


	<b><u>BHARAT HEAVY ELECTRICAL LIMITED</u></b>	Indent No.: Dated:	C /3991/10/6580 22.12.2010
	<b>UNIT'S ADDRESS:</b> HEEP, RANIPUR HARIDWAR - 249403 UTTARANCHAL, INDIA	Enquiry No. : Due Date :	
		Supplier Qtn. No.:	
	<b><u>CONTACT PERSON FROM PURCHASE DEPTT.:</u></b> <b><u>NAME: MR. K.ROY</u></b> <b><u>DESIGNATION: Manager (PPX-CAP)</u></b> <b><u>PHONE NO.: 0091 - 1334 - 285291</u></b> <b><u>E-MAIL: kroy@bhelhwr.co.in</u></b> <b><u>FAX NO. : 0091 - 1334 - 226462</u></b>	Date :	
<b><u>SPECIFICATION CUM COMPLIANCE CERTIFICATION FOR BAND SAW= Qty 2 No.</u></b>			
	<b>NOTE :-</b>		
	<p>1. Vendor must submit complete information against clause at Sl.No. 25 of the offer. the offers complying this clause, would only be considered.</p> <p>2. The vendor should fill the "Offered" Column in compliance to specified requirements and also "Deviations" Column, where there is deviation from the requirement. Duly filled specification cum compliance certificate should be 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.</p> <p>3. The offer and all documents enclosed with offer should be in English language only.</p>		
	<b>ADDRESS OF THE SUPPLIER :</b>	<b>ADDRESS OF THE INDIAN AGENT(S) :</b>	
	<b>TELEPHONE NOS.:</b>	<b>TELEPHONE NOS.:</b>	
	<b>FAX NOS.:</b>	<b>FAX NOS.:</b>	
	<b>E-MAIL ADDRESS :</b>	<b>E-MAIL ADDRESS :</b>	

SCOPE:	<b>SUPPLY, ERECTION &amp; COMMISSIONING OF BAND SAW AS BELOW :</b> <b>No of Machines : 2 No</b>				
SL. NO.	<b>DESCRIPTION OF BHEL REQUIREMENT</b>	<b>REQUIRED</b>	<b>OFFERED</b>	<b>DEVIATION</b>	<b>REMARKS</b>
1.0	<b>Purpose:</b> The Band Saw Machine is to be used for cutting of turbine blade flats of various sizes either in bundle clamping arrangement or cutting of individual blade blanks in intermediate operations with automatic adjustment of saw blade guide. The blade materials proposed to be cut off in this machine are mainly high temperature and creep resistant alloy steel hot rolled in material grade X22CrMoV12.1 , X20Cr13,X19CrMoVNbN111 and X12CrMoWVNbN10-1-1 having tensile strength up to 1050 N/MM <sup>2</sup> and hardness up to 335 BHN. The machine should be capable of cutting tougher material also.	Vendor to confirm			
2.0	<b>Broad Design Features:</b> The machine should be double column type with high natural stability and non vibrating drive for an optimal cutting capacity. The complete drive and saw frame should be laid parallel on a strong wear resistant column support and after cutting, the saw frame should automatically move to the Pre-selected height and drive switched off.	Vendor to confirm			
3.0	<b>Technical Specification:</b> Capacity :	Square 260x260mm or more (Smaller bars of different cross sections bundled together)			
3.1	Cutting Speed :	20 or less-90 or more M/Min			
3.2	Drive Motor: AC Frequency Control Drive for infinite variation of band speed through control panel.	3.7 KW or more			
3.3	Saw Band Dimension :	4100x32x1.1 mm			
3.4	Band saw blades. (Qty offered along with machine and qty offered extra - price per piece should be mentioned).	Vendor to comply and intimate the asked details.			
3.5	<b>Taper Accuracy:</b> Taper 0.1mm for 100 mm for material mentioned in SI no. 1	Vendor to offer			
3.6	<b>Accuracy on length:</b> 0.3mm for material mentioned in SI no. 1	Vendor to offer			
4.0	<b>OTHER TECHNICAL FEATURES/ACCESSORIES:</b>	Vendor to comply			
4.1	Completely automatic cutting cycle synchronized with an automatic bar feed mechanism and hydraulic clamping vice for accurate and repetitive cutting.	Vendor to comply			

