



BHARAT HEAVY ELECTRICAL LIMITED

UNIT'S ADDRESS:

CONTACT PERSON'S NAME/DESIGN./PHONE NO./E-MAIL

Encl

Supplier

**TECH SPECIFICATION CUM COMPLIANCE CERTIFICATE OF MOTORISED WORKING
CORE ASSEMBLY OF LSTG (EMT-6798)**

NOTE:-

1. Vendor must submit complete information against Pre Qualifying conditions (PQR) clause no. 16. The offer shall be processed further.
2. The "Offered" Column and where applicable, the "Deviations" & "Remarks" Column of this format shall be filled along with the offer. Inadequate / incomplete, ambiguous or unsustainable information against any of the conditions 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 AUTHORITY LIAISON TO BE FURNISHED

TELEPHONE NOS.:

TELEPHONE NOS.:

FAX NOS.:

FAX NOS.:

E-MAIL ADDRESS :

E-MAIL ADDRESS :

(WEX-Mech)

Deep Prakash
E2/WEX/BL-1

(WEX-Elect)

MANOJ K.R.
E3/WEX/BL-1

(FCX)

(Block-I, LSTG)

SCOPE: DESIGN, MANUFACTURING, SUPPLY AND ERECTION & COMMISSIONING OF MOTORISED WORKING PLATFORM FOR STATOR CORE ASSEMBLY
SPECIFICATIONS AS BELOW.

Sl.No.	Description for BHEL Requirement Specification No. EMT-6798	To be Specified / confirmed by	Offered
1.0	PURPOSE & WORK PIECE:		
1.1	PURPOSE: Motorised working Platform is required for carrying working personnel and material etc UP & DOWN during stator core assembly of 660 & 800MW Turbogenerators in core pit at different heights on outer side of TG stator cores having different diameters and heights during assembly work.	Vendor	
1.2	Work piece and Work place details:		
1.2.1	Work place (Core pits for stator core assembly in LSTG) details: Depth : (-) 6.0M from Ground level. Width : core pit = 4.5 M, Length of pit available for working platform structure: 8.1 M (Approx.)	Vendor	
1.2.2	Work piece details:		
1.2.2.1	Outer diameter of stator core : 3500mm (Maximum), 2600mm (Minimum)	Vendor	
1.2.2.2	Maximum height of stator core : 7100mm	Vendor	
2.0	SPECIFICATION:		
2.1	TECHNICAL PARAMETERS:		
2.1.1	Construction: Motorised Working platform shall consists of a rectangular box type steel outer structure with suitable ribbing, housing a single working platform having motorised movement (UP and DOWN) through Four lead screws & Lead Nuts, primary & secondary Gear boxes with drives and controls. Schematic layout of the motorised working platform is enclosed as Drawing EMT-6798 Sheet 1/2 and Sheet 2/2 . The complete structure with platform will be placed on the Assembly plate in core pit and should be of portable nature and shall be easily moved out and installed in the core pit using EOT crane without dismantling the platform. Structure to be designed such that no bottom supports are used under overhangs if any as it will create hindrance during assembly.	Vendor	
2.1.2	Material of Outer Structure: Steel hollow square / rectangular sections, confirming to IS:4923 procured from reputed vendors.	Vendor	
2.1.3	Outer Structure Dimensions: Height=9750mm (Max.) X Length = 8100mm(Max.) X Width =4300mm(Max.)	Vendor	
2.1.4	Level of working platform from pit bottom: 2300mm (Min) 10800mm (Max) or 4800mm above ground level	Vendor	

