Production Units & Workshops of Indian Railways - Need for professional management

Suggestions for optimum utilization of infrastructure & resources

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Part-A

PRODUCTION UNITS OF INDIAN RAILWAYS

Adapting to dynamic changes

Despite of heavy limitations imposed on them

A.1. Production units of Indian Railways

A.1.1 Production units of Indian Railways are catering the need of Loco and Coach requirements of IR over the years (Requirement during XII five year plan is given in Annexure-I of Part-A). Besides its' own PUs Railways is also getting coaches regularly from BEML Bangalore a Public Sector Unit. In the recent years IR also ventured into purchasing entire formation of trains from private firms, IR's Production Units are

Sl. No	Name	Abbr.	Year Estd	Location	Main products
1.	Chittaranjan Locomotive Works	CLW	1947	Chittaranjan	Electric Locomotives
2.	Integral Coach Factory	ICF	1952	Chennai	Passenger coaches
3.	Diesel Locomotive Works	DLW	1961	Varanasi	Diesel Locomotives
4	Diesel-Loco Modernisation Works	DMW	1981	Patiala	Diesel-electric Locomotives
5.	Rail Wheel Factory	RWF	1984	Bangalore	Wheels and axles
6.	Rail Coach Factory	RCF	1986	Kapurthala	Passenger coaches
7.	Rail Spring Karkhana *	RSK	1988	Gwalior	Passenger coach springs
8.	Rail Wheel Factory **	RWF	2012	Chhapra	Railway wheels
9.	Rail Coach Factory **	RCF	2012	Raebareli	Passenger coaches
10	Diesel Component Factory **		2013	Dankuni	Diesel Loco components

Doesn't have the status of fully fledged production unit** * Not started fully fledged production***

A.1.2. The main **Production Units of the Indian Railways in Locomotives** sections are:

i. **Chittaranjan Locomotive Works, Chittaranjan:** This locomotive factory is the oldest in India with its inauguration held on January 26th, 1950. CLW, as it is often referred to, deals with the production of steam locomotives, diesel locomotives, electric locomotives and AC electric locomotives.

ii. **Diesel-Loco Modernisation Works, Patiala:** This factory was primarily referred to as the Diesel Component Works ands was set in the year 1981. This factory was set to manufacture electric and diesel locomotives spare parts. Traction motors, rebuilding engine blocks, traction generators and motors and locomotive power packs form the basic production of this factory.

iii. **Diesel Locomotive Works, Varanasi:** This factory was set in the year 1961 and produced its first locomotives in the year 1964. This factory produces locomotives in-house like engines, fabricated bogies, superstructures and underframes. DLW specializes in producing diesel locomotives and mostly diesel electrics. Of late, this factory has also started producing equipments for industries other than railways.

A.1.3 **Rolling Stock for the Indian Railways** are produced at:

i. **Integral Coach Factory, Chennai:** This factory was set in the year 1955 to build coaches. The production rate of this factory has been par excellence and today it manufactures around 170 types of coaches. EMU, DMU, monitoring vehicles and diesel railcars are also produced by this factory.

ii. **Rail Coach Factory, Kapurthala:** This factory was set in the year 1987 and first production of this factory came out in the year 1988. Since 1991, this factory has been producing air-conditioned coaches with AC units mounted on the roof and air braked coaches. The factory specializes in the design and development of light weight high speed coaches.

iii. **Rail Coach Factory, Raebareli:** New production unit for coaching stock started its production activities in the year 2012. Coaches manufactured in this new Coach factory will primarily be of LHB-Alstom design, double-decker coaches, air suspension bogie, coupler and Self Propelled Accident Relief Train (SPART).

A.1.4 For **Axles and wheels, the Indian Railway production units** are situated at,

i. **Rail Wheel Factory, Bangalore:** Formerly referred to as the Wheel and Axle Plant, was set in the year 1984. This factory was set up to compliment the production of wheels and axles which was being done by Durgapur Steel Plant. The annual production of this factory is around 80,000 wheels and 50,000 axles.

ii. **Rail Wheel Factory, Chhapra:** Started its production in the year 2012

(Brief about individual Production Units of Indian Railways is given in Annexure-II of Part-A)

A.2. Limitations imposed on Production Units of Indian Railways

A.2.1. Even though PUs of Indian Railways adapted to all the dynamic changes incurred by Railways, their performance have always been under estimated. It is presumed that reduction of staff strength is the only measure for productivity improvement, cost reduction, implementation of technological advancement etc. **All Indian Railway PUs have no major human resources development polices, except resorting to reduction of staff strength**.

While PUs are blamed in the name of less productivity, higher cost etc, they never given with autonomy in their functioning.

