

Technical specification

PART B : TECHNICAL SPECIFICATION			
Retrofitting of LM guide shafts with radial bushes & centralized automatic lubrication system for System bender machine /Bay 5/Bldg 107			
Sl.No.	DESCRIPTION	BHEL SPECIFICATION	VENDOR'S RESPONSE
1	Application	The servo driven tube carriage unit vide to and fro movement is used for feeding tube to the tube bender of System bender machine by a measured accurate length and positioning at the bender die for bending operation. The to and fro movement of the carriage unit is guided along the 2 nos. of LM guide shafts above and below the carriage unit by 3 nos. of LM radial bushes integrated with its assembly .Also a centralized auto grease lubrication system is available in the carriage unit for lubricating the LM guide radial bushes for smoother movement of the carriage unit. The scope includes the dismantling of damaged LM guide shafts, damaged LM radial bushes & failed centralized lubrication unit ; retrofitting with new LM guide shafts, new LM radial bushes & new centralized automatic Lub. system & prove out for smoother operation of carriage unit without vibrations /jerk. Vendor to note & confirm	
2	Scope	1.Dismantling of the damaged LM guide shafts,LM radial bushes ,centralized Lub. Unit 2.Installation of new LM guide shafts,LM radial bushes, automatic centralized Lub. unit & integration with the System bender machine. 3.Prove out of the retrofitted system for smoother operation of carriage unit without vibration /jerk & effective lubrication of LM radial bushes for continuous production. Vendor to confirm & provide details	
3	Design Input	The vendor should make #ON THE SPOT# study of BHEL requirement prior to quoting. The offer submitted without site study shall not be considered for technical evaluation. Vendor to confirm	
4	Specification of LM guide shaft & LM radial bushes		
4.1	LM guide shaft specification	Chrome plated precision solid shaft X46Cr13 ; Diameter : 80 mm Surface or induction hardened ;Surface finish :h6 Surface hardened depth of hardness min 3.2 mm Min.Hardness :HRC 53 The surface hardness & depth of hardness of the shaft should be uniform in axial and circumferential direction Vendor to confirm & provide details	
4.2	LM guide shaft arrangement	The LM guide shafts available on the top and bottom of the carriage unit for guiding the assembly. The LM guide shafts total built up length shall be as mentioned in the sketch indicated in Annex. II-Quantity: 2 nos.The details of LM shaft such as : total length; mounting hole sizes, pitch between mounting holes and other machining dimensions shall be referred from sketch indicated in Annex. II & if required further details shall be taken from the machine during spot visit. Vendor to confirm	
4.3	LM guide shaft joint details	The standard shaft sections are joined together by a spigot-and-recess arrangement, one section having a locating plug and the other a mating hole (see sketch in Annex. II II).The total length of the LM guide shafts to suit the site requirement shall be built up from LM guide shafts of the standard length through plug socket joints (i.e., there should not be any protrusions on the joint as it shall obstruct the regular movement of the carriage unit. The vendor shall provide the breakup details of the LM guide shaft lengths built up to create the single LM guide shaft suitable for the existing site requirement. Vendor to provide details	
4.4	LM guide shaft make	LM guide shafts shall be of Rexroth-STAR /Thomson /THK/SKF /INA /NSK Vendor to provide details	
4.5	LM radial bushes	The LM radial bushes :Qty 3 nos to be fixed within the carriage unit in the existing provision without any modification in the carriage unit .Also the radial bushes are to be matched with the LM guide shafts. Vendor to confirm	
4.6	LM radial bushes make	LM radial bushes shall be of Rexroth-STAR /Thomson /THK /SKF /INA /NSK .The LM guide shaft & LM radial bushes to be of same make as both are mating components. Vendor to provide details	
4.7	LM radial bushes end sealing & dust prevention kit	LM radial bushes should be provided with suitable end sealing arrangement to avoid leakage of lubricants. Also dust prevention kit to be provide along the edges of the radial bushes assembly to avoid entrapping of dust within the radial bushes during operation. Vendor to confirm and provide details	
5	Specification of Centralized Automatic lubrication system		
5.1	Lubrication system	Centralized Automatic grease lubrication system with a provision for adjusting timer shall be provided for enabling programmed lubrication of the LM radial bushes to ensure smoother operation of the carriage unit without jerk/vibration The lubrication unit shall be linked with the existing automation Panel in the machine for automatic control. Also the lubrication pipelines shall be connected to LM radial bushes through proper distribution lines. Vendor to confirm	
5.2	Positioning	Centralized Automatic grease lubrication system to be installed in the space available on the carriage unit. Vendor to confirm	