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4.2	Hydraulic blade tensioning system and guides to keep the blade and under constant load at all times during cutting.	Vendor to comply			
4.3	Hydraulically controlled cutting feed for maintaining a constant cutting rate regardless of the work piece cross section.	Vendor to comply			
4.4	Power driven rotating brush continually flushed by cutting fluid to keep the blade and saw guide free of chips for smooth cutting .	Vendor to comply			
4.5	Controlled differential cutting pressure for easy to difficult material cutting.	Vendor to comply			
4.6	Blade breakage sensor/ motion detector providing automatic shut off.	Vendor to comply			
4.7	Automatic saw blade shut off after completion of cutting.	Vendor to comply			
4.8	Automatic height adjustment for saw frame.	Vendor to comply			
4.9	Automatic adjustment of saw blade guide to material width.	Vendor to comply			
4.10	Infinitely variable cutting speeds with direct display.	Vendor to comply			
4.11	Automatic Cut Length Setting by Digital Scale with 0.1 mm or less least Count	Vendor to comply and intimate details.			
4.12	Piece counter and length multiplier.	Vendor to comply and intimate details.			
4.13	Auto indexing shuttle of stroke length 500 mm and synchronized with auto cycle	Vendor to comply			
4.14	Auto cycle sequencing (PLC based) PLC of Siemens make only.	Vendor to comply and intimate technical details.			
4.15	Hydraulic clamping pressure regulator.	Vendor to comply			
4.16	Coolant system with electric pump, coolant flow regulator, coolant level glass and overflow indication.	Vendor to comply			
4.17	Material support stands with hardened rollers for cutting 6 meter long bars.(Details to be provided by vendor)	Vendor to comply			
4.18	Machine lighting equipment. Vendor to provide 5/15 Amp, 250 Volt socket near the panel for carrying out maintenance.	Vendor to comply			

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4.19	Well-guarded blade and wheel cover.	Vendor to comply			
4.20	First filling of all oils and lubricants and inform the annual consumption of oil / lubricant for 3 shift operation 7000 Hrs/ year basis.	Vendor to comply and inform the desired details			
4.21	Colour of the machine shall be apple green. RAL 6011	Vendor to comply			
4.22	Double column type with high natural stability and non-vibrating drive.	Vendor to comply			
4.23	The complete drive and saw frame should be laid parallel on a strong wear resistant column support.	Vendor to comply			
4.24	Working time meter/ Cutting time meter (Programmed in PLC)	Vendor to comply			
4.25	Infinitely variable feed control valve.	Vendor to comply			
4.26	Fully automatic lubrication system.	Vendor to comply			
4.27	Hand lubrication system for main column.				
4.28	Facility to Programme 99 types of job having different bar sizes, material composition, cut length required and no. of pieces to be cut with priority of cutting facility up to 10 batches. The same has to be demonstrated during Pre acceptance and Commissioning / Final acceptance of the machine at BHEL Hardwar.	Vendor to comply			
4.29	Continuous indication of feed rate and status of height of material remained to cut.	Vendor to comply			
4.30	Bellows/ sleeves for columns.	Vendor to comply			
4.31	Hydraulic clamping pressure regulator.	Vendor to comply			
4.32	PLC based controls and all necessary software. PLC / HMI communication Software (Licensed copy), all necessary cables for the backup and restore the PLC and HMI program, the procedure to take backups of PLC and HMI to be demonstrated.	Vendor to comply and furnish details.			

