

**SCOPE OF WORK FOR RECONDITIONING OF HIGH SPEED MOTOR SPINDLES (20 nos.) OF STARRAG MAKE (14 Nos.)&FISCHER MAKE (6 Nos.)FOR MACHINES OF NBS**

**Brief About the Motor Spindles:** The spindles are STARRAG & FISCHER make high speed milling motor spindles of 15000 rpm with hybrid ceramic bearings used on 5 axis CNC machining cells manufactured by M/s STARRAGHECKERT, Switzerland & M/S LIECHTI ENGINEERING AG,, Switzerland.Details of available spindle data is attached as Annexure-D for STARRAGmake spindles and Annexure-E for FISCHER make spindles.

Sl. No	Description	Quantity	Accepted (Yes/No)	Deviation	Remarks
1	SCOPE OF WORK (For one spindle)				
1.1	ESSENTIAL WORKS				
1.1.1	Replacement of all bearings including ceramic hybrid/ special bearings.	AS FITTED IN THE SPINDLE			<u>Bidder to comply</u>
1.1.2	Replacement of hydraulic piston-cylinder for tool clamping.				<u>Bidder to comply</u>
1.1.3	Replacement of draw bar springs.				<u>Bidder to comply</u>
1.1.4	Replacement of Collet/Gripperof tool clamping system as per existing part nos.				<u>Bidder to comply</u>
1.1.5	Replacement of all hydraulic, coolant and pneumatic seals.				<u>Bidder to comply</u>
1.1.6	Tool clamping position setting i.e., clamped with tool, clamped without tool and unclamped.				<u>Bidder to comply</u>
1.1.7	Other minor problems found after dismantling of the spindles in addition to essential works as per clause 1.1 above, have to be necessarily done by the vendor.				<u>Bidder to comply</u>
1.1.8	Replacement of rotary union for internal coolant (Vendor to ensure that thenew part is identical to the one fitted on the spindle.)				<u>Bidder to comply</u>

1.1.9	Replacement of encoder and encoder wheel (Details as per Annexure D For STARRAG make Spindle & Details as per Annexure E for FISCHER make spindle).	AS FITTED IN THE SPINDLE			<u>Bidder to comply</u>
1.1.10	Replacement of electrical connectors for encoder. Vendor to note that the connector mounted on the motor spindle is to be supplied along with matching connector for the machine. The machine side connector should be supplied with rubber glands for protection against ingress of liquids/ mist.				<u>Bidder to comply</u>
1.1.11	Replacement of electrical connectors for analog sensors. Vendor to note that the connector mounted on the motor spindle is to be supplied along with matching connector on the machine. The machine side connector should be supplied with rubber glands for protection against ingress of liquids/ mist				<u>Bidder to comply</u>
1.1.12	Replacement of all analog sensors used on the spindles (Details as per Annexure D For STARRAG make spindle & Details as per Annexure E for FISCHER make spindle)				<u>Bidder to comply</u>
<b>1.2</b>	<b>Optional works:</b>				
1.2.1	Rewinding of the HF motor spindle.	1 NO. EACH SPINDLE			<u>Bidder to comply</u>
1.2.2	Replacement of temperature sensor (KTY 130) for the motor winding temperature.	1 NO.			<u>Bidder to comply</u>
1.2.3	Replacement of the Bearing temperature sensors (3 Nos.) for FISCHER spindles only (Details as per ANNEXURE E).	1 SET OF 3 NOS.			<u>Bidder to comply</u>
1.2.4	<b>Details for the items at Clause No. 1.1 &amp; 1.2 are provided in ANNEXURE D For STARRAG</b>				

	<b>make spindle &amp; Annexure E for FISCHER make spindle to the extent of the information available with BHEL.</b>				
<b>2</b>	<b>SELECTION OF L1:</b>				
2.1	The selection of L1 will be made on the basis of the total of Material cost (Essential & Optional), Labour charges, and all taxes, duties as applicable (Cost to BHEL).For the purpose of selection of L1 bidder the optional works at Clause No. 1.2.1 & 1.2.2 will be taken as 20 Nos. and Clause No.1.2.3 will be taken as 6 Nos. as they are only to be used on 6 No. FISCHER Spindles.				<u>Bidder to comply</u>
2.2	In case more than one contractor quotes equal L-1 rates, lottery shall be drawn among L-1 parties to decide one L-1 party				<u>Bidder to comply</u>
<b>3</b>	<b>SPLITTING THE CONTRACT:</b>				
3.1	In order to develop more indigenous vendors for the spindle repair, competitive pricing and completion of work in shortest possible time, it is decided to split the contract in 50-30-20 ratio. The vendor at L1 will be awarded the 50% of total work. 30% of the work will be awarded to the next lowest bidder if they agree to accept L1 rates (L2 vendor). Thereafter the next lowest bidder after L2 vendor will be considered for 20% work if they agree to accept L1 rates (L3 vendor). In case L2&/ or L3 disagrees for L1 rate then L4 and so on will be offered at L1 rates.  In case no vendor other than L1 accepts the 30% & 20% work (at L1 rate), then the total contract will be awarded to L1 vendor. The portion of the contract i.e. 30% or 20% which is not acceptable by other bidders will be awarded to L1 vendor in addition to the earlier 50% contract.				<u>Bidder to comply</u>
3.2	<b><u>The spindles will be provided to the vendors in the following order/lots:</u></b>				<u>Bidder to comply</u>

