


BHARAT HEAVY ELECTRICAL LIMITED
UNIT'S ADDRESS:
**CONTACT PERSON'S NAME/DESIGN./PHONE NO./E-MAIL (FROM
PURCHASE DEPTT.)**

Enquiry No. : _____
Due Date : _____
Supplier Qtn.
No.: _____
Date : _____

**SPECIFICATION CUM COMPLIANCE CERTIFICATE OF SCOPE OF SUPPLY FOR SUPPLY, & COMMISSIONING OF 1 No:-
250 / 50 TON EOT CRANE , 23.067 m SPAN, 15.3m H.O.L., GANTARY BAY LENGTH 250M**
NOTE:-

1. Vendor must submit complete information against Qualifying Criteria - clause no. 16. The offer meeting this clause would only be processed.
2. The "Offered" Column and where applicable, the "Deviations" & "Remarks" Column of this format shall be filled in by the Vendor and submitted along with the offer. Inadequate / incomplete, ambiguous, or unsustainable information against any of the clauses of the specifications/requirements shall be treated as non-compliance.
3. The offer and all documents enclosed with offer should be in English language only.

NAME & ADDRESS OF THE SUPPLIER :	NAME & ADDRESS OF THE INDIAN AGENT :
TELEPHONE NOS.:	TELEPHONE NOS.:
FAX NOS.:	FAX NOS.:
E-MAIL ADDRESS :	E-MAIL ADDRESS :
SCOPE: SUPPLY, ERECTION & COMMISSIONING OF 1 No - 250 / 50 TON EOT CRANE, 23.067m SPAN, 15.3m H.O.L., GANTARY BAY LENGTH 250M COMPLYING WITH SPECIFICATIONS AS BELOW	

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / TO BE CONFIRMED BY	OFFERED	DEVIATIONS	REMARKS
1.0	PURPOSE : 250/30 MT EOT Crane.				
1.1	Purpose: 1No electric overhead traveling cranes of 250/50 MT (safe working load) for general engineering application purpose. All the Hooks shall have common crab i.e one trolley with 250T, 50T hook machinery. The Main Hook 250 MT would have calliper brake at Load end (Drum) ie Calliper brake mechanism .	Vender to confirm			
2.0	SPECIFICATION:				
2.1	CRANE CONFIGURATION:				
2.1.1	1 No electrical overhead traveling crane of 250/50 MT (safe working load) capacity for general engineering application purpose. All the three Hooks shall have common crab i.e one trolley with 250T, 50T hook machinery. The Main Hook 250 MT would have Calliper brake at Load end (Drum side) ie Calliper brake mechanism with Load cell & Display arrangement. The crane shall be of box type, double girder construction and designed for class M6 duty in accordance with IS 3177 (latest revision) . The Crane would have control from Cabin & Radio Remote Control with the help of VVFD drives.	Vendor to confirm			
2.2	CAPACITY:				
2.2.1	Safe Working Load (Main Hoist)	250MT			
2.2.2	Safe Working Load (Auxiliary Hoist)	50MT			
2.2.4	Span between gantry rail : The actual available span & other dimension are required to be measured by supplier before commencement of the work.	23.067 m			

2.2.5	Gantry rail height above floor level	15.3m			
2.2.6	Main Hook /Aux hook Height :	Vender to confirm			
2.2.7	Type of Main Hook / Aux hook : 250 T & 50MT- Ramshorm type Hook as per IS 5749 & material should confirm to 20Mn2 class IS 4637 class 2 (IS 1875) Ramshorm hooks shall be proof load tested for minimum 125% of SWL.	Vender to confirm			
	2.3 DETAILS OF RAIL, SPAN etc:				
2.3.1	Maximum wheel load : Approx tonnes .	Vender to specify			
2.3.2	Distance between wheel Centers of end carriage: Max.(approx) mm.	Vender to specify			
2.3.3	Minimum side clearance from gantry rail centers (available max 350mm from Rail centre)	Vender to specify			
2.3.4	Crab track centers mm (approx.)	Vender to specify			
2.3.5	Overall width Over Buffers. mm (approx.)	Vender to specify			
2.3.6	Overall width Over Buffers mm (approx.)	Vender to specify			
2.3.7	Operation : Cabin controlled as well as RRC.	Vender to confirm			
2.3.8	LT Rail : CR -120 With all fixing hardware above the fabricated Steel Gantary	Vender to specify			
2.3.9	Location	Indoor			
2.3.10	Electric power system : 415 volts, 50 Hz; 3-phase and Ground Control Supply : 110 volts AC	Vender to confirm			
2.3.11	CT Power Supply System : Through PVC Fr grade Copper conductor system - Trailing Festoon type arrangement.	Vender to specify			
2.3.12	End Stoooper for Gantry Rail to be Provided by the supplier for EOT Crane both-side of Crane (Total 4 Nos)	Vender to confirm			

