><th>Percentage</th><th>Flash butt weld population</th><th>Defects noticed in USFD testing</th><th>Percentage</th></tr><tr><td>JHS-MBA</td><td>6956</td><td>270</td><td>3.88</td><td>2048</td><td>6</td><td>0.29</td></tr><tr><td>MBA KID</td><td>329</td><td>23</td><td>6.99</td><td>2412</td><td>8</td><td>0.33</td></tr><tr><td>MBA KURJ</td><td>1446</td><td>0</td><td>0</td><td>9022</td><td>0</td><td>0</td></tr><tr><td>Total</td><td>8731</td><td>293</td><td>3.36</td><td>13482</td><td>14</td><td>0.1</td></tr></table> <ul style="list-style-type: none">In SSE / Mahoba, single shot crucible was not initiated in AT welding after 01 April 2015 due to non-supply of single shot crucible welding portion.	Name of the Section	AT weld population	Defects noticed in USFD testing	Percentage	Flash butt weld population	Defects noticed in USFD testing	Percentage	JHS-MBA	6956	270	3.88	2048	6	0.29	MBA KID	329	23	6.99	2412	8	0.33	MBA KURJ	1446	0	0	9022	0	0	Total	8731	293	3.36	13482	14	0.1
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Total	8731	293	3.36	13482	14	0.1																														
USFD testing	<ul style="list-style-type: none">USFD testing results of rail joints was not recorded in welding register.USFD was done by the Departmental and Contractual Team. As per USFD test result in Jhansi – Mahoba section 276 defective welds and 75 defective rails were exist at different locations. Year of welding in most of the defective welds was 2002 and 2003 i.e. these welds are old and prone to frequent weld failures.Training and Workshop for training of ADEN and SSE to handle USFD machines independently was not conducted in Jhansi Division of North Central Railway. SSE, Mahobawas not trained in USFD testing.Scanned images / peak patterns were not saved by the USFD team. Thus, in successive USFD test scrutiny / analysis by concerned supervisors / officers were not possible.Test check of 5 per cent was not conducted by ADEN in the section where the USFD testing was actually carried out by the Contractor.Due to irregularities in test check new flaw left out by the contractor / USFD team could not be detected.																																			
Preparation of location wise stock of USFD tested rails	<ul style="list-style-type: none">Instructions for preparation of location wise stock was issued by NCR. However, location wise stock of USFD tested rails was not made and certification from USFD operator before use in replacement / change of rail work was not ensured. No system existed to ensure that the only USFD tested rails was used for repair and casual renewal work.Check of rail / weld failure during 2016-17 in the jurisdiction of SSE / MahobaOneweld failure took place but, in order to establish whether the fracture was detectable and missed by USFD machine spot of fracture/ was not inspected by ADEN, Mahoba, Jhansi Division.																																			
Date of previous TRC Run and TGI	<p>Check of register of TRC results of track in the office of SSE, Mahoba revealed that:</p> <ul style="list-style-type: none">In Jhansi – Mahoba sectionmonitoring frequency of TRC was once in six months.Track recording was not conducted as per prescribed frequency as during 2016-17 track recording was carried in only one times on 24 July 2016. As per TRC register TGI of spot of the accident (Km 1291) was 110. i.e. no deficiencies were detected by TRC unit in track parameters.																																			
Inspection	<ul style="list-style-type: none">GPS based foot plate inspection device was not procured by NCR and inspection of track was carried out traditionally.Track maintainers were not equipped with communication equipment to report any failure, fracture or damage immediately from the section where short comings /																																			

	defects in track was observed.
<i>Deep screening of ballast</i>	Records of deep screening in the Jhansi – Mahoba section was not available in office of SSE / Mahoba and SSE states that Deep screening is overdue in a large portion of Jhansi – Mahoba section.
<i>De-stressing of LWR/CWR</i>	Details of De – stressing of LWR / CWR was not made available to Audit.
<i>Standardisation of Track structure</i>	<ul style="list-style-type: none"> Track structure was not standardised with 60 Kg, 90 UTS rails. As per rail change report during 2016-17, both 52 Kg rails were still in use. <p>During 2016-17 in 84 instances rail were replaced due to defects. Out of these,</p> <ul style="list-style-type: none"> 41 instances were caused by defects in welds at joints viz. defective weld, IMR weld, weld failure. In 23 cases rails were changed due to defects in rail viz pitted rail, scabbed rail, OBS rail.
