



PUNJAB STATE POWER CORPORATION LTD.

(Regd. Office: PSEB Head Office, The Mall, Patiala)

OFFICE CHIEF ENGINEER/METERING

C-3, Shakti Vihar, PSPCL, Patiala, Punjab-147001

Tel. No. 0175-2218871, Fax: 0175-2200284, e-mail: se-hq-metering@pspcl.in

CIN: U40109PB2010SGC033813, Registration Number: 33813,

Website: www.pspcl.in, E-tendering portal: <https://eproc.punjab.gov.in>

Subject: Tender enquiry no. MQP-194/2021-22/PO(M) for Supply, Installation, Testing, Commissioning, Reading, Analysis and 1 year O&M of Power Quality Meters complying to IEC 61000-4-30 class A.

CORRIGENDUM NO. – III

With reference to the subject cited tender enquiry the dates of submission of tender and opening of part-I & II of tender are rescheduled as under:

	Current Date	Extended date
Last date of downloading of tender documents	03.02.2022 upto 1100 Hrs	14.02.2022 upto 1100 Hrs
Last date of Bid submission	03.02.2022 upto 1100 Hrs	14.02.2022 upto 1100 Hrs
Bid opening (Part-I&II)	04.02.2022 upto 1500 Hrs.	15.02.2022 upto 1500 Hrs.

All other terms and conditions shall remain same.

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Dy.CE/HMC
PSPCL, Patiala



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CORRIGENDUM NO. -II

With reference to the subject cited tender enquiry the dates of submission of tender and opening of part-I & II of tender are rescheduled as under:

	Current Date	Extended date
Last date of downloading of tender documents	27.01.2022 upto 1100 Hrs	03.02.2022 upto 1100 Hrs
Last date of Bid submission	27.01.2022 upto 1100 Hrs	03.02.2022 upto 1100 Hrs
Bid opening (Part-I&II)	28.01.2022 upto 1100 Hrs	04.02.2022 upto 1500 Hrs

The following amendment / clarification has been made in the tender specification of Tender Enquiry MQP-194:

Sr. No.	Existing Clause	Amended/Proposed Clause
1.	CLAUSE 14 COMMUNICATION Data Communication Capability: Meter shall have minimum of two communication ports including one Ethernet port.	Data Communication Capability: Meter shall have minimum of two communication ports including one Ethernet port. Out of these two ports, atleast one port will be available for local retrieval of meter memory data.
2.	SCHEDULE-'C' GTP (GURANTEED TECHNICAL PARTICULARS) Serial no. 30 Individual Harmonics (both Voltage and Current): Up to 63 rd order	Individual Harmonics (both Voltage and Current): Up to 50th order
3.	CLAUSE 17.0 CYBER SECURITY FEATURES Advanced security: Up to 16 users with unique access rights. Perform resets, time syncs, or meter configurations based on user privileges.	Advanced security: Up to 16 users with unique access rights. Perform resets, time syncs, or meter configurations based on user privileges. Security capabilities help protect the confidentiality of information through

	<p>Security capabilities help protect the confidentiality of information through secure protocols that employ cryptographic algorithms, key sizes and mechanisms used to help prevent unauthorized users from reading information in transit, i.e. SSH (Secure Shell), SFTP (Secure File Transfer Protocol), and information at rest. Power quality meter shall have security features that can assist in making a facility NERC CIP (North American Electric Reliability Corporation Critical Infrastructure Protection) compliant. Power quality meter when used along with monitoring software, shall align with cyber security standards in the IEC 62443 international standard for business IT systems and Industrial Automation and Control Systems (IACS) products.</p> <p>If the above certifications are not available, then self-certification by the bidder undertaking compliance to above standards will have to be submitted. If self-certification found to be wrong at any stage, then EMD of the firm will be forfeited and firm will be blacklisted</p>	<p>secure protocols that employ cryptographic algorithms, key sizes and mechanisms used to help prevent unauthorized users from reading information in transit, i.e. SSH (Secure Shell), SFTP (Secure File Transfer Protocol), and information at rest.</p> <p>Power quality meter shall have security features that can assist in making a facility NERC CIP (North American Electric Reliability Corporation Critical Infrastructure Protection) compliant. Power quality meter when used along with monitoring software, shall align with cyber security standards in the IEC 62443 international standard for business IT systems and Industrial Automation and Control Systems (IACS) products.</p> <p>If the above mentioned certificate is not available with the bidder at the time of submission of bid, then the same will be provided by the bidder before the opening of price bid of the tender.</p>
4.	<p>30.1 CONSTRUCTIONSolar radiation test with IEC 62052-11 clause 6.3.4.....</p>	<p>.....Solar radiation test with IEC 62052-11 clause 6.3.4..... Note: This test report may be submitted by the bidder before the opening of price bid of tender.</p>
5.	<p>Clause 10.0 c) Meter shall have provision to log phase wise voltage and current power THD (total harmonic distortion).</p>	<p>Meter shall have provision to log phase wise voltage and current THD (total harmonic distortion).</p>

All other terms and conditions shall remain same. However, in case any conflict arises with any clause of the original specification, this corrigendum will prevail.

--Sd--
Dy.CE/HMC
PSPCL, Patiala



METERING ORGANIZATION

TENDER ENQUIRY NO. MQP- 194/2021-22/PO(M)

Supply, Installation, Testing, Commissioning, Reading, Analysis and 1 year O&M of Power Quality Meters complying to IEC 61000-4-30 class A.

OFFICE OF CHIEF ENGINEER / METERING
C-3, SHAKTI VIHAR
PUNJAB STATE POWER CORPORATION LIMITED
PATIALA-147001
PH.NO. 0175-2218871, 2200284.
FAX NO.0175-2200284

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**PUNJAB STATE POWER CORPORATION LIMITED
O/O CE/METERING, C-3, SHAKTI VIHAR, PATIALA**

NOTICE INVITING E-TENDERS

Department Name	Metering Organization
Tender Specification No.	MQP-194/2021-22/PO(M)
Tender Issuing Authority	Chief Engineer/Metering
Address details of issuing authority	C-3, Shakti Vihar, PSPCL, Patiala
Short Description	Supply, Installation, Testing, Commissioning, Reading, Analysis and 1 year O&M of Power Quality Meters complying to IEC 61000-4-30 class A.
Quantity	114 meters
Tender Documents	Tender documents can only be down loaded from website https://eproc.punjab.gov.in
Eligibility Criteria	As specified in specification
Start Date of Downloading	07.01.2022 at 1230 Hrs.
Prebid meeting	17.01.2022 at 1100 Hrs. through any online platform. Further information regarding pre bid conference will be intimated through subsequent corrigendum
Last date of downloading of tender documents	27.01.2022 upto 1100 Hrs.
Last date of Bid submission	27.01.2022 upto 1100 Hrs.
Bid opening (Part-I&II)	28.01.2022 upto 1100 Hrs.
Contact Person Name	Er. Charanjit Singh Hazuria
Contact Phone No.	0175-2200284
Contact E-mail ID	semeteringpatiala@gmail.com pometering@gmail.com
Tender documents attachment	As mentioned in the specification
Tender information in details	As mentioned in the specification

Tender specifications can only be downloaded from website <https://eproc.punjab.gov.in>. All the prospective bidders are requested to get their digital signature registered themselves on the website <https://eproc.punjab.gov.in> and get conversant with the process of on-line submission of tenders well in time so

as to submit the tender by the due deadline. No request for extension in the due date of tender opening on the above grounds shall be entertained. The bidders may contact <https://eproc.punjab.gov.in> at contact nos. 0120-4001002/0120-4200 462/0120-4001005/0120-6277787. It may be noted that no hard copy of these specifications will be issued by this office and these specifications can only be downloaded from the above mentioned website.

Corrigendum, if any after the publication of this tender enquiry shall only be uploaded on website <https://eproc.punjab.gov.in> and will not be published in newspapers.