A.2.2. TOO MANY BOSSES

i. PUs are controlled by many directorates of Railway Board including Mechanical, Electrical, Finance, Personnel, etc.
ii. Approval for expansion or introduction of new technology or introduction of new facility has to pass many stages and naturally takes lot of time.
iii. Inadequate fund allocation for new projects as well as augmentation projects.
iv. For standardization, approval of new design, design modification, absorption of new technology, vendor certifications etc PUs have to depend on RDSO, even though PUs are competent enough as well as having the capacity to perform them.
v. PUs cannot choose and purchase the machinery & plants on their own, according to their requirement. They have to depend on COFMOW for purchase of machinery & plants, many times it end up in getting unwanted or higher cost or unsuitable or half performing machinery & plants.
vi. Some of high value components required for coach / loco production are purchased by Railway Board in a centralized purchase system. While PUs have no control over the cost & schedule of supply of centralized purchase items, accountability of performance and cost & supply schedule of these items will have direct bearing on PUs.
vii. Very frequent changes of production programme add to the situation of uncontrolled & unscheduled work and higher cost.
viii. Due to frequent revision of production programmes, some of the items purchased become unusable adding to higher cost of rolling stock.

A.2.3. WRONG WAY OF REORGANIZING

i. Reacting under pressure Railways PUs in the name of cost control do end up only in reduction of man power, that too mostly from the pool of direct technicians who contributes directly to the production.
ii. Since the PUs are covered under incentive scheme it becomes easier to propose for surrender direct technician posts (since man hours are readily available) as a result of outsourcing.
iii. Actually this exercise prove to be unproductive rather than productive for the reasons that,
    a. Infrastructure, Machinery & Plants available in the shops from where outsourcing is effected, are very much underutilized, not justifying to their capital investment. Remaining infrastructure & man power are also not able to be used to their full potential because of breakage of production link.
    b. Feeder shops & customer shops are also losing their share of work load and slowly getting into the cycle of gross under utilization of resources & infrastructure.
    c. No fresh man power induction happens in these shops, resulting in older workforce, which may not fit to take new challenges physically and mentally. This scenario finally end up in further outsourcing dispite of availability of man & machine power.
    d. Since major portion of man power downsizing is done from the pool of direct employees working inside the factory, keeping intact the strength of indirect

employees, put the PUs in further disadvantageous position of high percentage of indirect employees.

iv. The problem of half of the infrastructure sitting around ideal in-house and going for outsourcing have made a situation of expenses run quite high.

v. Performance of rolling stock produced using outsourced items are also poor because of many quality issues.

A.3. Suggestions

A.3.1. OPPORTUNITIES IN-HOUSE

i. Experienced workforce with expertise skill in many areas of Mechanical production engineering & Electrical engineering.

ii. Blend of old and modern technological infrastructure in many areas of Mechanical production engineering & Electrical engineering.

iii. Rich experience in Design & Development.

iv. Communication chain between user Railways, ie, workshops and open line sheds & depots.

v. Availability of space within the PUs & in workshops available nearer to PUs for further expansion.

vi. Flexibility of production system to suit to the requirement.

vii. All PUs developed supplier industries around them that can also complement to the growth of PUs.

A.3.2. ROGHT WAY OF REORGANIZING BY PROFESSIONAL MANAGEMENT

i. **Human Resources utilization**

   a. Human resources utilization should be linked to utilization of infrastructure like man hours utilized per Sq.M of covered shed, man hours utilized per machine hours available, man hours utilized per Jig & Fixture hours, etc.

   b. Sizes of existing branches of Mechanical Engineering have to be kept as it is without resorting to any downsizing.

   c. Fresh induction of Technicians have to be done in all the shops / mechanical branches to enable availability of blend of experienced and youngsters.

   d. Flexible incentive system for better utilization of man power.

ii. **Infrastructure utilization**

   a. Utilisation of infrastructure have to be explored not only for the PUs also for the workshops available nearer to them.

   b. Infrastructure utilization bench marks have to be evolved as similar as given below

      a. Load lifted (excluding outsourced load) per Sq.M of covered shed.

      b. Load lifted against available machine hours

      c. Load lifted against available Jig & Fixture hours.

iii. **Controlled outsourcing**

   a. Full / partial outsourcing has to be done only after meeting out the bench marks mentioned in previous paras.

   b. Analysis on supplier failed items and expenditure incurred by PUs & man hours lost in manufacturing them under the condition of supplier failure.

iv. **Inventory control**

   a. Reduction of inventory cost substantially by following procurement techniques like JIT (Just-in-Time), ABC analysis, FSN analysis, 5S principle etc

   b. Purchase of items on batch order requirement instead of annual requirement.

   c. Reverse flow of information / document on the date of utilization of high value purchased items, to ensure that huge cost is not locked in inventory.

v. **Adequate flow of fund for expansion & technological upgradation**

   a. Sufficient fund allocation to complete major expansion projects instead of piece meal allocation.

b. Freedom for respective PUs to choose their expansion programme & technological upgradation.

vi. **Power to Procure**

a. There shall not be any centralized purchased items. All the material requirement of PUs should be procured by them only.

b. PUs should be allowed to procure required Machinery & Plants for them.

c. General Manager of respective PUs should be made as ultimate sanctioning power.

A.4. Non Starters - New Production units announced by Railways

A.4.1. Railway Ministry has announced various new production facilities for Coach, Diesel loco and Electric loco manufacturing during the Railway Budget presentations over the years, but, by and large they remains non-starter. Railways allocate meager amount of fund for all these new projects which not only serve the purpose, but results in wastage of capital investment.

