Indian Institute of Science (IISc), Bangalore - 560012

Supercomputer Education and Research Centre (SERC), IISc

Tender No.: SERC/UPS-battery-banks/2020/01
January 14, 2020

Tender notification for the procurement of two (2 Nos.) 500 KVA UPS battery banks (Last date: February 4, 2020).

The Supercomputer Education and Research (SERC), Indian Institute of Science, requires 500 KVA UPS battery banks for its large-scale critical UPS system. This is an open tender for the purchase of two 500 KVA UPS battery banks and buy-back of existing two 500 KVA UPS battery banks of Amararaja make.

1. Scope

This specification covers design, manufacture, assembly of components, testing at manufacturer's works, packing, supply and delivery to site of **valve regulated lead-acid (VRLA)/SMF** stationary batteries and associated accessories for indoor installation. The Battery Manufacturer or their authorized dealer must have Manufacturing Unit in India and the batteries must be manufactured in India.

Batteries for Purchase

SL. Nos.	DESCRIPTION OF ITEM	CAPACITY		QUANTITY
		VOLTS	AMPERE HOUR	
1	**SMF/VRLA STATIONARY BATTERIES:** **Make : Exide / Amararaja / HBL Knife / Global / Panasonic / Rocket / Yuasa Intex / Luminous / HBL Triumph / QUANTA / TATA Green / Power Sonic**	**2 Volts**	**600Ah**	**516 Nos.** **258 Cells / Bank**
All Batteries should be of the same Type, Design and Rating manufactured by the factory during the same period, using the same process and materials.				

Supervision of erection and commissioning of the battery bank shall have to be undertaken on mutual acceptance of the terms and conditions for the same, if required.

Buy-Back:

Removal of OLD / scrap batteries under a buy-back offer must be in the scope of supplier. Handing over the scrap batteries to a suitable Lead Recycler in adherence with the notification of the Government of India in the Ministry of Environment and Forests was published in the Gazette of India, Extraordinary, Part II-section 3 the Batteries (Management and Handling) Rules, 2001.

Batteries for BuyBack

SL. Nos.	DESCRIPTION OF ITEM	CAPACITY		QUANTITY
		VOLTS	AMPERE HOUR	
1	**SMF/VRLA STATIONARY BATTERIES:** **Make : Amararaja**	**2 Volts**	**600Ah**	**516 Nos.** **258 Cells / Bank**

The bidder may visit the site to inspect the facilities for the new batteries and the buy-back battery bank before quoting for the tender.

2. Eligibility Criteria for the Bidders

The bidders shall have offices located in various regions throughout the country, and definitely in Bangalore, equipped with the required instruments and properly trained personnel for taking care of after sales service throughout the expected life of the equipment.

The equipment covered by this specification is a very important source of power supply for a **24/7 DATA CENTRE / Critical Equipment Centre** and hence should be of high quality and reliability. The bidders shall preferably be ISO 9001 and ISO 14001 approved.

The bidder should be financially stable and the following documents shall be submitted by the bidder along with the bid.

- The bidder should have been in the business related to the batteries for at least five years. A documentary proof for this should be supplied.
- The bidder should have supplied similar units to large DATA or computer centers in the country and should include certificates of satisfactory performance from such past esteemed clients
- The bidders should have experience in design, manufacture, supply, erection of VRLA batteries for at least 3 years and whose equipment is in successful operation in industry for standby application for minimum 2 years as on the date of bid opening. A documentary proof for this should be supplied.
- Last three years Annual Report
- Details and range of products manufactured
- List of plants and machinery installed in the works of bidder relevant to the equipment in the bid.