	<ol style="list-style-type: none"> <li>1. <u>3 Starrag &amp; 2 Fischer spindles to L1 vendor.</u></li> <li>2. <u>2 Starrag &amp; 1 Fischer spindles to L2 vendor.</u></li> <li>3. <u>2 Starrag spindles to L3 vendor</u></li> <li>4. <u>3 Starrag &amp; 2 Fischer spindles to L1 vendor(Including one SX Spindle)</u></li> <li>5. <u>2 Starrag &amp; 1 Fischer spindles to L2 vendor(Including one SX Spindle)</u></li> <li>6. <u>2 Starrag spindles to L3 vendor</u></li> </ol>				
3.3	Various lots of the spindle will be provided to the vendor over a period of 2 years .Vendor to ensure the price validity of the work should be for 2 years from the date of award of work.				<u>Bidder to comply</u>
<b>4</b>	<b><u>QUALIFYING CONDITIONS:</u></b>				
4.1	Average Annual financial turnover during the last 3 years, ending 31st March 2015, should be at least 9.10Lacs. Vendor should submit Audited balance sheets for the last three years				<u>Bidder to comply</u>
4.2	<p>The Vendors must have successfully completed projects for supply / repairing /re-conditioning of high speed milling motor spindles of at least 15000 rpm and at least 19 KW during the last 7 years ending on 28 June 2016 and should be either of the following:</p> <p style="padding-left: 40px;">i) Three projects of above type with each project costing not less than Rs 6.09 Lacs.(Excluding taxes and duties)</p> <p style="text-align: center;">OR</p> <p style="padding-left: 40px;">ii) Two projects of above type with each project costing not less than Rs 7.61 Lacs.(Excluding taxes and duties)</p> <p style="text-align: center;">OR</p> <p style="padding-left: 40px;">iii) One project of above type with each project costing not less than Rs 12.18 Lacs.</p>				<u>Bidder to comply</u>

	(Excluding taxes and duties)  The above supplied / repaired/ reconditioned high speed milling motor spindles should have performed satisfactorily at least 6 months prior to 28 June 2016. 6 months period will be calculated on the basis of Commissioning certificates/relevant MOMs provided.  Vendor to provide P.O. / W.O copies and commissioning/ performance certificates /relevant MOMs for satisfactory operation of the above supplied / repaired/ reconditioned high frequency motor spindles along with name, address & contact details including e-mail IDs, telephone numbers of their customer. BHEL reserves the right to verify the information provided. Vendor is advised to attach only the relevant certificates and not attach papers irrelevant against this clause as irrelevant papers will not be considered.				
<b>5</b>	<b>INSPECTION OF THE SPINDLES BY THE BIDDERS BEFORE QUOTING:</b>				
5.1	The Vendors are advised to inspect the Spindles prior to quoting to ascertain all the relevant details required for successful completion of the work.				<u>Bidder to comply</u>
5.2	The vendors can inspect the spindles to be repaired, with prior intimation on any working day from 9:00 hrs to 16:00 hrs before the last date for submission of tenders.				<u>Bidder to comply</u>
<b>6</b>	<b><u>INSPECTION OF DEFECTIVE MOTOR SPINDLES AT BHEL, HARIDWAR BEFORE DISPATCH:</u></b>				
6.1	Inspection of all the items covered under scope of Work at Clause 1.1 & 1.2 shall be carried out by BHEL and vendor's representatives at BHEL, Haridwar works.				<u>Bidder to comply</u>
6.2	The optional items will be decided jointly by vendor and BHEL before handover of the spindles to the				<u>Bidder to comply</u>

	vendor at BHEL Haridwar.				
<b>7</b>	<b><u>PRE-DISPATCH INSPECTION AT VENDOR'S WORKS</u></b>				
7.1	Pre dispatch inspection of the spindle after repair work will be carried out by BHEL representatives at the vendor's works to verify the proper functioning of spindles through trial run and witness the checking of run out, overheating if any, clamping force etc. ( As per the test chart provided by BHEL, Haridwar). Test chart is attached at Annexure- D for STARRAG spindles and annexure-E for FISCHER make spindles.				<u>Bidder to comply</u>
7.2	Vendor shall invite BHEL representatives for carrying out pre dispatch inspection after the completion of the work. The vendor shall inform BHEL for pre dispatch inspection at least 7 days in advance.				<u>Bidder to comply</u>
7.3	Expenses of boarding and lodging of BHEL personnel during pre-dispatch inspection shall be borne by BHEL.				<u>Bidder to comply</u>
7.4	Deputed BHEL persons shall do pre acceptance of repaired spindles as per clause 7.1at vendor's work and give dispatch clearance.				<u>Bidder to comply</u>
<b>8</b>	<b><u>DELIVERY :(IF DELIVERY PERIOD IS NOT OFFERED/ ACCEPTABLE, OFFER WILL BE REJECTED)</u></b>				
8.1	Maximum six months or earlier from the date of receipt of defective spindles by vendor from BHEL, Haridwar works to the date of receipt of the repaired spindles at BHEL, Haridwar.				<u>Bidder to comply</u>
8.2	All the replaced items covered in Essential and Optional scope of work shall be returned to BHEL, Haridwar along with the repaired spindles including damaged /worn parts, defective parts/bearings and copper windings (if applicable) etc.				<u>Bidder to comply</u>