CONDITIONS:

1. If the day fixed for opening of tenders happens to be a holiday, the same will be opened on next working day at the same time and place.
2. All tenders must be accompanied by Earnest Money Deposit at the rates prescribed in the tender documents/specifications. The proof of online submission of EMD or certificate of PEMD shall be submitted in this office before the last date and time of tender opening. A scanned copy of the proof of online submission/PEMD certificate may be enclosed with tender.
3. Tenders must be valid for 120 (One hundred twenty) days.
4. PSPCL reserves the right to reject any or all the tenders received and also to increase or decrease the NIT quantity without assigning any reason thereof.
5. Conditional tenders / telegraphic / fax tenders shall not be accepted.
6. The whole tender should be properly page numbered (by print/typed) with Index showing all the contents of the tender documents.

Tenderers are requested to read the specification carefully and take cognizance of Corrigendum(s) /Amendment(s) of specification uploaded on e-tendering website, so that their offer may not be rejected on account of amendments / revisions in the earlier specification (if any).

Note:- One hard copy of the uploaded complete tender documents Part-I & Part-II only (except Part-III) shall also be submitted by the bidders in this office immediately after due date and time of opening of tender. The hard copy shall be exactly same as per the uploaded tender documents. Hard copy of tenders should be duly page marked with proper spiral binding. Any content of the hard copy, in variance to the uploaded copy shall not be given any cognizance.

**Dy.CE/HMC
PSPCL, Patiala**

CHECK LIST OF DOCUMENTS CONSISTING OF TENDER/ OFFER

Following documents are mandatory. Bidder to ensure that these are uploaded along with the tender for it to be treated as complete document:

Sr. No.	Details	To be sealed in	Remarks
1	EMD/PEMD (See para-13 of Schedule-'E' of tender documents)		Separate envelope & scanned copy with tender (Part-I of tender)
2	Schedule-A (particulars of the firm i.e. names & address of Directors etc.) duly filled up & signed.	Part-II	Fill online
3	Schedule-B (Un-Priced Bid Schedule) duly filled up & signed	Part-II	Fill online
4	Schedule-C (GTPs) duly filled up and signed by authorized official complete in all respects.	Part-II	Fill online
5	Schedule-C-I (Information for appraisal of firm) duly filled up and signed	Part-II	Fill online
6	Schedule-D (Schedule of Deviation) duly filled up and signed by authorized official complete in all respects and enclosing any supporting documents.	Part-II	Fill online and upload relevant documents.
7	Annexure-A (Detail of Testing Facilities)	Part-II	Fill online and upload relevant documents.
8	Annexure-B (undertaking form for Order Preference duly filled up and signed by authorized official complete in all respects.		Can be submitted upto 5.00PM on the date of opening of Part-I & II or of Price Bid (i.e. Part-III)
9	Income Tax Returns of firm as well as Directors/ partners/ Proprietor of the firm for the latest 3 years.	Part-II	Scan & Upload
10	Duly Audited Annual Financial Reports or Turn Over figures certified by Chartered Accountant for latest three years.	Part-II	Scan & Upload
11	Legally valid Authorization signed by Chairman & other Directors of the firm in case of Limited Companies & by all partners in case of partnership firms authorizing the signatory to sign the tender & deal with PSPCL.	Part-II	Scan & Upload
12	Memorandum & Article of Association for public/ private Ltd. firm, Partnership deed for	Part-II	Scan & Upload

	Partnership firms and supporting document for proprietary firm		
13	Schedule-B (Breakup of prices) as Part-III of offer	Part-III	Fill online only
14	Type Test Certificate(s) of offered item	Part-II	Scan & upload
15	Undertaking regarding liaison etc.	Part-II	Scan & upload
16	Any other supporting documents enclosed mentioning the purpose	Part-II	Scan & upload

INSTRUCTION: The check list be marked in confirmation of enclosing the documents mentioned therein. Bidder to ensure that the documents are enclosed in the serial order as mentioned in the check list.

GENERAL COMMERCIAL PARTICULARS**(To be enclosed with Part-II of tender)**

(Following information must be supplied by the tenderers)

1.	Indicate quoted quantities of the item(s)	
1.	GST	
	i) GST taken in quoted prices @	
	ii) Indicate whether any Input credit benefit is considered. Mention Yes/No	
1.	Indicate GST/TIN no. of the firm	
1.	Indicate Validity of offer (No. of days may be given)	
1.	Whether delivery schedule of NIT acceptable. Mention Yes/No	
1.	Whether General Terms of Tender Specification are acceptable. Mention Yes/No	
1.	Whether duly audited and certified Annual Financial Reports or Turnover figures certified by chartered accountant for latest 3 years. Mention Yes/No	
1.	Whether Copy of PAN No. of the Firm & all Directors/ Partners is enclosed? (Mention Yes/No)	
1.	Income Tax return of the firm as well as Directors/ Partners/ Proprietors of the firm for the latest 3 years? (Whether enclosed). Mention Yes/No	
1.	Whether undertaking regarding liaison etc. is enclosed (Mention Yes/No)	
1.	Copy of Memorandum and Article of Associations. Whether enclosed. (Mention Yes/No)	
1.	Whether defaulter/ blacklisted / business dealings suspended by PSPCL. (Mention Yes or No)	
1.	Details along with proof of previous supply of similar type of material to or any other Power Utility/ Electricity Board whether enclosed (Mention Yes/No)	
1.	a) Name/ Designation of Contact person	
	b) Phone, Mob. No, Fax No.	
15.	Any other information to be mentioned by the bidders	

Note: Tender of those firms shall be out rightly rejected who will supply false/ wrong information(s).

**Authorized Signatory
Name & Designation
Address and seal of the firm**

Procurement of Permanent Power Quality Meters complying to IEC 61000-4-30 class A and Empanelment of technically eligible firms for private sale of above material

1.0 SCOPE

- i) Design, Supply, Installation, Testing, Commissioning, Reading, Analysis and 1 year O&M of Permanent Power Quality Meters complying to IEC 61000-4-30 class A for measurement of different electrical parameters, listed elsewhere in the document, including Voltage Harmonics, Current Harmonics, Frequency, THD (of Current and Voltage), Unbalance (Current and Voltage), Crest factor, Sag and Swell, Number of Interruptions, Total Demand Distortion, Flicker etc. Meter shall be suitable for 11kV and above supply.
- ii) Meter should be AMR compliant with external modem through any of the port available in the offered meter, so that it can be connected to Automated Remote Meter Reading System. Meter manufacturer shall supply relevant API/software, IT infrastructure required for this purpose
- iii) Reading, Analysis & O&M for period of one year.
- iv) Software for data downloading and analysis.
- v) Meter shall have EN50160 compliance reporting.
- vi) Training on installation / configuration of Power quality Instrument.

2.0 APPLICATION

Permanent Power Quality Meters are to be installed at identified locations on 11/33/66kV feeders.

3.0 APPLICABLE STANDARDS

The equipment offered shall comply with the recognized rules of technology and are therefore in accordance with the corresponding Indian/ IEC standards with latest amendments thereof unless otherwise specified.

Sr. No.	Standard	Description
1	IEC 61000-4-30	Electromagnetic compatibility (EMC)-Testing and measurement techniques-Power quality measurement methods
2	IEC62052-11	Electricity metering equipment (AC)-General requirements, tests and test conditions- Part 11: Metering equipment
3	IEC62053-22	Electricity metering equipment (AC) – Particular requirement –Static meters for active energy (class 0.2S) OR IS 14697-AC Static Transformer Operated Watt hour And Var- Hour Meters, Class 0.2S and 0.5S.
4	IEC62053-24	Electricity metering equipment (AC) – Particular requirement

		Static meters for reactive energy (class 0.5S) OR IS 14697-AC Static Transformer Operated Watt hour And Var- Hour Meters, Class 0.2S and 0.5S.
5	IEEE519	Recommended Practice and Requirements for Harmonic Control in Electric Power Systems
6	IEC 61000-4-7	Testing and measurement techniques –General guide on harmonics and inter-harmonics measurements and instrumentation, for power supply systems and equipment
7	IEC 61000-4-15	Flicker Measurement
8	IEEE1159.3	Defines power quality data interface format
9	IEEE 1159	IEEE Recommended Practice for Monitoring Electric Power Quality
10	IEC 61000-4-2	Electrostatic discharge
11	IEC 61000-4-3	Immunity to radiated fields
12	IEC 61000-4-4	Immunity to fast transients
13	IEC 61000-4-5	Immunity to surge
14	IEC61000-4-6	Immunity conducted
15	IEC61000-4-12	Damped oscillatory waves immunity

For conflict related with specification, the order of priority shall be – i) This technical specification ii) IEC 61000-4-30 (with latest amendments).