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4.33	Automatic Cycle pause	Vendor to comply.			
4.34	Hand held programming unit of PLC/ HMI (Siemens make preferred) should be offered optionally alongwith necessary cable and software.	Vendor to comply and furnish details.			
4.35	Full Stroke Hydraulic Bundle cutting arrangement to rapidly cut the broad mix of steels including various blade crosse-section , plate, angle, tube and small structural steel sections. The bundle clamping arrangement should have the following features: a. The clamping should be hydraulic and integrated with the machine. b. Atleast two sets of clamping - front and rear. The minimum gap between the arrangement should be about 100 mm. c. The top clamp should be lever type with adjustment. d. The Clamping arrangement should be from both top and bottom. The top clamping arrangement ( for both front and rear ) should be valve operated for controlling/ cutting off the hydraulic pressure.	Vendor to comply and furnish technical details.			
4.36	Provision of pulse cutting for high alloy material alloy steel.	Vendor to comply			
4.37	Shuttle vice should not open throughout the length and machine should cut programme length to minimum length variation.	Vendor to comply			
4.38	Split vice construction	Vendor to comply			
4.39	' V ' belt driven brush for perfect cleaning of chips from blade gullet.	Vendor to comply			
4.40	Hydraulic tracer arrangement should be provided to regulate cutting feed to enhance the productivity.	Vendor to comply			
4.41	Provision of pulse cutting for high alloy material alloy steel.	Vendor to comply			
4.42	Position unit of cut off length incremental decoder.	Vendor to comply			
4.43	Clamping pressure display	Vendor to comply			
4.44	Cycle sequencing with PLC	Vendor to comply			
4.45	Hydraulic main vice and shuttle vice	Vendor to comply			
4.46	Tool box consisting of Torque wrenches, spsnners, Allen Keys, Grease Gun, Tong tester/Clamp meters of reputed make to measure AC/DC current etc.	Vendor to comply			

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5.0	<b>CHIP CONVEYOR:</b>	Vendor to comply			
5.1	Slate type / Scraper type swarf conveyor with swarf chute for efficiently removing swarf leaving coolant behind.	Vendor to comply			
5.2	Overload Protection device for Chip Conveyor to be provided	Vendor to offer			
6.0	Bar Exhaust control facility.	Vendor to comply			
7.0	Display unit, (Vendor to intimate make and submit technical specifications along with the offer)	Vendor to comply			
8.0	<b>LEVELING &amp; ANCHORING SYSTEM</b>				
8.1	Complete set of anchoring materials including foundation bolts, nuts, washers, fixators, leveling shoes etc for alignment and fixing of the machine on the floor should be supplied. Details to be submitted.	Vendor to offer			
9.0	<b>TOOLS FOR ERECTION, OPERATION &amp; MAINTENANCE</b>				
9.1	Tools and Equipment required for erection of the machine shall be brought by the vendor. Necessary tools like Torque Wrench, Spanners, Keys, grease guns, Tong tester/Clamp meters of reputed make to measure AC/DC current etc. required for operation and maintenance of the machine should also be supplied by the vendor. List of such tools should be submitted with offer.	Vendor to offer			
10.0	<b>ERECTION &amp; COMMISSIONING:</b>				
10.1	Supplier to take full responsibility for carrying out the erection, start up, testing of machine, it's control & all types of other supplied equipment, cutting of test pieces etc. Service requirement like power, air & water shall be provided by BHEL at only one point to be indicated by supplier in their foundation/layout drawings. The equipment is to be located in a room where crane of only 5 MT is existing. In case crane of higher capacity is required, it is to be arranged by vendor by hiring mobile crane from local sources at their own cost. Helping personnel shall be provided by BHEL for erection and commissioning activities. Details of these requirements should be informed by vendor in advance.	Vendor to confirm and submit necessary details.			
10.2	Broad Schedule of Erection and Commissioning shall be submitted with the offer.	Vendor to submit			

