Annexure -I

Qualifying Criteria for Volumetric Screw Feeder

Part- A

Ref: BHEL:CRC:QC:01 **Dt.** 10.04.2019

The BIDDER / VENDOR have to necessarily provide the following details, for making an assessment of the firm's capability and competency in the technical bid.

BHEL will study both the Qualifying Criteria and Response for Technical Specifications. The Price bid will be opened only if both the Qualifying Criteria and Response for Technical Specifications are found acceptable otherwise the offer will be rejected.

The BIDDER is expected to give complete details against each clause in the table given below and wherever necessary an additional sheet may be attached giving clear reference number to cover the required details. Bidders not meeting / filling the data sheet are liable for rejection.

S NO.	REQUIREMENTS	VENDOR'S RESPONSE
1.1	The BIDDER / VENDOR (OEM) shall have a minimum FIVE Years of Continuous Experience in Design, Manufacture & Supply of "Volumetric Screw Feeder" with VFD control. Vendor shall indicate the actual number of years of experience in the field.	
1.2	The BIDDER / VENDOR to furnish Reference List of Customers of Volumetric Screw Feeder with VFD has been supplied in the past five years, with complete address and details of contact person.	
1.3	Please enclose Performance Certificate from atleast one Indian or Foreign customer for the model quoted. Format enclosed as Annexure - A	
1.4	Service Back-Up from the PRINCIPAL Equipment Maker shall be guaranteed. The addresses of Agents/Service Centre in India to be provided.	
1.5	The BIDDER / VENDOR shall assure a continuous support for SPARES and SERVICE for TEN Years, from the date of commissioning of the equipment at BHEL Works.	

Note: *BHEL reserves the right to verify information submitted by vendor. In case the information is found to be false / incorrect, the offer shall be rejected.*

Supplier Name, Designation and Address.	Signature & Official Seal

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ANNEXURE-A

PERFORMANCE CERTIFICATE

(On Customer's Letter Head with Additional Sheet – if necessary)

1. Supplier of the Equipment :

2. Make & Model of the Equipment :

3. Month & Year of Commissioning :

4. Application for which the Equipment is used :

5. a. Equipment Serial Number :

   b. List of Accessories procured with the Equipment:

6. Performance of the Equipment : Satisfactory / Good / Average / Not Satisfactory

7. Feed- back on 'After Sales Service' by the Supplier :

8. Remarks / Reasons for Recommendations :

Date:

Signature & Seal of the Authority
Issuing the Performance Certificate

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Part - B

Ref : BHEL:CRC:TS: 01 **Dt.** : 10-04-2019

Instructions:

1. Supplier is requested to give specific confirmation for each point specified **in Table 1** WITH DETAILS of the item to be supplied and not to specify only 'YES/NO'.
2. **Any deviation from the specifications may be brought-out clearly by the supplier in the technical bid**
3. Bidders meeting the Qualifying criteria as per **Part - A** only are eligible to be considered for evaluation of their bid.
4. The vendor shall submit the offers in TWO parts.
    a. Technical Offer and
    b. Commercial Offer and Price bid
5. The technical offer shall contain complete details against all clauses of Technical specifications given by BHEL. The Technical offer shall be supported by copies of product catalogues, GA drawings and data sheets.
6. Vendor shall indicate the actual number of years of experience in the field and reference list of customers

Equipment:

- VOLUMETRIC SCREW FEEDER SYSTEM WITH VFD CONTROL – all Inclusive

Scope of Supply:

- Supply of Volumetric Screw Feeder system not limited to, hopper with lid, hopper agitator/vibrator, variable frequency drive (VFD), feeder control unit, supporting stand/structures, accessories and spares for continuous and reliable feeding of sorbents into the boiler test facility at specific feed rates, as per the specifications mentioned in the Table 1 below.

- Vendor to include the quantity of spares required for two years of continuous operation of the equipment. List of spares required/offered with unit price to be enclosed separately.

- Safe Packing of complete feeder system suitably and delivery up to BHEL, Trichy – 620014.

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Application of feeder:

- The volumetric screw feeder is to be installed in the downstream of the boiler test facility for continuous feeding of the sorbents into the test facility. Hopper of the feeder is loaded/refilled manually. The feeder should be capable of operating continuously at various feed rates based on speed with the desirable accuracy specified. The feeder will be operated/controlled through the existing DCS (Metso) with PC. Manual operation/control of the feeder shall also be included.

- The feeder will be installed on the existing structural steel platforms of the test facility based on the design drawings, ground clearance provided by supplier. The feeder discharge dimensions are to be provided by vendor for connecting to the test facility. Feeder specification requirements, process parameters and sorbent characteristics are given in the **Table 1** below.

