U.P. Jal Vidyut Nigam Limited.

TENDER DOCUMENT FOR

NAME OF WORK :- **Supply, Installation, Testing and Commissioning of 01 No., 110V DC, 200 AH Battery set of 55 cells (2V each lead acid plate type) at Babail PH.**

TENDER NOTICE NO. :- **T- 24/HGD/2022-23**

OFFICE OF THE EXECUTIVE ENGINEER
HYDEL GENERATION DIVISION, KHARA BADSHAHI BAGH.
U.P. JAL VIDYUT NIGAM LTD.
BADSHAHIBAG, SAHARANPUR – 247122

कार्यालय अधिशासी अभियन्ता, जल विद्युत उत्पादन खण्ड
उ0प्र0 जल विद्युत निगम लि0, खारा–बादशाहीबाग, सहारनपुर उ0प्र0।
पंजीकृत एवं कार्पोरेट कार्यालयः– 12वॉ तल शक्ति भवन विस्तार, 14 अशोक मार्ग, लखनऊ।

पत्रांक..... दिनॉकः

निविदा सूचना

सरकारी विभागो/निगमों में कार्यरत, समान कार्य के अनुभवी ठेकेदारों/फर्मो से निम्नलिखित कार्य हेतु दिनॉक 14.11.2022 तक अपरान्हः 3:00 बजे तक वेबसाईट e-tender.up.nic.in पर e-tendering के माध्यम से निविदाये आमन्त्रित की जाती है। निविदा सम्बन्धी समस्त अभिलेख e-tender.up.nic.in की वेबसाइट पर दिनॉक. 17.10.2022 अपरान्हः 03:00 बजे से दिनॉक 14.11.2022 तक अपरान्हः 03:00 बजे तक उपलब्ध रहेगें, जहॉ पर ठेकेदारों द्वारा वेबसाइट पर ऑन लाईन अपनी निविदा दरें (मय टैक्निकल/फाइनेंशियल) डाली जायेगी। निविदा हेतु निर्धारित धरोहर धनराशि RTGS/NEFT के रुप में तथा निविदा मूल्य RTGS/NEFT के माध्यम से "अधिशासी अभियन्ता जल विद्युत उत्पादन खण्ड खारा–बादशाहीबाग, सहारनपुर के **(Punjab National Bank के खाता संख्या 1019001100000016 एवं IFSC- PUNB0101900)** में जमा कर साक्ष्य के रूप में यू0टी0आर0 सं0 की प्रति ईटेण्डर प्रपत्रों के साथ ईटेण्डर पोर्टल पर अपलोड करना अनिवार्य होगा। ऑन लाइन टैक्निकल बिड दिनॉक 15.11.2022 को अपरान्ह 12:00 बजे खोली जायेगी। टैक्निकल बिड क्वालीफाई करने वाले ठेकेदारों की ही फाइनेंशियल बिड खोली जायेगी। निविदाओं को बिना किसी कारण बताये निरस्त करने का अधिकार अद्योहस्ताक्षरकर्ता के पास सुरक्षित रहेगा। निविदा से सम्बन्धित विवरण निम्नवत् हैः–

क्रम सं0	निविदा संख्या	कार्य का नाम	आगणन की धनराशि (लाख रु0 में)	धरोहर राशि (रु0 में)	टेण्डर का मूल्य (रु0 में कर सहित)	कार्य अवधि
1.	T-23/HGD/2022-23	Complete Operation of Babail Power House (2x1.5 MW) along with Minor Maintenance work for a period of one year	17.29	35000.00	2360.00	12 माह
2.	T-24/HGD/2022-23	Supply, Installation, Testing and Commissioning of 01 No., 110V DC, 200 AH Battery set of 55 cells (2V each lead acid plate type) at Babail PH	6.72	13500.00	950.00	90 दिन
3.	T-25/HGD/2022-23	Hiring of 03 No. vehicle (Tata Sumo/Mahindra Bolero Model 2016 or later) for One No. for SE, HGC Khara, One No. for E.E HGD Khara and One No. for Khara Power House Maintenance duty	8.43	17000.00	1180.00	12 माह

अधिशासी अभियन्ता

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INSTRUCTIONS TO TENDERS

Tender No.	**:-**	**T- 24/HGD/2022-23**
Name of work	**:-**	**Supply, Installation, Testing and Commissioning of 01 No., 110V DC, 200 AH Battery set of 55 cells (2V each lead acid plate type) at Babail PH.**
Estimated cost	**:-**	Rs. 6.72 Lac.
Tender Cost	**:-**	Rs. 950.00
Earnest Money	**:-**	Rs 13500.00
Period	**:-**	3 Month

1. Geographical Situation of site :

A. Belka Power House :-

2x1.5 MW capacity (Hydro) Power House, Tahsil Behat Distt- Saharanpur, about 25 km far from Saharanpur city towards Saharanpur-Yamunotri Road, Nearest Railway station is Saharanpur.

B. Babail Power House :-

2x1.5 MW capacity (Hydro) Power House, Village Babail Tahsil Behat Distt- Saharanpur, about 15 km far from Saharanpur city towards Saharanpur-Yamunotri Road, Nearest Railway station is Saharanpur.

