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				<b>REVISION: 00</b>	Approved:      Alok Mandal 
			Prepared  ASWANTH KUMAR K P	Issued CE-Engg-SCADA	Date 28.07.2020




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<div>SECTION –A</div> <div>GENERAL INSTRUCTIONS TO BIDDERS</div> <div><p><b>Introduction</b> : Bidders are required to submit technical offer for 410KWH Battery Energy Storage system for M/s TERI –3 sites in NCT of Delhi. The bidder shall be totally responsible for the desired performance of the offered BESS system including survey, planning, design, engineering, manufacturing, testing, insurance,supply, installation and commissioning, comprehensive AMC on Turnkey basis. All required documents against this tender/specification shall be submitted in English only.</p><p>1. Submission of Documents :</p><p>a. Documents listed in Section-B of this specification for meeting Pre Qualification Requirements (PQR) should be submitted in separate cover with “Section – B – Pre Qualification” written on cover.</p><p>b. Technical offer / proposal as per Section-C of this specification should be submitted in a separate cover with “Section – C Technical offer” written on cover.</p><p>2. <u>Evaluation methodology</u> :</p><p>A. Bidder’s PQR &amp; Technical offer document cover will be opened first for review and evaluation by BHEL. In case the bidders offer do not meet the PQR, then corresponding techno-commercial offer will not be considered for further evaluation in the tender. Technical offers of those bidders who meet PQR shall be considered for review and further consideration.</p><p>B. Bidders declared qualified for meeting Pre Qualification Requirements mentioned in section B and are presently not registered with BHEL EDN Bangalore for supplying BESS package, shall be informed by email to submit online BHEL vendor registration form at <a href="http://www.bhel.com">www.bhel.com</a>.</p><p>C. If required during evaluation of PQR and technical offers/bids, vendor should be present at BHEL Electronics Division, Bangalore, for discussions. Further in the event of order, during approval of the vendor documents by customer, vendor shall accompany BHEL representative for discussions with customer/consultant.</p></div>				

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<div><div><div>COPY RIGHT AND CONFIDENTIAL</div><div>The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in anyway detrimental to the interest of the company.</div></div><div><div><b>SECTION –B</b></div><div><b>PRE-QUALIFICATION REQUIREMENTS (PQR)</b></div><div><div><div><div>1. The bidder should have minimum two years of experience in executing contract of grid interactive BESS (viz. supplied/commissioned/running) across the globe. Purchase Order/ Completion Certificate of past five years should be enclosed.</div><div>2. The bidder having installed &amp; operationalized the grid interactive battery energy storage system(s) of cumulative installed capacity of 125 kW for 2 hours or higher, out of which at least one grid interactive battery energy storage system should be of 30 kW for 2 hours capacity or, higher (in India or globally). Certificate issued by the Employer/ Client certifying the operation without any adverse remark along-with copy of purchase order prior to the date of techno- economic bid opening, shall be provided.</div></div><div><div>The following documents are required for acceptance:</div><div><div>2.1 Un-priced purchase order copy / Completion Certificate of past five years of end user placed on bidder.</div><div>2.2 Certificate issued by end user certifying the operation without any adverse remark along-with copy of purchase order mentioning the date of installation of the supplied system</div><div>2.3 List of past supplies in tabular form mentioning name of project, year of supply, year of commissioning, make of system etc.</div></div></div><div><div>Note: If the furnished PTR, end user contact details are found wrong/incorrect, the offer will be rejected.</div><div><div>3. The responsibility of complete system including Engineering, selection of components, and erection and commissioning, AMC shall be with original BESS manufacturer. For this OEM shall submit a letter in original. Further, OEM shall also submit letter indicating availability of service, spares for a minimum of 10 years after supply.</div><div>4. Bidder must meet the Technical Specifications as stipulated in the Tender, and the bidder(s) must be able to provide the after-sales warranty and support services.</div><div>5. If Bidder is not Original Equipment Manufacturer (OEM), then Bidder has to include Authorization letter from OEM for Design, Engineering, Manufacture, Testing, Supply, Erection and Commissioning of the offered system.</div><div>6. Along with the documents related to PQR above, following details shall also be included in the Offer:<div><div>6.1 Technical literature / Manuals of offered BESS system.</div><div>6.2 Details of Manufacturing, testing &amp; inspection facility.</div></div></div></div></div><div><div>Note: In case Bidder does not submit details mentioned in above clauses or meet the requirements of Pre-qualification requirements, Offers will be summarily rejected and Bidder’s technical offers/proposals will not be evaluated. Please read carefully the General Instructions in Section-A of this specifications.</div></div></div></div></div></div>				