- The bidder must have supplied and installed at least ten battery systems of 500 KVA or above. The bidder must provide the list of such systems along with user certification for at least five of the systems.
- Must hold valid Document proofs related to adherence of the Batteries (Management and Handling) Rules, 2001

3. Design and Constructional Features of the Batteries to be Purchased

3.1 Type

The battery shall be Valve Regulated Lead Acid (VRLA) Sealed Maintenance Free type with AGM (Absorbant Glass Mat) technology. JIS C8707 - Sealed Lead Acid Stationary Batteries (Valve Regulated type) and TEC G/BAT-01/02 Mar 2000 with latest amendments. Valve Regulated Lead Acid Stationary Batteries.

Battery shall not require distilled water addition ever and shall suppress generation of hydrogen gas by means of such a system that the oxygen generated at positive plate is absorbed by negative plate by reaction in the battery.

3.2 Positive Plates

Antimony or Cadmium is not acceptable in positive plate alloy.

To ensure sufficient service life, there shall be sufficient number of Positive Plate with required surface area. Each positive Plate shall be rated not more than 10% of the total Rated Capacity of the battery. For in case of 600Ah battery, each plate capacity shall not be more than 60Ah±5%.

3.3 Negative Plates

Negative plates shall be designed to match the positive plates and combination of positive and negative plates shall ensure long life with minimum lifetime of five years and trouble-free operation of battery. The negative plates shall be more than the positive plate.

3.4 Container and Lid

Should be made from polypropylene co-polymer plastics. They shall be sufficiently robust and not liable to deformation under internal operating pressures and within the temperature ranges normally encountered. It should be leak-proof, non-absorbent and resistant to the acid with low permeability. The cells above 500 Ah should have ribbed exterior to facilitate heat dissipation provide mechanical robustness. The container and lid material shall be of FR GradeV0 Poly as per UL94. The container and Lid arrangement has to be 100% Leak Proof.

3.5 Valve

Valve shall have
- have explosion proof vent closure.
- be self-releasing pressure regulating type.
- operate on opening & closing pressure between 2 to 6 Psi.
- have flame arrestor to prevent the possibility of external sparks entering the cell.

3.6 Racks/Trays

Mild steel with powder coating with anti corrosive paint including base channel plated foundation nuts,

bolts etc. The colour of the Racks/Trays shall be as per available standard.

3.7 Terminals

Terminals shall be of integral lead terminal with solid copper core suitable for minimum M6 threading intercell, inter module and inter stack. Bone intercell connectors & terminals shall be suitably protected by transparent covers.

3.8 Plate Assembly

Copper terminal plate (for terminating cables) suited to support equivalent C3 discharge rate shall be provided.

3.9 Connectors

The connectors shall be lead plated copper connector. Connector shall be suitably lead coated to withstand corrosion due to sulphuric acid.

3.10 Seal

TIG welding shall be done for post sealing.
Additional Epoxy resin sealing shall be provided for double assurance against leakage.
A certificate on the sealing and the leak rate limits must be enclosed.

3.11 Self Discharge Rate of Battery

Self discharge rate shall be less than 0.5% of C10 capacity per week at 27 deg. C. ***The bidder shall provide spec sheet and test data results confirming the same.***

3.12 Charging

The tenderer shall specify lower optimum voltage to be maintained by chargers to maintain batteries in fully charged condition for minimum water loss and maximum battery life for the systems. The tenderer shall also specify freshening charge requirement if any, for optimum battery life.

3.13 Design Float Life Expectancy of the Battery

Design life of the battery shall be around 20 years on float mode and at 27 deg. C. ***The bidder shall provide spec sheet confirming the same.***

3.14 Designed Cyclic Life Expectancy of the Battery at 27 deg C

Depth Of Discharge (DOD)	Minimum no of Cycles
20%	4000 Cycles
50%	1800 Cycles
80%	1400 Cycles

The bidder shall provide spec sheet confirming the same.