2. The bidders are requested to make themselves fully conversant with the scope of work seeing working site, technical specification, general terms and conditions as per terms and conditions for the work contract for UPJVNL special terms and conditions etc. before submission of the tender and thereafter they should quote their rates in price schedule accordingly so that no ambiguity at later stage arise.

3. The tender must be submitted in two parts, known as part-I (pre-qualifications for opening of Part-II) and part-II (price bid) part-I of the tender shall be opened electronically in the presence of bidder's representatives, who choose to attend at the prescribed venue, date and time mentioned in tender notice. Part-II of tender shall be opened after the approval given by SE for only those bidders who have fulfilled the pre-qualifying conditions of the tender on the basis of documents submitted in Part-I of the tender opening date of the Part-II shall be informed later. Time of open the part-II will be remain same as in part-I , Part-II of the tender shall be opened electronically in the presence of bidder's representatives, who choose to attend at the prescribed venue, date and time.

4. A) E-bids (Technical and Financial) must be submitted by the bidders at e-procurement website http://etender.up.nic.in not later than as prescribed date and time in tender notice.

b) The purchaser may at this discretion, extends this deadline for submission of bids by amending the bid documents.

5. Late Bids

The server time indicated in the bid management window on the e-procurement website http://etender.up.nic.in will be the time by which the bid submission activity will be allowed till the permissible date and time schedule in the bidding. Once the bid submission period is over, the bidder cannot submit their bid. Bidder has to start the bid submission well in advance so that submission process is completed within the scheduled period. Failing which it shall be the bidder's responsibility.

6. withdrawal and resubmission of E-bids

a. At point of time a bidder may withdraw their bid submitted online before the bid completion of bid submission period.

b. The bidder has to request the purchaser with a letter, attaching the proof of withdrawal and submission of bid security/EMD in the office of purchaser for taking back the bid security EMD as per the manual procedure.

c. The bidder can resubmit their bid as and when required till the scheduled bid submission end date and time. The bid submitted earlier will be replaced by the new one. The bid security submitted by the bidder earlier will be used of revised bid and the new bid submission summary generated after the successful submission of the revised bid will be considered for evaluation purpose.

d. The bidder can submit their revised bids as many times as possible by up loading their bid documents within the schedule period for submission of e-bids.

e. No bid can be resubmitted subsequently after the period for submission of kids is over.

7. Bidders are advised to study the bid document carefully. Submission of bids against the tender notice shall be deemed to have been done after careful study and examination of the procedure, terms and conditions stipulated in the bid documents with full understanding of its implications.

8. The bid document is available at e-procurement website http://etender.up.nic.in interested bidders may view, download the bidding document, seek clarification and submit their bid online up to the prescribed date and time through uploading on e-procurement website http://etender.up.nic.in.

9. The bidders are required to submit the cost of tender document as stated above through of RTGS/NEFT in account of Executive Engineer Hydel Generation Division Khara Badshahibagh Saharanpur (U.P.) (**Punjab National Bank A/c No. 1019001100000016 & IFSC- PUNB0101900**).

10. All bids must be accompanied by a bid Earnest Money Deposit in the form of RTGS/NEFT in account of Executive Engineer Hydel Generation Division Khara Badshahibagh Saharanpur (U.P.) (**Punjab National Bank A/c No. 1019001100000016 & IFSC- PUNB0101900**). The scanned copy of bid document fee Tender Cost & Earnest money must be up loaded electronically along with all the bid documents. The original of bid document fee, Earnest money with copy of all other required certificates and document should be furnished to the office of the Executive engineer Hydel Generation Division Khara Badshahibagh Saharanpur (U.P.) within schedule time. Failing which the bid shall not be considered/opened & is liable to be rejected.

11. The bids shall be electrically opened in the presence of bidder's representatives, who choose to attend, at the prescribed venue, date and time mentioned above.

12. The purchaser reserves the right to cancel any all the bids/annual the bidding process without assigning any reason thereof.

13. In the event of date specified for bids opening, being declared a holiday then bid shall be opened on next working day at schedule time.

14. All the required document shall be submitted/uploaded by the bidder electrically in the PDF format. However, the financial bid should be submitted in the XLS format.

15. No deviation from the Technical specification & Technical conditions shall be acceptable. The price bid of only those firms shall be opened who shall fulfill following pre-qualifying conditions. The tenderer are requested to submit the following document in support of the same in part-I of the tenders, failing which part-II (Price bid) of the tender shall not be opened.

A Tender Bid Part-I

PRE-QUALIFYING CONDITIONS OF TENDER

NAME OF WORK:- Supply, Installation, Testing and Commissioning of 01 No., 110V DC, 200 AH Battery set of 55 cells (2V each lead acid plate type) at Babail PH

Tender No.:- T- 24/HGD/2022-23

E-bids (Technical and Financial) must be submitted by the bidders at e-procurement website http://etender.up.nic.in not later than as prescribed date and time in tender notice.

Tender bid part-1 of tender should be uploaded against specified Tender No. "T- 24/HGD/2022-23" containing the copies of following scanned documents duly signed & stamped by bidders.