2.6	CONSTRUCTION:						
2.6.1	GIRDER						
2.6.2	The crane shall be generally of box type, double girder construction and to be designed for class M4 duty in accordance with IS 3177 (latest revision)	Vender to confirm					
2.6.3	The box girder should have proper Camber & fabricated with MS plate / web & proper diaphragm or stiffening plates and should be robust enough to handle the loads safely as per IS 807 / IS 800. The welded joints shall be Tested . All butt joints shall be 100% X rayed on tension & 25% on compression joints.	Vender to confirm					
2.6.4	M.S. chequered plate platform shall be provided along the full length on both sides of the crane with Toe Board to comply with statutory requirement of factory act . Platform shall have clear width of 1000mm	Vender to confirm					
2.6.5	Box Girder & End carriage joints should have fit bolts only.	Vender to confirm					
2.6.6	For all bolted joints the holes are to be drilled and reamed and bolts are to be force fitted.	Vender to confirm					
2.6.7	Hand railing shall be fitted on both side of the end carriages and throughout the length of the plat form (height of 1.1 m.) parallel to girder. Size of the hand rail shall be not less than 1" bore heavy gauge steel pipe. The vertical pipes to have flanges at the bottom for proper support. Suitable hand railing should be provided on CT Trolley also.	Vender to confirm					
2.6.8	All Rotating parts & Overhang parts should be suitably guarded.	Vender to confirm					
2.7	End Carriage	Vender to confirm					
2.7.1	The end carriages shall be of approved design, with L type Brackets of substantial construction and ample stiffness built up of mild steel sections securely riveted or welded together. They shall project over the run way rails and shall be so arranged that in the event of derailment the drop cannot exceed 1 inch. Proper hand railing should be provided on end carriage.	Vender to confirm					

2.7.2	The end carriages of the crane are to be mounted on double flanged wheels of approved diameter in accordance with IS:3177. Number of wheels on each side of the crane shall be 8 Nos (Total 16 Nos in the Crane for LT motion) The Wheel should be of forged steel having composition as C55 Mn 75 (EN 9) hardened to 250-280 BHN confirming SAE 1055 / IS 1570 & shall be fitted with roller bearings. Greasing nipples should be provided and the grease be retained and dirt excluded by means of suitable seals.				Vender to confirm	
2.7.3	Track wheels: The double flanged wheels of suitable diameter shall be used in accordance with IS:3177. The Wheel should be of forged steel having composition as C55 Mn 75 (EN 9) hardened to 250-280 BHN confirming SAE 1055 / IS 1570 & shall be fitted with roller bearings. Greasing nipples should be provided and the grease be retained and dirt excluded by means of suitable seals. The wheel being machined to profile to suit the LT & CT rail. Clearance between the rails and the guiding wheels, if any, should be at least 3 mm (1/8") on either totaling 6 mm (1/4") for smooth running.				Vender to confirm	
2.7.4	Traveling Motion Brake: For LT DC disc brakes of BCH or Pette Make and EHT brakes are required to be provided. All brakes for each motion drive of LT should operate simultaneously and adequate interlocks are to be provided to ensure that all brakes are applied simultaneously.				Vender to confirm	
	2.8 Crab:					
2.8.1	Crab Frame: This should be built up of steel sections like Channels , T- Beam & / or fabricated plates and the upper surface of the frame should be plated all over wherever required, in order to give great lateral rigidity and maintenance facility. There should be lubrication point provided conveniently on the top for easy lubrication to all moving parts below the surface of the trolley such as balancing sheaves etc.				Vender to confirm	

2.8.2	Crab Traverse Mechanism: Two / One No CT Motor shall be connected to one controller but the rotor circuits would be entirely independent to avoid synchronization and permit the slight variation of speed, necessary to let the crane run freely on a track which deviates slightly from perfect straightness.				Vender to confirm	
2.8.3	The wheels should be of forged or cast steel duly secured to hard shaft steel axles and to run on sturdy roller bearings. The bearings to be enclosed in housing and arranged for grease lubrication and one axle should be driven by a motor through enclosed gearing.				Vender to confirm	
2.8.4	For CT DC disc brakes of BCH or Pethe Make are required to be provided. All brakes for each motion drive of CT should operate simultaneously & adequate interlocks to be provided to ensure that all brakes are applied simultaneously.				Vender to confirm	
2.8.5	These brake should also be operated for parking/emergency				Vender to confirm	
	2.9 Hoisting Mechanism				Vender to confirm	
2.9.1	This shall consist of heavy duty mild steel fabricated rope drum driven by totally enclosed bearing. The drums shall be of ample diameter and sufficient length to take the full amount of rope without over lapping when the hooks are in the highest position and when hooks are in the lowest position there shall be at least two full turns of rope remaining on each drum. The method of attachment of the ropes shall be such that in the event of a rope unwinding completely, there shall be no danger of its becoming free from the drum. The drum should have right and left hand spiral grooves machine to suit the hoisting rope and would be spigotted and bolted to the final driving gear. The whole gear box should be smooth and noiseless in operation and preferably of complete helical gear type construction. The rope anchorage at each end should have at least two independent clamps. The sizes of wire rope shall be selected depending on load from either 13mm/16mm/18mm/22mm/26mm/36mm nominal diameter only.				Vender to confirm	