		 A4-10	<b>SECTION-C</b> <b>PURCHASE SPECIFICATION</b>		<b>PS 4702165</b>	
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<b>COPY RIGHT AND CONFIDENTIAL</b> The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in anyway detrimental to the interest of the company.		<p style="text-align: center;"> <b>PURCHASE SPECIFICATION</b>   <b>OF</b>   <b>410 KWH BATTERY ENERGY STORAGE SYSTEM (BESS)</b>   <b>FOR</b>   <b>M/s TERI (The Energy and Resources Institute), New Delhi</b> </p>				
		<b>REVISION: 00</b>	Approved: Alok Mandal 			
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		<div><div><div>बीएच ई एल</div><div>BHEL</div></div><div>A4-11</div></div>	PURCHASE SPECIFICATION		PS 4702165
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<div>COPY RIGHT AND CONFIDENTIAL</div> <div>The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in anyway detrimental to the interest of the company.</div>					<p>This document covers specifications of BESS System for M/s TERI for 3 sites in NCT of Delhi. The detailed specifications of the BESS system are given in the following sections. The vendor shall be totally responsible for the desired performances of the offered BESS system including survey, design, engineering, manufacturing, testing, supply, installation , commissioning and Warranty along-with CAMC for 5years(Total Turnkey Project).</p> <p><b>Objective:</b> Tender for Design, Supply, Testing, Installation and Commissioning, Warranty along-with Comprehensive Annual Maintenance Contract (CAMC) for 5 years of Battery Energy Storage Systems (BESS) on Turnkey Basis.</p> <p><b>Location and Applications:</b> Under UI-ASSIST initiative TERI in-association with BRPL(BSES Rajdhani Power Ltd.) conducted a detailed feasibility study within BRPL licensee area in the NCT of Delhi, and had identified few selected locations to demonstrate operational use cases of grid-scale BESS on pilot-basis. The details of BESS application(s) and size for specified locations are mentioned below:</p> <div><div><div>1. <b>Category-A:</b> BESS will be used to manage overload of a Distribution Transformer (DT) serving mainly residential consumers. BESS to be installed on the LT side of DT will be charged when the loading of DT is lower than a particular threshold level and discharged when loading exceeds the defined threshold level.</div><div>2. <b>Category-B:</b> Here in, the proposed application of BESS is to supply the back-up power to common/critical loads (loads such as lift, water pump and lighting load) of gated group housing society during power outages. The system will be charged from grid power and also from existing solar PV installed as and when available. Additionally, there should be a provision to charge the BESS from DG power, DG synchronization if required.</div><div>3. <b>Category-C:</b> TERI-School of Advanced Studies (SAS) is an institution with TOD tariff applicable for five months. In this case, BESS will be charged during off-peak hours and discharged during peak hours. This application aims to demonstrate BESS operations with difference in prices during a day at a constant rate. During remaining times of the year, BESS operations may be used for research work within technical constraints of the battery technology.</div></div></div>

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Table 1: Category-wise BESS descriptions for all 3 site:

	Location	Application	Useful Capacity of BESS at the Beginning of Life	Battery Chemistry	Designed Rating of BESS
Cat-A	990-kVA DT in Taimoor Nagar, New Friends Colony, New Delhi	Overload management of DT (primary application)	230 kWh/ 125 kW	Li-Ion (LFP)	Technology Dependent
Cat-B	Dwarka (Ispatika Apartments, Dwarka), New Delhi	Supply Critical/ Common Load of a Gated Residential Community (primary application)	120 kWh/ 240 kW	Li-Ion (LFP)	Technology Dependent
Cat-C	TERI-SAS, Vasant Kunj Institutional Area, New Delhi	Savings on TOD price difference (primary application)	60 kWh/ 50 kW	Li-Ion (LFP)	Technology Dependent

Note: There will be other applications of BESS in those sites, in-addition to primary applications.