3.15 Capacity of the Battery

The capacity of the battery declared at various discharge ratings at various end voltages shall be as hereunder

Period of Discharge	Ah Capacities	Discharge Current (Amps)	End Cell Voltages
10 Hours	600	60	1.75
9 Hours	587	65.3	1.75
8 Hours	570	71.3	1.75
7 Hours	550	78.6	1.75
6 Hours	527	87.9	1.75
5 Hours	499	100	1.75
4 Hours	469	117.3	1.74
3 Hours	430	143.4	1.74
2 Hours	379	189.9	1.7
1 Hour	300	300	1.7

The bidder shall provide spec sheet and test data results confirming the same.

4. Electrical Characteristics of the Batteries to be Purchased

a. The supplied batteries should be compatible with the following UPS specifications and operating modes.

- UPS-related technical specifications: Available in:
  - http://www.serc.iisc.ac.in/serc_web_new/wp-content/uploads/2020/01/Technical-Specfication-MHT-300-500-kVA.pdf.
- Operating modes of UPS: On-line mode (normal operation, emergency operation and by-pass operation), Stand-by ON mode, Smart Active mode, Stand-by OFF mode.

b. Battery shall be suitable for Constant Current Constant Voltage Charging.
c. Nominal Float Voltage shall not exceed 2.25 V per cell @ 27 deg.C
d. Recharging shall be done at normal float voltage.
e. Charging current shall not exceed 0.15 C, where C is the Capacity in Ah@ 10 hours of discharge end cell voltage 1.75 V @ 27 deg.C
f. Battery shall not demand boost charging at any point of time during its operation.
g. Battery shall not demand equalizing charge at any point of time during its operation.
h. The Ampere Hour Efficiency shall be Minimum 90% and Watt Hour Efficiency shall not be less than 80%. ***The bidder shall provide test data results confirming the same.***
i. The internal resistance of each cell at fully charged condition shall not exceed 0.40 Milli Ohms. ***The bidder shall provide spec sheet confirming the same.***
j. 100% cells shall be tested for leak free performance. ***Vendor shall attach a copy of the test report along with the dispatch documents.***
k. Vendor is expected to monitor the voltage and current data of the cells during initial charge and test discharge by means of automatic data logging for traceability. Vendor shall maintain the data base of the same and provide the document to the Institute as and when called for and this is binding for five years.
l. The vendor shall test the batteries for all parameters specified in this document every year. The batteries should not have lost more than 20% of its initial capacity at the end of five years.

5. Marking

Each cell shall be marked in a permanent manner to indicate the following information.

- Manufacturer's type and trade name.
- Cell number.
- Type of plate.

- Ah capacity at 10 hr rate.
- Type of container.
- Month and year of manufacture / Batch No. etc.,
- Test for C10 Capacity and Voltage During Discharge.
- Ampere Hour and Watt Hour Efficiency Test.

6. Installation, Warranty and Acceptance of the Equipment

a) During the **Acceptance test the entire Battery Bank will be charged and discharged to a minimum of 3 to 5 cycles as suggested by the Chair, SERC** to a safe value prescribed by the vendor / supplier / OEM etc., with an external load in the presence of an infrastructure person or team from our Institute. The external load has to be arranged by the supplier.

b) Warranty on the Batteries should be valid for a period of at least **5 years from the date of acceptance of the equipment.**

c) If a battery bank as a whole does not meet the required power/storage requirements as mentioned in this document any time during the warranty period, the vendor must provide replacement and assure quality with the appropriate tests to match the original specifications.

d) Service calls have to be attended within the same day. Replacement of major defective items has to be made within two days.

7. Summary of the Documents to be Provided by the Bidder

a. Documentary proofs and details asked for the bidders' eligibility criteria (page 2).
b. Certificate on sealing (Section 3.10 in page 4).
c. Spec sheet and test data result on self-discharge rate of batteries (Section 3.11 in page 4).
d. Spec sheet on design float life expectancy (Section 3.13 in page 4).
e. Spec sheet on design cyclic life expectancy (Section 3.14 in page 4).
f. Spec sheet and test data result on battery capacity (Section 3.15 in page 5).
g. Test data result on Ampere hour efficiency (Section 4, point h in page 5).
h. Spec sheet on internal resistance (Section 4, point i in page 5).
i. Test report on leak free performance (Section 4, point j in page 5).