2.9.2	The gearing should consist of heat treated alloy steel pinions and carbon steel gears, the larger gears may have forged carbon steel rims shrunk on and secured to heavy duty cast iron centres or cast steel. All gears shall have machine cut teeth & hardened to 250-280 BHN, the high speed gears having single helical teeth, and the remainder teeth and free from noise, for smooth operation. The drum shaft and pinion shaft shall be mounted on antifriction bearings and all gearing shall be enclosed in a heavy duty cast iron gear box with jointing surfaces machined and made leak proof.				Vender to confirm	
2.9.3	Hoist Brakes: For Hoisting ie 250MT , 50 MT should be of DCEM of BCH Make brakes are required to be provided. Brake drum used shall be dynamically balanced. Adequate care & arrangement to be provided for ease in maintenance. Main brakes along with additional back-up brakes are required to be provided. Brakes should be normally held 'ON' by a balance weight on spring and released only when command is given to motor. Additional Calliper Brake of BUBENZER BREMSEN - EMCO OR SVENDBORG, DENMARK make is required to be provided on flange(s) of Rope Drum so that in case of any eventuality Calliper brakes would act & stop the loaded Rope Drum for 250 MT.				Vender to confirm	
	2.10 Limit Switch Gear :					
2.10.1	There should be two limit switches for each hoisting and lowering motion so that in the event of failure of one, the other must operate and prevent accident resulting for over hoisting and failure of one limit switch. 2nd limit switches for each hoisting motion should be gravity type.				Vender to confirm	
2.10.2	Shunt type limit switches with single arm spring loaded should be provided on both ends of carriage for traverse long travel motion and anticollision type limit switch should be provided for travel motion.				Vender to confirm	

2.10.3	All limit switches should be connected only in interlock circuits	Vendor to confirm			
	2.11 Rope Hook and Sheaves	Vendor to specify			
2.11.1	The 250/50 Ton loads should be supported on sufficient Nos of falls of steel wire rope, the factor of safety being not less than 6. Rope for 250/50 Ton load should be RHO Usha Martin non rotating type (preferred sizes of wire rope shall be either 13mm or 16mm or 18mm or 22mm or 26mm or 36mm only) having 6X37/36 filler construction ungalvanised wire laid 12/6 + 6/F/1 in each strand, 180 kg. sq.mm. tensile strength, right hand ordinary lay wire ropes with fiber main core tested to IS 2266.	Vendor to confirm			
2.11.2	The 250 ton hook should be the Ramshorm type Hook as per IS 5749 & material should confirm to 20Mn2 class IS 4637 class 2 (IS 1875). 50 MT shall be High Tensile Steel Shank Hook(Trapezoidal Section). Duly Hardened , Tempered Followed By Quenching In Oil. Hook Material & Manufacturing Shall Be Done As Per Is 3815:1977 Material Grade-3. Each Hook should Swivel freely on thrust ball bearing.	Vendor to specify			
2.11.3	Sheaves are to be of heavy duty cast iron mounted on ball bearings. Properly secured with the sheaves with covers & Guards to be fitted to prevent the rope leaving the sheaves, even when the hook is lowered to rest on the ground and the ropes allowed to fall slack. The hook guard should be secured in such a manner that there should be no bolts protruding in the inner side of the hooks.	Vendor to specify			

2.13 Crane Control Panel.					
2.13.1	It shall be of IP54 class and shall comprise of following: Incommer SFU/MCCB, AC Drive for Main Hoist/Auxiliary Hoist/Cross Travel/Long travel. Standard accessories for drives like semiconductor line fuses, Line contactor, Line commutating & output chokes, Dynamic braking chopper and resistance, Radio remote control receiver and all interfacing accessories for control of crane from cabin/RRC.	Vendor to confirm			
2.13.2	The relays and contactors should be robust design & generally in conformity with BS 587. The Remote & Master control interfacing should have perfect Zero-interlocking for safe operation of crane. All coils of contactors & relays should have RC surge suppressors.	Vendor to confirm			
2.14 AC Vector Drive:					
2.14.1	<p>The drive must be of PWM flux vector control technology employing IGBT's for achieving near sinusoidal output voltage. It must have the following specifications:</p> <p>a) The drive must be rated for continuous duty and shall have overload capacity of 150% for 60 sec.</p> <p>b) The drive must be rated for ambient conditions of 55 degrees temperature and relative humidity of 95%. In case of deviations in these values, the drive must be adequately derated which shall be supported by manufacturers derating charts.</p> <p>c) The motor braking shall be dynamic through inbuilt/external chopper and resistance box. The capacity shall be suitable for providing 150% braking torque.</p> <p>d) The drive rating should be selected considering derating factor at 55 degree centigrade. The main hoist & Aux. Hoist motors shall have encoder- feedback for optimum control through VVFD.</p> <p>e) The drive must have special software designed for crane application which shall have features like anti-torque lowering, co-ordinated control of thruster brakes etc.</p> <p>f) The drive must have highly dynamic & precise control with capability to generate 150% torque at zero speed.</p> <p>g) The drive must have static & dynamic auto-tuning facility to enable perfect optimisation of connected motor.</p> <p>h) The drive must have all standard protections like stall protection, single phasing, over voltage, over current, thermal protection of motor & drive etc.</p> <p>i) Model of Drives selected for hoisting, the same model of drives shall be used for LT & CT drive for ease of maintenance.</p> <p>Fault resetting should be possible through remote.</p> <p>j) Alram &</p>	Vendor to Confirm			