Meter should conform to all the applicable standards amended upto the original date of issue of this tender enquiry.

4.0 CLIMATIC CONDITIONS

The meter shall be suitable to work satisfactorily under the following conditions:

Minimum ambient temperature	-5°C
Maximum ambient temperature	55°C
Minimum relative humidity	26%
Maximum relative humidity (condensing)	95%
Altitude	Upto 1000 meter above mean sea level

The meter shall withstand and operate satisfactorily without loss of accuracy under the most hazardous climatic conditions specified above. Parts and surface, which are subject to corrosion, shall be provided with protective coating.

5.0 GENERAL TECHNICAL REQUIREMENTS

1	TYPE	Power quality meter shall comply with IEC 61000-4-30 class “A” standard for measurement of different electrical parameters for evaluating supply quality. Measurement of True rms 1024 samples per cycle
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2	Accuracy	Class of accuracy of the metering system shall be 0.2S as per IEC 62053-22/23 for energy measurement along with confirming to Class A as per IEC 61000-4-30 and IEC62586-2.
3	FREQUENCY	50HZ \pm 5%
4	SECONDARY VOLTAGE	Suitable for operation from 110V Ph-Ph or 63.5V Ph-N.
5	BASIC CURRENT(Ib)	-/5 Amps or -/1 Amps as per requirement
6	MAXIMUM CONTINUOUS CURRENT	200% Ib
7	POWER CONSUMPTION	The active and apparent power consumption in each voltage circuit at reference voltage, reference temperature and reference frequency shall be as per IEC 62053-22 OR as per IS 14697-AC Static Transformer Operated Watt-hour And Var-Hour Meters, Class 0.2 S And 0.5 S.
8	POWER FACTOR	0.0 lag-Unity-0.0 Lead
9	DESIGN	Meter shall be designed with application specific integrated circuit (ASIC) or micro shall be assembled on printed circuit board using surface mounting technology, factory calibration using high accuracy (0.02 class) software based test bench
10	Onboard Memory (in Mbytes)	128 MB or more

6.0 The meter shall have capability to detect and log power quality parameters as defined in IEC61000 4–30 Class A Edition 3 and High accuracy measurements with 1/2 cycle update rate for:

- a) Supply Frequency
- b) Magnitude of supply voltage & Current
- c) Flicker – Short time and Long time
- d) Voltage & Current harmonics upto50th order
- e) Over/Under voltage deviation
- f) Voltage unbalance
- g) phase reversal
- h) Main signalling voltage

7.0 The meter shall have feature to detect and log the occurrence, capture waveforms and restoration of power quality events as defined in IEC61000-4-30 along with date and time of event.

a) Voltage Sag and Swell

Analyze severity/potential impact of sags and swells:

- magnitude and duration data suitable for plotting on voltage tolerance curves
- per phase triggers for waveform recording or control operations

b) Interruption

c) Rapid voltage change

d) Simultaneous capture of all voltage and current channels

- sub-cycle disturbance capture (16 to 1024 samples/cycle)

8.0 VOLTAGE UNBALANCE:

Meter shall also have facility to measure and record unbalance of voltage i.e. negative to positive ratio / zero to positive ratio as specified in IEC 61000-4-30.

9.0 WAVEFORM, RMS VALUE CAPTURING & WAVEFORM STREAMING

1. The meter shall have provision to log PQ events with pre and post waveform (at least for 4 cycles each) for detailed analysis of events.
2. Up to 1/2-cycle interval recording, stores detailed characteristics of disturbances or outages. Trigger recording by a user-defined set point, or from external equipment.
3. High speed data recording (down to 10 ms).

10.0 POWER QUALITY MEASUREMENT AND LOGGING

The meter display should depict the total harmonic distortion (THD) of current and voltage up to 50th level for providing the feature of supply monitoring to Utility.

- a) Meter shall have provision to measure & log harmonic up to 50thharmonics for voltage and current.
- b) Meter shall have provision to measure & log inter-harmonics up to 50thharmonics for voltage and current.
- c) Meter shall have provision to log phase wise voltage and current power THD (total harmonic distortion).
- d) Meter shall have provision to log phase wise TDD (total demand distortion). However, provision to log average current TDD is optional.
- e) Meter shall detect voltage sag and swells and should have waveform in case of any event.
- f) Meter shall have EN50160 compliance reporting.
- g) Meter shall have Flicker detection as per IEC-61000-4-15.

11.0 SUPPLY QUALITY COMPLIANCE:

Meter shall have capability to log all the parameter required to generate voltage quality compliance report. Limits should be configurable using configuration tool and this stored data in the meter shall be used to generate compliance report.

12.0 HARMONIC MEASUREMENT FOR STATISTICAL ANALYSIS AS PER IEEE519

Harmonic measurement for evaluation of voltage and current harmonics with respect to IEEE519, Recommended Practice and Requirements for Harmonic Control in Electric Power Systems.

13.0 TIME SYNCHRONIZATION:

For RTC synchronization meter shall have provision of time synchronization over PTP (Precision Time Protocol) / SNTP (Simple network time protocol)/ NTP (Network Time Protocol) / MQTT (Message Queuing Telemetry Transport).

14.0 COMMUNICATION

Data Communication Capability: Meter shall have minimum of two communication ports including one Ethernet port.

15.0 LCD DISPLAY

Meter should have intuitive display with provision of following parameters

- a) View a real-time phasor diagram for installation check.
- b) Read billing data, including energy consumption and peak demand.
- c) Monitor voltage, current, power factor, frequency and power.
- d) Analyze system waveforms with built-in oscillography **or on webpage** .
- e) Harmonics histogram & other display parameters at least till 50th cycle.

16.0 SELF DIAGNOSTIC FEATURES

Indications to show the satisfactory performance of the meter shall be provided in the meter. The meter shall have capability to check its circuits for any malfunctioning. If some malfunctioning occurs, the meters should record such malfunctioning. The details of the self-diagnostic feature shall be certified by the manufacturer/supplier. It should be possible to check correctness of CT & PT connection to meter and polarity for proper functioning.

17.0 CYBER SECURITY FEATURES

Advanced security: Up to 16 users with unique access rights. Perform resets, time syncs, or meter configurations based on user privileges.

Security capabilities help protect the confidentiality of information through secure protocols that employ cryptographic algorithms, key sizes and mechanisms used to

help prevent unauthorized users from reading information in transit, i.e. SSH (Secure Shell), SFTP (Secure File Transfer Protocol), and information at rest.

Power quality meter shall have security features that can assist in making a facility NERC CIP (North American Electric Reliability Corporation Critical Infrastructure Protection) compliant. Power quality meter when used along with monitoring software, shall align with cyber security standards in the IEC 62443 international standard for business IT systems and Industrial Automation and Control Systems (IACS) products.