GENERAL TERMS & CONDITIONS

1. **Two-bid system** (separate technical and financial bids) in sealed tenders, covers containing the technical and commercial bids must be individually sealed, and superscribed respectively as "500 KVA UPS Battery Bank – Technical Bid" and "500 KVA UPS Battery Bank – Commercial Bid". The two covers must be enclosed in a larger envelope, sealed, superscribed as "500 KVA UPS Battery Bank".
2. IISc reserves the right to cancel the tender at any time without assigning any reason whatsoever.

TECHNICAL BID – TERMS & CONDITIONS

1. The technical bid must clearly specify the following:

a. Executive summary of the proposal.
b. Technical details of the system.
c. Technical compliance statement stating compliance against each item in the technical specifications given in the enquiry.
d. Terms and conditions of the offer.
e. Supporting technical materials, including brochures, highlighting unique characteristics.
f. A copy of the masked Commercial bid of the bill-of-materials.

2. Vendors who include price information in the technical bids will be automatically disqualified.
3. Technical bids will be opened first. IISc may seek clarifications after opening of technical bids.

COMMERCIAL TERMS & CONDITIONS

1. Price bids of only technically qualified vendors will be considered. Commercial bid shall be opened for the technically qualified bidders after the technical evaluation. The Institute will communicate by email provided in the technical bid the date and time of opening of the commercial bid to the qualified bidders. Commercial bids will be opened on the said date and time, irrespective of the presence of the bidders / authorized representatives.
2. The commercial bid should contain among other things, payment terms, warranty, installation, commissioning etc. as per requirements of IISc mentioned in the tender document. All such conditions must be in line with the tender. In case of any deviation or conditional offer, the bid may be treated as non-responsive and hence will not be considered for evaluation.
3. Prices should be quoted only in Indian Rupees. IISc is eligible for concessional GST for IISc purchases as per DSIR registration. IISc will provide necessary documents required for availing the concessional GST for indigenous items. Bidders should consider these facts while offering their price bids for this tender. IISc will only provide relevant documents for availing concession / exemption in GST subject to submission of documents (viz. Proforma Invoice, acceptance of the order) required from vendor side. The component of tax, and any other statutory levies should be shown separately and not included in the total amount, to enable us to avail exemption.
4. Proposals should contain the name and contact details, viz., phone, fax and email of the designated person to whom all future communication will be addressed.
5. Prices should be quoted in detail, for all the subsystems given in the Technical Specifications part of the tender. Further, bid and price validity should be for six months from the date of opening of the technical bids.
6. IISc will place the purchase order only on the successful bidder as per the decision of IISc. In this regard, decision of IISc will be final and binding.

PAYMENT TERMS

1. The total project cost will consist of Equipment supply and installation and warranty for five years from the acceptance and successful installation as per decided by IISc.
2. 100% payment shall be released by IISc against delivery, inspection, successful installation, commissioning and acceptance of the equipment at IISc Bangalore in good and functional condition and to the entire satisfaction of the Purchaser (IISc).

3. Payment will be subject to deduction of TDS as per rules / laws and any other deduction as per PO terms.
4. The total solution as per the agreed bill of materials must be supplied within 3 weeks after receiving a firm PO from IISc. The installation and acceptance must be completed within 2 weeks after supply of the equipment.

Important Dates

1. Release of tender: January 14, 2020.
2. Last date for sending queries: January 27, 2020. Queries may be sent to Chair, SERC (chair.serc@iisc.ac.in)
3. Response to queries and release of corrigendum to the tender based on the queries, if necessary: January 29, 2020.
4. Submission of the bid: February 4, 2020, 5 PM IST.

The bid should be addressed to:

The Chair
Supercomputer Education and Research Centre (SERC)
Indian Institute of Science (IISc)
Bengaluru
India - 560012.