DLF/Marhowra

1. Project Background

- **Hon'able MR announced in Parliament during Rail Budget 2006-07 for setting up new Diesel Locomotive manufacturing unit at Marhowra with capacity to manufacture 150 nos locomotive per year.**

- **Rly Bd sanctioned vide Pink Book item no-324/2006-07 at the abstract cost of Rs 2052 Cr. for setting of Diesel Locomotive Factory at Marhowra.**

- **Project Mode - PPP, JV between Foreign Investor and Indian Railways (74:26) with M/s Wabtec USA(Diesel)**

- **Under Marhowra Project, 1000 diesel locomotives will be supplied in 11 years INCLUDING maintenance of 500 locomotives at Roza and Ghandhidham Depots.**
- **DLF Marhowra set up under PPP (Public-Private Partnership) agreement with an investment of Rs 1220 Cr.**
- **Joint venture between Ministry of Railways with Indian Railways equity share of 26% and leading international M/s Wabtec who have the latest State of the art technology.**

- **Indian Railways has spent on Infrastructure Rs. 207 Cr. in Marhowra till date and companies paid up equity of IR is Rs. 100 Cr. Each**
- **DLF MEW will turn out 1000 Nos (WDG4G-4500HP-700 Nos. & WDG6G-6000HP-300 Nos.), 6 Axle, Co-Co type Diesel Locomotive, based on IGBT technology, in a span of 11 years to cater the need for hauling heavy goods traffic at higher speed.**

2. TECHNICAL PARAMETER OF WDG4G & WDG6G

SN	Parameters	WDG4G	WDG6G
1	Gross Horse Power (GHP)	4500	6000
2	Traction Horse Power (THP)	4260	5686
3	Nominal Axle Load (MT)	22	23
4	Starting TE	544 KN	570 KN
5	Continuous TE	405 KN	420 KN
6	Braking Effort	270 KN	286 KN
7	Maximum speed	100 Kmph	100 Kmph
8	Gear Ratio	85:18	85:16
9	Brake Specific fuel consumption (BSFC) @ N8	<=150 g/bhp-hr	<=150 g/bhp-hr
10	Fuel Tank capacity (In Liters)	6000	8000
11	Loco weight	132 T	138 T
12	Length over coupler pulling faces	22567 mm	22313
13	Minimum Maintenance interval	92 days	92 days
14	Minimum availability (%)	95	95

3. TECHNICAL INFORMATION

S.N	Silent feature	WDG4G(Wabtec)	WDG6G (Wabtec)	HHP-IR
1	Engine	GEVO-12	GEVO-16	710-G3B
2	Engine HP	4500-12 Cylinder	6000-16 Cylinder	4500-16Cylinder
3	Fuel Injection	Electronic fuel injection	Electronic fuel injection	Mechanical unit injection
4	Load Control	Engine Control Unit (Electronic)	Engine Control Unit (Electronic)	Woodward Governor
6	Engine starting	Start with Alternator	Start with Alternator	With separately 2 starter Motor
7	Turbo super charger	Yes	Yes	yes
8	SFC	150g/hphr	150g/hphr	1.72 litre/1000gtkm
9	Engine Mounting	Mounted on isolator to reduce vibration	Mounted on isolator to reduce vibration	No
10	Compressor	Electric AC Motor driven	Electric AC Motor driven	Shaft driven
11	Auxiliaries	Multi-speed, motor driven for optimized load control	Multi-speed, motor driven for optimized load control	Shaft driven
12	Traction System	IGBT based AC-AC traction system with individual Axle control for enhanced reliability	IGBT based AC-AC traction system with individual Axle control for enhanced reliability	AC-AC (medha, Emd, Siemens)

13	Auxiliary Generator	Included with Main alternator	Included with Main alternator	Aux-generator shaft driven
14	Bogies	Fabricated bogie with load tested and fatigue tested	Fabricated bogie with load tested and fatigue tested	Fabricated bogie
15	APU	Yes	Yes	Yes
16	Air brake System	Fast brake, parking brake on 4 wheel, TBU EBD-600m, 12 brake cylinder, fast application	Fast brake, parking brake on 4 wheel, TBU EBD-600m, 12 brake cylinder, fast application	Knorr Bremse, hand brake on 1 wheel EBD-900m, 6 brake cylinder
17	Axle Load	22 ton	23 ton	21.7 ton
18	Tractive Effort	544KN	570kn	540KN
19	Max Speed	100 KMPH	100 KMPH	100KMPH
20	Gear Ratio	85:15	85:18	90:17
21	Fuel oil & Lub oil	1 fuel pump,1 Lub oil pump motor driven	1 fuel pump,1 Lub oil pump motor driven	1 fuel oil pump,3 lub oil pump shaft driven
22	Cooling System	1 water pump,1 radiator fan with motor driven	1 water pump,1 radiator fan with motor driven	2 water pump, 2 radiator fan

4.SPECIAL FEATURE COMPARISON WITH IR-HHP

SL NO.	FEATURE	APPLICATION
1	High Hauling capacity	5400 ton starting hauling capacity
2.	Event Recorder	90 days parameter saved and crass worthiness
3.	Alerter	VCD applied penalty brake in case loco pilet idle
4.	Trip Monitor	Monitor trip, optimize trip & record data in given trip
5.	Locotrol	Making multi unit by using radio frequency (DPCS)
6.	Loco vision	Clear visibility, fitted with LED light(headlights, marker light, flasher light)
7	Wheel slip detection	In case of wheel slip, control torque on slip wheel axle till speed become same for all wheel
8	Fuel Efficient & Emission control	5% more efficiency than other, 50% less Emission than other
9	Noise level in cab	Less than 85dB
10	Traction motor trouble	In case of trouble in traction motor, CIO Automatically isolate traction motor, but tractive effort remains constant
11	Automatic emergency brake	In case of over speed, automatic brake apply and traction cut off
12	Back up brake	Back up pneumatic brake system provided in case of failure of electronic brake they maintence b.c & b.p pressure
13	Consolidated control Architecture	all control switch provided in one place-in cab
14	Auxiliary cab	Power and Electronics and Electrical equipment's in single module cab
15	Auxiliary cab	High voltage and low voltage equipment separately
16	Optimal packaging of Electrical hardware & Equipment‘s	Enabling Ease of maintenance-single control cabinet& Auxiliary cabinet
17	Fuses and circuit Breakers	Provided in all power and control circuit to prevent over current/short circuit.