2.15	Control Cabin (Indoor Operation)	Vendor to specify			
2.15.1	Opening to the cage on the platform should be approximately 750mm X 750mm (2 1/2'X2 1/2'). The cage to be of the open type suitable for use in an enclosed building. A ladder should be provided between the cage & the inspection platform of the crane. The controllers(Joy stick) should be so positioned as to facilitate easy operation and maintenance Cab. size should be about 1525mm X 1372mm (5'-0" X 4'6"). All the cables in the cabin shall laid in tray nicely dressed and clamped.	Vendor to confirm			
2.15.2	The controllers for speed control of variable speed drives shall be (5 steps) joystick type. A warning hooter shall also be provided which should also be operable from RRC. A 5.0 kg dry chemical powder fire extinguisher with a long discharge nozzle should be provided in the operators cabin.	Vendor to confirm			
2.15.3	A revolving type cushioned seat is to be provided in the cabin for the crane operator at a suitable height.	Vendor to confirm			
2.15.4	A 60 watt lamp, one blower type heater (Convector) , one 16" sweep cabin fan (Orient/CG/Bajaj / Usha make) with guards and a suitable step down transformer should be provided in the cabin.	Vendor to confirm			
2.15.5	An inspection lamp is also to be provided with 110V plug point in the cabin.	Vendor to confirm			
2.16	Crane Bridge Lighting	Vendor to confirm			
2.16.1	Eight Nos HPSV energy efficient HPL 125 Watts flood lights with fittings should be provided with suitable guard protection below the Platform.	Vendor to confirm			
2.16.2	As the power supply will be only 415 volts, 3 phase, 3 wire, 50 cycles. Step down transformer required for 220 Volt bridge lights, cabin lights, fan, and for any other equipment should be supplied along with individual main switch for each, directly connected with the incoming supply and not in the crane circuit.	Vendor to confirm			

2.17	Electrical Wiring:					
2.17.1	All types of cables, connections, circuit breakers etc. required for connecting BHEL's power supply point to different parts of the crane controls / cabinets, shall be the responsibility of vendor.	Vendor to confirm				
2.17.2	All internal wiring inside control panels should be 2.5 sq.mm copper wires having PVC insulation. All copper wire terminals will be lug of either soldered Crimping type.	Vendor to confirm				
2.17.3	All electrical installation and wiring should strictly conform to IE Act and latest IEE Rules and other standard practice as adopted by the Indian Standard Institution.	Vendor to confirm				
2.17.4	Double earthing by bare copper wire (8 SWG) shall be provided throughout the crane.	Vendor to confirm				
2.17.5	All control terminations should be ferruled such that the numbers are clearly visible from outside. Crimped terminations should be provided for control cables and as far as possible for main cables. All device reference shall be painted or labelled or engraved for identification.	Vendor to confirm				
2.17.6	The crane shall be supplied complete with all wiring & materials . The cross traverse conductors shall be Shrouded DSL along with with one spare set of current collector All internal wiring inside control panels should be copper wires PVC insulated FR grade with ISI mark only.	Vendor to confirm				
2.17.7	All wiring shall be nicely dressed in cable Trays/trunking . Suitable marking should also be made.	Vendor to confirm				

2.17.8	Shrouded DSL leads, complete with necessary supporting insulators, current collector, straining screws and clamp connectors etc. This DSL should have LED type Indication Bulb for each end for each phase with necessary mounting Brackets. The Power supply shall be fed from its extreme end. The Tenataive length of the bay is about 250 meter.				Vendor to Confirm		
2.17.9	A spare set of suitable current collector should also be provided				Vendor to Confirm		
2.17.10	Main power cable from main SFU at floor level the DSL should also be supplied and installed				Vendor to Confirm		
2.18	Miscellaneous						
2.18.1	The structural steel work in the box Girder and crab frame should be given one coat of suitable primer during fabrication. Gear boxes and similar parts to be given coat one coat of oil paint & bright parts be given coats of rust preventive paint. After erection at site the crane should be given two coats of deep orange synthetic enamel conforming to IS 5 Shade 591				Vendor to confirm		
2.18.2	The first fill of oil, grease etc. for the commissioning of the crane shall be provided by the supplier.				Vendor to confirm		
2.18.3	The tool box with standard tools shall be supplied with the crane and suitable heater should be provided inside the cabin.				Vendor to confirm		
2.18.4	A list of bought out items should be furnished with name of makers & BHEL's approval obtained before placing order to ensure that they are of best quality and standard make.				Vendor to confirm		
2.18.5	Engraved Indication plates for SWL, Hooks, Sheaves, Pulley etc, panel Identification , Master Controllers position marking should be preferably done wherever possible.				Vendor to confirm		