S.N	Name of new production unit	Date of announcement
1.	New Electric Loco works to be set up at Madhepura.	Rly Budget 2007-08
2.	New Diesel Loco works to be set up at Marhora	
3.	A new rail coach factory to be set up in Kerala.	Rly Budget 2008-09
4.	Setting up of a new coach factory to manufacture about 500 EMU/MEMU coaches per annum in the Kanchrapara-Halisahar Railway complex.	Rly Budget 2009-10
5.	Setting up of a new coach factory to manufacture about 400 DEMU coaches per annum at Haldia	
6.	A Diesel Multiple Unit (DMU) factory to be set up at Sankrail.	Rly Budget 2010-11
7.	A new Rail Axle Factory to be set up in New Jalpaiguri	
8.	Five state-of-the-art wagon factories to set up at Secunderabad, Barddhaman, Bhubaneshwar/Kalahandi, Guwahati and Haldia	
9.	Setting up of a refrigerated container factory at Budge	
10.	Diesel Component Factory at Dankuni	commissioned
11.	Two additional new manufacturing units for coaches to be established in the Kutch area in Gujarat and at Kolar in Karnataka with active participation of the State Governments	Rly Budget 2012-13
12.	A plant for manufacture of traction alternators for high horse power diesel locomotives to be set up at Vidisha in Madhya Pradesh	
13.	Setting up of a factory at Shyamnagar in West Bengal to manufacture next generation technology propulsion system for use in high power electric locomotives	
14.	New Forged Wheel Factory at Rae Bareli	Rly Budget 2013-14
15.	Coach manufacturing unit in Sonepat district – in collaboration with Haryana state Government	

Besides the announcement of these Production Units augmentation proposals for many POH & Repair workshops are also pending.

A.4.2. WISE INVESTMENT

Instead of allocating insufficient fund to all the new projects, which are not helpful for completion of project except locking the capital, sufficient fund shall be allocated for two or three projects so that they can be finished in a reasonable time and financial return can be ensured by early completion of projects.

Part-B

SUGGESTIONS FOR OPTIMUM UTILIZATION OF MECHANICAL WORKSHOPS OF INDIAN RAILWAYS

Huge infrastructure available

Scope for vast improvement

B.1. OPTIMUM CAPACITY UTILIZATION OF MECHANICAL WORKSHOPS OF INDIAN RAILWAYS

B.1.1. 45 Mechanical Workshops of Indian Railways were established over the years for the purpose of periodical overhaul of locos, coaches, wagons, mobile cranes etc. Many of the workshops were established more than century ago, still they have adapted to the dynamic changes of Indian Railways from the age of steam locos to 3-phase electric locos, wooden coaches to LHB coaches. Important statistics of mechanical workshops of IR is given below,

B.1.2. **Total Staff Strength & Area available in C&W workshops**

Sanctioned Strength	**155898**
Supervisors Strength	9621
Total area in acres	6204
Covered area in acres	858
Percentage covered area	14%
Township area available in 16 workshops in acres	4955
Kancharapara workshop of Eastern Railway alone has 1606 acres of workshop land plus 1462 acres of township area.	

(***Infrastructure available in individual workshops given in Annexure-I of Part-B****)*

More than 1.5 lakh strong workforces, 6204 acres of workshop area, township area more than workshop area are the strength of these workshops, which are being underutilized gravely.

B.1.3. ENORMOUS CHANCES FOR IMPROVEMENT

i. Availability of plenty of open space. Only 14% of workshop area are having covered shed (out of 6204 acres of total land only 858 acres are having covered shed).

ii. Even if 20% of available vacant land in IR workshops its township area is proposed to be used, IR will get 2500 acres of land.

iii. All these workshops are having huge township area almost equal or even more than its workshop area.

iv. They are well connected with existing rail network.

v. They are also situated inside metro cities & other major cities of the country.

vi. Some them have also developed industrial area nearer them.

B.1.4. SUGGESTIONS FOR WORKSHOPS' CAPACITY OPTIMIZATION

1. Workshops of Indian Railways shall be utilized as ancillary Production Units.

IR has decided to change its entire fleet of coaching stock with stainless steel bodied LHB coaches from existing ICF designed coaches. POH schedule of LHB coaches are 36 months against ICF coaches' 18 months schedule which will results in decreased work load for mechanical workshops.

Additional work that will emerge out due to addition of more number of coaches will be compensated by increased periodicity of POH, hence huge space available in these workshops will available as surplus.