If the above certifications are not available, then self-certification by the bidder undertaking compliance to above standards will have to be submitted. If self-certification found to be wrong at any stage, then EMD of the firm will be forfeited and firm will be blacklisted

18.0 MANUFACTURING PROCESS, ASSEMBLY AND TESTING

Meter shall be manufactured using latest 'state of the art' technology and methods prevalent in electronic industry. The meter shall be made from high accuracy and reliable surface mount technology (SMT). All inward flow of major components and sub assembly parts (CT, PT/RTC/Crystal, LCD, LED, power circuit assembly etc.) shall have batch and source identification. Multilayer 'PCB' assembly with 'PTH' (plated through Hole) using surface mounted component shall have adequate track clearance for power circuits. SMT components shall be assembled using automatic 'pick-and place' machines, reflow soldering oven, for stabilized setting of the components on PCB. For soldered PCBs, cleaning and washing of cards, after wave soldering process is to be carried out as a standards practice. Assembly line of the manufacturing system shall have provision for testing of sub-assembled cards. Manual placing of components and soldering to be minimized to items, which cannot be handled by automatic machines.

Test points should be provided to check the performance of each block/stage of meter circuitry. RTC shall be synchronized with real time at the time of manufacture. However, if meters are delivered with isolated battery, RTC can be set as per actual date and time during commissioning. Meters testing at intermediate and final stage shall be carried out with testing instruments, duly calibrated with reference standard with traceability of source and date.

19.0 PERFORMANCE UNDER INFLUENCE QUANTITIES

The meters performance under influence quantities shall be governed by IEC 62586-2 or by IS 14697. The accuracy of meter shall not exceed the permissible limits of accuracy as per standard IEC 62586-2 (latest version) / IS 14697.

20.0 OUTPUT DEVICE

Power quality meter shall have test output, accessible from the front, and be capable of being monitored with suitable testing equipment while in operation at

site. The operation indicator must be visible from the front and test output device shall be provided in the form of LED. Resolution of the test output device shall be sufficient to enable the starting current in less than 10 minutes.

21.0 MARKING OF METERS

The marking on every meter shall be in accordance with IEC. The basic marking on the meter shall be as follows:

- a) Manufacturer's name and trade mark
- b) Serial Number
- c) Year of manufacture
- d) Type Designation
- e) Number of phases and wires
- f) VT commissioning information
- g) CT commissioning information
- h) Reference frequency

The letters PSPCL shall be indelibly and clearly marked at the appropriate place of the meters. In addition, the words 'Property of PSPCL, Purchase Order No. and date' shall be either punched or marked indelibly on the name plate

22.0 QUALITY ASSURANCE

The manufacturer shall have a comprehensive quality assurance program at all stages of manufacture for ensuring products giving trouble free performance. Details of the bidder's quality assurance and test set up shall be furnished with the bid. A detailed quality assurance program shall be finalised with the successful bidder during the award stage. Bidder shall furnish following information along with the bid:

- i. Organization structure of the manufacture and his main sub suppliers(PCB, SMT cards, CT/PT with details of QA set up, overall workflow)
- ii. Copy of system manual showing 'QAP'(Quality assurances Plan) as actually practiced during manufacturing and final testing
- iii. List of raw material and critical components(ASIC chip, crystal clock, memory register Chip, transformers, optical ports etc.) with their suppliers
- iv. Stage inspection of product before final testing
- v. Procedure adopted for 'in-situ' testing of PCBs, after placement of surface mounted components for quantitative parameters variations of tolerance by self or sub contractor
- vi. Testing and calibration facility, date of calibration of test bench, manpower data of bench operators
- vii. Sample copies of test certificate of bought out components

23.0 SAMPLE & FIELD DEMONSTRATION

Firms shall submit one sample meter having current rating of -/1 Amp which shall be installed at any location to be finalized by PSPCL. Further, the data from the meter shall be retrieved by AMR and data analysis for the period of one week for measurement of different electrical parameters, listed elsewhere in the document, including Voltage Harmonics, Current Harmonics, Frequency, THD (of Current and Voltage), Unbalance (Current and Voltage), Crest factor, Sag and Swell, Number of Interruptions, Total Demand Distortion, Flicker etc. will be submitted by the bidder to ascertain the acceptability of their products. The assessment will be done by a committee comprising of three officers of PSPCL of the rank of Sr.XEN or above as decided by the competent authority. The tender of the firm shall only be opened if the sample meter will be as per the specification and will yield satisfactory results in the field demonstration. In case order is placed on a firm, the meters shall be supplied as per the sample & the specification.

24.0 CALIBRATION AT SITE

It shall not be possible to change calibration of meters at site.

25.0 OPERATION MANUALS

The supplier shall supply free of cost with each meter a detailed operating, maintenance manual containing brief specifications, connecting diagram, operating instructions, precautions to be observed & method of communication of the equipment with the PC etc. The supplier shall also supply software to the purchaser for use.

26.0 PACKING

The equipment shall be supplied in proper/safe packing material for safe transportation with PSPCL name marked on it.

27.0 IT INFRASTRUCTURE

Bidder shall provide requisite IT infrastructure which may include HES, MDM (if any) and cloud storage (mandatory) to ensure remote access to power quality data of all the meters as per the relevant standards. The software for power quality data downloading, data analysis and other features to be provided by the bidder and the firm shall provide IT infrastructure including HES and MDM (if any) on cloud.

27.1 HEAD END SYSTEM (HES)

- a) The main objective of HES is to acquire meter data automatically avoiding any human intervention and monitor parameters acquired from meters.
- b) HES will be suitable to support collection and storage of data as per performance level for a defined no. of PQMs with facility of future expansion as per requirement of PSPCL.

c) HES would perform all the requisite functions as per the defined functionalities of PQM and it is the responsibility of the bidder to supply the requisite software and hardware to achieve the defined functionalities of PQM. HES shall ensure data integrity checks, for example, checksum, time check, pulse, overflow, etc. on all metered data

d) HES shall be developed on open platform based on distributed architecture for scalability without degradation of the performance using additional hardware. HES shall support storage of raw meter data, alarms and alerts for minimum 45 days. Adequate data base and security features for storage of data at HES need to be ensured.

e) The key functions of HES (not limited to) may be as follows:

- i. Acquisition of meter data on demand & at user selectable periodicity
 - ii. HES shall ensure data integrity checks, for example, checksum, time check, pulse, overflow, etc. on all metered data
 - iii. Signals for connect & disconnect of switches present in end points like meter
 - iv. Audit trail and Event & Alarm Logging
 - v. Encryption of data for secure communication
 - vi. Maintain time sync with meter
 - vii. Store raw data for defined duration (minimum 3 days)
 - viii. Setting of PQM configurable parameters. Parameter configuration can be done via WEB Server.
 - ix. Communication device status and history
 - x. Network information in case more than one technology is deployed in field between the two devices
 - xi. HES shall export all meter data to MDM via CSV/CIM/XML/IEC 61968/PQDIF. The solution shall be Service Oriented Architecture (SOA) enabled. In case, PSPCL has implemented any SOA/ESB architecture, the data exchange to and from HES shall be through this ESB.
 - xii. Critical reporting functionality for the following suggestive critical events:
 - Alarms and event log for meter events.
 - Data not received from Meter
 - Communication link failure with Meter
 - Network failure, etc.
 - xiii. Non-Critical reporting functionality for the following suggestive non-critical events:
 - Retry attempts on communication failure
 - Periodic reading missing
 - Failure to connect etc.
- f) Communication
- a. HES shall communicate with meters using WAN technology.
 - b. HES shall automatically retry for missed data; the number of retry attempts shall be configurable.
 - c. To receive confirmation on successful execution of a command.

d. HES shall ensure data integrity checks, for example, checksum, time check, pulse, overflow, etc. on all metered data.

g) Monitoring and Reporting Capability

HES shall have critical and non-critical reporting functionality. The critical & non critical information generated from this reporting functionality shall be made available to MDM at user configurable periodicity.