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2.1.5	Vertical movement of working platform: Min. from 2300mm from bottom of core pit to 10800mm (Max.) i.e. 4800mm above Ground Level.	Vendor	
2.1.6	Drive Mechanism : Vertical movement of platform shall be by using 4 Nos. vertical Lead screws & Lead Nuts	Vendor	
2.1.7	Lead Screw Material: Medium carbon steel alloy.	Vendor	
2.1.8	Lead Screw size : OD 70 mm(Min), Pitch =18 mm, Square Threads and nuts.	Vendor	
2.1.9	Motors Details : To be provided by vendor. (All motors shall be of reputed make like ABB/ Crornpton/Siemens/Bharat Bijlee or Equivalent)	Vendor	
2.1.10	Primary Gear Box = 2 Nos. Worm Gear Box Double ended output shafts. Details : To be provided by vendor. (All Gear Box shall be of reputed make like Shanti / New Allenberry / Radicon/ Elecon/ Greaves or Equivalent) .	Vendor	
2.1.11	Secondary Gear Box = 4 Nos. Worm Gear Box Details : To be provided by vendor. (All Gear Box shall be of reputed make like Shanti / New Allenberry / Radicon/ Elecon/ Greaves or Equivalent) .	Vendor	
2.1.12	Bearings: Only SKF / FAG/ NTN / INA or Equivalent make bearings shall be fitted in the equipment.	Vendor	
2.1.13	Limit Switch Details : To be provided by vendor. (Limit switch shall be of reputed make like BCH/ OMRON/ TECHNIC or Equivalent) .	Vendor	
2.1.14	Speed of platform (UP & DOWN) : 1000mm/min (fixed) approx.	Vendor	
2.1.15	Braking time/distance : To be furnished	Vendor	
2.1.16	Inner dia of working platform : 3700mm	Vendor	
2.1.17	Changeable Platforms (Aluminium Chequered Plates) : Changeable platforms shall be provided having various inner diameters to suit different outer diameters of Job. One set of changeable platforms of suitable OD having following Inner diameters shall be provided with the working platform: (a) 2800mm, (Qty=1Set.) (b) 3100mm, (Qty=1Set.) (c) 3350mm, (Qty=1Set.) (d) 3650mm. (Qty=1Set.) The changeable platform too shall have openings with cover to cater to clause at sl. no 2.1.26. These changeable platforms shall also have suitable bottom support for the working load.	Vendor	
2.1.18	Total load carrying capacity of working Platform: 1000 Kgs or more	Vendor	
2.1.19	A small almirah / rack with hinged doors with latch to be provided on the platform to keep small items required during assembly operations. Size Ht=1000mmXL=800mmX440mm Approx.	Vendor .	

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2.1.20	Working platform shall be electromechanical type. Hydraulic, Chain pulley etc. is not acceptable.	Vendor	
2.1.21	Furnish installation details of the equipment along with General arrangement drawing and also details of scope of the vendor and BHEL.	Vendor	
2.1.22	Top working surface of working platform shall consist of aluminium chequered plate. One set of changeable platforms of each size as per point 2.1.17 of aluminium chequered plate (Thickness 3mm - Min.) shall be provided to cater to the stator cores of various outer diameters. Suitable slots shall be provided in platform for smooth sliding and fixing of changeable platforms during stator core manufacturing. Covers with hinges to be provided to open and close the openings when desired. Top working plate shall be re-inforced from bottom side with suitable supports to take the working load with suitable factor of safety.	Vendor	
2.1.23	Detachable protective railing made out of suitable material shall be provided around working surface of platform for safety of working personnel. Two suitable hinged gates to be provided at East and west side for entry / exit of working personnel.	Vendor	
2.1.24	Sufficient clear gap shall be provided in the working platform so that stator core with max outer diameter (3500mm) can be taken out of the working platform in vertical condition, after work completion without removing the working platform.	Vendor	
2.1.25	Assembly of stator cores of 660 & 800MW turbogenerators can be carried out in the stator core pit. For assembly of 660MW TG core an Assembly plate of size L=6600mm, W=4000mm, T=200mm ((Drawing No R7082-0425) alongwith other toolings is used at the bottom of pit below the proposed motorised platform. For assembly of 800MW TG core an Assembly plate of size L=7100mm, W=4200mm, T=200mm (Drawing No R7082-0460) alongwith other toolings is used. To carryout assembly of both 660MW and 800MW TG core in same pit we need to interchange the assembly plate and other toolings below it. Design of Platform shall be such that the complete structure including working platform, Gear Boxes, Drives can be moved out of the core pit without disassembly of any part. Similarly the complete structure shall be placed back in position with the help of EOT Crane. Vendor shall submit their scheme for removal and placement of the motorised working platform. Preliminary along with offer and Final within 30 days of placement of Purchase Order along with General arrangement drawing (refer Cl.9.0 & 9.1) for BHEL approval.	Vendor	