<i>Use of Small Track Machines for mechanized track maintenance</i>	<ul style="list-style-type: none"> In Jhansi – Mahoba section all maintenance activities are being done through manually as well as through machines. Track maintenance work such as de-stressing, reconditioning, toe load measuring, lifting, troling and screening of ballast was impacted due to the following constraints: Number of small track machines was not adequate Arrangement for transport of these machines was not proper Spares for small track machines were not available in local market For emergency repairs of Small track machines imprest was not sanctioned. Staff deputed on deployment / operation of small track machines were not trained. <p>This impacted</p> <ul style="list-style-type: none"> Check of records of SSE, Mahoba revealed that there was huge shortage of small track machines. During June 2017, <ul style="list-style-type: none"> 7 out of 11 Abrasive rail cutters were out of order 13 out of 20 Rail drilling machines were out of order 2 out of 3 Rail profile weld grinders were out of order
<i>Manpower for track maintenance</i>	Out of 127 track maintainers on roll 20 track maintainers were deployed in other than track maintenance work.
<i>Training for permanent way staff</i>	<p>In NCR, checks of competency certificate in selected sections showed that no system existed to ensure that only trained staffs were posted in LWR / CWR section. It was seen that</p> <ul style="list-style-type: none"> 61 Track maintainers were posted in the section of SSE / Mahoba without imparting initial training of track maintenance. Records of refresher courses were not maintained and Competency certificate for working on LWR section was also not obtained for Key man, Gang mate. TMS report of training of staff was also not updated as a result monitoring of training programme at higher level was not carried out.
4. Derailment of Train no. 18101, Tata-Jammu Tawi Express on 25 March 2015	
<i>Train no. and name</i>	Train no. 18101 Tata Jammu Tawi Express
<i>Date of Accident</i>	25.05.2015, 13:45

Spot of Accident	Near KM-887/21 in Sirathu- Athsarai Section
Zonal Railway	North Central Railway
Division	Allahabad
Name of the Section	Allahabad - Kanpur
Jurisdiction of SSE	SSE/Khaga
Jurisdiction of ADEN	ADEN, Line, Allahabad Division
Loss of life/ railway property	11 coaches derailed, cost of damage Rs.1.64 crore Death of 10 passengers
Cause of accident	Buckling of Track
Report of the Commissioner of Railway Safety (CRS)	Report of CRS finalised on 26.05.2015 and as per enquiry report of CRS derailment of Train caused by buckling of track. Responsibility fixed against three railway staffs.
Audit findings regarding track maintenance activities of the section where an accident of passenger train took place on 25May 2015	
Preparation of Perspective Plan for manual track maintenance by the sectional officials	<ul style="list-style-type: none"> Advance perspective maintenance plans for maintenance were not prepared by SSE, Khaga. Advance planning for realignment of curves, deep screening, casual renewal of points and crossing, welding, de-stressing etc. were not made.
Plan for mechanised maintenance through Track Machines (Zonal Headquarters)	<ul style="list-style-type: none"> Annual plan for deployment of various track machines was intimated to Sr. Divisional Engineer (Coordination), Allahabad on 29 April 2016, i.e. after 29 days from the start of the year. Deployment plan of various track machines was not intimated to concerned ADEN and SSE.
TMS reports of Allahabad Division during 2016-17	<ul style="list-style-type: none"> Advance planning for smooth shifting and functioning of machines was not made. Advance planning for smooth shifting and functioning of machines was not made and 2341 machine daysout of 6878 machine days i.e. 34 per cent were not utilised / wasted over Allahabad Division on account of non-availability of block, depot work, repair, shifting, Staff rest, site not ready, bad weather, non-availability of fuel etc.
Utilisation of track machines in Allahabad Division	<ul style="list-style-type: none"> Average shortfall in achievement of target for 17 machines over Allahabad Division of NCR was 57 per cent with minimum value of 23.34 and maximum value of 81.61 percent. Shortfall in targets of ballast cleaning machine (70.5 per cent), ballast regulation machine (68.5 per cent), Tamping, lifting, slewing and deep screening of track (39 per cent), Tamping, aligning and labelling of track (76.8 per cent) and Lining, labelling and tamping of track (62.8 per cent).
Welding of rail joints	<ul style="list-style-type: none"> Use of AT welds, due to which tracks are prone to frequent weld failures, still widespread. In jurisdiction of SSE / Khaga, single shot crucible was not initiated in AT welding after 01 April 2015 due to non-supply of single shot crucible welding portion. In some cases single shot crucible was used only after January 2017.

