



A view of DEMU train, NFR

Rolling Stock

New Rolling Stock placed on line during the year is given in the following table:

Type of Rolling Stock	Year	Units placed on line					
		Replacement account			Additional account		
		B.G.	M.G.	N.G.	B.G.	M.G.	N.G.
Diesel Locos	2015-16	95	-	03	256	-	-
	2016-17	236	-	05	104	-	-
Electric Locos	2015-16	68	-	-	191	-	-
	2016-17	64	-	-	189	-	-
Wagons@ (in vehicle units)	2015-16	13,412					
	2016-17	12,323					
@Total wagons produced during the year (including BLC & Pvt. Wagons)							
Electric Multiple Units							
Motor Coaches	2015-16	127	-	-	10	-	-
	2016-17	201	-	-	24	-	-
Trailer Coaches	2015-16	258	-	-	16	-	-
	2016-17	402	-	-	48	-	-
Main line Electric Multiple Units							
Motor Coaches	2015-16	-	-	-	35	-	-
	2016-17	-	-	-	32	-	-
Trailer Coaches	2015-16	-	-	-	108	-	-
	2016-17	-	-	-	96	-	-
Passenger Carriages	2015-16	885	-	-	2,134	-	-
	2016-17	614	-	-	2,013	-	-
Other Coaching Vehicles	2015-16	66	-	-	86	-	-
	2016-17	16	-	-	111	-	-



Express 21 Locomotive oldest one

Stock condemned during the year was as under:

Type of Rolling Stock	B.G.		M.G.		N.G.	
	2015-16	2016-17	2015-16	2016-17	2015-16	2016-17
Diesel Locos	95	236	38	19	03	15
Electric Locos	68	64	-	-	-	-
Wagons (in Vehicle Units)	8,429	2,462	177	295	-	-
Electric Multiple Units						
Motor Coaches	7	32	-	-	-	-
Trailer Coaches	88	46	-	-	-	-
Passenger Carriages	1,103	1,403	233	389	44	8
Other Coaching Vehicles	182	181	19	15	-	-

Traction

The entire passenger and freight traffic, in terms of both Gross Tonne Kilometres (GTKMs) and Train Kilometres was carried by diesel and electric locomotives. Steam locomotives, however, continued to run on certain steam circuits including Hill Railways as icons of IR's glorious past.

The traction-wise fleet as on March 31, 2017, was as follows:

	As on March 31, 2016	(in units) As on March 31, 2017
Locomotive		
Steam	39	39
Diesel	5,869	6,023
Electric	5,214	5,399
Total	11,122	11,461



Automatic coach washing plant at Modgaon, KRCL

Manufacturing of Rolling Stock

The performance of Production Units during 2016-17 was as under:

- **Chittaranjan Locomotive Works (CLW), Chittaranjan** manufactured 292 BG 3-phase HHP electric locomotives (equipped with IGBT technology based propulsion system & auxiliary converters).
- **Diesel Locomotive Works (DLW), Varanasi** manufactured 334 BG HHP diesel locomotives including 02 BG Electric HHP Locomotives and 16 diesel locomotives for Non-Railway Customers (NRCs). DLW has started manufacturing of electric locomotives from 2016-17. The total value of sales for NRC was ₹185 Crores.
- **Integral Coach Factory (ICF), Chennai** manufactured 2,215 coaches including 241 Diesel Electric Multiple Units (DEMUs), 21 Self Propelled High Speed Accident Relief Train (SPART) coaches (7 train sets), 400 LHB coaches and 528 coaches (44 rakes) for MRVC and 52 coaches for Non Railway Customers. The approximate value of sale for NRC customers is ₹1,251 crores including coaches for MRVC.
- **Rail Coach Factory (RCF), Kapurthala** manufactured 1,489 coaches including 120 Main line Electric Multiple Units (MEMUs), 493 light weight LHB coaches with higher passenger comfort and amenities and 138 coaches for Non Railway Customers of the value of ₹248.5 crores.
- **Modern Coach Factory (MCF), Raebareli** manufactured 576 LHB coaches during 2016-17.
- **Rail Wheel Factory (RWF), Bengaluru** produced 45,940 wheel-sets. It also manufactured 1,30,033 wheels and 74,444 axles. The value of sale for NRC customers is of ₹37 crores.
- **Rail Wheel Plant (RWP), Bela** produced 23,770 wheels during 2016-17.
- **Diesel Loco Modernisation Works (DLMW), Patiala** successfully upgraded 114 Nos. of diesel electric locomotives to 3100 HP, thus increasing the hauling capacity to the extent of 3 to 4 additional coaches. DMW also manufactured 32 mainline shunting locomotives for IR.