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2.1.26	The motorised working platform shall have Provision for Removal & Placement of Angle Plates vide Drawing number R7082.0424 (Drg. Enclosed for reference) without damaging / dismantling platform while platform is in its installed position. Suitable opening in the platform to be provided with foldable covers to cover once the angle plates are in position. (Refer Schematic layout Drawing EMT-6798 sheet 1/2 and 2/2 enclosed.) Suitable covers also to be provided to be used during operations when both angle plates are removed. These covers shall also have opening of 250X250mm for placement of core bar pressing fixture and shall have covers when not in use.	Vendor	
2.1.27	The motorised working platform outer structure shall have four beams(two nos each side) fixed in longitudinal direction at heights 4000mm and 7000mm for placement of Heating unit during heating & pressing of the stator core. Vendor shall supply two numbers beams loose which will be placed on the fixed beams for placement of heating unit. Suitable provision of fastening to be provided (refer sec A-A and sec C-C of Drg. EMT-6798 sheet 2/2) Total weight of the heating unit is approx. 2000Kgs. The heating unit shall be removed after heating is complete. The structure to be suitable to handle this heating unit load and working platform load.	Vendor	
2.1.28	Vendor may visit the site at BHEL Haridwar before quoting their offer to clearly understand the requirement.	Vendor	
2.2	Control panel:		
2.2.1	Main control panel for operation of the motorised working platform shall be provided at ground level.	Vendor	
2.2.2	One remote operator's panel shall be provided on the working platform at a suitable location.	Vendor	
2.2.3	Emergency stop switch shall be provided on each control panel	Vendor	
2.2.4	Each operator's panel shall have mains ON/OFF, RAISE/LOWER, INCHING mode, STOP, EMERGENCY STOP push buttons, LED indicators for raise/lower of working platform with suitable alarm / bell at beginning of operation for alerting the working personnel.	Vendor	
2.2.5	Two numbers plug socket for single phase 3 pin power supply shall be provided for lamp/illumination on the working platform.	Vendor	
2.3	ELECTRICAL SYSTEM:		
2.3.1	415V + 10% / -15%, 50HZ +/-3 HZ, 3 Phase AC (3 wire system with out neutral) Power Supply Source will be provided by BHEL at a single point near the equipment, as per layout recommended by Vendor. All types of cables, connections, circuit breakers etc. required for connecting BHEL's power supply point to different parts of the equipment/control cabinets, shall be the responsibility of vendor.	Vendor	
2.3.2	Tropicalisation: All electrical / electronic equipment shall be tropicalized	Vendor	

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2.3.3	All electrical & electronic control cabinets & panels should be dust and vermin proof	Vendor	
2.3.4	All electrical components in the cabinets should be mounted on DIN Rail	Vendor	
2.3.5	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. cooling of the cabinets to be provided if required.	Vendor	
2.3.6	Motors shall conform to IEC or Indian Standards	Vendor	
2.3.7	All cables moving with working platform should be installed in Caterpillar/ Drag chain/ Steel Conduits i.e suitable arrangement. Additionally, all the cable trays etc. required for laying of cables should be included in the offer.	Vendor	
2.3.8	Vendor should ensure the proper earthing for the equipment and its peripherals.	Vendor	
2.3.9	Two Suitable overhead LED Lights to be provided on the outer structure at east and west side of the platform for complete illumination of the working area for the entire travel of the working platform.	Vendor	
2.4	SAFETY ARRANGEMENTS: The following safety features in addition to other standard safety features should be provided on the equipment.	Vendor	
2.4.1	Non slip platform top surface.	Vendor	
2.4.2	Stability.	Vendor	
2.4.3	Slow jerk free movement.	Vendor	
2.4.4	Positive locking at any desired position.	Vendor	
2.4.5	Electrical interlocking between raise/lower buttons.	Vendor	
2.4.6	Guards for Gear Boxes, drive couplings etc.	Vendor	
2.4.7	Manual operation in case of power failure.	Vendor	
2.4.8	Emergency stop switch at suitable location on each platform.	Vendor	
2.4.9	All cables should be well supported and protected.	Vendor	
2.4.10	Safety lights at suitable locations.	Vendor	
2.4.11	Protection in case of box nut wear out/failure.	Vendor	
2.4.12	A suitable ladder to be provided on the structure of platform for movement of personnel in case of electrical failure/fault and for repair etc.	Vendor	
2.5	ENVIRONMENTAL PERFORMANCE OF THE EQUIPMENT :		
	The equipment shall confirm to following factors related to environment :	Vendor	