1. Tenderer have to deposit the requisite amount of Tender fee and earnest money as per tender notice in the desired shape. Any mode of transaction other than as mentioned in tender notice will not accept. Tenderer has to upload the receipt of the transaction.
2. The agreement on non-judicial stamp paper of Rs. 100/- or as applicable from time to time regarding validity of offer on prescribed Performa with the signature of two witness specifying name, profession and complete postal address of tenderers as well as witness.
3. Latest Income Tax clearance certificate /Return file forFY 2020-21 or later.
4. Self-Attested Latest financial turnover of the firm issued by the Bank/ chartered Accountant Average annual financial turnover during the last 3 year, ending 31st March, 2022 should be at least Rs. 2.00 Lacs (30% of estimated cost)

5 Copy of LOI/Agreements executed under Gov/Semi Gov. Hydro Power Station/ Thermal Power Station, which shall have experience of successfully completing similar nature of Supply during last 7 year ending March, 2022 should be either of the following:-

I. Self-Attested copy of Three similar completed works costing not less than the amount equal to each of the Rs.2.70 Lacs (40% of estimated cost)

OR

II. Self-Attested copy of Two similar completed works costing not less than the amount equal to each of the Rs. 3.40 Lacs (50% of estimated cost)

OR

III. Self-Attested copy of One similar completed works costing not less than the amount equal to each of the Rs. 5.40 Lacs (80% of estimated cost)

6 Self-Attested copy of 15 digit PAN based computerized GST registration certificate must be enclosed.

7 (i) Tenderer should be manufacturer of industrial battery for last15 years.

OR

(ii)Tenderer should be authorised dealer of company which are manufacturing industrial battery for last 15 years.

8. Tenderer should also provide the Performance Report issued by Gov./Semi Gov. owned Hydro Power Station/ Thermal Power Stationfor successful completion of above said supply of last 05 years.

(Chandra Bhan Prasad)
Executive Engineer

B Tender Bid Part-II

1. This part of the tender will contain price bid only, part-II of tender shall be opened after approval given be SE ,HGC, Khara for only those bidders who have fulfilled the pre-qualifying conditions of the tender on the basis of documents. Submitted in part-I of the tender. Opening date of the part-II shall be intimated later. Time to opening part-II of tender will be remain same as in part-I. part-II of the tender shall also be opened electronically in the presence of bider's representatives. Who choose to attend, at the prescribed venue, date and time.
2. Rate should be quoted in figure & words exclusive of service tax in prescribed xls. sheet. (i.e BOQ). If there is a discrepancy between words and figures, the amount in words will prevail, GST shall be paid extra at actual as legally applicable.
3. The earnest money of un-successful bidders of the tender shall be returned to them after finalization of tender.
4. All the terms and conditions of UPJVNL form 'A' And 'B' will also be applicable.
5. Conditional offer will not be accepted in any case and will be rejected immediately.
6. No request for consideration of earnest money from pending bills/security money/EMD shall be entertained. And no tenderer can exempted from submission of EMD.
7. **Validity of Offer:-** The tender submitted by the bidders must valid for a period of 6 months from the date of opening of tender.

Other condition in regard to E-tender.

I. If the opening date happened to be a holiday then the tender shall be opened on the next working day at the same time as mentioned in tender notice.

II. After awarding the LOI, if any thing comes in to notice regarding false documents submitted for getting the tender or bidder involved in mafia activity or threatened other bidders or entrapped other bidder in participating in tender, the tender shall be cancelled and any loss to the Nigam on this account shall be responsibility of the contractor, in such cases action to be taken as deemed fit.

III. It may be noted that no request for extension in the due date of tender opening shall be entertained.

IV. UPJVNL may revise or amend the specification, drawing or any other documents forming part of the tender documents prior to the date notified for opening of the tenders. Such revision or amendment, if any will be communicated to all the tenderers as amendment to this invitation of tenders, in time.

V. The tenderer to whom the work is awarded, shall execute a written agreement as specified above, with the department /UPJVNL, on 100/- Rupees non-judicial stamp paper. (Purchase by the contractor in his own name/ firm), after intimation by this office.

VI. If any tenderer's rates are accepted and he does not turn up for agreement even after intimation the earnest money submitted by him will be forfeited.

Signature of Contactor
With seal

Executive Engineer

DECLARATION

TENDER FORM

Name of the work:

From:

To,

The Executive Engineer
Hydel Generation Division
U.P. Jal Vidyut Nigam Ltd.
Khara Badshahibagh Saharanpur U.P.

Dear Sir,

With reference to your invitation of tender for the above, I/We hereby offer to U.P. Jal Vidyut Nigam Ltd. The items in the schedule of price rate to the satisfaction of the purchaser or in default there-of-forfeit to pay to U.P. Jal Vidyut Nigam Ltd. The sum of money mentioned the said conditions.
The rates quoted are net and firm and in full satisfaction of all claims.
I/We agree to abide by this tender for a period of six months from the date fixed for opening of the same.

A sum of Rs. **In the form of** **as earnest money** in favour of the "Executive Engineer, Hydel Generation Division, U.P. Jal Vidyut Nigam Ltd. Khara Badshahibagh Saharanpur" is enclosed full value of which clause (3) of the said condition of contract.
I/We hereby undertake and agree to execute a contract in the form annexed here-to in accordance with the conditions of contract.

