

	ANNEXURE-I TO P.I 721134013	Dt.03.10.2013		
	<b><u>BHARAT HEAVY ELECTRICAL LIMITED</u></b>			Enquiry
	<b><u>UNIT'S ADDRESS:BHEL BHOPAL</u></b>			Due Date :
				Supplier Qtn. No.:
			Date :	
<b><u>SPECIFICATION CUM COMPLIANCE CERTIFICATE OF TECHNOLOGICAL FIXTURE(ROTATOR) - 150 TON</u></b>				
<b>NOTE:-</b>				
1. Vendor must submit complete information against Qualyfinf condition clause no. 17.0 The offer meeting this clause				
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 SUPPLIER :				
FAX NOS.:				
E-MAIL ADDRESS :				
<b>SCOPE: SUPPLY, INSTALLATION &amp; COMMISSIONING OF TECHNOLOGICAL FIXTURE(ROTATOR) - 150 TON COMPLYING WITH SPECIFICATIONS AS BELOW</b>				
<b>SNO</b>	<b>DESCRIPTION FOR BHEL REQUIREMENT</b>	<b>SPECIFIED / CONFIRMED BY</b>	<b>OFFERED</b>	<b>DEVIATIONS</b>

SNO	DESCRIPTION FOR BHEL REQUIREMENT	SPECIFIED / CONFIRMED BY	OFFERED	DEVIATIONS
1	<b>PURPOSE: (Operations/Jobs involved): Rotation of cylindrical jobs up to 150 Ton weight and Turning Diameter 1000 mm to 5000 mm at Various prespecified RPM. The turning rolls to be Self Aligning type/ Self centring automatic . The Technological fixture(rotator)to be used for job rotation during welding and to be suitable for heavy fabrication</b>	Vendor to Confirm		
2	<b>SPECIFICATION:</b>			
2.1	<b>Driver Turning Rolls</b>			
2.1.1	Load Capacity $\geq$ Min. 75 ton	Vendor to Confirm		
2.1.2	Concentric Vessel Turning Capacity: $\geq$ Min. 150 tons	Vendor to Confirm		
2.1.3	Typical jobs Diameter Range:Min. 1000 - 5000 mm	Vendor to Confirm		
2.1.4	Speed range atleast variable between: Min. 100 - 1250 mm /min	Vendor to Confirm		
2.1.5	Dynamic Brake and Rapid traverse to be provided.	Vendor to Confirm		
2.1.6	Adequate arrangement shall be their to avoid screwing of job (linear shifting during rotation)	Vendor to Confirm		
2.1.7	General Assembly drawing to be sent along with offer with complete technical specifications.	Vendor to Confirm		
2.1.8	Rotator should be able to roll minimum shell dia of 1000mm	Vendor to Specify		
2.2	<b>Idler Turning Rolls</b>			
2.2.1	Load Capacity $\geq$ 75 ton	Vendor to Confirm		
2.2.2	Typical jobs Diameter Range:Min. 1000 - 5000 mm	Vendor to Confirm		
2.2.3	Speed range: Free-Wheeling	Vendor to Confirm		
2.2.4	Rotator should be able to roll minimum shell dia of 1000mm	Vendor to Confirm		
2.3	<b>Wheels for Driver and Idler Turning Rolls</b>			

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2.3.1	Material: Poly Urethane tires rimmed with steel	Vendor to Confirm		
2.3.2	Material of rolls should be suitable to withstand temperature 100 ° C	Vendor to specify		
2.3.3	Wheel Width(T) and diameter(D) : Min.150 mm x Dia 560 mm	Vendor to specify		
2.3.4	Overload discs to be provided.	Vendor to Confirm		
2.3.5	Bearing: Sealed and heavy ( SKF or FAG make only )	Vendor to specify		
2.3.6	Nos of Roller per axle : 1	Vendor to Confirm		
2.3.7	Nos. of axle ( Drive Unit ): Min.4	Vendor to Confirm		
2.3.8	Nos. of axle ( Idler Unit ): Min.4	Vendor to Confirm		
2.3.9	Approx. Overall Length x width x Height of Drive / Idler Unit :	Vendor to specify		
<b>3 Motors for Rotation / Tilting</b>				
3.1	Type: AC frequency variable motor with 10 meter length of Pendant.	Vendor to Confirm		
3.2	Make and Model: Siemens or ABB	Vendor to specify		
3.3	Capacity and Rating of Motor: Min. 2 Nos and 5 HP	Vendor to specify		
3.4	Controller for Motor: AC Vector drive of Allen Bradley / Siemens / ABB / Schneider / Yashakawa	Vendor to specify		
3.5	The roller speed should remain constant (neither decrease nor overdrive) in case of eccentric weight of the job. Vendor to specify the details of transmission arrangement.	Vendor to specify		