<b>9</b>	<b>TRANSPORTATION &amp; INSURANCE:</b>				
9.1	Packing & Forwarding, Transportation and transit insurance for the spindles will be borne by the vendor for the transportation from BHEL, Haridwar to vendor's works and back to BHEL, Haridwar.				<u>Bidder to comply</u>
<b>10</b>	<b>ACCEPTANCE CRITERIA:</b>				
10.1	Final acceptance shall be at HEEP ,BHEL Haridwar after :- a) Upon completion of the scope of work. b) Successfully testing of the repaired spindles at BHEL HARIDWAR.Spindles will be accepted on the basis of the performance of the spindles w.r.t the following as per the spindle test chart: i) Temperature within tolerance range at maximum rated speeds and load. ii) Run out of the spindles with in the tolerance value. iii) Clamping force as per test chart of the spindles. iv) Feedback of the sensors within tolerance range for the positions of unclamp, clampwith tool and clamp without tool. v) Encoder signal level within the tolerance range c) After settlement of all pending issues related to work for one lot, a certificate for Completion of works in all respect for the concerned lot shall be released within 15 days by BHEL which will be the referred document for Final Acceptance and final payment to the vendor for that lot.				<u>Bidder to comply</u>
<b>11</b>	<b>OFF-LOADING OF WORK:</b>				
11.1	Further offloading of the work either in part or in full is not permitted. Vendor must confirm the availability of its own manufacturing/repair facility.				<u>Bidder to comply</u>
<b>12</b>	<b>EARNEST MONEY</b>				
12.1	Vendors have to deposit the Rs.200000 as EMD. EMD may be deposited in cash, through pay order				<u>Bidder to comply</u>

	or through demand draft in favor of HEEP, BHEL, Haridwar only.				
12.2	EMD shall be converted to security deposit if the work is awarded.				<u>Bidder to comply</u>
12.3	EMD of unsuccessful bidders shall be refunded back normally within fifteen days of acceptance of award of work by the successful bidder.				<u>Bidder to comply</u>
12.4	EMD shall not carry any interest.				<u>Bidder to comply</u>
12.5	EMD by tenderer will be forfeited as per tender documents, if:				<u>Bidder to comply</u>
12.5.1	After opening the tender, the tenderer revokes his tender within the validity period or increases his earlier quoted rates.				<u>Bidder to comply</u>
12.6	<p><b>Offers without EMD will be rejected and will not be considered for evaluation. However "MSE suppliers can avail the intended benefits only if they submit along with the offer, attested copies of either EM II certificate having deemed validity (five years from the date of issue of acknowledgement in EM II) or valid NSIC certificate or EM II certificate along with attested copy of a CA certificate (Format enclosed at Annexure -1 where deemed validity of EM II certificate of five years has expired) applicable for the relevant financial year (latest audited). Date to be reckoned for determining the deemed validity will be the date of bid opening (Part 1 in case of two part bid). Non submission of such documents will lead to consideration of their bid at par with other bidders. No benefit shall be applicable for this enquiry if any deficiency in the above required documents are not submitted before</b></p> <p>price bid opening. If the tender is to be submitted through e-procurement portal, then the above</p>				<u>Bidder to comply</u>

	required documents are to be uploaded on the portal. Documents should be notarized or attested by a Gazetted officer. "				
<b>13</b>	<b><u>SECURITY DEPOSIT</u></b>				
13.1	The rate of security deposit will be as below: i) Up to Rs. 10 lacs : 10% ii) Above Rs. 10 lacs up to Rs. 50 lacs : Rs 1 lac + 7.5% of the amount exceeding Rs. 10 lacs iii) Above Rs. 50 lacs: Rs. 4 lacs +5% of the amount exceeding Rs. 50 lacs				<u>Bidder to comply</u>
13.2	The security deposit should be submitted before the start of work in the following forms: i) Cash deposit at the cash counter of Finance dept. of BHEL, Haridwar ( As permissible under the income tax act ) ii) Pay Order, Demand Draft in favor of HEEP, BHEL, Haridwar iii) Local cheque of Scheduled Banks, subject to realization. iv) Bank Guarantee from Scheduled Banks/ Public financial Institution as defined in the companies act. The bank guarantee format should have the approval of BHEL.				<u>Bidder to comply</u>
13.3	Security deposit shall not carry any interest.				<u>Bidder to comply</u>
13.4	i) EMD of successful tenderer can be converted and adjusted against the security deposit. ii) Security deposit shall be refunded to the vendor as follows: 100% security deposit amount shall be refunded to the vendor after successful completion of the work for the concerned lot& after submission of PBG by vendor.				<u>Bidder to comply</u>

<b>14</b>	<b><u>Bank guarantee for spindles</u></b>				
14.1	Vendor shall submit a Bank Guarantee for Rs. 2,25,000/= Per Spindle for the duration of the custody of spindles at their works.				<u>Bidder to comply</u>
<b>15</b>	<b><u>Performance Bank Guarantee :</u></b>				
15.1	Vendor shall be required to submit a Performance Bank Guarantee (PBG) for 10% of the total work order/ contract value for the delivered lot size which shall be valid for a period of 12 months from the date of final acceptance of the repaired motor spindles. However PBG will be released as per clause 17.1				<u>Bidder to comply</u>
15.2	The PBG shall be submitted on a non-judicial stamp paper of value not less than Rs.100/- issued by any one of the nationalized banks.				<u>Bidder to comply</u>
<b>16</b>	<b><u>COST OF TENDER DOCUMENTS:</u></b>				
16.1	The techno commercial bid must be accompanied with a bank draft of Rs. 1000/-(Rs. One thousand only) in favor of HEEP, BHEL Haridwar towards cost of the tender documents, without which the quotations shall be rejected. The bank draft of tender cost should be enclosed in the Techno-commercial bid envelope.				<u>Bidder to comply</u>
<b>17</b>	<b><u>Warranty :</u></b>				
17.1	Vendor shall stand warranty of the repaired spindles for satisfactory working of Six months after successful installation of the repaired spindles on the machine or 1 year whichever is earlier for the delivered lot.				<u>Bidder to comply</u>
17.2	Vendor shall attend the calls for repair during the warranty period and depute their servicing personnel within two working days of the receipt of first intimation by BHEL.				<u>Bidder to comply</u>