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10.3	Charges, duration, terms & conditions for Erection & Commissioning should be furnished in detail separately by vendor along with offer.	Vendor to offer			
10.4	Portion, if any, of the machine, accessories and other supplied items where paint got rubbed or peeled off during transit or erection should be repainted and matched with the original adjoining paint by the vendor before final acceptance.	Vendor to confirm			
11.0	SPARES : Following spares to be provided for each machine( Quantity will be doubled for two machines)				
11.1	Spares for atleast 2 years, three-shift trouble free operation of machine shall be offered. The spare package should include items for machine, hydraulic, lubrication,coolant,measuring device,electrical & Electronic systems and PLC ( if applicable). It should include all attachments, accessories and peripherals. The spares's offer should contain individual item wise list along with price breakup, specification and source of supply. The following spares may also be quoted, if not covered in the standard spare package:	Vendor to confirm			
11.2	<b>Electronic Spares:</b> 1 No of each type of the following to be supplied alongwith the machine- PLC power supply , CPU, Input & output cards, Drive controllers (complete),display unit, any other electronic unit/ PCB used on the machine.	Vendor to confirm and submit necessary details including make and quantity			
11.3	<b>Electrical devices:</b> All different types of contractors, relays, timers, indicating lamps, limit switches, proximity switches, fuses, push buttons, Electronic Piece counter and solenoid valves. - 3 Nos each type <b>Lubrication system:</b> Spares including motor, pump etc. DC Power Supply 24 V.				
11.4	<b>Hydraulic system:</b> Hydraulic Pump, Coolant Motor + Pump Set, Lubrication Pump, piston cylinder , set of all types of oil seals, pressure guages, solenoid valves, pressure regulators, flow control valves, filters, pressure switches, flow and float switches, high pressure hoses, solenoid coils Two quantity of each item at point no 11.3.				
11.5	<b>Mechanical :</b> Chain & sprocket , rollers , safety clutches , brakes , Carbide Wear Plate set, Band saw guides, guide bearings, two sets of driver & driven pulleys.				

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12.0	Documents & Manuals: 5 sets of all operational and maintenance manuals containing all assembly/ sub assembly drawings, circuit diagrams of the machine hydraulic, pneumatic, coolant system, lubrication system with proper identification no. and descriptions and electrical system shall be supplied. The party should also supply the hard copy of PLC program/ ladder logic diagram (if applicable). The manuals should also contain detailed spare part list along with specification, part number and address of manufacturers.	vendor to confirm			
12.1	Basic Machine operation and maintenance/ service manual - 3 copies	vendor to confirm			
12.2	Electrical schematic of the machine- 3 copies	vendor to confirm			
12.3	All Documentations in CD - 1 set	vendor to confirm			
12.4	Complete list of parts used in the machine along with specification, part/ ordering numbers and address of manufacturer in case of purchased item- 3	vendor to confirm			
12.5	Spare part list along with specification, part number and address of manufacturers (including Brought out items) - 5 sets.	vendor to confirm			
12.6	Service and user manuals of all bought out items- 5 sets.	vendor to confirm			
12.7	Hard copy of PLC program/Ladder diagram along with cross reference and comments in English language only- 3 Sets	vendor to confirm			
12.8	PLC programming manual	vendor to confirm			
12.9	Commissioning and interface manual of dive controller.	vendor to confirm			
12.10	Back up of PLC program, HMI program on USB Stick(4GB) or more	vendor to confirm			
	<b>TRAINING AND PRE DESPATCH INSPECTION</b>				
13.0	Training & Pre -dispatch Inspection : Training of BHEL personnel for mutually agreed period in the field of operation, mechanical/ hydraulic maintenance, electrical and electronic (including PLC, HMI & drive) maintenance shall be offered. Training on PLC/ HMI to be provided at Control manufacturer's works. Also BHEL trainee will do pre-dispatch inspection by witnessing accuracies, verification of all machine functions and cutting of max. size job for which material is to be arranged by Vendor. Dispatch clearance will be given after full satisfaction by B.H.E.L. trainees. Vendor to intimate for PDI 15 days in advance for indigenous supplier and 45 days in advance for foreign supplier.	Vendor to comply			