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4	<b>Operation &amp; Control System: All the controls, switchgear and drive of the rotator shall be housed in a compact IP42 grade enclosure of RITTAL make or equivalent. It shall be preferably mounted at a convenient location on the base frame of the rotator. If the controls are supplied with PLC system , PLC shall be of Siemens/Allen Bradley/ABB/Modicon/Mitsubishi / GE Fanuc make only. Necessary licensed PLC program software with necessary PC interface cable to be provided for accessing / monitoring / troubleshooting of PLC logic. Backup of the PLC program alongwith hardcopy should be provided.</b>	Vendor to specify		
<b>4.1</b>	<b>Operational Control at Control Panel</b>			
4.1.1	Safety Disconnect switch	Vendor to Confirm		
4.1.2	Power On-Off switch with indication lamp.	Vendor to Confirm		
4.1.3	Local / Remote selector switch	Vendor to Confirm		
4.1.4	Start stop switch for Rotation	Vendor to Confirm		
4.1.5	Selector Switch for rotation in clockwise and anticlockwise direction.	Vendor to Confirm		
4.1.6	Rotational speed control with Speed infinitely variable at least between Minimum range 100 - 1250 mm /min along with speed indicator	Vendor to Specify		
4.1.7	Control pannel have a Digital speedo meter for setting of speed by RC Pendant., supply voltmeter and Ammeter also be provided.	Vendor to Confirm		
4.1.8	Emergency Stop Switch	Vendor to Confirm		
4.2	<b>24 Volt dust tight Remote control pendant: The length of cable connecting the main panel shall be at least 10m long. The cable shall be housed in heavy duty metallic conduit with PVC sheath of LAPP make or equivalent. It shall have following controls:</b>	Vendor to Specify		

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4.2.1	Start stop switch for Rotation	Vendor to Confirm		
4.2.2	Selector Switch for rotation in clockwise and anticlockwise direction.			
4.2.3	Low speed Inching facility .	Vendor to Confirm		
4.2.4	Emergency Stop Switch	Vendor to Confirm		
<b>5</b>	<b>CONSTRUCTION:</b>			
<b>5.1</b>	<b>Drive arrangement : Clutch arrangement shall be provided in the Drive system roller in order to protect the gear Boxes to avoid damage, while loading and unloading the jobs. All member in the drive shall be provided with cover to protect from dust and heat.</b>	Vendor to confirm		
5.2	The Technological fixture(rotator) should be made to suit Robust work environment, frequent handling and temperature due to welding of Jobs placed	Vendor to confirm		
5.3	The Technological fixture(rotator) to be designed will be normally used on one fixed position hwoever on few occasions it may be required to be shifted hence should be suitable for portability. Adequate lifting and clamping arrangement to be provided for the purpose.	Vendor to confirm		
5.4	The Turning rolls including all the bearings gears etc to be made suitably to withstand temperature of 100 ° C, which may occur due to welding or preheating for long hrs	Vendor to Specify		
5.5	Protectative cover shall be provided for motor / Gear Box and wherever necessary.	<b>Vendor to Confirm</b>		
5.6	Overlaod protection for electrical motor.	<b>Vendor to Confirm</b>		