HES shall support reporting of communication failure history of nodes/routers/access points etc. and give an exception report for nodes/routers/access points not communicating for last 24 hours (the reporting period shall be on user configurable period). MDM shall have feature to send email/SMS notification of configured alarms & events to selected users.

h) INTEGRATION

HES shall export all meter data to MDM via CIM/XML/IEC-61968. The solution shall be Service Oriented Architecture (SOA) enabled. In case, PSPCL has implemented any SOA/ ESB architecture, the data exchange to and from HES shall be through this ESB.

i) The bidder shall have the responsibility of ensuring the successful meter data acquisition from the remote metering nodes on suitable communication network by their own head end system at the predefined polling frequency (15min/hourly/daily/monthly) using end to end encryption (as per industrial standard encryption) for data security and demonstrate the same in the MDM system.

The polling frequency of parameters shall be programmable as per requirements of PSPCL. Data retention period for MDM is 6 years.

j) The software for two way communication/other features required for successful functioning of PQMs is to be provided by the bidder and the firm shall provide their HES and MDM for number of meters awarded to the firm on cloud.

k) The successful bidder shall have the responsibility for the upkeep and maintenance of the complete end to end system upto HES and MDM for one year after successful commissioning of PQMs and shall execute a service level agreement (SLA) for the same with PSPCL. However, duration of FMS can be increased further up to one more year on same rates, terms and conditions by mutual consent of bidder and PSPCL. Further, per unit charges of SIM rental and FMS charges shall be payable after commissioning of individual PQM on quarterly basis, which shall be released after 2 months of successful commissioning. In case, Meter is commissioned from 1st to 10th of calendar month, the 2 months' time shall be deemed to be current month and next month (e.g. meter commissioned on 06/06/2020, the payment shall be due after 31.07.2020) However if meter is commissioned from 11th of calendar month to the end

of the month, the 2 months' time shall be deemed after next 2 months (e.g. meter commissioned on 11/06/2020 or 28/06/2020, the payment shall be due after 31.08.2020).

l) Both the HES as well as MDM/MDMS (Meter Data Management System) shall be based on cloud.

m) Information Security the HES must support the following Security principles:

- Confidentiality:

The metrology and consumption information communications have to meet confidentiality requirements to protect the customer's privacy and business information.

- Integrity:

Integrity means that the transmitted data from the meter to the utility as well as control commands from the utility to the meter and the received data from meters are maintained and protected from any changes such as malicious modification, insertion, deletion, or replay.

- Availability:

The system should restrict the ability of internal or external users to launch attacks against other components or networks. Besides, the main reason for unavailability of data is component failure, such as communication failure (due to interference, cut cables, path degeneration, loss of bandwidth, network traffic, etc.), software problem, physical damage, or human tampering with the meter.

- Accountability:

Accountability techniques prevent either receiver or sender from denying a message by ensuring that undeniable proof will exist to verify the truthfulness of any claim of an entity. Accountability is specifically important for billing purpose as well as responses to control signals and in the actual metrology data.

NOTE: In case Meter Data Management System (MDMS) is not required in the solution provided by bidder, then HES shall support the functions of MDM like storage, archiving, retrieval & analysis of meter data and various other functions as defined in Clause 27.2 related to MDM. Further, in this case, Transfer of HES to PSPCL will be on the similar lines as that of MDM defined in Clause relating to the same.

The display and analysis of various power quality critical parameters/dashboards be as follows:

- i) Voltage disturbances, including the date and time of the last disturbance.
- ii) Total Harmonic Distortion (THD) content of current and voltage with historical values upto 50th order and the maximum THD.
- iii) IEEE1159.3 Power Quality Data Interchange Format (PQDIF) Support.

- iv) EN50160 Edition 4 compliance report.
- v) IEE519 Compliance Reporting.
- vi) IEC 61000-4-30 compliance report shall display a summary of the IEC 61000-4-30 compliance for a set of measuring points in the system for a given period.

27.2: METER DATA MANAGEMENT

i) Meter Data Management System (MDMS) The Meter Data Management System shall support storage, archiving, retrieval & analysis of meter data and various other MIS along with validation & verification algorithms. It shall act as a central data repository with interactive dashboard. MDMS shall have capability to import raw or validated data in defined formats and export the processed and validated data to various other systems sources and services in the agreed format. It shall provide validated data for upstream systems such as billing, analytics, reporting, etc. MDMS also supports future requirement of PSPCL & supports integration of other smart grid functionalities like consumer information system, customer care, network planning & analysis, load analysis/forecasting, Peak Load Management, Outage management, Distribution Transformer Monitoring system, self-healing system etc. as & when implemented by PSPCL. MDM shall have the following core functionalities:

ii) Asset Management

a. MDM shall maintain information and relationships between the current installed meter location (apartment, shop, industry/ address etc.), Consumer information (Name etc.), Consumer account no, Meter ID, GIS supplied information (longitude, latitude, connection with feeder/ transformer/ pole etc.) etc.

b. MDM shall also support device lifecycle management from device registration, installation, provisioning, operations and maintenance to decommissioning etc. The MDM shall generate exceptions for meter or modules not delivering the correct meter data after installation. The MDM shall provide a reconciliation report that identifies the meters that have been installed but not communicating for a designated (configurable) period. MDM shall generate reports on the number of meters installed in comparison to the number of meters successfully communicating.

c. The software should support tracking the status of meters and communication equipment from the date when they are installed in the field. The history of in-service asset location is maintained throughout the device life with start and end dates associated with each in-service location reference.

d. Ability to report & log any damage/ deterioration in meter attributable to consumer /utility.

iii) AMR Installation Support

a. The MDM shall also support device lifecycle management from device registration, installation, provisioning, operations and maintenance to decommissioning etc. The MDM shall generate exceptions for meter or modules not delivering the correct meter data after installation.

b. The MDM shall provide a reconciliation report that identifies the meters that have been installed but not communicating for a designated (configurable) period. MDM shall generate reports on the number of meters installed in comparison to the number of meters successfully communicating.

iv) Meter Data

a. The MDM shall accept input, process, store, and analyze Meter data from HES and meter data collected through hand held meter reading instruments and manual meter reads. In case of manual reads, provision should be there to insert associated notes like assessed energy, etc.

b. The MDM shall provide storage of all collected Meter Data, events and alarm. It shall have capacity of storing 5 years data or more via archiving.

c. The archiving of data should be done monthly and all data older than 30 days/hours should be archived.

d. Provide complete history and audit trail for all data collected from meters including commands sent to meters and other devices for 30 days (configurable period).

e. Execute on-demand read processes.

f. The MDM shall have the ability to manage at a minimum 15 minute interval data.

g. The contractor shall ensure data integrity checks on all metered data received from data collection systems.

v) Customer Service Support

The solution shall provide customers with access to current and historical data related to power quality indications. The data shall be displayed in graphical and tabular form depending on user choice. The Customer may also access data through customer portal. The solution shall integrate via a user friendly graphical interface.

MDM shall support email/SMS notification of configured alarms & events to selected users.

MDM shall support the web portal or shall have the ability to interface with the 3rd party portal/utility portal to provide the consumer near real time online views of data. The portal should provide user friendly access to consumer for their data via colorful graphs and charts and can download the data into a spreadsheet.

MDM shall support mobile app through which consumer shall be able to log in through android/iOS/Window based mobile app to see information related to his power quality monitoring.

vi) Analytics

The MDM shall have capability of analysis of power quality data

vii) Reporting

The Report function shall enable Utility to deliver reports in standard digital format such as PDF, Excel, etc.

Integration of MDM with SAP

The integration of MDM with existing SAP system of PSPCL for consumer billing is also within the scope of bidder. The requisite information regarding this integration will be provided to the successful bidder by IT department of PSPCL.

viii) Transfer of HES and MDM to PSPCL

On the completion of the project, PSPCL may either continue with the MDM and HES system on cloud or transfer the requisite softwares and database to its servers of PSPCL owned HES and MDM (both hardware based) at Patiala. The transfer of database to servers of PSPCL i.e. HES and MDM (both hardware based) at Patiala will be done with the mutual consent of PSPCL and the bidder and suitable charges mutually agreed will be paid. In this case, the transfer of software will be free of cost but the license fee if any after the completion of the project including 1 year O&M period will be borne by PSPCL.