Dated: Your's Faithfully

Witness: Signature of Tenderer in full
With seal

Agreement for validity of rate on non judicial stamp paper of rupees 100.00

VALIDITY AGREEMENT

Tender invited by : The Executive Engineer, Hydel Generation Division
Khara Badshahibagh. Saharanpur

Tender for :

Tender Notice No. **: T-24/HGD/2022-23**

Due date :

Name of contractor :

……
……
……
……

In consideration of the U.P. Jal Vidyut Nigam Ltd. having treated the tenderer to be an eligible person whose tender may be considered, the tenderer hereby agrees to the conditions that the proposal in response to the above invitation shall not be withdrawn within six months from the date of opening of the tender, also to the condition that if thereafter the tenderer does withdraw his proposal within the said period, the earnest money deposited by him may be forfeited to the U.P. Jal Vidyut Nigam Ltd. In the discretion of the purchaser.

Signed this day of 2022

Witness

1……

2……..

Signed by Tenderer
(with Seal)

Technical Specification for 110V DC 200Ah Battery Bank

General Technical Particulars

	Units	
Type of Cell		**OPz stroke/TBS HDP type**
Nominal Voltage per cell	Volts	2
Standards to which battery is manufactured		IS 1651with transparent SAN Container
Number of cells in the battery bank		55
Nominal Voltage of Battery bank	Volts	2 X 55
Declared Capacity at 27 degree C upto 1.80 ecv		
Initial	AH	200
Rated	AH	200
End of Life	AH	160 & above
Capacity in AH at various end cell voltages and duration of discharge		
	E.C.V.	**Ah output**
1 hour	1.67	102.00
4 hour	1.76	158.40
8 hour	1.78	185.40
9 hour	1.80	195.80
10 Hour	1.80	200.00
Maximum momentary current for 1 min till 1.60 e.c.v	A	360
Expected life of battery under normal operation & maintenance conditions	Years	Above 15 years in stand-by float application
Internal Resistance of cell (IR)	milli ohms	0.35-0.45
Total Resistance of Battery	Ohms	Depends on the total nos. of cells
Loss in capacity in 28 days due to self discharge	%	<6-8%
Recommended Charging rate for		
a) Float Charging		
i) Limit current	A	30
ii) Voltage	V	2.23 vpc
b) Boost charging		
i) Starting Current	A	24
ii) Finishing current	A	12
iii) Voltage	V	2.75
Trickle Charging Rate		
i) Minimum	mA	200
ii) Maximum	mA	800
Equalizing charge		
a) Voltage	V	2.3
b) Current	A	10
c) Duration	Hrs.	6
d) Interval between successive equalizing charge	Months	3

Recommended Specific gravity at 27 deg C		
a) for first filling		1.220 +/- 0.005
b) at full charge		1.240 +/- 0.005
c) when Battery is discharged at 10 hours rate		1.140 - 1.120
Permissible max. temperature of Electrolyte		
i) During Initial Charging	deg C	50
ii) During Normal Operation	deg C	45
Overall dimensions		
Each Cell L x W x H (tolerance of +/- 2 mm in each case)	mm	103X206X430
Distance between cell centres	mm	Depends on the battery layout
Quantity of Electrolyte per Cell	litres	4.2
Quantity of Electrolyte for battery (Including 10% extra)	litres	55 X electrolyte per cell X 1.1
Weight (+/-5%)		
Each cell		
without acid	kg	11.5
with acid	kg	16.7
Complete Battery		
without acid	kg	55X each cell weight without acid
with acid	kg	55 X each cell weight with acid

Material and type of Plates

i) Positive Plates

Material		Lead-Antimony alloy spine
Height of Positive Plate	mm	As per IS 1651: 2013
Thickness of Positive Plate	mm	As per IS 1651: 2013
Area of Positive Plate	sqm	As per IS 1651: 2013
No. of positive plates per cell		3

ii) Negative Plates

Material		Lead - Calcium alloy grid
Height of Negative Plate	mm	As per IS 1651: 2013
Thickness of Negative Plate	mm	As per IS 1651: 2013
Area of Negative Plate	sqm	As per IS 1651: 2013
No. of negative plates per cell		4

Material and type of Separators

Material		Synthetic fiber based material
Thickness of separator	mm	As per IS 6071
Clearance between bottom of the plate and the bottom of the container	mm	As per IS 6071
Clearance between top of the plates and top of container	mm	As per IS 6071
Provision of explosion vents		YES
Type of Vent and Filling Plugs		Explosion proof microporous ceramic made

Container

Thickness of Container	mm	5-7
Material of Container		Transparent SAN

Cover

Type of cover		Adhesive sealed
Material of Cover		Opaque SAN

Connections

Material of Inter-Cell Connectors		Insulated Lead Plated Copper
Thickness of Inter-Cell Connectors	mm	3mm
Method of connection		Bolted
Inter-row, Inter-tier connectors and end take-offs furnished?		Yes
Material of Bolt, Nut and Washer for Inter-Cell and Cable Connections		Lead plated MS

Racks

a) Number of racks	02
b) Number of cells per rack	24-31
c) Type of racks	As per standards
d) Material of rack	Sal wood
e) Dimensions of the racks	As per standards