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5.7	Frame: All weld robust construction and shall have properly machined and stress relieved. Vendor shall shown the relavent document of stress relieving of frame during PDI.	Vendor to Confirm		
5.8	Bearing: Sealed and heavy duty , shall be of reputed make ( Vendor to specify the make)	Vendor to Confirm		
5.9	Gear Box: Worm reduction Gear Box for minimum backlash, shall be of reputed make like Greaves(Premium) or Bonfiglioli ,or Shanit Gears ( Vendor to specify the make)	Vendor to Confirm		
5.10	Field loss protection relay for motor protection	Vendor to Confirm		
<b>6</b>	<b>ELECTRICAL SYSTEM</b>			
6.1	415V $\pm 10\%$ , 50HZ $\pm 3\%$ , 3 Phase AC (3 wire system with out neutral) Power Supply Source will be provided by BHEL at a single point near the turning rolls, 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 turning rolls/control cabinets, shall be the responsibility of vendor.	Vendor to confirm		
6.2	All electrical & electronic control cabinets & panels should be dust, heat and vermin proof	Vendor to confirm		
6.3	Motors shall conform to IEC or Indian Standards (Make Siemens, Crompton, Bharat Bijli )Other make is not acceptable	Vendor to confirm		
6.4	Vendor should ensure the proper earthing for equipment and its peripherals.	Vendor to confirm		

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6.5	Inter connecting cables with connectors duly protected from heat / damages during use.	Vendor to confirm		
<b>6.6</b>	<b>Safety / environmental protection of turning rolls to be provided.</b>	<b>Vendor to confirm</b>		
<b>8</b>	<b>ACCESSORIES:</b>			
<b>8.1</b>	<b>Accessories if any recommended by vendor for better functioning of equipment.</b>	Vendor to specify		
<b>8.2</b>	<b>Rotating earthing to be provided. (Vendor to give details)</b>	Vendor to specify		
<b>9</b>	<b>SPARES: ( To be quoted seperately )</b>			
9.1	Unit price list for itemised breakup of mechanical, electrical and electronic spares used on technological fixture (Rotator) in sufficient quantity as per recommendation of Vendor for 2 years of trouble free operation on three shifts continuous running basis should be offered by vendor. The spares will be ordered as per requirement. Note: The price of the spares will not be considered for the evaluation of the machine cost (L1 criteria). (Unit Price of each item of spare should be offered)	Vendor to specify		
9.2	All types of spares for total technological fixture (Rotator) and accessories should be available for at least ten years after supply of the technological fixture (Rotator) . If technological fixture (Rotator) is likely to become obsolete in this period, the vendor should 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 to specify		
9.3	Recommended set of spares for all attachments are to be offered with details.	Vendor to specify		

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9.4	Vendor to confirm that complete list of spares for turning rolls and accessories, along with specification / type / model, name & address of the spare supplier shall be furnished along with documentation to be supplied with the turning rolls	Vendor to confirm		
<b>10</b>	<b>DOCUMENTATION : Four sets of following documents (Hard copies) in English language should be supplied along with the turning rolls</b>	<b>Vendor to confirm</b>		
10.1	Detailed O & M manual of turning rolls with all drawings of turning rolls assemblies/sub-assemblies/parts including electrical diagrams. All Assembly/Sub Assembly Drawings shall be supplied with the part list also	Vendor to confirm		
10.2	Catalogues, O&M Manuals of all bought out items and supplied accessories including drawings, wherever applicable.	Vendor to confirm		
10.3	Complete Master List of parts used in the turning rolls shall be submitted by the vendor.	Vendor to confirm		
10.4	One additional set of all the above documentation on CD ROM, wherever possible.	Vendor to confirm		
10.5	The electrical circuit diagraeme along with PCB card drawing shall be provided . Detail drawing of AC frequency variable drive also require for maintenance purpose.	<b>Vendor to Confirm</b>		
<b>11</b>	<b>INSTALLATION &amp; COMMISSIONING</b>			



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11.1	Supplier to take full responsibility for carrying out the erection, start up, testing of technological fixture (Rotator), it's control system & all types of other supplied equipment.. Service requirement like power, air shall be provided by BHEL at only one point to be indicated by supplier in advance. Other requirements like crane and helping personnel shall also be provided by BHEL. Details of these requirements should be informed by vendor in advance. 3 phase Supply cable of reputed make of 30 Mts also to be supplied by vendors	Vendor to confirm		
11.2	Successful proving of BHEL components by the supplier shall be considered as part of commissioning. All tests, as mentioned at clause 13 (Machine Acceptance) shall form part of the commissioning activity.	Vendor to confirm		
11.3	Tools, instruments and other necessary equipment required to carry out all above activities should be brought by the supplier.	Vendor to confirm		
11.4	Charges, duration, terms & conditions for I&C should be furnished in detail separately by vendor along with offer.	Vendor to confirm		
<b>12</b>	<b>AMBIENT CONDITIONS &amp; THERMAL STABILITY :</b>			
12.1	Total turning rolls including all system and all supplied items should continuously work trouble free and efficiently under following operating conditions and should give specified accuracies. Ambient Conditions: Temperature = 5 to 50 degree Celsius Relative Humidity = 95% max. (Vendor to confirm that turning rolls is suitable for above and details of provisions on the turning rolls for the same are to be furnished by Vendor)	Vendor to confirm		