<b>18</b>	<b><u>OFFER:</u></b> The offer should be submitted in two parts and in following manner.				<u>Bidder to comply</u>
<b>18.1</b>	<b><u>TECHNO-COMMERCIAL BID</u></b>				
18.1.1	The envelope shall contain the Techno-commercial Bid (ANNEXURE 'A') with technical details and commercial terms & conditions along with relevant documents like copies of ESI, PF code, PAN No., Service Tax Registration. No., TIN No., CST No., Experience Certificates, Audited Balance Sheet of last 3 years , Tender cost, EMD and Check List as per ANNEXURE 'C' and Certificate by Chartered Accountant on Letter Head as per ANNEXURE '1'				<u>Bidder to comply</u>
18.1.2	The envelope shall be super scribed with "Techno-Commercial Bid", Name of work & NIT No.				<u>Bidder to comply</u>
18.1.3	Point-wise compliance of this scope of work is to be given by vendors while submitting their techno-commercial offer in the format provided by BHEL. Each page of the compliance list has to be signed & stamped by the vendor. Documents submitted along with the offer shall be signed and stamped in each page by authorized representative of bidder.				<u>Bidder to comply</u>
18.1.4	The vendor must note that no prices are to be quoted/ mentioned in the techno-commercial offer.				<u>Bidder to comply</u>
<b>18.2</b>	<b><u>PRICE BID</u></b>				
18.2.1	The second envelope shall contain only the price bid with separate price for materials (Essential and optional), labour cost, & applicable taxes & duties on Price Bid Format only as per ANNEXURE B				<u>Bidder to comply</u>
18.2.2	Any other information in the price bid shall not be considered and the quotation is likely to be rejected. Price bid document shall be signed and stamped by authorized representative of bidder at the bottom of page.				<u>Bidder to comply</u>
18.2.3	The envelope shall be sealed and super scribed with "Price Bid", Name of work & NIT No.				<u>Bidder to comply</u>
18.2.4	Price bids of only those vendors shall be opened whose techno commercial bids are acceptable.				<u>Bidder to comply</u>
18.2.5	Both the above two envelopes shall be kept in another sealed envelope. The envelope shall be super-				<u>Bidder to comply</u>

	scribed with “Quotation for (name of work), NIT No. & due date and shall be submitted in Tender Box kept in the Tender room of Purchase department at the 4th floor of the Main Administrative Building of BHEL, HEEP, Haridwar and it should also contain Bidder address.				
<b>19</b>	<b><u>TENDER SUBMISSION AND OPENING:</u></b>				
19.1	Tender room location : Tender room of Purchase department at the 4th floor of the Main Administrative Building of BHEL, HEEP, Haridwar				<u>Bidder to comply</u>
19.2	Tender submission time/ Date: 1:30PM /28 June 2016				<u>Bidder to comply</u>
19.3	Tender opening time/ date and venue : 2:00 PM / 28 June 2016 at venue Tender room mentioned at clause 20.1				<u>Bidder to comply</u>
19.4	Quotations must be valid for at least 120 days from the date of tender opening.				<u>Bidder to comply</u>
<b>20</b>	<b><u>TERMS OF PAYMENT</u></b>				
20.1	<ul style="list-style-type: none"> <li>i) No advance or part payment shall be made.</li> <li>ii) 100% Payment for the lot under repair will be made within 1 month from the date of the final acceptance of the defined lot of spindles as per clause 3.2. However vendor may club the lots if there is only one vendor at L1 rates.</li> </ul>				<u>Bidder to comply</u>
20.2	<p>All the payment shall be made through e-payment after submission of following documents.</p> <ul style="list-style-type: none"> <li>i) E-payment form duly filled (Form will be provided by BHEL)</li> <li>ii) Income tax exemption letter( if applicable)</li> <li>iii) Details of service tax</li> <li>iv) Regular Invoice</li> <li>v) Payment will be credited directly to vendor’s bank account</li> </ul>				<u>Bidder to comply</u>

	To enable us to avail MODVAT credit for excise duty, all the relevant papers are to be submitted to BHEL				
20.3	Excise duty & CST/VAT will be paid on material cost and service tax will be paid on labour charges at actuals. Related original documents to be submitted for availing MODVAT credit by BHEL.				<u>Bidder to comply</u>
20.4	Vendors should submit their invoices against goods and services immediately after supply of goods and services but not later than 30 days from the invoice date. In case of any delay consequential losses like loss of input credit and non-availability of concessional forms etc. shall be to vendors account.				<u>Bidder to comply</u>
20.5	Timely submission of CENVATABLE invoices along with necessary documents to enable availment of CENVAT (Excise duty, Service Tax & VAT) credit by BHEL. <i>Note: Wherever CENVAT credit cannot be availed within given time limit due to delay in submission of invoices or for any other reasons attributed to vendor, loss of such CENVAT credit will be recovered from such vendor.</i>				<u>Bidder to comply</u>
<b>21</b>	<b><u>Late Delivery Penalty Clause :</u></b>				
21.1	LD @ 2% per week on the lot handed over to vendor subject to a maximum of 10% of the contract value for the lot size shall be applicable for delay in deliveries. The delivery period will be as per clause no. 8.1. Reasons attributed to BHEL will not be accounted for late delivery penalty.				<u>Bidder to comply</u>
<b>22</b>	<b><u>Risk Purchase Clause</u></b>				
22.1	In case of delays in supplies / defective supplies or non-fulfilment of any other terms & conditions given in the work order the purchaser may cancel the work order in full or part thereof and may also make the purchase of the material / service from elsewhere / alternative source at the risk and cost of supplier. Vendor does not agree to above clause, their offer is liable to be rejected. In case any				<u>Bidder to comply</u>