2.19	Radio Remote Controller: Since each of 250 Ton crane is required to be operated in tandem when need arises a changeover option shall be available with remote so that single remote can operate both crane simultaneously also. Individual RRC shall comprise of the following.	Vendor to confirm			
2.19.1	<p>I) Transmitter: It shall be suitable for 5 steps control of AC drive through push buttons. The 5-steps joystick remote must have following functions:</p> <ul style="list-style-type: none"> • Main Hoist: Up/Down, through 5 steps joystick • Aux. Hoist: Up/Down, through 5 steps joystick • Long Travel: Left/Right, through 5 steps joystick • Cross Travel: Fwd/Right, through 5 steps joystick • Hooter Operation: Normal push button • Emergency Stop: Raised distinctive pushbutton. • Key switch: Removable unique key to disable transmitter. • Battery check facility & indicator. • Push button for drive fault reset. <p>II) Receiver with antenna suitable for above transmitter.</p> <p>III) Battery charger.</p> <p>IV) 2 set of batteries for transmitter.</p>	Vendor to confirm			
2.19.2	Transmitter: The transmitter shall be lightweight, rugged, reliable and made from ABS plastic. It shall be operable from Ni-Cd rechargeable battery, which shall provide minimum 72 hours of operations with full charge. It shall be supplied housed in a protective leather cover.	Vendor to confirm			
2.19.3	Receiver: It shall be supplied housed in a suitable panel and shall have antenna for receiving transmitter signals. It shall have following features:	Vendor to confirm			
2.19.3.1	Microprocessor based digital encoding and decoding system with immunity from spurious signals and should use 16 bits identity code unique to each RRC system.	Vendor to confirm			

2.19.3.2	Continuous auto checking between transmitter and receiver communication, so as to stop the complete system in case of failure at either end.	Vendor to confirm			
2.19.3.3	Auto checking of the commanded motion and stopping of all the motions in case of any misbehavior either way.	Vendor to confirm			
2.19.3.4	System should have self-diagnostic and alphanumeric fault display.	Vendor to confirm			
2.19.3.5	System should confirm to national and international safety standards like IS 3771:1999 CLAUSE 14.5, BS 466 etc. & furnish details of safety & QA plan followed.	Vendor to confirm			
2.19.3.6	Operating range should be 100 mtrs.	Vendor to confirm			
2.19.3.7	The output relays for driving motion contactors shall be heavy duty, rated for 10Amps at 110VAC	Vendor to confirm			
2.20 General Conditions for RRC:		Vendor to confirm			
2.20.1	System should be able to operate in harsh environmental conditions like temp up to 55 deg C and humidity 95% max. It should be able to with stand high level of vibrations, electrical noise arising out of the movement of the crane.	Vendor to confirm			
2.20.2	Incoming supply available is 415 V, +/- 10%, 3 Phase, 3 wire (no neutral), 50 Hz, ±1.5Hz	Vendor to confirm			

2.20.3	Vendor shall clearly indicate whether license is required to operate the RRC System. If required then it has to be arranged by the supplier. If not then enclose the necessary documents. However, BHEL would prefer suitable RRC operative in 335-336 Mhz band upto 1mW of transmitted power , which does not require license.				Vendor to confirm			
2.20.4	Battery Charger: It shall be suitable for charging the Ni-Cd batteries of transmitter. It shall constant current type with auto-cutoff facility on full charge. Indication shall also be available for charging cycle and status of the battery etc.				Vendor to confirm			
2.20.5	Batteries: Batteries suitable for 72 Hrs operation of transmitter are to be supplied.				Vendor to confirm			
2.20.6	Interface Panel: The panel shall be of good quality powder coated of IP54 grade, crane duty and shall contain following accessories				Vendor to confirm			
2.20.7	Incomer Switch fuse unit (SFU).				Vendor to confirm			
2.20.8	Emergency Stop Contactor to be provided to cut power to all motors emergency conditions.				Vendor to confirm			
2.20.9	Illuminating lamps LED Type (R, Y & B) for three phase supply indication.				Vendor to confirm			
2.20.10	Suitable RC surge suppressors shall be provided across coil of each contactor/Timer. Interlocking to be provided with existing limit switches of all the motions for safe operation of the crane.				Vendor to confirm			
2.20.11	Mounting of all the devices of the interface panel shall be designed for operation under heavy vibration on EOT cranes. Ease in maintenance aspect should be integral aspect while deciding size of panel / designing of panel.				Vendor to confirm			
2.20.12	Hooter: It shall be high output, weather resistant sounders used in fire/security applications. It shall have features like a) High Output (110 dB or more), b) Selectable tone (minimum three), c) Continuously rated etc. Make: RS component.				Vendor to confirm			

3.0 ERECTION & COMMISSIONING:					
3.1 The crane is to be Erected at site by the supplier with their own labour, tools and tackles. However, Lifting Hook of 80 Ton shall be provided at the apex of Truss of Block for lifting of Crane, other equipments like winch, Sheaves/ Sheave Pulley Block etc shall be brought by the supplier on returnable basis.			Vendor to confirm		
3.2 The supplier shall however bring their own Cradle along with Chain / Slings & other lifting tackles (on returnable basis) for conducting load test at BHEL site. BHEL will provide load in the form Steel Plates. The load test shall be performed at BHEL site for proofing of the crane w.r.t technical, Safety Parameters etc the Crane shall be commissioned.			Vendor to confirm		
3.3 Various tests like gradual loading, overload at 125%, Deflection test at 100% load, Braking, Operational Speds etc shall be conducted after proofing of the crane w.r.t technical, Safety Parameters etc the Crane shall be commissioned.			Vendor to confirm		
3.4 Commissioning-spares, required for commissioning of the crane shall be brought by the supplier on returnable basis.			Vendor to confirm		
3.5 Portion, if any, of the crane / sub- assemblies / panel or other -accessories- where paint has rubbed off or peeled during transit or erection should be repainted and merged with the original surrounding paint by the vendor. For this purpose, the vendor should supply sufficient quantity of touch-up paint of various colours of paint used.			Vendor to confirm		