However, no charges will be paid to the bidder if the existing scheme i.e. on cloud continues. In this case also the license fee if any after the completion of the project including 1 year O&M period will be borne by PSPCL. The transfer of software will be free of cost.

NOTE: In case Meter Data Management System (MDMS) is not required in the solution provided by bidder, then HES shall support the functions of MDM like storage, archiving, retrieval & analysis of meter data and various other functions as defined in Clause 27.3 related to MDM. Further, in this case, Transfer of HES to PSPCL will be on the similar lines as that of MDM defined in Clause relating to the same.

27.3 CLOUD SERVICE PROVIDER (CSP) REQUIREMENTS

Bidder may partner or appoint as a sub-contractor a local party in India to provide large-scale Datacenter / Cloud services for HES and MDM.

Bidder/consortium partner must be empanelled cloud service provider by DEITY (Department of Electronics and Information Technology, Govt. of India) for public cloud, virtual private cloud and community Govt. cloud.

Both HES and MDM are to be based on cloud.

1.1. Operational Management

- a) CSP should provide access of cloud virtual machines either by SSH in case of Linux and RDP in case of Windows servers.
- b) CSP should enable PSPCL to get console access of cloud virtual machine from portal and perform operations.
- c) CSP should upgrade its hardware time to time to recent configuration to delivery expected performance for this Project.
- d) Investigate outages, perform appropriate corrective action to restore the hardware, operating system, and related tools.
- e) CSP should manage their cloud infrastructure as per standard ITIL framework in order to delivery right services to Project.
- f) The CSP should allow different users with different level of access on CSP portal. For example, billing user should not be able to provision resources or delete any resources
- g) The CSP should allow quota management for each department/ISV/Group. The resources to specific department/group/ISV should be as per allocated quota only. If there is any request for more than quota request, then it should be sent as request to admin.

1.2. Compatibility Requirements

- a) CPS must ensure that the virtual machine format is compatible with other cloud provider.
- b) CSP should give provision to import cloud VM template from other cloud providers.
- c) CSP should ensure connectivity to and from cloud resources used for this project is allowed to/ from other cloud service providers if require.

1.3. Cloud Network Requirement

- a) CSP must ensure that cloud virtual machine of project is into separate network tenant and virtual LAN.
- b) CSP must ensure that cloud virtual machines are having private IP network assigned to cloud VM.
- c) CSP must ensure that all the cloud VMs are in same network segment (VLAN) even if they are spread across multi datacenters of CSP.
- d) CSP should ensure that cloud VMs are having Internet and Service Network (internal) vNIC cards.
- e) CSP should ensure that Internet vNIC card is having minimum 1 Gbps network connectivity and service NIC card is on 10 Gbps for better internal communication.
- f) In case of scalability like horizontal scalability, the CSP should ensure that additional require network is provisioned automatically of same network segment.
- g) CSP must ensure that the public network provisioned for cloud VMs is redundant at every point.
- h) CSP must ensure that cloud VMs are accessible from PSPCL private network if private links P2P/MPLS is used by PSPCL.
- i) CSP must ensure that there is access to cloud VMs if PSPCL require to access it using IPSEC/SSL or any other type of VPN.
- j) CSP should ensure that cloud VM network is IPV6 compatible.
- k) CSP should have provision of dedicated virtual links for data replication between their multiple datacenter in order to provide secure data replication for DR services.
- l) CSP should ensure use of appropriate load balancers for network request distribution across multiple cloud VMs.

1.4. Cloud datacenter specifications

- a) The datacenter of CSP must be within India only.
- b) All the physical servers, storage and other IT hardware from where cloud resources are provisioned for this project must be within Indian datacenters only.
- c) The DC & DR sites should be separated by a minimum distance of 100 kilometers.
- d) The CSP datacenters should have adequate physical security in place.
- e) The CSP datacenters should comply/certified Tier III datacenter norms.
- f) The Data Center should conform to at least Tier III standard (preferably certified under TIA 942 or Uptime Institute certifications by a 3rd party) and implement tool-based processes based on ITIL standards.

1.5. Cloud Storage Service Requirements

- a) CSP should provide scalable, dynamic and redundant storage.
- b) CSP should offer provision from self-provisioning portal to add more storage as and when require by PSPCL.
- c) CSP should clearly differentiate its storage offering based on IOPS. There should be standards IOPS offering per GB and high-performance disk offering for OLTP kind of

workload. CSP should delivery minimum 8000 IOPS per TB for OLTP load. The IOPS for NON OLTP load should be minimum 3000 per TB.

d) CSP should have block disk offering as well as file/object disk offering to address different kind of Project needs.

1.6. Cloud Security Requirements

a) CSP should ensure there is multi-tenant environment and cloud virtual resources of this project are logically separated from others.

b) CSP should ensure that any OS provisioned as part of cloud virtual machine should be patched with latest security patch.

c) In case, the CSP provides some of the System Software as a Service for the project, CSP is responsible for securing, monitoring, and maintaining the System and any supporting software.

d) CSP should implement industry standard storage strategies and controls for securing data in the Storage Area Network so that clients are restricted to their allocated storage

e) CSP should deploy public facing services in a zone (DMZ) different from the application services. The Database nodes (RDBMS) should be in a separate zone with higher security layer.

f) CSP should give ability to create non-production environments and segregate (in a different VLAN) non-production environments from the production environment such that the users of the environments are in separate networks.

g) CSP should have built-in user-level controls and administrator logs for transparency and audit control.

h) CSP cloud platform should be protected by fully-managed Intrusion detection system using signature, protocol, and anomaly based inspection thus providing network intrusion detection monitoring.

1.7. Data Management

a) CSP should clearly define policies to handle data in transit and at rest.

b) CSP should not delete any data at the end of agreement without consent from PSPCL.

c) In case of scalability like horizontal scalability, the CSP should ensure that additional generated data is modify/deleted with proper consent from PSPCL.

1.8. Disaster Recovery Management

a) CSP is responsible for Disaster Recovery Services so as to ensure continuity of operations in the event of failure of primary data center and meet the RPO and RTO requirements.

b) RPO should be less than or equal to 2 hours and RTO shall be less than or equal to 12 hours

- c) There shall be asynchronous replication of data between Primary DC and DRDC and the CSP will be responsible for sizing and providing the DC-DR replication link so as to meet the RTO and the RPO requirements.
- d) During normal operations, the Primary Data Center will serve the requests. The Disaster Recovery Site will not be performing any work but will remain on standby. During this period, the compute environment for the application in DR shall be available but with minimum possible compute resources required for a functional DR as per the solution offered. The application environment shall be installed and ready for use. DR Database Storage shall be replicated on an ongoing basis and shall be available in full (100% of the PDC) as per designed RTO/RPO and replication strategy. The storage should be 100% of the capacity of the Primary Data Center site.
- e) In the event of a site failover or switchover, DR site will take over the active role, and all requests should be routed through that site. The pre-requisite to route request to DR should be articulated properly and shared by CSP.
- f) Whenever there is failover from primary to secondary, compute environment for the application at DR site shall be equivalent to DC
- g) The installed application instance and the database shall be usable and the same SLAs as DC shall be provided.
- h) The bandwidth at the DR shall be scaled to the level of Data center when DR is activated.
- i) The CSP shall clearly define the procedure for announcing DR based on the proposed DR solution. The CSP shall also clearly specify the situations in which disaster shall be announced along with the implications of disaster and the time frame required for migrating to DR. The CSP shall plan all the activities to be carried out during the Disaster Drill and issue a notice to the Department at least two weeks before such drill.
- j) The CSP should offer dashboard to monitor RPO and RTO of each application and database.
- k) Any lag in data replication should be clearly visible in dashboard and alerts of same should be sent to respective authorities.