Innovation in EMU/MEMU rakes and Mumbai area:

Introduction of new state-of-the-art technology AC EMU rakes in Mumbai area:

All 72 EMU rakes of 12 car with energy efficient IGBT based 3-phase propulsion system under MUTP-II project have been manufactured and inducted into passenger service in Mumbai suburban network.

Two EMU rakes with indigenously developed energy efficient IGBT based 3-phase propulsion system have been manufactured by ICF. Tests and trials have been completed & awaited for CRS sanction.



Carshed of Metro Railway at Kavi Subhash Station



Class PT Locomotive



DLW Built first Electric Locomotive-6000 HP WAP7 Varun

It has been decided to manufacture 565 EMU coaches with energy efficient IGBT based 3-phase propulsion system with Air conditioning, CCTV camera, Automatic door closing system, gangways/vestibules under MUTP-III project for Mumbai Suburban system.

One prototype Air conditioned EMU rake with indigenously developed 3-phase IGBT based electrics has been manufactured and is in the final stage of tests/trials at Western Railway.

Provision of Surveillance camera in EMU/MEMU & Kolkata Metro Coaches:

It has been decided to provide CCTV Surveillance Cameras in all coaches of Indian Railway.

Energy Efficient Measures

- LED fitting
- Provision of LED light fitting in coaches
- Till date around 1300 coaches are retrofitted with LED fittings
- All new coaches from Production Units are manufactured with LED light fittings
- With the provision of LED fittings in all coaches an annual saving of ₹68 crores is likely to be achieved.

Imports

Import content of raw material/components, in terms of percentages of total production cost (excluding performance charges) for different types of rolling stock manufactured in Indian Railway Production Units for the year 2016-17 is furnished below:



5500 HHP WDG-5 Diesel Electric main line heavy goods service locomotive

Production Unit	Locomotives	Import content (%)	
		2015-16	2016-17
DLW	WDP-4D	19.76	12.39
	WDG-4D	21.21	12.63
	WDG-5	74.84	74.19
	WDG-4D (NRC loco)	-	12.63
	WDG-3A (NRC loco)	-	1.44
CLW	WAG-9	2.44	3.66
	WAP-7	2.57	3.53
	WAP-5	3.15	4.20
ICF	LGS	1.32	-
	LSCN	1.37	4.01
	LACCN	1.13	3.75
	LACCN	0.92	4.33
	LWLRRM	0.78	3.20
	LS-ANTODAYA	-	2.81
	RCF/KAPURTHALA	ACCN/LHB (3 Tier AC LHB)	3.54
	ACCN/LHB (3 Tier AC LHB) (HUMSAFAR)	-	1.95
	ACCW/LHB	2.72	2.05
	FAC/LHB(1 st AC LHB)	2.73	2.03
	WLRRM/LHB	3.18	1.59
	WLRRM/LHB (HUMSAFAR)	-	1.55
	CBAC/LHB	-	2.12



Indigenized wheel disc assembly, CLW

	FCZAC/LHB	2.74	2.08
	FCZAC/LHB (HUMSAFAR)	-	1.63
	SCZAC/LHB	2.74	2.07
	SCZAC/LHB (HUMSAFAR)	-	1.40
	FACWAC	-	2.06
	LWSCN	5.61	2.86
	LWSCZ	3.47	2.62
	LGS	4.91	2.05
MCF	LWACCW	3.59	3.30
	LWACCN	4.74	3.31
	LWSCN	7.12	6.96
	HUMSAFAR	-	3.00
	LS(GEN)	-	7.20
	LS-5	-	4.39
	ANTYODYA	-	5.75



Opening of DLW Built first diesel Loco Kundan for public

IR's bulk requirement of wagons is met by wagon manufacturing units both in public and private sectors as well as PSUs under the administrative control of Ministry of Railways. During the year 2016-17, 12,323 wagons were inducted in Indian Railway System. Out of these, 1,030 wagons (including 462 BLC wagons) were manufactured by railway workshops and the remaining 11,293 wagons including 80 BLC wagons were manufactured by wagon industry.

During the year 2017-18 (upto September, 2017), 4,466 wagons were inducted in Indian Railway system. Out of these, 580 wagons (including 301 BLC wagons) were manufactured by Railway Workshops and the remaining 3,886 wagons were manufactured by wagon industry.