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5.3	Lubrication system makes	Centralized Automatic grease lubrication system of makes Rexroth /Vogel /SKF /CenLub . Vendor to provide details	
5.4	Lubrication pipe line distribution	To be observed during spot visit	
5.5	Arrangement of LM guide shafts & LM radial bushes	To be observed during spot visit	
6.0	Scope of Supply and Work by Vendor		
6.1	LM guide shafts to be built up to 16.010 meter approx. suiting to the site requirement Qty: 2 nos, LM guide radial bushes Qty: 3 nos , Automatic Centralized grease lubrication system for the LM radial bushes with suitable distribution lines Qty: 1 set. Vendor to confirm		
6.2	Supply, Installation and Prove out of the retrofitted LM guide assembly system with Auto. Centralized lubrication system in the System bender machine bay 5 building 107, as per BHEL requirement and instructions. The vendor to visit BHEL, Trichy to assess the site condition, before submission of the offer. Vendor to confirm		
7	General Points:		
7.1	General Arrangement Drawing of the LM guide shafts assembly to be retrofitted shall be provided along the offer confirming to the reference sketch in Annex. II. Vendor to provide details		
7.2	The successful vendor has to visit the site after placement of order, to ascertain the exact dimensions of the LM guide shafts with mounting holes arrangement as in reference sketch Annex. II and get drawing approval from BHEL Engineer within 2 weeks from the date of PO before manufacturing. Vendor to confirm		
7.3	Scope of Work: 1.Dismantling of existing damaged LM guide shafts - 2 nos 2. Dismantling of LM radial Bushes from the carriage unit -3 nos.(Without damaging the carriage unit as the LM radial bushes are fixed within the housing of the carriage unit) 3. Installation of new LM radial bushes within the carriage unit assembly and then fixing the carriage unit along the new LM guide shafts. 4. Installation of Centralized Automatic grease Lubrication System and distribution lines to the LM radial bushes & integrating with the machine control panel for enabling timer control 5. Testing and Prove out. Vendor to confirm		
7.4	The entire retrofitting (i.e., dismantling, installation of the LM guide shaft assembly in the carriage unit)is to be carried out by the vendor and is to be completed within 10 working days from the date of handing over of the site to the vendor by BHEL. Vendor to confirm		
7.5	It is in the scope of vendor to arrange the required tools and tackles and the required manpower to complete the work within the specified time. Vendor to confirm		
7.6	Crane assistance required for the dismantling and installation in the machine will be provided by BHEL. Vendor to confirm		
7.7	Required electrical connection for the Centralized Automatic Lubrication system will be carried out by BHEL including cabling. Vendor to note		
7.8	BHEL WILL only supply consumables like power, water, oil, cotton waste, service air, welding rod, welding machine etc., at free of cost required for erection and commissioning of the system, rest all are in vendor's scope. Vendor to note		
7.9	Utility at BHEL Input Voltage: AC 415 V+/-10%, 50 Hz+/-3%, 3-Phase, 3 Wire system. Control Voltage: DC 24 V Shop Air Pressure: Around 4.5 Bar in 1" line. Vendor to note		
8	Test and Prove out	The retrofitted system after installation in the carriage unit of the System bender machine will be checked for continuous operation for minimum 15 days of regular production. During the mentioned Prove out periods there should not be any vibrations /jerk in the operation of the Carriage unit. Also the functioning of the timer based controlled automatic centralized grease lubrication system should be established & proved during the prove out period. Vendor to confirm	
9	Pre-despatch inspection	The complete set of LM guide shafts with material certificates,LM radial bushes & centralized automatic lubrication system shall be provided for inspection at vendors work for checking & giving despatch clearance before receipt at BHEL.	
10	Test certificates /Catalogues	1.Catalogues /technical datasheet of the LM guide shaft, LM radial bushes & centralized automatic grease lubrication system to be provided in the technical offer . 2.Pre dispatch certificate from OEM for LM guide shaft,LM bushes & centralized lubrication system along with supply The technical offer without the required pre dispatch certificate/catalogue/data sheet will not be considered for evaluation. Vendor to confirm & provide details	

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11	Technical offer	The technical offer shall include the following: Complete Scope of Supply -LM guide shafts - 2 sets ,LM radial bushes - 3 nos , Centralized automatic grease lubrication system - 1 set with distribution lines & required fasteners and bolts required for installation -1 set. Installation and Performance Prove-Out Details with breakup of action plan. A schematic diagram showing the LM guide shaft with mounting hole dimensions confirming to site requirement & associated details with salient dimensions shall be submitted. Vendor to confirm & provide details	
12	Perf. Bank Guarantee (PBG)	10% PBG to be submitted by vendor after placing order. Vendor to confirm	
13	Delivery Period	a)The vendor shall submit the drawings for approval to BHEL within 2 weeks from the date of purchase order. b)The delivery Period has to be maximum of 16 Weeks from the date of drawing approval by BHEL. Vendor to confirm	
14	Packing	Sea worthy & rigid packing for all items and other supplied items to avoid any damage/loss in transit. Vendor to confirm	
15	Warranty	Warranty for retrofitting system shall be given for a period of 12 months from the date of commissioning or 18 months from the date of supply which ever is earlier, against deficiency in performance and failure in materials and workmanship. Vendor to confirm	