1.9. Managed Services

- a) Network and Security Management:
- Monitoring & management of network link proposed as part of this solution.
 - Bandwidth utilization, latency, packet loss etc.
 - Call logging and co-ordination with vendors for restoration of links, if need arises.
 - Addressing the ongoing needs of security management including, but not limited to, monitoring of various devices / tools such as firewall, intrusion protection, content filtering and blocking, virus protection, and vulnerability protection through implementation of proper patches and rules.
 - Ensuring that patches / workarounds for identified vulnerabilities are patched / blocked immediately

- Ensure a well-designed access management process, ensuring security of physical and digital assets, data and network security, backup and recovery etc.
- Adding/ Changing network address translation rules of existing security policies on the firewall
- Diagnosis and resolving problems related to firewall, IDS /IPS.
- Managing configuration and security of Demilitarized Zone (DMZ) Alert / advise PSPCL about any possible attack / hacking of services, unauthorized access / attempt by internal or external persons etc.

b) Server Administration and Management:

- Administrative support for user registration, User ID creation, maintaining user profiles, granting user access, authorization, user password support, and administrative support for print, file, and directory services.
- Installation/ re-installation of the server operating systems and operating system utilities
- OS Administration including troubleshooting, hardening, patch/ upgrades deployment, BIOS & firmware upgrade as and when required/ necessary for Windows, Linux or any other O.S proposed as part of this solution whether mentioned in the RFP or any new deployment in future.
- Ensure proper configuration of server parameters, operating systems administration, hardening and tuning
- Regular backup of servers as per the backup & restoration
- Managing uptime of servers as per SLAs.
- Preparation/updation of the new and existing Standard Operating Procedure (SOP) documents on servers & applications deployment and hardening

1.10. Backup Services

- a) CSP must provide backup of cloud resources. The backup tool should be accessible
- b) To perform backup and restore management as per policy & procedures for backup and restore, including performance of daily, weekly, monthly, quarterly and annual backup functions (full volume and incremental) for data and software maintained on the servers and storage systems using Enterprise Backup Solution.
- c) Backup and restoration of Operating System, application, databases and file system etc. in accordance with defined process / procedure / policy.
- d) Monitoring and enhancement of the performance of scheduled backups, schedule regular testing of backups and ensure adherence to related retention policies
- e) Ensuring prompt execution of on-demand backups & restoration of volumes, files and database applications whenever required.
- f) Real-time monitoring, log maintenance and reporting of backup status on a regular basis. Prompt problem resolution in case of failures in the backup processes.

- g) Media management including, but not limited to, tagging, cross-referencing, storing (both on-site and off-site), logging, testing, and vaulting in fire proof cabinets if applicable.
- h) Generating and sharing backup reports periodically
- i) Coordinating to retrieve off-site media in the event of any disaster recovery
- j) Periodic Restoration Testing of the Backup
- k) Maintenance log of backup/ restoration
- l) CSP should provide network information of cloud virtual resources.
- m) CSP must offer provision to monitor network uptime of each cloud virtual machine.

1.11. Web Application Firewall as Service

- a) Cloud platform should provide Web Application Filter for OWASP Top 10 protection
- b) CSP WAF should be able to support multiple website security.
- c) CSP WAF should be able to perform packet inspection on 7th layer.
- d) CSP WAF should be able to block invalidated requests.
- e) CSP WAF should be able to block attacks before it is posted to website.
- f) CSP WAF should have manual control over IP/Subnet. i.e., Allow or Deny IP/Subnet from accessing website.
- g) The attackers should receive custom response once they are blocked.
- h) CSP must offer provision to customize response of vulnerable requests.
- i) CSP WAF should be able to monitor attack incidents and simultaneously control the attacker IP.
- j) CSP WAF should be able to Grey list or Backlist IP/Subnet.
- k) CSP WAF should be able to set a limit to maximum number of simultaneous requests to the web server & should drop requests if the number of requests exceed the threshold limit.
- l) The WAF should be able to set a limit to maximum number of simultaneous connections per IP. And should BAN the IP if the threshold is violated.
- m) Should be able to set a limit to maximum length of path to URL.
- n) Should be able to limit maximum size of request to Kilobytes.
- o) CSP WAF should be able to limit maximum time in seconds for a client to send its HTTP request.
- p) Should be able to BAN an IP for a customizable specified amount of time if the HTTP request is too large.
- q) Should be able to limit maximum size of PUT request entity in MB
- r) The WAF should be able to close all the sessions of an IP if it is ban.
- s) Should be able to Ban IP on every sort of attack detected and the time span for ban should be customizable. There should be a custom response for Ban IP.
- t) The Dashboard should show a graphical representation of
 - Top 5 Attacked Websites.
 - Top 5 Attacking IP.

- Top 5 Attack types.
 - Top 5 Attacked URLs.
- u) For analysis purpose the Dashboard should contain following information:
- Number of requests to web server.
 - Number of attacks.
 - Number of Attackers.
 - Types of error messages and on. Of error messages sent to the users.
 - Total Bytes sent during transaction

1.12. Database support service

- a) Installation, configuration, maintenance of the database (Cluster & Standalone).
- b) Regular health checkup of databases.
- c) Regular monitoring of CPU & Memory utilization of database server, Alert log monitoring & configuration of the alerts for errors.
- d) Space monitoring for database table space, Index fragmentation monitoring and rebuilding.
- e) Performance tuning of Databases.
- f) Partition creation & management of database objects, Archiving of database objects on need basis.
- g) Patching, upgrade & backup activity and restoring the database backup as per defined interval.
- h) Schedule/review the various backup and alert jobs.
- i) Configuration, installation and maintenance of Automatic Storage Management (ASM), capacity planning/sizing estimation of the Database setup have to be taken care by the vendor.
- j) Setup, maintain and monitor the 'Database replication' / Physical standby and Asses IT infrastructure up-gradation on need basis pertaining to databases.

1.13 Cyber Security

- a) The bidder shall submit detailed document on end-to-end implementation of security architecture detailing.
- b) The system shall comply to the best security standards and practices followed in Power Utilities.
- c) The system should be having the features of token based authentication system, tracking and log maintenance of successful and failed login attempts, archiving of failed login attempts, user access control, encrypting passwords,
- d) The system should have the implementation of Password revocation, tokens for authentication, encryption mechanisms, intrusion detection mechanism and prevention
- e) The system should be able to detect service impact attack and mitigation plan

- f) Certifications from standard laboratory for cyber security compliances should be submitted.
- g) The system should have encryption mechanisms for security patches and software delivered over the internet.
- h) The software delivered by the bidder should be free from backdoors, Trojans viruses and worms and other malicious vulnerabilities.
- i) The supplier shall provide necessary firewalls, anti-virus software and other malicious software detection, prevention and removal tools..

Note: The requirement of PSPCL is to access cyber-secured PQ data remotely. It is up to the bidder to provide best and reasonable solution for the same which may include provision of MDM or not. However, Cloud service is mandatory.

28.0 SUPPORT SERVICES

In addition to the supply of meters and equipment the supplier would be required to extend supports services as under:-

The supplier shall provide meters along with software for power quality analysis based on the data retrieved from the meters, so as to reflect on the following parameters for enabling the purchaser to take necessary corrective actions for future:-

1. Voltage quality compliance report
2. PQ event analysis
3. IEEE 519 reporting
4. The computer software (Windows based preferably) should have suitable interface to transfer the power quality data to software offline/online through any port. The computer software should be able to convert the data received from the meter into database so that further processing of the output is possible.
5. The successful bidder shall be required to impart free of charge practical training to PSPCL staff at the place and timing desired by PSPCL to equipped them for use of the meters and software including data off loading and report generation.

29.0 TYPE TESTS

Bidder shall furnish along with the offer type tests reports as per IEC 61000-4-30 class A and other standards mentioned in Clause no.3 of this specification from any recognized lab (national or international) duly authorized for testing of class A power quality meters as per IEC 61000-4-30.