Many of these workshops can be utilized as ancillary unit for existing Production Units available nearer as mentioned below,

Production Units	**Workshops proposed to be ancillary units**	**Area** *in acres*
Integral Coach Factory, Chennai	i. Carriage & Wagon Works Perambur, S.Rly ii. Loco Works Perambur, S.Rly iii. Engineering Workshop, Arokkonam, S.Rly	129 54
Rail Coach Factory, Kapurthalla	i. Amristar Workshop, Northern Railway ii. Jagadhari Workshop, Northern Railway iii. Kalka Workshop, Northern Railway	40 286 4
Rail Coach Factory, Raebareli	i. Alambagh Workshop, Northern Railway ii. Charbagh Workshop, Northern Railway	40 31
Diesel Locomotive Works, Varanasi	i. Gorakhpur Carriage workshop, NE Railway ii. Gorakhpur Engineering Workshop, NE Railway	73
Chittaranjan locomotive works	i. Kanchrapara workshops, Eastern Railway ii. Jamalpur workshops, Eastern Railway	1606 691

2. Conversion of Mechanical Workshops into full fledged Production Units

Size of some the mechanical workshops are nearer to a Production unit size and all these workshops are having the infrastructure for all the basic Mechanical Engineering activities like Welding, Fitting, Machining, Sheet Metal Work, Forging & Black Smith, Carpenter, Painting, Tool Room, Millwright etc, they also have basic infrastructure for Electrical Fitting works. These infrastructure have to be optimality utilized instead of scaling down them.

Besides the workshop area these workshops are having huge township area. Major portion of town ship area can be released for productivity activity by reorganizing staff quarter and construction of multi storied staff quarter.

Following six major workshops are having the scope for converting them into Production Unit of Indian Railways.

Zonal Railways	**Workshop**	**Workshop land** *In acres*	**Township area** *In acres*
Eastern Railway	Jamalpur	691	553
	Kancharapara*	1606	1462
Southern Railway	Golden Rock	200	600
South Eastern Railway	Kharagpur	150	*Biggest Township area of IR Combined township with Division & other departments consists of 25000 staff quarter*
Southern Railway	Gutapali	296	130
South Western Railway	Hubli	240	*Combined township with Division & other departments*

****Production of EMUs from Kancharapara workshop is scheduled from the financial year 2014-15. But remains a non-starter, due to poor project implementation plan of Railways.***

3. Sparing of workshop lands to Railway Suppliers

Reputed private firms who are supplying item to Railway Workshops & Production Units shall be allowed to establish their unit in Railway workshop premises for a fixed period. Cost advantage of equivalent to investment in land & transport shall be passed on to Railways.

4. Setting up of Modern Logistic Parks in free space available in workshops

Country is in need of best logistics services. Combination of rail service with 65,000 route km having access to major ports, having plenty of free space available in workshops which are situated inside Metro Cities & Major cities of the country can serve the purpose.

Warehouse hubs where freight comes into the wearhouse then they distribute it to different places with available Rail & Road network can be a grand success.

Annexure- I for Part-A

Requirement of rolling stock during XII th Five Year Plan & Production units of Indian Railways.

Measurers to upgrade the requirement & quality of passenger services during the 12th Plan (2012-13 to 2016-17)

Enhancing accommodation in trains:

Augmenting the load of existing services with popular timings and on popular routes to 24/26 coaches would help generating additional capacity and availability of additional berths/seats for the travelling public.

Enhancing speed of trains:

At present, speed of trains of Mail/Express trains is below 55 kmph. These are low as per international standards**.** Segregation of freight and passenger traffic, enhancing the sectional speeds, and rationalization of stoppages are important measures for speed enhancement.

The speed of especially the passenger trains is quite low at present primarily because of the coaching stock in use and due to multiplicity of stoppages enroute. There is scope for speeding up of these services by replacing trains with conventional stock by fast moving EMUs/MEMUs/DEMUs. Enhancing the sectional speeds is another enabling factor in speeding them.

Introduction of tailored services:

The travelling requirement of various sectors and various classes of passengers differ. Between major cities and metros, fast services with very limited stoppages are preferred. Introduction of non-stop services and services with higher accommodation between popular destinations would serve passenger requirement well.

Measures to improve Commuter service:

Due to increase in passenger and freight traffic, the local trains running with conventional stock need to be replaced with DEMU, MEMU and EMU stock as per the requirement to cater to enhanced quantum of traffic and also for faster and smooth operations.

Major strategies to enhance average speed of trains would be:

i. Enhancing the sectional speeds.
ii. Segregation of freight and passenger services.
iii. Enhancement of production capacity of production units so the replacement of the conventional trains by EMUs/MEMUs/DMUs which have better acceleration/deceleration is undertaken at a faster pace.
iv. Rationalization of stoppages.

Strategies for decongesting major passenger terminals:

Terminal congestion has emerged as the single biggest constraint for running of greater number of train services. Major inputs are required for the projected introduction of over 300 trains every year in terms of expansion in the infrastructural facilities like pit-lines, platforms, stabling facilities etc.