1.0 Scope of work


The Selected Bidder shall be obligated to perform the following Scope of Work, but not limited to, in relation to installation of BESS.

**A. Planning, design, engineering, transportation to site, insurance, supply at site, un-loading, storage, handling, installation, integration, testing, commissioning & demonstration for acceptance of all equipment/ materials and miscellaneous items required to complete the BESS installation, which includes, but is not limited to the following:**


- a. Battery packs, Power conditioning system, Air conditioning (AC) system, Fire-fighting system, UPS, system hardware, measurement & control device and other associated items necessary for trouble free operation and maintenance of whole system.
- b. Containers, structures, Earthing design, and battery modules inter-connection.
- c. Power Conditioning Units (PCU) with monitoring & control related equipment such as actuators, sensors, transducers etc.
- d. Appropriate protection and safety features.
- e. Project Management including adherence to all requisite safety practices.


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		<div>f. Fire-fighting and fire detection systems.</div> <div>g. Factory acceptance test and site acceptance test</div>		
<div>COPY RIGHT AND CONFIDENTIAL</div> <div>The information on this document is the property of Bharat Heavy Electricals Limited. It must not be used directly or indirectly in anyway detrimental to the interest of the company.</div>		<b>1.1. Delivery</b>		
		<p><b>Delivery of materials:</b> All the materials as specified in the purchase order should be delivered at the sites of installation within NIT commercial terms schedule. Transit insurance and storage insurance till the handing over of all materials will be within the scope of work. The Contractor should provide the manufacturer’s warranty on all components supplied.</p> <p>It shall be the sole responsibility of the Contractor to get verified the quality and quantity of the supplied material at the site of delivery.</p> <p><b>Delivery time for installation and commissioning:</b> The systems will be deemed commissioned only after successful trial run of the system for three (3) days from the date of installations. Warehousing and storage of all components will be in the scope of work till the commissioning of all systems as per the purchase order.</p> <p>Please note complete Work has to be completed within NIT commercial terms schedule.</p> <p><b>Insurance:</b> Transit Insurance, storage insurance and erection insurance of the materials and equipment’s for setting up the BESS shall be arranged by the Contractor for the total supply The goods supplied under the contract shall be fully insured for 6 years against loss or damage incidental to manufacture or acquisition, transportation, storage during transportation</p>		
		<b>1.2 Installation and Commissioning of BESS that includes:</b>		
		<div><div>a. Special care to be taken while designing the system to cater to heavy rainfall, strong winds, temperature difference and earthquake that may be prevalent in the area.</div><div>b. The Selected Bidder shall provide all related drawings to relevant IS/ IEC standards</div><div>c. Documentation and Training to TERI’s and BRPL’s officials.</div><div>d. Undertake Pre-commissioning and Commissioning of all supplied equipment.</div><div><div><div>i. Test running of the grid-connected BESS facility including battery operation trials at Site, prior to handover.</div><div>ii. Installation of appropriate measurement and control devices at required location, with submission of drawings - approved prior to commencement of work on Site.</div><div>iii. Commissioning certificate from relevant authorities for the facility.</div></div><div>e. No request for deviation in site specifications will be entertained by BHEL. All the site parameters such as space availability, electrical and civil infrastructures etc. have to be properly considered by the Contractor during site visit. BHEL Site survey report is also attached (Annexure VII) for reference. Any additional cost in making upgrades at the sites (for all three categories) will be borne by the Contractor . In case of any change in Location for Category-B, it is the responsibility of the Contractor to carry out the site visit and evaluate the new site for installation of Battery Energy Storage System at its own expenses. Any additional cost, if arises, due to any change in scope of work shall be finalized on mutual agreement between BHEL &amp; Contractor on the basis of component wise cost</div></div></div>		