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2.5.1	Maximum noise level shall be 85db(A) at normal loading condition, 1M away from the equipment. This will be measured as per international standard like DIN 45635-16 supplier to demonstrate compliance to noise level, if so required.	Vendor	
2.5.2	Paint of the equipment should be suitable for rust prevention and should not peel off.	Vendor	
3.0	AMBIENT CONDITIONS & THERMAL STABILITY :		
3.1	Total equipment should work trouble free under following operating conditions Power Supply: Voltage: 415 V +10%, - 15% Frequency: 50 Hz +3%, - 3% No. of phases = 3 Ambient Conditions: Temperature = 2 to 48 degree Celsius Relative Humidity = 95% max.	Vendor to confirm that equipment is suitable for operate in these weather conditions.	
3.2	Weather conditions are tropical, Atmosphere may be dust laden during some part of the year. Equipment shall be kept in the normal shop floor condition. Max. temperature variation is up to 25 deg Celsius in 24 hours.	Vendor to confirm that equipment is suitable for operate in these weather conditions.	
3.3	Thermal Stability of the complete equipment keeping in view specified Ambient Conditions at BHEL works, trouble free operation of the equipment should be ensured by vendor.	Vendor	
4.0	LEVELING AND ANCHORING SYSTEM: The motorised platform shall be directly placed on the Assembly plate in the core pit and fixed using M24 bolts with tapped holes on Assembly plate. The platform structure shall have levelling provision and anchoring of the structure at 4 places on the ground level in existing foundation (refer Drg. EMT-6798 sheet 1/2). Vendor to submit the details of the pockets in foundation for Anchoring the platform with ground along with the offer and also indicate the grouting compound and Grouting procedure etc for foundation bolts of anchoring materials for BHEL approval alongwith General arrangement drawing. BHEL will construct the pockets as per the Approved General arrangement drawing. Vendor shall supply suitable foundation bolts, anchoring materials etc.	Vendor	
5.0	TOOLS FOR ERECTION, OPERATION & MAINTENANCE :		
5.1	Special tools and equipment required for erection of the equipment shall be brought by the vendor. Necessary tools like Torque Wrench, Spanners, Keys, grease guns etc. For operation and maintenance of the equipment should be supplied. List of such tools should be submitted with offer.	Vendor	

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6.0	SPARES: Following spares required for 2 years trouble free operation of the equipment shall be offered by the vendor. (Any spare not applicable for the equipment from the following list or any additional spare recommended by the vendor shall be clearly mentioned in the offer). List of the spares to be submitted along with the offer. Unit price of each item of spare shall be offered. 1. Bearings for gear box -- Qty -- 08 Nos. 2. Lovejoy couplings -- Qty -- 04 Nos. 3. Lead nut -- Qty -- 01 Set 4. Limit switches, Micro switches ---Qty-- 01 Set. 5. Drive each type --Qty -- 1 No. 6. Controller (each Type) --Qty -- 1 No.	Vendor	
6.1	All types of spares for total equipment and accessories shall be available for at least ten years after supply of the equipment. If equipment or control is likely to become obsolete in this period, the vendor shall inform BHEL sufficiently in advance and provide drawings of parts / details of spares & suppliers to enable BHEL to procure these in advance, if required.	Vendor	
6.2	Vendor to confirm that complete list of spares for equipment and accessories, along with specification/ type/ model, and name & address of the spare supplier shall be furnished along with documentation to be supplied with the equipment.	Vendor	
7.0	FIRST FILLING OF OIL GREASE ETC: First filling of all oils, grease etc. shall be in the vendor's scope of supply.	Vendor	
8.0	DOCUMENTATION: Five sets of the following documents (hard copies) in English language should be supplied along with the equipment.	Vendor	
8.1	Operating and maintenance (O&M) manuals of the equipment.	Vendor	
8.2	Detailed Maintenance manual of equipment with all drawings of equipment assemblies/sub-assemblies/parts including Electrical / Electronics / Gear Boxes / Hydraulic circuit diagrams. All Assembly/ Sub Assembly Drawings shall be supplied with the part list.	Vendor	
8.3	Catalogues, O&M Manuals of all bought out items including drawings, wherever applicable.	Vendor	
8.4	Complete Master List of parts used in the equipment shall be submitted by the vendor.	Vendor	
8.5	One additional set of all the above documentation on CD ROM, wherever possible.	Vendor	