3.6	Schedule of Erection and Commissioning shall be submitted with the offer.	Vendor to confirm			
3.7	Charges, duration, terms & conditions for E&C should be furnished in detail separately by vendor along with offer.	Vendor to confirm			
4.0	ELECTRICAL SYSTEM :				
4.1	415V \pm 10% 50Hz \pm 1.5 Hz, 3 Phase AC (3 wire system plus ground) Power Supply Source will be provided by BHEL by means of ICTP switch at one location for erection purpose. However For Crane supply Shrouded DSL is required to be provided by supplier. Control Supply for crane shall be 110V ac. All types of cables, connections, circuit breakers, transformers, current collectors etc. required for connecting the DSL power supply to different parts of the crane / control cabinets, shall be the responsibility of vendor.	Vendor to confirm			
4.2	Tropicalisation: All electrical / electronic equipment shall be tropicalized.	Vendor to confirm			
4.3	All electrical & electronic control cabinets & panels should be dust and vermin proof.	Vendor to confirm			
4.4	All electrical components in the cabinets should be mounted firmly on backelite plate or on DIN Rail so that there is no break in circuitry during traversing & accidental hit by adjoining Cranes or severe jerks at rail Joints.	Vendor to confirm			
4.5	All electrical and electronic panels including operator's panel should be provided with fluorescent lamps for sufficient illumination and power receptacles of 220Volts, 5/15 Amp AC. All adapters/receptacles should have compatibility with Indian equivalents.	Vendor to confirm			
4.6	All cables including cross-traverse conductor shall be shrouded DSL . All connecting Cables should be properly dressed in cable trays/ trunking with appropriate clamps. Cable for Crane lighting shall be in flexible mild steel Conduit pipe.	Vendor to confirm			
4.7	Vendor should ensure the proper earthing for the crane's electrical equipment & its peripherals .	Vendor to confirm			

	5.0 SAFETY ARRANGEMENTS: Following safety features in addition to other standard safety features should be provided on the crane .	Vendor to confirm			
5.1	Crane should have adequate and reliable safety interlocks / devices to avoid damage to the crane, workpiece and the operator due to the malfunctioning or mistakes. Crane functions should be continuously monitored and alarm / warning indications through lights/ alarms should be available.	Vendor to confirm			
5.2	Load Cell & Display & tripping mechanism for 250MT & 50 MT Hook : The system should sense Load to be lifted at Crane Hook . The Load cell shall sense the load, display prominently (8 " Font clearly visible from Ground) & subsequently protect overloading in Cranes by tripping the hoisting machinery . In case of overloading the system should trip the entire Hook machinery for which suitable interlocking should be done with facility of voice messaging as per BHEL instructions. Accuracy of Load cell : 0.5% at full load ; Repeatability : 0.01 % of full scale.	Vendor to confirm			
5.3	A detailed list of all alarms / indications provided on Crane should be submitted by the supplier.	Vendor to confirm			
5.4	All the pipes, cables etc. on the crane should be well supported and protected.	Vendor to confirm			
5.5	All the rotating parts used on machine should be statically & dynamically balanced to avoid undue vibrations. Open gears, couplings, fans/ rotating parts should be provided with suitably guarded.	Vendor to confirm			
5.6	Safety Lights at both ends to be provided (preferably Flashing during the travel).Also 2 Nos Bull - Eye plate with painting of circular Red & white Strips are to be provided at either side of Crane to be provided)	Vendor to confirm			
5.7	Suitable Lifting arrangement like Lifting Hooks, Jacking pads , Eye Bolts etc is required for lifting of Motors, other subassemblies or heavier structures.	Vendor to confirm			

5.8	Emergency Switches should be provided at suitable locations	Vendor to confirm			
5.9	Electrical cable & signalling cables should be suitably separated.	Vendor to confirm			
5.10	DSL Guard should be provided	Vendor to confirm			
5.10	Hook Guard should be provided	Vendor to confirm			
	6.0 ENVIRONMENTAL PERFORMANCE OF THE MACHINE :	Vendor to confirm			
6.1	The Crane shall conform to following factors related to environment :	Vendor to confirm			
6.2	Maximum noise level shall be 85 dB(A) at normal load condition, 1 M away from the crane with correction factor for back ground noise, if necessary. This will be measured as per international standards like DIN 45635-16. Supplier to demonstrate compliance to noise level, if so required.	Vendor to confirm			
6.3	If any safety / environmental protection enclosure is required it should be built on the Crane by the vendor.	Vendor to confirm			
6.4	Paint of the Crane should be applied only after providing rust-preventor (primer) coat.	Vendor to confirm			
6.5	Oil / Grease should not dip/ fall from the Crane	Vendor to confirm			