USFD testing	<ul style="list-style-type: none">USFD was testing of the section was carried out by the Departmental Team and by the contractor M/s Khemchandra.SSE, Khaga was not trained in USFD testing.Test check of 5 <i>per cent</i> was not conducted by ADEN in the section where the USFD testing was actually carried out by the Contractor.Scanned images / peak patterns were not saved by the USFD team. Thus, in successive USFD test scrutiny / analysis by concerned supervisors / officers were not possible.Due to irregularities in test check new flaw left out by the contractor / USFD team could not be detected.																																																						
Preparation of location wise stock of USFD tested rails	<ul style="list-style-type: none">Instructions for preparation of location wise stock were issued by NCR. However, location wise stock of USFD tested rails was not made and certification from USFD operator before use in replacement / change of rail work was not ensured. No system existed to ensure that the only USFD tested rails was used for repair and casual renewal work.Check of rail / weld failure during 2016-17 in the jurisdiction of SSE / Khaga revealed that one number of weld failure took place but, in order to establish whether the fracture was detectable and missed by USFD machine spot of fracture/ was not inspected by ADEN, Line, Allahabad.																																																						
Date of previous TRC Run and TGI	<p>Check of register of TRC results of track in the office of SSE, Khaga revealed that:</p> <ul style="list-style-type: none">Allahabad – Kanpur route of Indian Railway comes under ‘A’ routes i.e. monitoring frequency of TRC was once in three months.During 2016-17Track recording by TRC was conducted on 22.07.2016 and 26.12.2016 i.e. recording of track was not conducted as per prescribed frequency.Track recording car did not have an uninterrupted run over Allahabad – Kanpursection of NCR and speed of TRC was also not uniform. Thus, comparable results between successive recordings were not produced by TRC unit.																																																						
Inspection	<ul style="list-style-type: none">GPS based foot plate inspection device was not procured by NCR and inspection of track was carried out traditionally.Track maintainers were not equipped with communication equipment to report any failure, fracture or damage immediately from the section where short comings / defects in track was observed.																																																						
Deep screening of ballast	<p>In the jurisdiction of SSE, Khaga, Deep screening was overdue at 07 locations for length of 25 Kilo meter between twoto five years, as detailed below:</p> <table><tr><th>S.no.</th><th>Section</th><th>Line</th><th>Deep Screening month & year</th><th>Location from km/m to Km/m</th><th>Length</th></tr><tr><td>1</td><td>SRO - Yard</td><td>UP</td><td>2003</td><td>881.83 to 882.63</td><td>0.80 TKM</td></tr><tr><td>2</td><td>ASCE YARD</td><td>UP</td><td>2002</td><td>888.88 to 889.46</td><td>0.60 TKM</td></tr><tr><td>3</td><td>KUW YARD</td><td>UP</td><td>2002</td><td>894.00 to 895.24</td><td>1.24 TKM</td></tr><tr><td>4</td><td>KTCE YARD</td><td>UP</td><td>2002</td><td>899.85 to 901.14</td><td>1.29 TKM</td></tr><tr><td>5</td><td>SNIE YARD</td><td>UP</td><td>2005</td><td>914.22 to 915.40</td><td>1.18 TKM</td></tr><tr><td>6</td><td>SRO YARD</td><td>DN</td><td>2005</td><td>881.82 to 882.84</td><td>1.02 TKM</td></tr><tr><td>7</td><td>KUW - SNIE</td><td>DN</td><td>2003</td><td>895.27 to 914.22</td><td>18.95 TKM</td></tr><tr><td colspan="5">Total</td><td>25.08 TKM</td></tr></table>	S.no.	Section	Line	Deep Screening month & year	Location from km/m to Km/m	Length	1	SRO - Yard	UP	2003	881.83 to 882.63	0.80 TKM	2	ASCE YARD	UP	2002	888.88 to 889.46	0.60 TKM	3	KUW YARD	UP	2002	894.00 to 895.24	1.24 TKM	4	KTCE YARD	UP	2002	899.85 to 901.14	1.29 TKM	5	SNIE YARD	UP	2005	914.22 to 915.40	1.18 TKM	6	SRO YARD	DN	2005	881.82 to 882.84	1.02 TKM	7	KUW - SNIE	DN	2003	895.27 to 914.22	18.95 TKM	Total					25.08 TKM
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De-stressing of LWR/CWR	<p>In the sections of SSE, Khaga,during 2016-17, de-stressing is required at 07 locations of main line. Details are as under:</p>																																																						