COACHES/ EMUs

i. Complete switch over to new manufacture of only LHB design coaches by the end of XIIth Plan.
ii. Raise the crash worthy quotient of coaching stock on IR through larger deployment of LHB coaches, and incremental enhancement in ICF coaches.
iii. Introduction of AC/non-AC trains at speeds more than 130 kmph by induction of LHB design coaches.
iv. Introduction of automatic under gear and wheel profile measuring/ examination system to improve efficiency of train examination at terminals and pit lines.
v. Development and implementation of on-board coach diagnostic systems.

vi. Induction of more no. of double-decker LHB FIAT AC coaches with high speed and higher carrying capacity for inter-city travel.

vii. Induction of automatic fire alarm system in coaching trains for early detection of fire. Introduction of automatic fire detection and suppression system for power cars, pantry cars which are more vulnerable to fire accidents.

viii. Introduction of standard block rake concept for coaching trains.

ix. Design and development of under slung DG set power car for improved utilization for commercial purposes.

x. Introduction of high speed high carrying capacity VPUs on LHB FIAT platform.

xi. Setting up of mechanized laundries on BOOT model for managing the daily volume of bed rolls with superior wash quality.

xii. Introduction of new super AC class for improved comfort and features and more exclusivity.

xiii. Introduction of Green toilet technology in coaches.

xiv. With new sections in BG coming on the IR network either due to gauge conversion or due to new lines ,need for branch line operations of passenger trains is increasing. This is best addressed by DEMUs since they are low cost, do not require massive infrastructural investments and they release locos for freight and passenger operations on main line. With a new factory coming up at Haldia which is slated to manufacture upto 400 DEMU coaches per annum priority to be given to large scale proliferation of DEMU services in the North East, North Bihar, Eastern and North Eastern UP, Gujarat, J&K and many other far flung areas of the country.

xv. Introduction of High speed bogies for Self-propelled coaches (SPART/DEMUs).

xvi. New design of Stainless Steel DEMUs with 3 phase technology.

xvii. Design and development of differently abled friendly coaches and enabling facilities for their travel in AC and non-AC coaches.

ROLLING STOCK REQUIREMENT DURING XIIth PLAN

Type of Stock	Requirement* on additional account (2012-13 to 2016-17)	Requirement on replacement account ** (2012-13 to 2016-17)	Total requirement (2012-13 to 2016-17)	Anticipated acquisition 2012-2017
Coaches (incl. EMUs, MEMUs and DEMUs)	25440	7626	33066	24000
Diesel Locos	1500	500	2000	2000
Electric Locos	1800	210	2010	2010
Wagons (in VUs)	76396	29263	105659	105659

** Requirement of coaches is projected based on 10% annual growth.*
Requirement of wagons is based on growth in freight traffic at 100 MT per annum and assuming a 2% increase in utilization during XII th Plan

******* *Requirements on replacement account for all rolling stocks are based on actual over age arising and the trend of average condemnation.*

ANTICIPATED REQUIREMENT OF ROLLING STOCKS DURING XII PLAN YEAR WISE

Type of Rolling Stock	Year					
	2012-13	2013-14	2014-15	2015-16	2016-17	Total
Coaches	4000	4200	5000	5200	5600	24000
Diesel Loco	325	327	448	450	450	2000
Electric Loco	350	351	404	455	450	2010
Wagons	18659	22197	22020	21043	21740	105659

PRODUCTION PROGRAMME OF COACHES PU WISE

Anticipated Production/Acquisition of coaches from PUs/other sources						
	2012-13	2013-14	2014-15	2015-16	2016-17	Total
ICF (Coaches)	1500	1500	1600	1700	1700	8000
RCF/Kapurthala (Coaches)	1600	1600	1600	1600	1700	8100
RCF/RBL(Coaches)	60	75	500	500	1000	2135
Kancharapara (EMUs)			100	250	250	600
Haldia (DMUs)	16	64	120	200	200	600
Palghat (Coaches)				100	100	200
Singur (Metro and EMU)				50	50	100
BEML/Others(Coaches & EMUs)	824	961	1080	800	600	4265
Total	4000	4200	5000	5200	5600	24000

Annual outturn of ICF & RCF have crossed 1700 coaches in the year 2012-13 itself against the planned year of 2015-16.

BEML (annual capacity of 850 coaches) is regularly supplying coaches to Indian Railways with "price cap" equal to that of ICF manufacturing cost.

Annexure- II for Part-A

Profile & Product Range of Production Units of Indian Railways

Chittaranjan Locomotive Works

INFRASTRUCTURE AVAILABLE AS ON 31.3.2014

1. WORKSHOP

Land area under workshop	10,04,4 Hect.
Total plinth area in shops including stores shed	2,39,843 sq. m.

2. STAFF

Group -A	113
Group -B	75
Group -C	9,310
Group -D	2854
Total	12,352

3. TOWNSHIP

Total area	18.34 Sq. km
Length of Road	203 km
Residential Quarters	9,346 nos.

4. POWER SUPPLY

Maximum Contract demand	11.0 MVA
Generation of Electricity during this year	4,54,27,745 kwh

NEW PROJECTS

Augmentation of facilities for enhancement capacity of Three phase locos to 50 locos per year. (AP-50)

Augmentation of facilities for enhancement capacity of 3 phase locos to 50 locos per year. In long term perspective, production of 3- phase locos at CLW will increase and production of conventional locos will reduced gradually.

Project for creation of additional facility for enhancing the production capacity of CLW up to 200 locos per year.(AP-200)

Project for creation of additional facility for enhancing the production capacity of CLW up to 200 locos per year. This was required to enhance the production capacity of CLW to 200 locos per annum (including 50 three phase locos per annum) to meet the increased loco requirement of Indian Railway.