	vendor accepts risk purchase clause initially and subsequently declines to honour the term in the eventuality of RISK PURCHASE, they may be banned for business with BHEL.				
<b>23</b>	<b><u>General Conditions :</u></b>				
23.1	Point wise compliance statement shall be submitted by the party with reference to the above scope of supply against each clause/ sub-clause with relevant details & comments. Non-compliance to any of the clauses & quoting inadequate quantity can lead to dis-qualification of the offer.				<u>Bidder to comply</u>
23.2	The Vendor is advised to inspect the spindles prior to quoting to ascertain all the relevant details required for successful completion of the work.				<u>Bidder to comply</u>
23.3	The offers of the bidders who are on the banned list as also the offer of the bidders, who engage the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL web site www.bhel.com				<u>Bidder to comply</u>
23.4	Vendor must compulsorily quote the quantity exactly as per the Scope. No reduction in quantity/ work as per the above Scope is permissible.				<u>Bidder to comply</u>
23.5	BHEL reserves the right to reject the lowest or any tender or accept any tender in full or in part without assigning any reasons whatsoever.				<u>Bidder to comply</u>
23.6	If any information/documents submitted by the contractor are found false/fake at any stage, their tender will be cancelled and the earnest money deposited shall be forfeited and may lead to debarring from the future participation in tenders.				<u>Bidder to comply</u>
23.7	The Vendor should submit their best price at this stage itself and they will not be allowed to revise the price. Any revision / discount given by the vendor subsequently will be ignored.				<u>Bidder to comply</u>
23.8	Check List as per Annexure 'C' must be enclosed with techno-commercial bid.				<u>Bidder to comply</u>
23.9	The risk of delay/loss in transmission by post/courier rests with the bidder.				<u>Bidder to comply</u>
23.10	Conditional tender is likely to be rejected.				<u>Bidder to comply</u>

23.11	In case the date of tender opening happens to be a BHEL declared holiday, tenders shall be opened on the next working day.				<u>Bidder to comply</u>
<b>24</b>	<b>COMMERCIAL TERMS</b>				
24.1	Prices shall be quoted on “Firm Price” basis only. The prices should be on F.O.R BHEL,Haridwar basis inclusive of Packing & Forwarding, transit insurance & Transportation charges, applicable ED , Sales Tax and Service Tax which should be clearly indicated in attached Price bid format as per “Annexure B”				<u>Bidder to comply</u>
24.2	Validity of offer shall be for a minimum period of 120 days from the date of Tender Opening				<u>Bidder to comply</u>
24.3	Freight & transit insurance charges to and fromBHEL,Haridwar&Dispatching station shall be borne by theparty. Vendor shall collect the defective spindles from BHEL, Haridwar and deliver the repaired spindles to BHEL, Haridwar				<u>Bidder to comply</u>
24.4	The material will be dispatched to <b>Central Plant Stores, HEEP, BHEL, Haridwar</b> with instructions to forward the same to <b>Shri. Pawan Singh Rawat (WEX/MM-NBS), HEEP, BHEL, Haridwar-249403.</b>				<u>Bidder to comply</u>
	<b>PACKING:</b>				
25.1	Supplier shall arrange for adequate protection and packing of the consignment so as to avoid loss and damage during transit and also take appropriate measures to prevent metal parts from rusting and corrosion during transit. Handling instructions shall be clearly printed /painted on the packages. Each package should carry a detailed packing slip. Supplier shall be responsible for any loss/damage during transit due to defective/inadequate packing				<u>Bidder to comply</u>

## ANNEXURE 'B'

### (PRICE BID FORMAT)

Name of Work :

NIT No. & Date :

Bidder's Offer No. & Date:

The rates are to be quoted for unit quantity considering the total requirement of 14 nos. Starrag Spindles and 6 nos. Fischer spindles.

Sl No.	Description of work	Unit	Qty	Basic Cost per spindle (In Rs.)	Excise Duty (%)	VAT/CST (%) VAT with FORM17 or CST with C-FORM	Service tax (%)	Total Cost per spindle (in Rs.)
1	MATERIAL AGAINST ESSENTIAL WORK FOR RECONDITIONING OF HIGH SPEED MOTOR SPINDLES (SR. NO. 1.1 OF SCOPE OF WORK).	SET	01					
2	LABOUR AGAINST ESSENTIAL WORK FOR RECONDITIONING OF HIGH SPEED MOTOR SPINDLES (SR. NO. 1.1 OF SCOPE OF WORK).	SET	01					
3	OPTIONAL WORK 2.1: MATERIAL & LABOUR FOR REWINDING OF HF MOTOR SPINDLE( SR. NO. 1.2.1 OF SCOPE OF WORK) .	SET	01					
4	OPTIONAL WORK 2.2: MATERIAL & LABOUR FOR REPLACEMENT OF TEMPERATURE SENSOR KTY 130 FOR THE MOTOR WINDING TEMPERATURE( SR. NO. 1.2.2 OF SCOPE OF WORK).	SET	01					
5	OPTIONAL WORK 2.3: MATERIAL & LABOUR FOR REPLACEMENT OF BEARING TEMPERATURE SENSOR (3 NOS.) FOR FISHER SPINDLE ONLY( SR. NO. 1.2.3 OF SCOPE OF WORK).	SET of 3 nos.	01					