	<table><tr><th>Location from</th><th>Location To</th><th>Required de-stressing in kilo meter</th></tr><tr><td>895.34</td><td>899.85</td><td>4.51</td></tr><tr><td>894.33</td><td>895.24</td><td>0.91</td></tr><tr><td>900.16</td><td>900.92</td><td>0.76</td></tr><tr><td>900.14</td><td>900.92</td><td>0.78</td></tr><tr><td>901.13</td><td>906.80</td><td>5.67</td></tr><tr><td>914.42</td><td>915.10</td><td>0.68</td></tr><tr><td>915.30</td><td>921.0</td><td>5.70</td></tr><tr><td colspan="2">Total</td><td>19.01</td></tr></table> <p>Records of de-stressing were not maintained and access to TMS reports were not provided to Audit. Thus could not be ascertained that the due de-stressing was carried out.</p>	Location from	Location To	Required de-stressing in kilo meter	895.34	899.85	4.51	894.33	895.24	0.91	900.16	900.92	0.76	900.14	900.92	0.78	901.13	906.80	5.67	914.42	915.10	0.68	915.30	921.0	5.70	Total		19.01																													
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Use of Small Track Machines for mechanized track maintenance	<p>In Allahabad – Kanpur section all maintenance activities are being done through manually as well as through machines. Track maintenance work such as de-stressing, reconditioning, toe load measuring, lifting, trolling and screening of ballast was impacted due to the following constraints:</p> <ul style="list-style-type: none">• Number of small track machines was not adequate• Arrangement for transport of these machines was not proper• Spares for small track machines were not available in local market• For emergency repairs of Small track machines imprest was not sanctioned.• Staff deputed on deployment/ operation of small track machines was not trained.																																																								
Manpower for track maintenance	<p>As on 1 March 2015, the staff position in under the SSE/Khaga was as follows:</p> <table><tr><th>Category</th><th>Sanction</th><th>Actual Men on roll</th><th>Shortage</th></tr><tr><td>Blacksmith</td><td>08</td><td>06</td><td>-02</td></tr><tr><td>Welder</td><td>05</td><td>02</td><td>-03</td></tr><tr><td>Fitter</td><td>02</td><td>02</td><td>00</td></tr><tr><td>Car penter</td><td>01</td><td>01</td><td>00</td></tr><tr><td>Penter</td><td>01</td><td>01</td><td>00</td></tr><tr><td>Mate</td><td>08</td><td>07</td><td>-01</td></tr><tr><td>Key Man</td><td>13</td><td>8</td><td>-05</td></tr><tr><td>Track Maintainer</td><td>222</td><td>176</td><td>-46</td></tr><tr><td>Head Trolley Man</td><td>04</td><td>03</td><td>-01</td></tr><tr><td>Trolley Man</td><td>12</td><td>07</td><td>-05</td></tr><tr><td>Gate Man</td><td>28</td><td>28</td><td>00</td></tr><tr><td>Stock issuer</td><td>01</td><td>01</td><td>00</td></tr><tr><td>Total</td><td>305</td><td>242</td><td>-63</td></tr></table> <p>Out of 242 staff on roll, 41 staff were absent from the duty without any intimation to office establishment between 01.05.2014 to 30.05.2015. Though shortages of staff were communicated by SSE in the monthly reports, no action was taken so far for filling of vacancies.</p> <p>As such, actual man power of SSE's after rest, leave, sick, absent and training was being used in maintenance activities. Thus, work of regular maintenance in jurisdiction of SSE, Khaga was hampered.</p>	Category	Sanction	Actual Men on roll	Shortage	Blacksmith	08	06	-02	Welder	05	02	-03	Fitter	02	02	00	Car penter	01	01	00	Penter	01	01	00	Mate	08	07	-01	Key Man	13	8	-05	Track Maintainer	222	176	-46	Head Trolley Man	04	03	-01	Trolley Man	12	07	-05	Gate Man	28	28	00	Stock issuer	01	01	00	Total	305	242	-63
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Total	305	242	-63																																																						
Training for permanent way staff	<p>In NCR, Check of competency certificate in selected sections showed that no system existed to ensure that only trained staffs were posted in LWR / CWR section. It was seen that</p>																																																								

	<ul style="list-style-type: none"> • 30 Track maintainer were posted in the section of SSE / Khaga without imparting initial training of track maintenance. • Records of refresher courses were not maintained and Competency certificate for working on LWR section was also not obtained for Keyman, Gangmate. • TMS report of training of staff was also not updated as a result monitoring of training programme at higher level was not carried out.
5. Accident of Train no. 53342 DN–Muri-Dhanbad Passenger on 22 June 2014	
<i>Train no. and name</i>	Train no. 53342 DN–Muri-Dhanbad Passenger
<i>Date of Accident</i>	22 nd June 2014 at about 05.35 hours
<i>Spot of Accident</i>	In Muri – Bokaro Section at Bokaro ‘A’ cabin Km 402/06.