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14.0	<b>Accuracy tests:</b> All accuracy tests to be conducted at supplier's as well as customer's work shall be indicated in the offer with complete details like type of tests to be carried out, acceptance norms etc. All accuracy list to be indicated.	Vendor to confirm and submit necessary details.			
15.0	<b>FOUNDATION</b>				
15.1	<b>Foundation Design:</b> In case any special foundation is required for installing the machine, detailed foundation drawings to be offered. The vendor should agree to supply 5 copies of machine layout and foundation drawings (hard copies as well as autocad drgs) within one month of Placement of LOI / Order.	Vendor to confirm and submit necessary details.			
16.0	<b>Prove out and acceptance:</b> After successful erection and commissioning at BHEL, Hardwar supplier shall carry out field testing as per specified accuracy to prove the system. The prove out component will be mutually agreed ( Capacity : Both round and Square will have to be tried. The total no. of lots to be tried will be mutually discussed). Proveout of Facility to Programme 99 types of job having different bar sizes, material composition, cut length required and no. of pieces to be cut with priority of cutting facility up to 10 batches. Supervision of one weeks ( 6 working days) routine production after satisfactory commissioning. Final acceptance shall be made by BHEL at BHEL, Hardwar after successful completion of erection, commissioning accuracy testing and supervision.	Vendor to comply			

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17.0	<b>OPERATING CONDITION:</b>	Vendor to accept & confirm.			
17.1	Supply condition: All machine electrical, controls and paint shall be suitably tropicalized. The machine should work trouble free in the following conditions: Power Supply : 3 Phase AC 415V (+10/ 15%) 50Hz +/-3%, 3 wire system Compressed Air : 4-6 Kg/Cm <sup>2</sup> Room Temperature : 3deg to 45 deg Celcius Humidity : 50% to 95%				
17.2	Power Supply Voltage will be provided by BHEL at a single point near the machine, 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 machine/control cabinets, shall be the responsibility of vendor. Vendor should ensure the proper earthing for the equipment and its peripherals/accessories. Any material requirement for the same should be informed with foundation design/drawings so that same could be incorporated during construction of foundation. The vendor can take earthing connection from the nearest available location of the production shop.				
18.0	<b>OTHER TECHNICAL DETAILS:</b> Following technical details/ features are to be quoted/ submitted with the technical offer:	Vendor to confirm and submit necessary details.			
18.1	Arrangement of lubrication of all moving/ rotating parts.				
18.2	The construction details of all machine assemblies/ sub-assemblies and all major machine elements/ accessories.				
18.4	The total connected load of the machine and peripherals.				
18.5	Total machine weight and maximum weight of sub-assembly(s) to be handled during commissioning.				
18.6	Floor space requirement, over all size and height of the machine/ equipment.				
18.7	Service requirement of compressed air, water etc. indicating supply condition.				
18.8	Requirement of any special coating on foundation to prevent seepage of oil, water etc.				