7.0 TOOLS FOR ERECTION, OPERATION & MAINTENANCE :				
7.1	Lifting Hook at the top of Block -Truss shall be made available for Crane Erection purpose, other equipment like Winch, Mobile Crane , Sheave Pulley Blocks , Tools & tackles etc shall be brought by the Supplier on returnable basis. Other Special tools and equipment required for erection of the Crane shall be brought by the vendor on returnable basis. Necessary tools like Torque Wrench, Spanners, Keys, grease guns etc.for operation and maintenance of the crane should be supplied. List of such tools should be submitted with offer .	Vendor to confirm		
7.2	All necessary levels / other instruments and devices for testing of the Crane including cradle for load testing except the load (for which steel plates will be provided by BHEL, the maximum size of Structural steel plates would be 220mm thick x 2100mm width x 5000mm Long) should be brought by Vendor on returnable basis.	Vendor to confirm		
7.3	Maintenance: Adequate maintenance facility shall be provided for ease in maintenance for assemblies/sub-assemblies including gear boxes / machinery / Panel / wiring/ etc.	Vendor to confirm		
8 SPARES: (Optional)				
8.1	Item wise breakup of mechanical, hydraulic, electrical and electronic spares used on the crane in sufficient quantity as per recommendation of Vendor for 2 years for trouble free operation on three shifts continuous running basis should be offered by vendor. The list to include following, in addition to other recommended spares: (Unit Price of each item of spare should be offered)	Vendor to Specify		

8.2	Mechanical & Hydraulic Spares: Thrusters and DCEM Brake for all motion and Hoists, Long Travel driving and ideal Shafts, Cross Travel driving and ideal Shaft, Driving and Driven Wheel, CT and LT couplings, Pulley of bottom block of each hoist, LT Bearing Cover, Plumber Block for each Motion, Hydraulic Seals for Gear Boxes, Brake Drum for main and auxiliary hoist.	Vendor to Specify			
8.3	Electrical /Electronic Spares: Brake coils, Current Collector system, all types of Transmitter/ Receiver spares like PCBs relays and electronic cards and other electronic spares for RRC and AC Drives.	Vendor to Specify			
8.4	Vendor to confirm that complete list of spares for the crane and its controls- along with specification / type / model- and name & address of the spare supplier shall be furnished along with documentation to be supplied with the Crane	Vendor to confirm			
9.0	DOCUMENTATION : Five sets of following documents (Hard copies) in English language should be supplied along with the machine	Vendor to confirm			
9.1	During participation in technical Bid	Vendor to confirm			
9.1.1	G.A. Drawing	Vendor to confirm			
9.1.2	Wheel Load Diagram (Wheel Distance & Wheel Load)	Vendor to confirm			
9.1.3	Sketches showing full details of cranes with dimensions / end clearances (between centre of LT rails to column face of building), overhead clearance from LT rails, hook approach limits, lift height, Details of Web thickness baffle plates, Stiffeners ,of Girder section , End carriage (Boggies) Trolley Section etc.	Vendor to confirm			
9.1.4	Vendor to submit, along with offer, the reference list of customers where similar cranes have been supplied mentioning the customer, major specifications of the supplied Crane, Control System, Year of Supply etc	Vendor to confirm			
9.1.5	Vendor to submit appropriate Q.A. Plan .	Vendor to confirm			

	9.2 After Receipt of Order:	Vendor to confirm			
9.2.1	Calculation for Box Girder, End Carriage structural plates/ Web / Stiffner plate, Wheel Load calculation & Calculation for selection of Diameter of Wheel, Motor, Gearbox and Brake etc. 5 - sets of followings documents like G. A Drawings, Structural drawings like End-carriage, Box Girder, Assembly Drawings/ Sub- assembly Drawings, Gear Box Drawings (specially of Typical Gears having Helix Angle, Pressure Angles, Modules etc.) , DSL Drawings Bracket/ Current Collector System, Hook Block, LT & CT wheel, Main Hook & Aux. Hook assembly LT machinery, Hoisting machinery, Electrical Drawings comprising Power, Control Circuits , Electronic Circuitry diagram for RRC etc. No fabrication / purchase of BO. items should be taken up before the approval of the drawings.	Vendor to confirm			
9.2.2	Operating manuals of Crane - 5 Sets	Vendor to confirm			
9.2.3	Detailed Maintenance manual of Crane. Spares- part list / concerned drawing of the spares - 5 Sets	Vendor to confirm			
9.2.4	Maintenance, Interface & commissioning manuals for Controller & drives - 2 Sets	Vendor to confirm			
9.2.5	Catalogues, O&M Manuals of all bought out items including drawings, wherever applicable.	Vendor to confirm			