Maintenance of Rolling Stock

The number of units of rolling stock given periodic overhaul (POH) in railway workshops during the year are given in the following table:

Type of Rolling Stock (BG + MG)	Periodic overhaul (nos.) undertaken during the year	
	2015-16	2016-17
Diesel Locos	511	486
Electric Locos	465	436
Coaches	30,415	30,649
Wagons	49,075	49,663

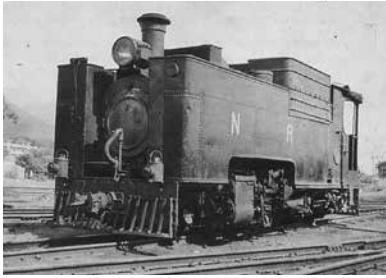
The percentage of ineffective stock to the total stock on line for different types of rolling stock was as follows:

Type of Rolling Stock	Percentage of ineffective stock to the total stock on line			
	B.G.		M.G.	
	2015-16*	2016-17	2015-16*	2016-17
Steam Locos	-	-	12.39	28.28
Diesel Locos	8.76	8.93	18.17	17.15
Electric Locos	6.97	7.43	-	-
EMU Coaches	11.50	12.0	-	-
Passenger Carriages	6.10	5.95	2.56	1.08
Other Coaching Vehicles	6.04	5.55	0.83	-
Wagons	4.26	3.63	100.00	100.00

*revised



First Train on Thane Bridge GIPR 1853-54



KC 520 Steam Locomotive

Export Order

The total value of exports of rolling stock during 2016-17 was ₹373.10 crore. The cumulative value of export of rolling stock/spares up to the end of March 2016 and March, 2017 was ₹2,578.75 crore and ₹2,951.85 crore, respectively. The value of export of rolling stock/spares during April-September, 2017 was ₹68.62 crore.

The exports during 2016-17 include locos and lease cum maintenance with KTMB to Malaysia.

Modernization of Workshops

Central Organisation for Modernisation of Workshops (COFMOW) was established under the Ministry of Railways by the Government of India for modernizing Indian Railways workshops. The modernization project was funded through World Bank credits. Since its establishment in the 1979, year COFMOW has assisted in modernizing Indian Railways Production Units and Maintenance Workshops. This has involved purchasing over 21,331 machines valued at ₹5,895 crore. It continues its endeavor to provide crucial technical support to the various manufacturing & maintenance units of Indian Railways. It has now taken up turnkey projects of setting up workshops/expansion of workshops.

COFMOW is in a position to offer its services to those needing modernization or up gradation of their manufacturing/maintenance activities with enhanced productivity. COFMOW provides professional advice and procurement of machine tools and allied equipment.

Salient Features

- Imbibing latest State of the Art technologies available worldwide in the field of M&P.
- Professional expertise is gained through training staff in the required area by interaction with firms and studying the field requirements.
- Supports not only Mechanical units, but all the departments of Indian Railways vis-à-vis their M&P requirements.
- Upgradation and compilation of specifications of all machines used in various workshops, maintenance sheds and Production Units.
- E-tendering is being done for all M&P items.
- Reverse Auction.
- Successive efforts for indigenization have led to FOREX savings.
- Setting up complete plants on composite, turnkey basis.

Key Milestones

S. No.	Year	Fund Utilization (₹in crore)
1.	2015-16	443
2.	2016-17	481



Class YF Locomotive

Turnkey Projects

COFMOW has recently embarked upon the journey of handling Turnkey composite works including machinery/plant, Civil and Electrical works, all executed in tandem.

ICF Expansion Project:

- Composite works contracts for augmentation of production capacity at ICF for manufacturing of advanced LHB coaches (Cost. ₹127 crore) has been completed and handed over.
- More than 350 LHB shells have so far been manufactured from the facility.

Spring manufacturing facility for ICF:

- A composite turnkey project for manufacturing of Coiled Spring at ICF has been awarded at ₹84 crores. Work is under progress.

Automatic Wheel & Axle Assembly Complex for RWF:

- Composite project has been awarded at ₹49.42 crores in May, 2016 and work is under progress.

Augmentation of Wheel Shop at Matunga Workshop, Central Railway

- Project for Augmentation of Wheel Shop Capacity at Matunga Workshop has been awarded at ₹62.00 crores and is under progress.

Creation of Wheels and Bogie Overhauling Facility/Central Railway:

- Turnkey Project basis for Creation of Wheels and Bogie Overhauling Facility at Sanpada EMU Car Shed, Central Railway has been awarded at ₹33.64 crores and is likely to be completed by the end of 2017.

Setting up of BG Coach POH Shed with holding capacity of 27 Non AC Coaches, Nagpur/SECR:

- A Composite work on Turn Key basis for Setting up of BG coach POH shed with holding capacity of 27 Non AC Coaches at Moti Bagh Workshop, Nagpur at ₹83.95 crore has been awarded and work in progress.

Besides the above modernization and augmentation work of POH capacity to 150 wagon at Dahod workshop (Western Railway) and augmentation of BG coach POH capacity from 50 to 100 coaches at Bhavnagar Workshop are under finalization.

Simulators:

- A turnkey contract for 12 nos. Simulators has been awarded valued at ₹155 crore (approx.) to enhance the skills of train drivers. 09 nos. simulators have been supplied and 06 have been commissioned.
- Another turnkey project of 14 nos. of Simulators at an estimated cost of ₹162.96 crore has been floated.