Ventilation requirements		As per IS
Characteristic Curves (furnish curve numbers and attach separate sheet)		
Recommended Storage life of Battery (Dry shelf life)		12 months
Does the battery meet the required duty cycle curve	Yes/No	Yes

(Chandra Bhan Prasad)
Executive Engineer

Scope of Work

a. Removal of old & damaged cells of existing 01 set of 110 V, 200 AH battery bank (55 Nos. cells).

b. Supply, Installation & Commissioning of 01 set of 110V, 200AH Battery bank with wooden battery bank stands.

c. Testing of 110V, 200AH Battery bank on no load, half load & full load.

d. Buy back of old & used 01 set of 110V, 200AH Battery bank (55 nos. cells).

e. Submission of test report in 03 set at manufacturer site & work site

Note:- 1. Any other work required for completion of said job not mentioned above shall be considered included in the scope of work.

2. All the consumables & material required for successful completion of work shall be arranged by the contractor at his own cost.

(Chandra Bhan Prasad)
Executive Engineer

SPECIFICATION FOR TUBULAR TYPE LEAD-ACID STATIONARY BATTERIES IN TRANSPARENT SAN CONTAINER.

Section – 1 : General Instructions

1.00.0 SCOPE

1.00.01 This specification covers design, manufacture, assembly of components, testing at manufacturer's works, packing, supply and delivery to site, Tubular type lead-acid stationary batteries in Transparent SAN container and associated accessories for indoor installation.

1.00.02 Supervision of erection and commissioning of the battery bank must be done at site in presence of engineer-in-charge.

2.00.0 QUALIFYING REQUIREMENTS FOR BIDDERS

2.00.01 The bidders who have experience in design, manufacture, supply, erection of Tubular batteries in Transparent SAN container and whose equipment is in successful operation in hydro/thermal power plant for at least ten years at two different sites as on the date of bid opening are eligible to submit the bids. The bidders shall have offices located in various regions throughout the country equipped with the required instruments and properly trained personnel for taking care of after sales service throughout the expected life of the equipment.

2.00.02 The equipment covered by this specification is a very important source of power supply for a power plant/ substation and hence should be of high quality and reliability. The bidders shall preferably be ISO 9001 and ISO 14001 approved

2.00.03 The bidder shall be financially stable and the following documents shall be submitted by the bidder with the bid

a) Last 3 years Annual Report
b) List of plants and machinery installed in the works of bidder relevant to the equipment in the bid.
c) Details and range of products manufactured
d) List of past supplies of similar products.

3.00.0 APPLICABLE STANDARDS (LATEST REVISION)

3.00.01

IS-1885 :	Electrical vocabulary, secondary cells and batteries
IS-1069 :	Water for storage batteries
IS-266 :	Sulphuric acid for storage batteries
IS-8320 :	General requirements for methods of tests for lead-acid Storage batteries.
IS-1146 :	Specification for rubber and plastics container for lead acid storage batteries
IS-6071 :	Synthetic separator for lead acid batteries
IEEE-485 :	IEEE Recommended practice for sizing of large lead acid Storage batteries for generating stations and substations.
IEEE-484 :	Recommended practice for design and installation of Storage batteries.
IEC896-1 :	Stationary Lead-acid Batteries
IS1651:2013:	Stationery cells with positive Tubular plates in transparent plastic containers.

4.00.0 DESIGN AND CONSTRUCTIONAL FEATURES OF BATTERY

4.01.01 Type

The battery shall be lead acid Tubular type in Transparent SAN container (TBS) . Sealed Maintenance Free VRLA type/ Nickel Cadmium type batteries are not acceptable.

4.01.02 Positive Plates :

The plates shall be of good quality lead material & workmanship and shall be free from blow-holes, cracks and other imperfections. The tubular positive plates shall consist of a suitable bar with spines cast of suitably alloyed lead to give adequate mechanical strength and minimum electrical resistance.

The tubular spines shall be cast of an alloy of Pb and Antimony with Antimony content not greater than 3% by weight. The casting shall be done using proper controlled procedure preferably using high pressure casting machine with an operating pressure not less than 90-100 Bars. Low antimony alloy (not greater than 3%) will ensure low water loss and a guaranteed topping up frequency of not more than once in 12 months. High pressure cast spines will ensure a long life and trouble-free operation.

Porous, acid resistant and oxidation resistant tubes shall be inserted one over each spine. After insertion, the tube shall be adequately filled and packed with active material (preferable through a rotary shaking machine) before their lower ends are closed by common plastic bar. The construction and material of tube shall be such as to reduce the loss of active material and shall be able to withstand normal internal stresses developed during service.

4.01.03 Negative Plates :

The negative plates shall be of flat pasted type and should be made of lead-calcium alloy. The pasting shall be done on an automated machine for better control of process parameters. It should have adequate mechanical strength and would be so designed that active material is maintained in intimate contact with the grid under normal working conditions throughout the life of the battery.

4.01.04 Separators:

The separators shall be micro-porous type to avoid direct as well as side shorts. It should be acid resistant, chemically inert and should have excellent oxidation resistance and high degree of porosity to ensure minimum internal resistance. Average volume porosity should be more than 45%. It should not exhibit any tendency to swell or shrink at temperature encountered during operation. Micro-porous synthetic separators shall conform to latest IS: 6071.