**Note:**

- Bidder may please note that all relevant columns should be duly filled up and in case any column is left blank it will be considered as inclusive in the prices quoted. All pages to be duly signed and stamped by authorised signatory.**
- In case of errors in addition of sub-totals, the sub-totals shall prevail and the total shall be accordingly corrected.**

## Annexure 'C'

### CHECK LIST FOR TENDER

NIT No. :

Vendor shall ensure that following documents / particulars have been enclosed with tender. **This check list shall be enclosed with Techno-commercial Bid.**

S. No.	Particulars	YES/NO	REMARKS
1.	<b>Sealed Techno-commercial Bid</b> as per Annexure 'A'		
2.	<b>Compliance</b> to all the points of the Annexure 'A'		
3.	Copies of ESI, PF code, PAN No., Service Tax Registration. No., TIN No., CST No., Experience Certificates as per clause 18.1.1 of Annexure 'A'		
4.	<b>Audited balance sheets</b> for the last three years should be submitted i.e, 2014-15, 2013-14, 2012-13 required as per clause 18.1.1 of Annexure 'A'		
5.	<b>All the documents as per clause 4 of Annexure 'A'</b>		
6.	<b>Bank draft of Tender cost</b> enclosed (tender cost must be in techno-commercial bid envelope) as per clause 16 of Annexure 'A'		
7.	<b>Earnest Money Deposit (EMD)</b> required as per Clause 12 of Annexure 'A' of NIT (EMD must be in techno-commercial bid envelope)		
8.	<b>Sealed Price Bid</b> as per Annexure 'B' of NIT		
9.	<b>Certificate by Chartered Accountant on Letter Head</b> (if applicable) required as per Clause 12.6 of Annexure 'A' of NIT		

**Vendor's Signature & Seal**

**ANNEXURE-'1'**

**Certificate by Chartered Accountant on Letter Head**

This is to certify that M/s ..... (hereinafter referred to as 'company') having its registered office at ..... is registered under MSMED Act 2006, Entrepreneur Memorandum No. Part -II ..... Dtd: ..... Category: ..... (Micro/ small). (Copy enclosed).

Further verified from Books of account that the investment of the company as per the latest audited financial year..... as per MSMED Act 2006 is as follows:

- 1. For Manufacturing Enterprises:** Investment in plant and machinery (i.e. original cost excluding land and building and the items specified by Ministry of small scale Industries vide its notification No. S.O. 1722(E) Dtd. October 5 , 2006):  
**Rs. .... Lacs**
- 2. For Service Enterprises:** Investment in equipments (i.e. original cost excluding land and building and furniture, fittings and other items not directly related to the service rendered or as may be notified under MSMED Act, 2006):  
**Rs. .... Lacs**

**(Strike off whichever is not applicable)**

The above investment of Rs..... Lacs is within permissible limit of Rs.....Lacs for..... (Micro/ small) (Strike off whichever is not applicable) category under MSMED Act 2006.

**Or**

The company has graduated from its original capacity (Micro/ small) (Strike off whichever is not applicable) and date of graduation of such enterprise from its original capacity is..... (dd/mm/yy) which is within the period of 3 years from the date of graduation of such enterprise from its original category as notified vide S. O. No. 3322 (E) dated 01.11.2013 published in the gazette notification dated 04.11.2013 by ministry if MSME.

Date:

(Signature)

Name-

Membership No.-

Seal of Chartered accountant

Vendor's Signature & Seal

**ANNEXURE-D**

**SPINDLE DETAIL AND TEST CHART**

**MACHINE MODEL: HX & SX**

**MAKE: M/S STARRAGHECKERT , SWITZERLAND**

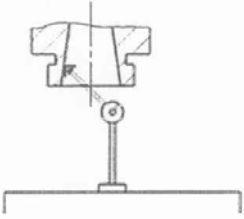
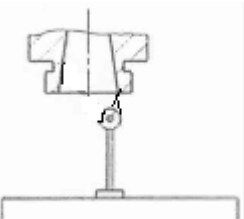
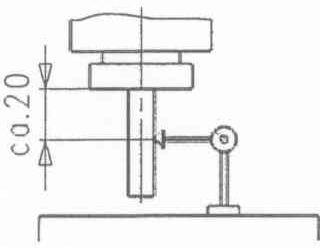
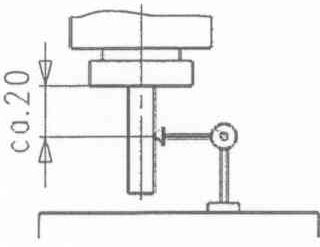
<b>Sl. No.</b>	<b>Description</b>	<b>Data / Specification <u>SX – 051</u></b>	<b>Data / Specification <u>HX – 253</u></b>
1.	Maximum Spindle rated RPM	15,000 rpm.	15,000 rpm.
2.	Runs at max.	15,000 rpm.	15,000 rpm.
3.	Spindle Motor power	19kW	27 kW.
4.	Frequency	Variable with variable drive. Max. frequency 500 Hz.	Variable with variable drive.
5.	No. of poles	4	Not Known
6.	Tool Clamp	Draw bar mechanism with helical cup springs	Draw bar mechanism with disc/helical coiled springs.
7.	Coolant Through Spindle.	Yes	Yes
8.	Spindle is cooled by refrigerating coolant system.	Yes	Yes
9.	Spindle Taper	HSK A 63	HSK A 63
10.	Clamping force	>18kN	20-22 KN
11.	Spindle Torque	165 Nm	90 Nm
12.	Bearing used –	Ceramic Hybrid Bearings.	Ceramic Hybrid Bearings.
13.	Seal reference	Not Available.	Not Available.
14.	Lubrication	One time grease lubrication	One time grease lubrication
15.	Analog sensor	Linear Output Signal range : 0-10VDC	Linear Output Signal range : 0-10VDC
16.	Encoder	Lenord & Bauer Minicoder GEL 244 KN	Lenord & Bauer Minicoder GEL 244 KN