Modernization and augmentation of production capacity from 200 to 275 locos per year.(AP-275)

Modernization and augmentation of production capacity from 200 to 275 locos per year. The demand of electric locomotives is going up continuously to cope with the increase in freight traffic and passenger traffic and to take care of requirements of new routes of electrified. With increased electric locomotives requirement, CLW shall produce at the rate of 275 locomotives per year.

Electric Locomotive Factory at Dankuni, West Bengal

The unit will work as an ancillary unit of CLW. Initially state of art 3-phase high HP locomotive with regenerative breaking of 6000 HP (WAG-9) electric locomotive will be turned out. Subsequently, the infrastructural facilities shall be utilized for the production of 9000 HP locomotives in future.

Centre of excellence for design, development & evaluation of advanced technology system for electrical rolling stock.

The purpose of establishing the Centre of Excellence is to develop capability for designing, development and evaluation of advanced technology systems for Electric Rolling Stock. The idea is to become a technology exporter from present status of technology importer in Rolling Stock equipments. The main benefit that will accrue from this project is that we shall become self reliant in the field of development of Electric Rolling Stock equipments which will come in a big way not only for the domestic requirement of adoption of new technology in rolling stock but we shall be in a position to cater to the emerging world market as per the customized requirement of different countries.

Diesel Locomotive Works / Varanasi

A flagship production unit of Indian Railways offering complete range of products in its area of operation with annual turnover of over 2200 Crore.

State of the art Design and Manufacturing facility to manufacture 200 locomotives per annum with wide range of related products viz. DG Sets, Loco components and sub-assemblies.

Supply of spares required to maintain Diesel Locomotives and DG sets. Unbeatable trail-blazing track record in providing cost-effective, eco-friendly and reliable solutions to ever increasing transportation needs for over four decades.

Fully geared to meet specific transportation needs by putting Price - Value - Technology equation perfectly right.

A large base of delighted customers among many countries viz. Myanmar, Sri Lanka, Malaysia, Vietnam, Bangladesh, Tanzania, Angola, to name a few, bearing testimony to product leadership in its category.

Types of Locos produced:- WDM-2, YDM-4, 3100 HP WDM-2C, 2300 HP WDP-1, 3100 HP WDG-2, 3100 HP WDP-2, 4000 HP WDG-4 , 3300 HP WDG-3C, IGBT based WDG-4, Dual Cab WDP-4D, 5500 HP WDG-5, Dual Cab WDG-4D, WDP4B 'PRATEEK', 2.4 MW Diesel Generating Set.

Diesel Loco Modernisation Works

ROLE OF DMW IN THE GROWTH OF INDIAN RAILWAYS DMW

Engaged in Manufacture/Rebuilding, Upgradation and Modernization of Diesel Locos.

DMW started rebuilding activities with the outturn of 3 Locos and 15 Powerpacks in the financial year 1989-90

Record Breaking Performance of 156 Locos including 75 rebuilt locos, 80 new Locos (WDM3D/WDS6) & 01 Multi Gen Set Loco and 156 Powerpacks in 2013-14.

DMW has taken another giant leap with successful manufacture of First 2400 HP Multi Gen Set Loco in Mar'13 conforming to US EPATIER II Environmental Norms on Indian Railways and Second Multi Gen Set Loco was manufactured in Feb'14.

During rehabilitation, up-gradation of Horse Power of Locomotive from 2600 HP to 3100/3300 HP is done along with fitment of latest sub-assemblies like Microprocessor, AC-DC power transmission, Fuel Efficient Engine Kits, Roller Bearing Suspension System, and Crew Friendly Features, to extend the trip schedule of Locos to 40 days and Locos give better reliability, availability, improved performance during service with better fuel efficiency.

DMW has achieved highest production figures in all major areas of activities, i.e. new loco manufacturing, Supply of Motorised Wheel Sets, Remanufacture of Traction Motors etc. DMW manufactured 64 new WDM3D locos, 16 new WDS6, 01 Multi Gen Set Loco, 75 rebuilt locomotives and achieved the highest ever turnover of Rs. 1738 Crores in 2013-14.

Basic Statistics

	Item	As on 31.03.2013	As on 31.03.2014
1.	Land in Hectares	225.47	225.47
2.	Quarters in Nos.	1749	1749
3.	Covered Area of Shops in Sqm.	88194	89865
4.	Covered Area of other service Building in Sqm.	71308	73663
5.	Track (BG)	11 Km	11 Km
5.	Roads in Kms.	29 Km	29 Km

Product Range of ICF - Chennai

Important Statistics

1. **Total area of the complex**
   a. Shell division - 25.89 Hectares;
   b. Furnishing division - 50.82 Hectares;
   c. Colonies - 15.02 Hectares;
   d. Service and Welfare Buildings - 5.45 Hectares;
   e. Afforestation - 40.00 Hectares(approx.).