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18.9	Maximum noise level in full load condition, it should be well within the specified limits of regulatory body.				
18.10	Details of vibration damping arrangement if applicable.				
18.11	Lay out of power lines pipelines of water, oil air supply etc.				
18.12	Detailed catalogues, sketch/ photograph of the machine accessories/ attachments.				
19.0	<b>TROPICALISATION</b>				
19.1	All electrical / electronic equipment shall be tropicalized.	Vendor to confirm			
19.2	All electrical & electronic control cabinets & panels should be dust and vermin proof.	Vendor to confirm			
19.3	All electrical components in the cabinets should be mounted on DIN Rail.	Vendor to confirm			
19.4	All motors shall conform to IEC or Indian Standards	Vendor to confirm			
20.0	<b>SAFETY ARRANGEMENTS</b>				
20.1	Following safety features in addition to other standard safety features should be provided on the machine:	Vendor to confirm and comply			
20.2	All the rotating parts used on machine should be statically & dynamically balanced to avoid undue vibrations & noise.	Vendor to confirm and comply			
20.3	Emergency Switches at suitable locations should be provided.	Vendor to confirm and comply			
20.4	Automatic over load protection	Vendor to confirm and comply			
20.5	Adequate protection for all moving and rotating parts to be ensured	Vendor to confirm and comply			
21.0	<b>ENVIRONMENTAL PERFORMANCE OF THE MACHINE</b>	Vendor to confirm			
21.1	The Machine should conform to following factors related to environment :				
21.2	Maximum noise level shall be 85 dB (A) at 1 meter away from the machine 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 asked for.	Vendor to confirm.			

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21.3	There shall not be any emissions from the machine. All fumes etc. during machining shall be arrested by Fume extraction system.	Vendor to confirm.			
21.4	There should not be any effluent from the machine. In case there are any effluents from the machine, requisite effluent treatment plant or pollution control device should be built into the machine by the supplier.	Vendor to confirm.			
21.5	No hazardous chemicals shall be required to be used in the machine.	Vendor to confirm.			
21.6	If any safety / environmental protection enclosure is required it should be built in the machine by the vendor.	Vendor to confirm.			
21.7	Paint of the machine should be oil / coolant resistant and should not get peeled off and mixed up with coolant.	Vendor to confirm.			
22.0	<b>PACKING</b>				
22.1	Rigid packing be made for all items of complete machine, all accessories and other supplied items to avoid any damage/loss in transit. When machine is despatched in containers, all small loose items shall be suitably packed in boxes.	Vendor to offer			
23.0	<b>GUARANTEE</b>				
23.1	Guarantee for complete machine, control system and all supplied accessories/equipments for 24 months from the date of final acceptance of the machine. Any spare required during guarantee period shall have to be arranged by the vendor free of cost and duty levied (if any) have to be borne by the vendor.	Vendor to offer			
24.0	<b>REQUIREMENT</b>				
24.1	HMI display for displaying various machine parameters , PLC I/O s and alarm outputs including necessary buttons for editing.	Vendor to offer			

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25.0	<b>QUALIFYING CRITERIA:</b>				
	Only those vendors (OEMs) should quote who have supplied and commissioned at least one Band Saw of same or higher sizes (Capacity and power indicated at clause no. 3.0 & 3.2 respectively) in the past ten years (on the date of opening of Tender) and referred machine is presently working satisfactorily for more than one year after commissioning (on the date of opening of Tender). The following information is to be submitted by the vendor about the companies where similar machines have been supplied. This is required from all the vendors for qualification of their offer.	Vendor to accept & confirm			
	1. Name of the customer / company where referred machine is installed.	Vendor to inform			
	2. Complete postal address of the customer.	Vendor to inform			
	3. Month & Year of commissioning	Vendor to inform			
	4.Parameters of machine(s) supplied ( Capacity and Power) and application for which the machine is supplied	Vendor to inform			
	5. Name and designation of the contact person of the customer.	Vendor to inform			
	6. Phone, FAX no. and email address of the contact person of the customer.	Vendor to inform			
	7. Performance certificate from the customers regarding satisfactory performance of machine supplied to them (Original Certificate or Through E-mail directly from the customer). The original performancecertificate may be returned after verification by BHEL, if required.	Vendor to submit			
	8.BHEL reserves the right to verify the information provided by vendor. In case the information provided by vendor is found to be false/ incorrect, the offer shall be rejected	Vendor to accept & confirm			
	(V.K.SINGH/SE-TBM) (V.K.CHUGH/SDGM-TBM) (N.HALDHER/SDGM-WEX-M) P.SINHA/SE-WEX-EM (P.K.SINGH/ DM-WEX-CNC)				

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