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9.0	GENERAL ARRANGEMENT DRAWING: Preliminary General arrangement drawing of Motorized working Platform should include drawings of assemblies / sub assemblies / parts including Electrical / Electronic/ Mechanical/ diagrams indicating all the details such as overall size and weight, dimensional details of fabricated steel body, location of motors and gear - worm shaft arrangements, make and article number of the bearings, location of control Panel, Control Panel design , make and specification of motor, location of lifting hook etc. are to be furnished with the offer.	Vendor	
9.1	Final General Arrangement Drawing with details as mentioned in Sl. No. 9.0, is to be submitted by the vendor for BHEL approval within one month after placement of Purchase Order.	Vendor	
10.0	ERECTION AND COMMISSIONING :		
10.1	Supplier to take full responsibility for carrying out the erection & commissioning of the equipment. Service requirement like power, air & water shall be provided by BHEL at only one point to be indicated by supplier in their Layout/General Arrangement drawings. Other requirements like crane and helping personnel shall also be provided by BHEL. Details of these requirements should be informed by vendor in advance.	Vendor	
10.2	Successful proving of the equipment by the supplier shall be considered as part of commissioning.	Vendor	
10.3	Tools, Tackles, instruments and other necessary equipment required to carry out all above activities should be brought by the supplier.	Required	
10.4	Commissioning spares, required for commissioning of the equipment within stipulated time, shall be brought by the supplier on returnable basis.	Vendor	
10.5	Portion, if any, of the equipment, accessories and other supplied items 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	
10.6	Schedule of Erection and Commissioning shall be submitted with the offer.	Vendor	
10.7	Charges, duration, terms & conditions for E&C should be furnished in detail.	Vendor	

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11.0	PROVEOUT OF THE EQUIPMENT		
11.1	The equipment is to be proved at BHEL works for its proper function by demonstrating all the functions as per technical parameters to the satisfaction of BHEL.	Vendor	
11.2	Dimensional inspection of the main items (vendor to submit dimensional inspection report for all major manufactured items).	Vendor	
12.0	EQUIPMENT ACCEPTANCE: (Tests/Activities to be performed by vendor)	Vendor	
12.1	Pre Despatch Inspection (PDI): Tests/activities to be carried out at suppliers works before despatch of the equipment. Visual inspection, Dimensional Measurement with reference to approved General Arrangement Drawing and Demonstration of all features of the motorized working platform at vendor's works by BHEL representatives before despatch. Complete motorised working platform shall be assembled by the supplier at their works and made operational for inspection by BHEL representative(s). Vendor shall give advance intimation for carrying out the Pre dispatch inspection of the platform.	Vendor	
12.1.1	TRAINING: Three BHEL Persons shall be trained at vendor's works for the equipment for the area & period given below: (a) Electrical, Electronic maintenance of the equipment & other supplied items (Period 1 week) (b) Mechanical maintenance of the equipment & other supplied items (Period 1 week) (c) Operation of the equipment & other supplied items (Period 1 weeks) Pre-dispatch inspection (ref. Sl.No. 12.1) of the equipment shall also be carried out by the team during their stay at vendor's works for the training. Vendor may specify days required for pre-dispatch inspection. BHEL reserves the right to choose no. of persons, field & period of training, out of above, while deputing their engineers for training.	Vendor	
12.1.2	Travel, boarding & lodging for the trainees shall be borne by BHEL.	Vendor	
12.1.3	Competent, English speaking experts shall be arranged by the vendor during training for satisfactory & effective training of BHEL personnel.	Vendor	
12.1.4	Vendor to quote for training on per man per week basis	Vendor	

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12.2	Tests/activities to be carried out at BHEL works while commissioning the equipment: Installation of the working platform in the Stator core pit. Demonstration of all features of the motorised working platform, control system, manuals & accessories to the satisfaction of BHEL for efficient and effective use of the equipment as per technical specifications.	Vendor	
13.0	PACKING: Proper packing of the items is to be ensured to avoid any damage in transit. In case of foreign suppliers, Sea worthy & rigid packing for all items of complete equipment, all accessories and other supplied items to avoid any damage/loss in transit. When the equipment is despatched in containers, all small loose items shall be suitably packed in boxes	Vendor	
14.0	GUARANTEE : 24 Months from the date of acceptance of the equipment. Any spares required during the guarantee period shall have to be arranged by the vendor free of cost (up to BHEL Haridwar stores) and duty levied have to be borne by the vendor.	Vendor	
15.0	GENERAL : The vendor should submit the following information.	Vendor	
15.1	Model of the equipment	Vendor	
15.2	Total connected load (KVA):	Vendor	
15.3	Floor area required (Length, Width, Height) for complete equipment & accessories	Vendor	
15.4	Painting of the equipment: Working platform with structure shall be painted with zebra strips in black colour on yellow base. All other parts to be finish painted in apple green colour RAL 6011 (polyurethane paint)	Vendor	
15.5	Total weight of the equipment: 12 ton Max.	Vendor	
15.6	Vendor to submit, along with offer, the reference list of customers where similar equipment's have been supplied mentioning the customer, Model, major specifications of the supplied equipment, Year of Supply etc	Vendor	
15.7	Detailed catalogues, sketch/ photographs of the equipment should be submitted with the offer.	Vendor	
15.8	Delivery period : To be indicated	Vendor	