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		<p>already submitted by the Contractor as a part of financial bid.</p> <p>f. After successful supply/commissioning of the system and training, the system will be handed over to the person designated by TERI or, BRPL.</p> <p><b>1.3 General Instructions</b></p> <ol style="list-style-type: none"> <li>1. Security, safety, watch, and ward of all materials at sites shall be the responsibility of the Selected Bidder</li> <li>2. Expenses for any other works, supply of material, and providing services required for the successful commissioning and operation of the plant, but not specifically mentioned in this document shall be borne by selected bidder.</li> <li>3. Safety management to be strictly complied with by the Selected Bidder throughout implementation activity.</li> <li>4. All local labour, employment, and other issues shall be handled independently by the selected Bidder.</li> <li>5. The entire responsibility and risk relating towards the manpower working at the Site, and compliance of different statutory regulations like Workman Compensation Act, Employees State Insurance Corporation (ESIC), Factory Act. 1948, Contract Labour Regulation, and Abolition Act 1970, Shop and Establishment Act. 1948, and other Statutory regulatory bodies shall solely lie with the Selected Bidder. The Selected Bidder shall also be solely responsible for payment of wages, provident fund, bonus, retrenchment compensation leave, etc. applicable as per various statutory regulations to their entire workforce, and keep BHEL/TERI/BRPL and the eligible consumer indemnified in this regard against any claim.</li> </ol> <p><b>1.4 Operation and Maintenance</b></p> <ol style="list-style-type: none"> <li>a. The operation &amp; maintenance of the BESS would include wear, tear, overhauling, insurance, and replacement of defective cells, invertors, PCUs, spares, consumables &amp; other parts for a period of five years.</li> <li>b. The BESS system shall include energy management system (EMS), battery management system (BMS) and dashboard to display key operational parameters such as voltage, current, battery SoC, frequency etc.</li> <li>c. Monitoring of BESS performance and supply of all technical, production/operation data and information and making it available as and when required.</li> <li>d. The supplier shall be responsible to carry out routine and preventive maintenance and replacement of each and every component / equipment of the BESS in case of any failure and vendor shall provide all labour, material, consumables etc. for routine and preventive maintenance at his own cost.</li> <li>e. Carryout preventive maintenance of each and every component of the BESS and shall provide the required manpower, materials, consumables, components or equipment etc at regular intervals as per the discretion of BRPL/TERI.</li> <li>f. Carry out maintenance activities as a result of sudden failure/breakdown of any particular component or equipment. Bidder shall be responsible to carry out breakdown maintenance of each and every component of the BESS and shall provide the</li> </ol>		
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		<p>required manpower, materials, consumables, components or equipment etc. for breakdown maintenance at his own cost irrespective of the reasons of the breakdown/failure.</p> <p>g. Visit to the site on call basis to provide maintenance services within 12 hours of lodging of complaint by BRPL/ TERI through Telephone/ E-mail or, any form of written communication.</p> <p><b>1.41 OPERATION &amp; MAINTENANCE MANUAL</b></p> <p>An Operation, Instruction and Maintenance Manual in English language as per the requirement should be issued enclosing</p> <ol style="list-style-type: none"> <li>Basic principles of BESS operation.</li> <li>A small site-specific write-up (with a block diagram) on the BESS – its components, battery packs, inverter, junction boxes and expected performance shall be provided.</li> <li>Type of battery technology, Make &amp; Model number, Voltage &amp; capacity of inverter and cells, used in the BESS.</li> <li>Technical characteristics of the entire component are required to be provided.</li> <li>DO's and DONT's</li> <li>About the complete battery energy storage system including battery modules/cell arrangements, power conversion system, monitoring &amp; control devices, heat managements (AC/HVAC), fire protection, EMS functionalities and architecture .</li> <li>Clear instructions on regular maintenance and troubleshooting of the system</li> <li>Name, address and contact number of the contact person in case of non-functioning of the system</li> </ol> <p><b>1.5 Failure to rectify the problem</b></p> <ol style="list-style-type: none"> <li>If the Selected Bidder fails to rectify the problem, the distribution utility herein BRPL shall rectify the problem at the expense of the Selected Bidder.</li> <li>In case of non-responsiveness of the Selected Bidder to carry out the O &amp; M work, TERI/BRPL is free to empanel or allocate the work to the other selected company to carry out the maintenance activity. The payment for the O&amp;M will be recovered from the contract performance guarantee of the Selected Bidder.</li> <li>BRPL reserves the right to make surprise checks/ inspection visits at its own or through authorized representative to verify the O&amp;M activities being carried out by the Selected Bidder. Failure to adhere to above guidelines will result in penal action.</li> </ol>		
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