Total ICF area - 192.254 Hectares (475acre)

2. **Residential Accommodation**:
   (a) No. of quarters - 3013
   (b) % of staff housed - 25.2%

3. **Financials** (as on 01.04.2012)
   (a) Total assets - 584.28 Crores
   (b) Turnover (2011-12) - 1344.4 Crores

4. **Employee Strength** (As on 31.03.13)
   (a) Group 'A' & 'B' - 161
   (b) Group 'C' & 'D' - 11666
   Total - 11827

ICF & RCF have been meeting the needs of the Indian Railways for varied types of coaches, however sophisticated the type may be. Some of the important types are;

a. **SELF PROPELLED COACHES**

Electric Multiple Units for suburban services in Metropolitan cities;

Diesel Rail Cars;

Metro Coaches for Kolkata Metro Railways;

Diesel Electric Multiple Units & Diesel Hydraulic Multiple Units for non-electrified routes;

Mainline Electric Multiple Units for long distance inter-city commutership;

Accident Relief Trains / Medical Vans;

OHE Inspection Cars;

b**. AIR-CONDITIONED & NON-AIRCONDITIONED PASSENGER COACHES**

LHB coaches;

Air-conditioned Sleeper Coaches of first & second class;

Air-conditioned Chair Cars of first and second class;

c**. SPECIAL COACHES**

Air-conditioned & Non-air-conditioned Pantry Cars

High Capacity Power Cars for Shatabdi & Rajdhani Express Trains

Air-conditioned Military Ward and Saloon Cars for Indian Army.

Air-conditioned Saloon Cars, Dining Cars, Bar & Restaurant Cars, luxury suites for luxury tourist trains like Palace on Wheels (WR), Deccan Odyssey (CR), The Golden Chariot (SWR), Royal Rajasthan on Wheels (NWR) and Maharajas Express of IRCTC

Lifeline Express for operation of hospital on wheels

Jet Deflector Crane Cars, Inter Communication Coaches for DRDO

d**. EXPORT**

Against stiff international competition from more advanced countries, ICF has secured several export orders, most of which are repeat orders. So far, 359 bogies, 11 stainless steel coach shells and 571 coaches including air-conditioned coaches have been exported to 13 Afro-Asian countries. ICF has bagged a number of awards for Export Excellence also.

e. **DESIGN & DEVLOPMENT EFFORTS**

Complementing the existing design capacities and facilities, a fully computerised Design & Development Cell has been set up with sophisticated state-of-the-art computer designing facilities and testing equipment both for coach components and raw materials. D&D Centre uses 3-D modelling on Solid Works platform for generating 3-D drawings and IDEAS software for Finite Element Analysis.

Strain gauge testing and squeeze test are done on prototypes before commencement of series production.

Product Range of RCF / Kapurthala

Important Statistics

1. **Total area of the complex**
   - (a) Township - 838 Acres
   - (b) Workshop Area - 340 Acres
   - Total Area - 1178 Acres
2. **Workshop Area:**
   - (a) Covered Area - 2,42,657 Sq.mts.
   - (b) Uncovered Area - 1,20,270 Sq.mts.
3. **Roads**
   - (a) Concrete Roads - 7.6 Kms
   - (b) Bituminous Roads - 64.0 Kms
4. **Residential Accommodation**:
   - (a) No. of quarters - 3,995
   - (b) % of staff housed - 50.36%
6. **Plantation** - 2 Lakhs trees
7. **Financials** (as on 31.03.2013)
   - (a) Total assets - 1443 Crores
   - (b) Turnover (2012-13) - 2064 Crores
8. **Employee Strength** (As on 31.03.13)
   - (a) Group 'A' & 'B' - 167
   - (b) Group 'C' & 'D' - 7802
   - Total - 7969

a. **Broad Gauge Air Conditioned**

AC Sleeper (AC First, AC-2 Tier, AC-3 Tier)
AC Chair Car (Executive Class, Second AC)
Double Decker Coaches with seating capacity for 148 passengers as against the conventional 90 passengers.

b. **Broad Gauge Non Air Conditioned**

General Second Class Seating
General Second Sleeper
General Second Class Day Coach
General Second Class With Luggage Rack and Guard's Compartment
General Second Class With Disabled Compartment and Guard's Compartment
Power Cars

c. **Stainless Steel BG Coaches**

AC Sleeper (AC First, AC-2 Tier, AC-3 Tier)
AC Chair Car (Executive Class, Second AC)
AC Pantry Car
General Second Class Seating
General Second Sleeper
General Second Class With Luggage Rack and Guard's Compartment

d. **Meter Gauge Air Conditioned Coaches**

AC Sleeper (AC First, AC-2 Tier, AC-3 Tier)
AC Chair Car (Executive Class, Second AC)
General Second Class Seating
General Second Class With Luggage Rack and Guard's Compartment

e. **Self Propelled Coaches**

Accident Relief Train
Mainline Diesel Multiple Unit
Meter Gauge Diesel Multiple Unit

f. **Special Purpose Coaches**

RA Coaches
Parcel Vans
Refrigerated Parcel Vans
Postal Vans

g. **Coaches For Export**

Air-conditioned **diesel motive units** (**DMU**) to **Senegal**

Assigned to manufacture 50 stainless steel coaches for Bangladesh Railways.