4.01.05 Containers :

Containers shall preferably be made of transparent SAN copolymer giving excellent clarity, outstanding chemical resistance, rigidity and toughness with very high insulating qualities which eliminate the need for separate cell insulators. It shall have adequate mechanical strength to prevent bulging, cracking etc. during the life span of battery when operating under expected temperature range and due to action of static and dynamic loads and the action of electrolyte. These containers should enable the electrolyte level and the cell condition to be monitored at a glance. The containers shall conform to latest edition of IS-1146.

4.01.06 Cell Lids

It should be molded from opaque SAN or ABS and sealed to the container. It should be easily removable if the need arises.

4.01.07 Micro-porous Ceramic Vent Plugs: The vent plugs should be specially designed incorporating a micro-porous ceramic filter which effectively returns all acid spray to the cell, but allow free exit of oxygen and hydrogen which is generated at the end of boost charging. On removal, the plugs shall permit drawing of the electrolyte sample for servicing and of checking of the electrolyte level. The vent plug should preferably be flame retardant type to prevent any fire hazard in the battery room.

4.01.08 Connectors and fasteners :

Connectors shall be made of copper and completely insulated with rubber/plastics. Connectors should be adequately designed to carry maximum duty cycle as specified and shall offer minimum resistance. The current density for Copper connectors shall not be more than 15 Amps/ sq. mm. While considering the terminal voltage of the cell at the time of testing for discharge, the voltage drop due to inter-row and inter-cell connectors shall be considered. Connectors shall be adequately designed to withstand various stresses due to temperature changes, attack of acid and dynamic forces that could occur during the operation of the battery.

Fasteners should be made of suitable material and should also be completely insulated.

4.01.09 Electrolyte :

The electrolyte shall be battery grade sulphuric acid conforming to latest edition of relevant IS 266. The strength of the electrolyte in the cell during operation shall conform to the governing IS specification for the cell. Required quantity of electrolyte for the initial filling with 10% extra quantity shall be supplied in no-returnable non-degradable acid resistant strong plastic containers.

4.01.10 Water :

Water used in preparation of electrolyte and also to bring the level of electrolyte to the correct position during the course of operation or testing shall conform to the latest edition of IS-1069.

4.01.11 Terminal Post :

Positive and negative terminal posts of the cells shall be clearly and unmistakably identifiable. Terminal posts shall be designed to accommodate external bolted connections conveniently and positively. All metal parts of the terminals shall be of lead coated type. Bolts, heads and nuts, except seal nuts, shall be hexagonal and shall be lead coated. Terminal posts shall be adequately fixed to prevent its turning or twisting when the connectors are being fixed or removed. The junction between terminal posts and cover and between the cover and container shall be adequately sealed to prevent any seepage of the electrolyte. All terminals shall be provided with insulated covers.

The pole terminal should be of lead with a brass core insert, which shall increase the conductivity. The pole should have a double layered protection against crevice corrosion. The lead lining of the terminal should be protected against any contact with the electrolyte at the place where it emerges out of the cell interior through an injection molded plastic encapsulation.

4.01.12 General Requirements for Tests

Specific Gravity of Electrolyte:

The specific gravity of fully charged cells shall be adjusted to 1.240 +/- 0.005 at 27˚C.

Temperature Correction:

The capacity of the cell shall be corrected to 27˚C using the proper temperature correction factor pertaining to the type of the cell and the rate of discharge. The temperature correction should be made using factors supplied by the manufacturer but shall generally conform to some national or international standard for the similar type of cell.

4.01.13 Tests:

4.01.14.01 **Test for Capacity:**

The cell shall be tested for its rated capacity output. The fundamental requirement shall be a discharge for 10 hours whilst discharge at other rates, as decided mutually between the manufacturer and purchaser, may also be performed.

A fully charged cell shall be allowed to stand idle for a period of 12- 24 hours before performing this test. The cell shall be discharged at a constant current of I_{10} = C/10 where C is the rated 10 hour discharge capacity of the subject cell till the voltage of the cell reaches 1.80 volts per cell. In case of more than one cell being tested at a time (in most of the cases), the discharge to be discontinued at a time when the voltage of the group has reached 1.80 x n volts where n is the number of cells in the group.

The capacity of the cell thus established shall have to be corrected for temperature variation during the test if the temperature is different from 27 deg. C. The temperature correction shall be as per the relevant IS for the type of the cell in question.

The capacity output, at the first discharge, corrected to 27˚C shall not be less than 85% of the rated capacity of the cell. The cell shall reach 100% of its rated capacity within 5 charge-discharge cycles.

4.01.14.02 **Test for Charging Efficiency**:

Since the cells are expected to operate at various state of charge (SOC), the charging efficiencies at various depth of discharge needs to be measured and standardized for this application. Typically, charge efficiencies at 80%, and 10% SOCs are to be notified.

Charge Efficiency at 80% SOC :

A fully charged cell shall be discharged at a constant current of I_{10} for 2 hours. The voltage at the end of 2 hours (V_1) to be very meticulously noted.