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13	<b>MACHINE ACCEPTANCE:</b>			
13.1	<b>Tests/Activities to be Performed by Vendor at Vendor's work on the machine before dispatch :</b>	Vendor to accept & confirm		
13.3	The technological fixture (Rotator) should be tested for continuous running for minimum 5 hrs at various speeds.	Vendor to confirm		
13.4	Demonstration of all operational features of the total item, and all accessories.	Vendor to confirm		
13.5	<b>Test to be carried out at BHEL works while commissioning the turning rolls</b>	Vendor to confirm		
13.6	Demonstration of all features of the turning rolls & all accessories to the satisfaction of BHEL.	Vendor to confirm		
13.8	On Job prove out and one weeks independent operation of turning rolls by BHEL	Vendor to confirm		
13.8	Training of BHEL operators / maintenance personnel in operation / maintenance of complete turning rolls & accessories etc by the supplier's experts / engineers during their stay at BHEL works	Vendor to confirm		
14	<b>PACKING: Sea worthy &amp; rigid packing for all items of complete turning rolls, all Accessories and other supplied items to avoid any damage/loss in transit.</b>	Vendor to confirm		
15	<b>GUARANTEE : 18 months from the date of dispatch of the turning rolls.Offer with guarantee period less than 18 months shall be rejected.</b>	Vendor to confirm		
16	<b>GENERAL : The vendor should submit the following information:</b>			

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16.1	Floor area required (Length, Width, Height) for complete turning rolls & accessories	Vendor to specify		
16.2	Total weight of the technological fixture (Rotator).	Vendor to specify		
16.3	Vendor to submit, along with offer, the reference list of customers where similar turning rolls have been supplied mentioning the customer, turning rolls Model, major specifications of the supplied turning rolls, Year of Supply etc	Vendor to specify		
16.4	Detailed catalogues , sketch/ photographs of the m/c and accessories/ attachments should be submitted with the offer.	Vendor to specify		
	Equipment shall have shot blasted and nice appealing appearance and 2 coat each with rust proof varnish and attractive RAL standard polyurethane	<b>Vendor to Confirm</b>		
<b>17</b>	<b>QUALIFYING CONDITIONS :</b>			
17.1	Venders shall submit performance certificate where offer model of same ( Capacity 150 Ton , Idler + drive))or higher capacity for similar application in the past 5 years. This is required from all the vendors for qualification of their offer. The following information is to be submitted by the vendor about the companies where similar technological fixture (Rotator) have been supplied.	<b>Vendor to Confirm</b>		
17.2	Name of the customer / company where similar technological fixture (Rotator) is installed.	Vendor to specify		
17.3	Complete postal address of the customer.	Vendor to specify		
17.4	Year of commissioning.	Vendor to specify		
17.5	Application for which the equipment is supplied with details of accuracies achieved on the job.	Vendor to specify		

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17.6	Performance certificate from any one customer regarding satisfactory performance of machine supplied to them.	Vendor to confirm		
17.7	BHEL reserves the right to verify information provided by vendor. In case the information provided by vendor is found to be false/incorrect, the offer shall be rejected.	Vendor to confirm		
<b>18</b>	<b>TERMS &amp; CONDITIONS</b>			
18.1	Approximate percentage of payment against Delivery 80% and balance 20% after successful Installation & commissioning of the technological fixture(Rotator) at BHEL Bhopal Works against submission of performance bank guarantee for 10% of the item value.	Vendor to confirm		
18.2	Approximate time of Delivery 14 Weeks(Ex-Works)However 1 weeks shall be given delivery term as F.O.R.BHEL,Bhopal works.Delivery beyond 14 weeks shall be technically rejected.	Vendor to confirm		