8. **Total Coaches produced till 31st Mar 2012 is 25641**

RCF / Raebareli

Unprofessional implementation of Project – Takes one decade for completion

Sanctioned during the year 2006. Initially envisaged as a Joint Venture, it is now coming up as a wholly Departmental Unit. The objective of this project is to set up facilities for manufacture of modern design Coaches for the Indian Railways, simultaneously aiding development and generation of employment opportunities in the area. The foundation stone was laid on 13th February, 2007. Factory Construction, however, could only start in mid 2010, where after the pace has steadily accelerated with the first phase of Production starting in April, 2011.

VERY SLOW PROGRESS OF PROJECT

i. Project approved in the supplementary Railway Budget 2006-07.
ii. Foundation stone laid on 13th Feb, 2007
iii. Land acquisition activities started - 10th Aug, 2007
iv. Land lease deed signed with Uttar Pradesh Govt - 16th Jan, 2009
v. Inauguration of construction of factory boundary wall - 27th Jan, 2009
vi. Completion of Factory Boundary Wall - Dec, 2010
vii. Completion of Rail Connectivity - Jan, 2011
viii. Commissioning of 33 KV Transmission line & substation - Jan, 2011
ix. Roads for Phase I - Started - Oct 2010, Completed - Mar, 2011.
x. Finishing Shop - Started - Sept 2010, Completed - Feb, 2011.
xi. Furnishing Shop - Started - Sept 2010, Completed - Apr, 2011
xii. Phase-I Production (First coach ready) - 8" April, 2011
xiii. Dedication of the Factory to the Nation - 07 Nov, 2012
xiv. Nos of Coaches out in Year 2011-12 - 18
xv. Nos of Coaches out in Year 2012-13 – 70

Product Range of BEML / Bangalore (PSU)

BEML Limited as a full-fledged corporation was established in 1964 with Bangalore Complex as the mother unit. The Bangalore Complex (the then Rail Coach Factory) was in existence from 1947 as a part of Aircraft Factory (currently Hindustan Aeronautics Limited). Initially, the division was manufacturing Rolling Stock producing various models of Broad Gauge Coaches. Subsequently, over the years, the metro coaches and some of the defence products manufacture also has been added in this complex.

The products manufactured at Bangalore Complex are:

Rail & Metro

i. Stainless Steel Metro Cars for DMRC
ii. Passenger Coaches
iii. DC Electric Multiple Units
iv. AC Electric Multiple Units
v. Overhead Equipment Inspection Cars
vi. Rail Bus
vii. Treasury Vans
viii. Spoil Disposal Units
ix. Track Laying Equipment
x. Sky Bus
xi. MIL Rail Coaches
xii. Utility Track Vehicle (UTV)

Staff Strength & Area available in C&W workshops

		Sanctioned Strength	No of Supervisors	Total area in acres	Covered area
	Central Railway				
1.	Kurdwadi	317	16	5.6	0.9
2.	Matunga	8803	578	35	14
3.	Parel	5301	622	19	8.13
	Eastern Railway				
4.	Jamalpur	10100	585	691	58
5.	Kanchrapara	11307	779	1606	33
6.	Lilluah	10680	522	0.312	0.104
	East Central Railway				
7.	Samastipur	727	51	660	290.8
	East Coast Railway				
8.	Mancheswar	2018	98	121	9.5
	Northern Railway				
9.	Alambagh	4932	224	50	18
10.	Amritsar	2002	146	40	13
11.	Charbagh	4309	252	31	14
12.	Jagadhari	6917	246	286	17
13.	Kalka	668	52	4	2.12
	North Central Railway				
14.	Jhansi	5252	240	16	1
15.	Rail Spring Karkhana	465		54	3.6
	North East Railway				
16.	Gorakhpur	5692	378	73	31
17.	Izatnagar	2045	120	112	17
	North East Frontier Railway				
18.	Dibrugarh	2005	191	62.21	26.6
19.	Lumding	Statics not available			
20.	New Bongaigaon	3133	282	209	11
21.	Tindharia	111	10	1.65	0.94
	North Western Railway				
22.	Ajmer (Carriage)	3494	254	61	16
23.	Ajmer(Loco)	2308	237	39	17
24.	Bikaner	1074	74	34	6
25.	Jodhpur	1915	144	28	13
	Southern Railway				
26.	Golden Rock	6667	598	200	26
27.	Perambur (C&W)	5752	390	129	22
28.	Perambur (Loco)	2766	230	53.6	14.3
	South Central Railway				
29.	Lallaguda	3731	239	34	10
30.	Tirupati	1636		177	1
31.	Guntapalli	3026	167	296	13

	South Eastern Railway				
32.	Kharagpur	13569		150	69
33.	West Central				
34.	Bhopal	2282	197	400	12
35.	Kota	2939	198	105	14
	South East Central Railway				
36.	Raipur	1825	89	222.5	1
37.	Nagpur	Statics not available			
	South Western Railway				
38.	Hubli	3618	240	25	9
39.	Mysore	1984	160	24	7
	Western Railway				
40.	Bhavnagar	505	33	19	2
41.	Dahod	2332	153	67	13
42.	Junagarh	150	13	7	1
43.	Lower Parel	5301	622	19	8.1
44.	Mahalaxmi	1684	131	17.6	12.5
45.	Pratapnagar	556	60	19	1