- NOTE : 1) No Assembly drawing of the motor spindle is available.  
 2) No part drawing or part list can be provided.  
 3) No dismantling or assembly procedure is available.

## TEST CHART

### HX/SXMOTOR SPINDLE –STARRAG

SPINDLE NO. – HX/SX.....

SI No.		Description of test	Admissible deviation in microns	Measured value in microns
1	 <p>A schematic diagram showing a cross-section of a spindle taper. A vertical dashed line represents the axis of rotation. A circular feature is positioned on the taper surface, with a horizontal arrow pointing to it, indicating the measurement point for runout.</p>	<p>Run out of spindle taper</p> <p>Control movement by spindle rotation</p>	6	
2	 <p>A schematic diagram showing a cross-section of a spindle face. A vertical dashed line represents the axis of rotation. A circular feature is positioned on the face, with a horizontal arrow pointing to it, indicating the measurement point for runout.</p>	<p>Run out of spindle face</p> <p>Control movement by spindle rotation</p>	2	
3	 <p>A schematic diagram of a spindle assembly. A vertical dashed line represents the axis of rotation. A control arbor is shown extending from the spindle. A horizontal arrow points to the arbor at a distance of 20 mm from the gauge line. A vertical dimension line indicates a distance of 20 mm from the gauge line to the measurement point.</p>	<p>Runout of control arbor ( 150 mm) in spindle</p> <p>Measurement at 20mm from gauge line</p>	3	
4	 <p>A schematic diagram of a spindle assembly, similar to the previous one. A vertical dashed line represents the axis of rotation. A control arbor is shown extending from the spindle. A horizontal arrow points to the arbor at a distance of 20 mm from the gauge line. A vertical dimension line indicates a distance of 20 mm from the gauge line to the measurement point.</p>	<p>Run out of control arbor ( 300 mm) in spindle</p> <p>Measurement at 20mm from gauge line</p>	10	

## Temperature measurements

Sl. No.	Running time (Mins)	Rotational Speed (rpm)	Temperature Pos. 1 (°C)	Temperature Pos.2(°C)	Temperature Pos. 3 (°C)	Room Temperature (20°C)
1	30	5000				
2	30	10000				
3	30	12000				
4	30	14000				
5	30	15000				

**Maximum acceptable temperature: 40°C**

Pos.1 – At front bearings

Pos. 2- At middle of front and rear bearings

Pos. 3- At rear bearings

## TOOL CLAMPING FORCE MEASUREMENTS

Sl. No.	DESIRED VALUE OF CLAMPING FORCE	ACTUAL VALUE OF CLAMPING FORCE	REMARKS
1	20-22 KN(HX-253)		
2	>18 KN (SX-051)		

## ELECTRICAL/ ELECTRONICS TEST CHART

SPINDLE NO. – HX/SX.....

### 1. TOOL CLAMPING SYSTEM

Maximum and minimum values re to be taken during spindle rotation/ different positions of tool clamping system.

Sl. No.	Description	Desired Voltage	Tolerance	Achieved Voltage from sensor			Remarks
				Min.	Max.	Average	
1	Tool Unclamp	8.45 V	+0.4 V				
2	Clamped with tool	3.0 V	+/- 0.5 V				
3	Clamped without tool	1.04 V	+/- 0.1 V				

### 2. Temperature Sensors:

Sl No.	Description	Desired Resistance	Actual Resistance	Remarks
1	KTY ( in encoder connector between pin no. 8 & 9)	540-610 ohm		

### 3. Encoder Signals

Sl. No.	Description	Desired value	Tolerance	Actual	Remarks
1	No. of pulses between two reference marks ( both directions: Clockwise & Anticlockwise rotation of spindle)	256	NIL		
2	Peak to peak voltage	U/Ass= $\sim$ 1.1 V	0.95-1.2 V		
		U/Bss= $\sim$ 1.1 V	0.95-1.2 V		