Technical Specifications: TABLE 1

S.No	Description	BHEL's Specification/requirement	OFFERED	DEVIATION
1.	Feeder Type	Screw type feeder (Volumetric)		
2.	Feed rate range	**0.15 to 150 kg/h** by changing the speed of the screw rotation.		
3.	Feed flow accuracy	± 5 % of full scale		
4.	Feed flow control	Incremental control range from 0.15 to 150 kg/h flow to be provided.		
5.	Feed Flow	Continuous operation		
6.	Feeder Screw	– Single screw extrusion. – Length of screw can be 1 m or lower. – Outside diameter of screw, pitch, and feed depth, barrel diameter to be given by the vendor. – Screw housing shall be complete with supporting saddles, cover, clamps, bearings, hangers, trough ends, couplings and shaft, inlet and discharge openings etc.		

S.No	Description	BHEL's Specification/requirement	OFFERED	DEVIATION
7.	Feeding type	Gravitational, Flood feeding		
8.	Material of construction	Stainless Steel		
9.	Pressure & Temperature at feeder outlet	Pressure: - 50 to - 300 mm H_2O and Temperature: 100 – 200 °C		
10.	Type of Feed particles	Fine powder of Hydrated Lime (Calcium hydroxide, $Ca(OH)_2$) or Baking Soda (Sodium bicarbonate, $NaHCO_3$)		
11.	Feed Bulk density	500-900 kg/m^3		
12.	Nature of feed particles	Corrosive, Non Flammable, Moderately flowing.		
13.	Feed size	Particles passing thru 200 mesh (Taylor) screen i.e., Less than 75 microns		
14.	Feed particles temperature	Ambient		
15.	Moisture in feed	5 to 8 %		
16.	Hopper Capacity	200 Liters volume or 100 kg (Minimum). Vendor to specify the shape and dimensions of hopper. MOC shall be SS.		
17.	Hopper Fittings	With lid (air tight) & handle and with agitator/vibrator to avoid solids arching / bridging inside hopper and to ensure continuous flow of particles from the hopper into feed chamber for flood feeding. Hopper is loaded/refilled manually.		
18.	Available Power source	AC 415 V ± 15%, 3 phase, 50Hz ± 3%		
19.	Power consumption	Vendor to specify		

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S.No	Description	BHEL's Specification/requirement	OFFERED	DEVIATION
20.	Motor & Drive	– Reputed make. – Vendor to specify Make, Rating of motor and VFD with all details.		
21.	Interfacing with existing Data Acquisition System which accepts 24 VDC, 4 – 20 mA input signal.	– Preferred signal type 4 – 20 mA. – To be simple and user friendly. – Feeder will be connected to existing data acquisition system and feed flow rate to be controlled by BHEL PC. – Vendor to provide the connector details for arranging the connector cable		
22.	Dimensions and weight of feeder system	To be specified by the supplier. Vendor to provide the general arrangement drawings with dimensions of the feeder along with the offer for review.		
23.	Ambient Condition	– Temperature: 25 to 45^{0}C – Relative Humidity: 60-90 % – Dusty		
24.	Features	– Compact design – No erosion – Particles breakage during operation shall be minimum – Easy removable components for cleaning or maintenance.		
25.	Safety / Quality	– Vendor to confirm/certify – Provision for tripping of the drive due to any overload is preferable. – If any safety / environmental protection enclosure is required, it should be built in the machine by the vendor. – Vendor to submit quality plan for BHEL approval after placement of order. – There should not be any emissions from the system. No hazardous chemicals shall be		

S.No	Description	BHEL's Specification/requirement	OFFERED	DEVIATION
		required to be used. – Paint in system shall be oil / water resistant and should not get peeled off.		
26.	Spares / Accessories	• All the accessories required for the specified application and smooth operation are to be supplied by the vendor. • List of all the spares required for trouble free operation for a period of two years are to be provided separately along with the offer by the supplier.		
27.	Pre dispatch Inspection	Pre dispatch Inspection will be carried out by BHEL representative at vendor site (if required).		
28.	Installation & commissioning at BHEL, Trichy Unit	Supplier has to provide the details for assembly, installation and commissioning manual along with the Feeder to BHEL. Required Electrical power, layout drawings, electric drawings etc for installation of Feeder with VFD are to be provided along with the offer for review.		
29.	Manuals	Hardcopy of Operation & Maintenance Manuals (in English language) and its soft copies in CD should be supplied along with the Feeder system. Manuals should contain the operation and maintenance of feeder, motor, VFD, and all other items with drawings of main assemblies, sub-assemblies/parts including electrical circuit diagrams wherever applicable.		
30.	Guarantee	The manufacturer shall warrant the entire supply including the drive motor against deficiency in performance and failure due to defects in material and workmanship for a period of at least 12 months from the date of commissioning or 18 months from the date of supply which ever earlier.		

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