The cell, then, shall be charged at a constant current of I_{10} for 2 hours and after a rest period of 2-4 hours shall again be discharged at a constant current of I_{10}. The time taken to reach the voltage V_1 is to be noted during this discharge.
The ratio of these two times would be designated as the charge efficiency of the cell.

The time of discharge shall change to 9 hours for 90% SOC. The rest procedure being similar to the one explained.
The cell appropriate for this application should have the following charging efficiencies:

80% SOC	80%
10% SOC	90%

4.01.14.02.1 Retention of Charge

The charge retention of a cell is the capability of the cell to retain its capacity during the period of no charge, i.e. when not connected to the system, during transportation or storage. A fully charged cell shall be discharged for capacity appreciation as per clause 4.01.15 and recharged to full state of charge. The capacity output shall be noted as C1. After recharge the cell shall lie in open circuit condition for a period of 28 days. During this period, the temperature of the cell shall be kept close to 27 deg. C as much as practically possible. After completion of 28 days of idle standing, a second capacity discharge is to be performed. The capacity, corrected to 27 deg. C thus obtained, shall not be lower than 95% of the earlier actual capacity C1.

4.01.14.04 Water loss :

The cell/ battery after being fully charged shall be kept on a float charge of 2.4 volts per cell at a temperature of 40 deg. C for 21 days at a stretch. The loss of water due to evaporation and self discharge shall not be more than 0.65 grams per Ah.
The battery shall reach an equilibrium state of charge within 72 hours of such charging. This shall be indicated by the float current after 72 hours of constant float. The float current shall not be more than 3 mA per Ah.

4.01.15 Battery Racks :

The battery racks shall be constructed from good quality wood or of high strength good quality mild steel sections. These battery racks shall be painted by the bidder with two coats of acid/ alkali resistant paint of approved make. When steel stands are used, they should either be epoxy painted or epoxy powder coated with acid resistant grade of pigment as per approved coating process to provide a non-peelable protective coat. The racks shall be of single tier/ two tier construction depending on the final layout based on space availability.

4.01.16 Marking :

Each cell shall be legibly numbered serially to identify the cell during manufacture, testing, installation and operation of battery to identify after having assembled into battery bank in battery racks.
Following marking however, shall be provided

a) Manufacturer's type and trade name
b) Electrolyte level (min & max)
c) Type of container and standard AH capacity as per IS
d) Polarity marking as per relevant IS

A set of loose stickers shall be provided to mark the cells position in the assembled battery bank at site so that a cell removed for maintenance can be put back in original position.

(Chandra Bhan Prasad)
Executive Engineer

SPECIAL CONDITIONS OF THE CONTRACT

Name of work :- **Supply, Installation, Testing and Commissioning of 01 No., 110V DC, 200 AH Battery set of 55 cells (2V each lead acid plate type) at Babail PH**.

Tender Specification:- T- 24/HGD/2022-23

1. **GENERAL :-**
   These special conditions of the contract shall be read and construed along with the annexed general conditions of contract form "A" (modified by the provision here of) but if, there is any conflict or inconsistency between the provision hereof and those contained in general condition, the special conditions shall prevail.
2. **SCOPE OF WORK :-**
   The scope of work involved, will be as per schedule of rates & quantity and technical specification as enclosed.
3. **TIME FOR COMPLETION:-**
   The work covered under scope of work shall be carried out for 3 Months from the date of start of work.
4. **DATE OF START OF WORK:**
   The date of start of work under this contract shall be intimated by SDO (Babail), Khara Power House in writing who will supervise the work.
5. **LEVY OF PENALITY:-**
   A penalty @ ½% per week subjected to maximum of 10% of total value of the contract for delay in works beyond the time of completion shall be levied.
6. **ACCIDENT/ DEATH OF WORKER:-**
   The contractor shall be responsible for payment of accidental benefit and compensation in case of death of any worker engaged by him, as per provision of rules/ order of the govt. under the compensation act, No. liability whatsoever will be acceptable by the U.P. Jal Vidyut Nigam Limited.
7. **INSURANCE :-**
   As per Sl. No. 22 of Form "A".
8. **PERMISSION FOR ENTERING INTO POWER STATION:-**
   The contractor shall obtain permission cards for himself and for his other engineers and staff/workers to enter into power station premises/ area for execution of the work. The contractor shall take full responsibility for the good conduct of his staff/ workers engaged for the execution of the job.
9. **TERMINATION OF THE CONTRACT :-**
   The contract can be terminated at any time in case it is found that the work is not being carried out to the satisfaction of the engineer-in-charge or the satisfaction of his representative. Under such condition, the complete work will be got done througha other agency and all such extra expenditure incurred will be debited to the contractor's account.
10. **TRANSPORTATION OF MEN & MATERIAL:-**
    Contractor will make his own arrangement for the transportation of his men and material to work sites and back. Site storage facility will be provided to the contractor free of cost.

11. **TAXES :-**
    (a) Income tax, as applicable, shall be deducted from the bill.
    (b) W.C.T as legally applicable on the date of payment shall be deducted from the contractor's bill on all the works as specified in the above notification.
    (c) GST will be paid extra as per the rule (If applicable) if the firm is registered with appropriate authority.

12. **TERMS OF PAYMENT:-**

(a) 90% payment shall be released against running bill of the contractor.