**ANNEXURE-E**

**HIGH SPEED MOTOR SPINDLE(FISCHER)**

**MACHINE MAKE: LIECHTI**

**MAKE: FISCHER**

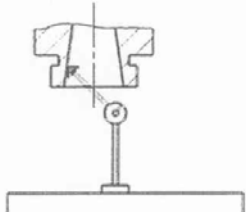
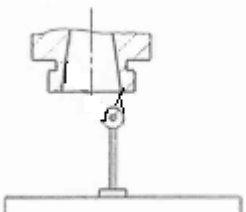
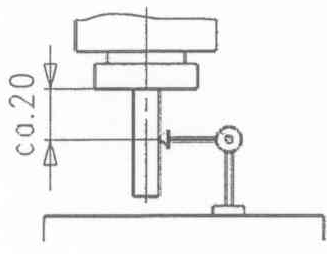
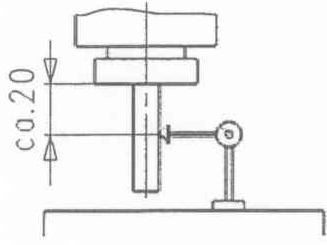
<b>Sl. No.</b>	<b>Description</b>	<b>Data / Specification</b>
1.	Maximum Spindle rated RPM	15,000 rpm.
2.	Runs at max.	15,000 rpm.
3.	Spindle Motor power	20 KW.
4.	Frequency	Variable with variable drive.
5.	No. of poles	4
6.	Tool Clamp	Draw bar mechanism with disc/helical coiled springs.
7.	Coolant Through Spindle.	Yes
8.	Spindle is cooled by refrigerating coolant system.	Yes
9.	Spindle Taper	HSK A 63
10.	Clamping force	14.4-18 KN
11.	Spindle Torque	166 Nm
12.	Bearing used	Ceramic Hybrid Bearings.
13.	Seal reference	Not Available.
14.	Lubrication	One time grease lubrication
15.	Analog Sensors	4-20 mA
16.	Encoder	Lenord & Bauer Minicoder GEL 244 KN

- NOTE : 1) No Assembly drawing of the motor spindle is available.  
2) No part drawing or part list can be provided.  
3) No dismantling or assembly procedure is available

## TEST CHART

### FISCHER MOTOR SPINDLE –LIECHTI ENGINEERING AG

SPINDLE NO. - MFW.....

SI No.		Description of test	Admissible deviation in microns	Measured value in microns
1	 <p>A schematic diagram showing a spindle taper being measured. A vertical line represents the axis of rotation, and a horizontal line indicates the measurement point on the taper. A circular arrow indicates the direction of spindle rotation.</p>	Runout of spindle taper Control movement by spindle rotation	6	
2	 <p>A schematic diagram showing a spindle face being measured. A vertical line represents the axis of rotation, and a horizontal line indicates the measurement point on the face. A circular arrow indicates the direction of spindle rotation.</p>	Runout of spindle face Control movement by spindle rotation	2	
3	 <p>A schematic diagram showing a control arbor of 150 mm length being measured. A vertical line represents the axis of rotation, and a horizontal line indicates the measurement point. A circular arrow indicates the direction of spindle rotation. A dimension line on the left indicates a distance of approximately 20 mm from the gauge line.</p>	Runout of control arbor ( 150 mm) in spindle Measurement at 20mm from gauge line	3	
4	 <p>A schematic diagram showing a control arbor of 300 mm length being measured. A vertical line represents the axis of rotation, and a horizontal line indicates the measurement point. A circular arrow indicates the direction of spindle rotation. A dimension line on the left indicates a distance of approximately 20 mm from the gauge line.</p>	Runout of control arbor ( 300 mm) in spindle Measurement at 20mm from gauge line	10	

## Temperature measurements

Sl. No.	Running time (Mins)	Rotational Speed (rpm)	Stator Temperature Pos. 1 (°C)	Front Bearing Temperature Pos.2(°C)	Front Bearing Temperature Pos. 3 (°C)	Rear Bearing Temperature Pos. 4 (°C)	Room Temperature (20°C)
1	30	5000					
2	30	10000					
3	30	12000					
4	30	14000					
5	30	15000					

**Maximum acceptable temperature: 25-30°C**

Pos.1 – Stator

Pos. 2&3- At front bearings

Pos. 4- At rear bearings

## TOOL CLAMPING FORCE MEASUREMENTS

Sl. No.	DESIRED VALUE OF CLAMPING FORCE	ACTUAL VALUE OF CLAMPING FORCE	REMARKS
1	14.4-18 KN		

## ELECTRICAL/ ELECTRONICS TEST CHART

SPINDLE NO. – MFW.....

### 1. TOOL CLAMPING SYSTEM

**Maximum and minimum values are to be taken during spindle rotation/ different positions of tool clamping system.**

Sr. No.	Description	Desired Current	Tolerance	Current from Sensor 1			Current from sensor 2			Remarks
				Min.	Max.	Avg.	Min.	Max.	Avg.	
1	Tool Unclamp	18.0mA	+/- 0.5 mA							
2	Clamped with Tool	8.0 mA	+/- 0.5 mA							
3	Clamped without Tool	5.0 mA	+/- 0.5 mA							

### 2. Temperature Sensors:

Sr. No.	Description	Desired Resistance	Actual Resistance	Remarks
1	Temperature bearing front PT100 DIN43760 (In sensor Connector between Pin No. 14 & 15)	105 - 115 ohm		
2	Temperature bearing back 3+4 PT100 (In sensor Connector between Pin No. 16 & 17)	105 - 115 ohm		
3	Temperature bearing front 2 PT100 (In sensor Connector between Pin No. 18 & 19)	105 - 115 ohm		
4	KTY (In encoder Connector between Pin No. 8 & 9 )	540– 610 ohm		

### 3. Encoder Signals

Sr. No.	Description	Desired	Tolerance	Actual	Remarks
1	No. of pulses between two reference marks (Both directions: Clockwise & Anticlockwise rotation of spindle)	256	NIL		
2	Peak to peak voltage	U/Ass = ~1.1V	0.95V-1.2V		
		U/Bss = ~1.1V	0.95V-1.2V		