9.2.6	Detailed specification of all rubber items like Oil- Seals / O- Rings etc	Vendor to confirm			
9.2.7	One Soft copy for the above requisities shall also be supplied in CD	Vendor to confirm			
9.2.8	RRC's frequency allocation license, Chemical & Proof load certificates of Hooks (Test certificates from a recognized Government Test House), Wire Rope (Break load test Certificate having Factor of safety not less than 6 shall also be furnished) , Forgings, wheels - Chemical composition, UV test report, Weld joints X- ray Test reports, Test report of Structural material, Electrical componets, Brakes, Spring Loaded Buffers etc shall also be furnished.	Vendor to confirm			
10.0	TRAINING:				
10.1	Vendor to impart training to BHEL personnel for operation & for maintenance at BHEL works for a period of 7 days after Erection, Commissioning and handing over of the Crane. Supplier should arrange for training of BHEL personnel free of cost for the offered RRC system / Drives maintenance.	Vendor to confirm			
11.0	AMBIENT CONDITIONS & THERMAL STABILITY :				
11.1	Total Crane including Controller system and all supplied items should work trouble free and efficiently under following operating conditions: Power Supply Voltage: 415 V \pm 10%, 50 Hz, \pm 1.5Hz No. of phases = 3 (3 Wire plus Ground) Ambient Conditions: Temperature = 5 to 55 degree celsius Relative Humidity = 95% max.	Vendor to confirm			
11.2	Weather conditions are tropical, Atmosphere may be dust laden during some part of the year. Crane shall be in the normal shop floor condition. Max. temperature variation is up to 25 deg Celsius in 24 hours.	Vendor to confirm			

12.0	CRANE ACCEPTANCE: (Tests/Activities to be Performed by Vendor)					
12.1	At Vendor Works: Inspection And Test					
12.1.1	Stage Inspection : BHEL Officials will stage inspect the crane for test-witness/ Physical inspection of Sub-assemblies, Gear Box, Wire Rope, Hooks, Weld test etc before closing of girder. And these stage inspection shall be carried out before painting of crane girders/ components. Supplier will furnish test certificates & guarantee for performance of these components / unit. BHEL shall inspect the Hooks proof load test at OEM's works.	Vendor to confirm				
12.1.2	No Load Test : During Final inspection before dispatch, the supplier shall assemble the complete crane and arrange for its physical inspection & checking of the camber as per IS 3177, the same shall be witnessed by BHEL officials. No load test run of sub assemblies shall also be witnessed. During this relevant Test certificates by OEM of Hooks, Wire Rope, Thruster Brakes, VVED Drives, RRC Master Controllers, Limit Switches, Gear Boxes etc shall also be examined.	Vendor to confirm				
12.2	At BHEL Works: Inspection And Test	Vendor to confirm				
12.2.1	Span, Diagonal, & other dimensions shall be examined.	Vendor to confirm				
12.2.2	Load Test :Overload test at 125% shall be conducted . Deflection at 100 % load shall be measured. Operational Speed & braking for all motions shall be tested in line with relevant IS. For load test the required load will be provided by BHEL. Remote operation, interlocking, Performance of motors with current measurement & other components like Load cell etc shall be carried out. Test- Reports & other documents shall be examined/ verified. If found satisfactory , the crane shall be accepted and considered as Handed Over.	Vendor to confirm				
12.2.3	The supplier shall however bring their own Cradle along with Chain / Slings & other lifting tackles (on returnable basis) for conducting load test at BHEL site. BHEL will provide load in the form Steel Plates. The load test shall be performed at BHEL site for proving of the crane w.r.t technical, Safety Parameters etc the Crane shall be commissioned.	Vendor to confirm				

13.0 PACKING:				
13.1 Rigid packing for all End Carriages, Girders etc . Other parts like sub- assemblies of cranes, Panel , RRC transmitter/ Panel etc shall be suitably packed so that the material reaches BHEL without any damage/loss in transit.	Vendor to confirm			
15.0 GENERAL : The vendor should submit the following information:	Vendor to confirm			
15.1 Total connected load (KVA):	Vendor to specify			
15.2 Total weight of the Crane	Vendor to specify			
15.3 Weight of heaviest part of Crane	Vendor to specify			
15.4 Weight of the Entire Crab	Vendor to specify			
15.5 Weight of the heaviest assembly/ subassembly of the Crane	Vendor to specify			
15.6 Dimensions of largest part/ subassembly/ assembly of the crane.	Vendor to specify			
15.7 Overall Length, Width, Height for complete Crane with accessories	Vendor to specify			
15.11 Weight of the 500 MT Hook	Vendor to specify			
15.13 Dimensions of largest part/ subassembly/ assembly of the crane.	Vendor to specify			

16.0	QUALIFYING CONDITIONS :				
16.1	Only those vendors, who have manufactured, supplied and commissioned at least two EOT Crane of capacity 200 Tonnes or higher with span 20m or higher and the supplied crane is presently working satisfactorily for more than 3 years after commissioning, should only quote. The following information is to be submitted by the vendor about the companies where similar Cranes have been supplied. This is required from all the vendors for qualification of their offer.	Vendor to Specify			
16.2	Vendors should have executed Single order of 2 crores or more in a financial year				
16.3	Name of the customer / company where similar Crane or higher capacity crane(s) are installed. (Copy of Purchase Order should be furnished)	Vendor to specify			
16.4	Complete postal address of the customer.	Vendor to specify			
16.5	Year of commissioning. (Copy of Commissioning Report should be furnished)	Vendor to specify			
16.6	Application for which the machine is supplied with details of accuracies achieved on the job.	Vendor to specify			
16.7	Name and designation of the contact person of the customer.	Vendor to specify			
16.8	Phone, FAX no. and email address of the contact person of the customer.	Vendor to specify			
16.9	Performance certificate from the customers, on their letter head, regarding satisfactory performance of machine supplied to them.	Vendor to Confirm			