<i>Zonal Railway</i>	South Eastern Railway
<i>Division</i>	ADRA
<i>Name of the Section</i>	Muri – Bokaro
<i>Jurisdiction of SSE</i>	Sr. Section Engineer (SSE) /Bokaro
<i>Jurisdiction of ADEN</i>	Assistant Divisional Engineer (ADEN), Bokaro, Adra Division
<i>Loss of life/ railway property</i>	No Casualty
<i>Cause of accident as per supervisors joint note</i>	Rail fracture of RHS tongue Rail (5.09 mtrs. From toe)
<i>Report of Chief Safety Officer(SER)</i>	Enquiry Report has been submitted by CTE, CSE, CETE and CSO on 08.07.2014.
Audit findings regarding track maintenance activities of the section where an accident of passenger train took place on 22nd June 2014.	
<i>Preparation of Perspective Plan for manual track maintenance by the sectional officials</i>	<ul style="list-style-type: none"> • Advance perspective maintenance plans were not prepared. • Advance planning for realignment of curves, deep screening, casual renewal of points and crossing, welding, de-stressing etc. were not planned.
<i>Plan for mechanised maintenance through Track Machines (Zonal Headquarters)</i>	Deployment plan of various track machines was not intimated to concerned SSE of Bokaro.
<i>TMS reports of Adra Division during 2014-15</i>	Not applicable in respect of Tongue Rail
<i>Utilisation of track machines in Adra Division</i>	Not applicable in respect of Tongue Rail
<i>Welding of rail joints</i>	Welding of joints does not arise in Tongue Rail
<i>USFD testing</i>	<ul style="list-style-type: none"> • USFD of the Section in between Km400/500 Km to 402/500 kms was done on 24 May 2014 by the PWI/USFD. No deficiencies were reported in USFD testing.

	<ul style="list-style-type: none">It was revealed during inquiry that testing of this fractured location of Tongue rail is beyond the capacity of normal USFD rail testing process and there is no special technique of testing of Tongue rails as mentioned in USFD Manual 2012.It was noted that this important aspect has not been taken care of till date as Railways have been spending lot of resources on USFD testing of track to detect flaws in the rails as well as welds.Therefore, some system should be adopted for USFD checking as well as monitoring of health of Tongue Rail on regular basis.								
Preparation of location wise stock of USFD tested rails	Not applicable								
Track recording	As per TMS record, TRC run prior to the date of accident in the section was done during July 2011 and thereafter in September 2014.								
Inspection	Scheduled monthly inspections were being done by the Sectional PWI and there was no shortfall.								
Deep screening of ballast	As per TMS record, In the jurisdiction of SSE, Bokaro, Deep screening in the section was last done during the year 2004-05 and then during February 2014. Therefore, Deep Screening was not overdue in the Section.								
De-stressing of LWR/CWR	De-stressing of Tongue Rail is not applicable.								
Standardisation of Track structure	Tongue Rail of Bokaro – A Cabin is of 60 Kg rail								
Use of Small Track Machines for mechanized track maintenance	<p>InMuri - Bokaro section all maintenance activities were done manually as well as through machines. Track maintenance work such as de-stressing, reconditioning, toe load measuring, lifting, troling and screening of ballast was impacted due to the following constraints:</p> <ul style="list-style-type: none">Number of small track machines was not adequateFor emergency repairs of small track machines imprest was not sanctioned.								
Manpower for track maintenance	<p>As on 1 April 2017, the Sanctioned Strength, actual men-in roll (Track Maintainers) under the SSE/Bokaro is as follows:</p> <table><tr><th>Sanctioned Strength</th><th>Men on Roll</th><th>Vacancy</th><th>Staff working in various Office Establishments</th></tr><tr><td>426</td><td>328</td><td>98</td><td>22</td></tr></table> <p>Though shortage of staff was communicated by SSE in the monthly reports, no action was taken so far for filling of vacancies. Further, 22 number of staff were engaged in various office establishments for which work of regular maintenance in jurisdiction of SSE, Bokaro was hampered.</p>	Sanctioned Strength	Men on Roll	Vacancy	Staff working in various Office Establishments	426	328	98	22
Sanctioned Strength	Men on Roll	Vacancy	Staff working in various Office Establishments						
426	328	98	22						
Training for permanent way staff	Check of competency certificate in selected sections showed that no system existed to ensure that only trained staffs were posted in LWR/ CWR section. However, It was seen that 85 Track maintainers were posted in the section of SSE, Bokaro without imparting initial training of track maintenance.								