(b) Balance 10% payment shall be released at the end of 1 month from the date of completion of work or 100% payment shall be released on submitting FDR/CDR of balance 10%.

13. RATES :-

(a) No escalation of rate over the finally accepted rates for escalation of the work shall be allowed during the pendency of contract.

14. NOTICE TO CONTRACTOR :-

Any notice to be given to the contractor may if the UP JVNL Engineer think fit be posted to his address or handed over to his authorized representative and such posting or acknowledgement shall be deemed to have been served such notice and the time mentioned and the general conditions for doing any act after notice should reach him in normal course.

15.OTHER TERM AND CONDITIONS:-

(a) The contractor shall remain liable to remove the defect that may develop in the works arising solely from the faulty workmanship.

b)The engineer-in charge shall have the right object employment or presence of any person, labour employed by the contractor for non compliance, negligence, misconduct of being considered undesirable in the interest of work and of receipt of such of objection, the contractor shall be bund to remove such person from the work areas.

(c) The contractor shall not be entitled for any claim caused by removal of person(s) as aforesaid.

(d)If for some reason, the department is unable at any time to clear the site and the work has to be stopped, the contractor shall not be entitled to any monetary claim arising out of such circumstance. He shall how ever be granted time limit extension to the extent, for such period during which the work remained suspended.

(e) All the specification in respect of the entire item is subject to alternations as per direction in writing of the Engineer-in-charge. In case of any dispute regarding specification, the decision of Executive Engineer, Hydel Generation Division Khara Power House, Badshahibagh (Saharanpur) shall be final and binding.

16. The contractor shall be fully responsible for any sort of accident or injury to the labour while on duty and he will take all possible measures to onsure that no such event is occurred. However, in case of any accident of any nature, during the execution of the above work, the department will not be held responsible or liable to make any compensation to contractor's labour

17. GENERAL:-

All the disputes arising out of and touching or relating to the subject or later on this agreement shall be subject to the jurisdiction of the local courts of Saharanpur and High Court of judicature at Allahabad.

17.1 In case of any loss or damage to Nigam's property during the execution of work due to negligence on the part of contractor's artisan / labour, the contractor has to bear the charges of these losses as assessed by the Executive Engineer, Hydel Generation Division, Khara Power House Badshahibagh (Saharanpur). In this regard, the decision of Executive Engineer will be final and binding on the part of contractor.

17.2 The contractor will observe all the rules and regulations of Factory, Act, Workman Compensation Act. Etc.

18.NOTICE TO CONTRACTOR :-

If work allotted /awarded to you /your firm a affidavit on stamp paper of Rs. 10.00 is to be submitted by you for exemption of stamp duty.

19. AGREEMENT :-

The successful tenderer shall have to executive an agreement for completing the work according to these specifications on Stamp Paper worth Rs. 100.00 only which will be provided by him at his own cost within ten days of receipt of letter in this reference.

20. GUARANTEE :- The works under these specifications shall have to be guaranteed for satisfactory performance upto the date of completion of contract.

21. If work allotted /awarded, a affidavit on stamp paper of Rs. 10.00 is to be submitted for exemption of stamp duty.

Executive Engineer

SCHEDULE OF RATE & QUANTITIES

TENDER SPECIFICATION NO. :-T-24/ HGD/2022-23

NAME OF WORK :- **Supply, Installation, Testing and Commissioning of 01 No., 110V DC, 200 AH Battery set of 55 cells (2V each lead acid plate type) at Babail PH**.

Sl. No.	Name of Work	Qty		Rate	Amount
1	01 set of 110 V Lead Acid stationary cells each set of consisting of 55 nos. 200 AH, tubular type cells (2 volt each) in transparent SAN container completed with tubular positive plates,negative plates, lids, vent plugs, bolts& nuts, with IRIT,Electrolyte of sp. gr. 1.220 sufficient for battery set, wooden battery stand with acid proof paint etc.	1	Set (55 Cells)		
2	Dismantaling, installation & commissioning of battery set.	1	Set		
3	**Less:-** Buy back of old battery set	55	Cells		

(Rs. In word)……

नोटः– निविदादाता द्वारा विभागीय लागत से कम लागत की निविदा डालने की दशा में शासनादेश सं0 622/23.12.2012/2 आडिट/08/टीसी–2, दिनॉक 08.06.2012 के अनुसार 10 प्रतिशत तक न्यूनतम दरें (Below rate) डालने पर 0.50 प्रतिशत प्रति 1 प्रतिशत कम दर पर तथा 10 प्रतिशत से अधिक न्यूनतम दरें (Below rate) पर 1 प्रतिशत प्रति 1 प्रतिशत कम दर पर प्रर्फोमेन्स गारन्टी की अतिरिक्त धरोहर धनराशि जमा करने के उपरान्त अनुबन्ध गठित किया जायेगा। निविदा दाता द्वारा उक्त धनराशि जमा न किये जाने पर उसकी धरोहर धनराशि जब्त कर अग्रिम कार्यवाही की जायेगी।

Signature of Contactor
With seal

Executive Engineer

Signature Not Verified
Digitally signed by CHANDRA BHAN PRASAD
Date: 2022.10.15 16:52:07 IST
Location: Uttar Pradesh UP