Bidders shall also submit, along with offer, Type Test Certificates of high quality Reinforced Polycarbonate or equivalent High Grade Engineering Plastic material used for meter housing material i.e. base/cover/terminal cover from any Govt. approved Laboratory. However, if bidder provides metallic meter module then the relevant clauses of IS 14697 will be applicable. Reports for type tests conducted in manufacturer's own laboratory and certified by testing institute shall not be acceptable. These tests must not have been conducted earlier than five years from the original scheduled date of bid

opening (Part-I & II).The purchaser reserves the right to demand repetition of some or all the type tests in the presence of purchaser's representative free of cost. In case type test certificate are not enclosed with the offer then the offer shall be rejected.

In addition to these, the tenderers shall submit valid ISO 9001:2015 certification for meter manufacturing, ISO 27001:2005 for information security management system & ISO 14001:2004 for environmental management system at the time of opening of Tender (i.e part- I & II of Tender).

30.0 CONSTRUCTIONAL REQUIREMENTS, METER COVER & SEALING ARRANGEMENT

30.1 CONSTRUCTION

Meter shall be made of high-quality materials/components to ensure high reliability and long life. For this, a meter should be subjected to mechanical tests and to evaluate the material used in the meter, it should be evaluated with following tests as per relevant IEC/IS14697 mentioned. The meter should be sealed in such a way that the inside of the meter is not accessible without breaking the seal and tampering with the body of the meter.

To evaluate the construction under the physical influences during packaging and transportation.

- i. Spring hammer test according to IEC publication 60068-2-75
- ii. Shock test was performed according to IEC 60068-2-27
- iii. Vibration test according to IEC 60068-2-6
- iv. The test was carried out according to IEC 60529, protection degree IP54 (indoor). CAT 2 as per IEC 60529.
- v. Material of both the terminal block and the meter case was subjected to a glow-wire test in accordance with IEC 60695-2-1.

To Evaluate the materials used and the Construction of the meter under the climate influences, meter should be assessed with regards to following points:

- i. Dry heat test as per IEC 60068-2-2
- ii. Cold test as per IEC 60068-2-1.
- iii. Damp heat cyclic test according to IEC 60068-2-30
- iv. Solar radiation test with IEC 62052-11 clause 6.3.4

Note: The above tests according to IS 14697 will also be acceptable.

The terminals shall be moulded/tight fit constructions with barriers and covers to provide secure and safe connections of CTs and PTs through the stranded copper conductors of 2.5mm size. The terminal block material was tested in accordance with ISO 75. The material of both the terminal block and the meter case was subjected to a glow-wire test

in accordance with IEC 60695-2-1. The temperature of the glow-wire was 960 degree C for the terminal block, 650 degree Celsius for the meter case and cover. The materials meet the requirements.

The terminal cover preferably be sealed independently of the meter cover. Bidder must submit the test certificate to this effect.

30.2 SEALING OF THE METER

To meet government regulations and utility security requirements, the meter should incorporate additional security elements:

- i. i. hardware-locked security system that prevents modification of meter parameters after the meter is sealed.
- ii traditional anti-tamper mechanical seals on the meter base unit and reset switch.

31.0 ACCURACY

The accuracy of measurement by meter shall be tested in accordance with relevant standards. Provision may be made that once the accuracy is brought within limits, the adjustments should be ceased and it shall not be possible to change the calibration of meters at site.

32.0 WORKING ENVIRONMENT

As per IEC 62053-22 (with latest amendment) meter to perform satisfactorily under Non Air conditioned environment (with in stipulations of IS) Meter body will conform to IP51 degree (or better) of protection. The meter shall be suitable designed for satisfactory operation under the hot and hazardous tropical climate conditions and shall be dust and vermin proof. All the parts and surface, which are subject to corrosion, shall either be made of such material or shall be provided with such protective finish, which provides suitable protection to them from any injurious effect of excessive humidity.

33.0 INSPECTION AND TESTING

Power Quality Meters is a new concept and no Indian Standard is presently available for these meters. Keeping this in view, the first lot of 10 meters (from each supplier who will be issued PO) be accepted on the basis of the type test reports as per IEC 61000-4-30 submitted by the bidder along with the tender, report of field demonstration and the routine test certificates to be submitted by the firm.

All the meters shall be tested, calibrated and sealed by the supplier at their works before dispatch and all the routine test certificates of individual meters shall be supplied.

The supplies will be further completed in two lots (hence total of three lot including first lot of 10 meters). One no. sample meter each shall be sealed in ME Lab from second and third lot of offered material and shall be got Type Tested by PSPCL from any recognized lab (national or international) duly authorized for testing of class A power quality meters as per IEC 61000-4-30. The cost of that meter as well as cost of type test will be borne by

the supplier. Thus, a total of 2 type tests will be carried out to ascertain the conformance to IEC 61000-4-30 for testing of class A power quality meters. In case of any failure during above Type Tests, the entire lot shall be rejected at the risk and cost of the supplier. Further, the second and third lot will also be tested in ME labs if suitable testing equipment for testing of power quality meters is available.

34.0 CERTIFICATES

Following Self Certificates will be furnished by the bidders in their offer that:

- i. RTC Drift shall be within (+/-)180 seconds per year.
- ii. Software takes care of 29th Feb of the leap year.

35.0 EMPANELMENT OF FIRMS

Technically suitable firms (whose part-III of the tender has been opened) shall be empanelled for private sale of meters to consumers/prospective consumers of PSPCL against this tender enquiry as per terms & conditions of PSPCL, given as under:

- i. Empanelment for private sale of meters to consumer/perspective consumers of PSPCL shall be done on L-1 Ex-works prices with 10% profit margin plus applicable taxes and duties extra as applicable.
- ii. Firms shall write on the nameplate the words "Private sale under PSPCL Jurisdiction".
- iii. This office can de-empanel any firm due to bad performance, change in specification of meters and Over-charging from the consumer over the rates fixed as above etc within the empanelled period.
- iv. The firms shall be eligible for private sale during the month only after delivering the said material to PSPCL for the month as per delivery schedule of Purchase Order if order is placed on them.
- v. To ensure the quality of material, the firms will get meters inspected in suitable lots by a team of two officers of PSPCL as per terms & conditions of this spec. MQP-194/PO(M).
- vi. 100% testing of all the meters sold in private market shall be carried out in respective M.E. Lab of PSPCL before installation at consumer's premises. In case, the testing equipment is not available by the time the meters are procured then the meters will be accepted based on the routine tests and the type test certificates submitted by the firm.
- vii. The Private Sale of meters shall be allowed without any cut-off date unless otherwise withdrawn. This specification is a guideline, for Power Quality metering features. However, the Tenderers should offer the meter as per standards bringing out clearly the all-technical features provided in their Power Quality Meters.

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PSPCL, Patiala

SPECIAL INSTRUCTIONS

1. Pre- Qualifying Criteria:

- i) Turnover of the Lead bidder during any one financial year out of last three financial years should be equal to or more than 5 crores. The quantity quoted should not be less than 25% of the tender quantity.
- ii) In case of imported meter, bid given by firm's authorized Indian representative will be acceptable against authorization by the principal (Foreign) manufacturer for its 'sale' and 'after sale service'.
- iii) Consortium shall be accepted between maximum three organizations/firms. i.e. meter manufacturing firm or its authorized Indian representative, HES/MDM provider and Cloud service provider. Lead bidder of this consortium needs to be mandatorily a Meter manufacturer or its authorized Indian representative.

In case of a Consortium, the Lead Partner shall be sole point of contact for PSPCL for the tendering and operation of the Contract and disputes if any.

In case of a Consortium, the LOA/LOI and PO shall be issued ONLY in the name of the Lead bidder, and all payments shall be made to the Lead bidder, for administrative convenience.

Note: In case of consortium, bidder(s) shall

- a) Provide clarity on the roles and responsibilities of consortium members.
- b) Ensure that all the members are part of the contractual arrangement between themselves before submitting the bid.
- c) Submit jointly signed agreement.

In case bidder fails to execute the project then all the firms forming consortium will be blacklisted.

- iv) The bidder/consortium partners will have to submit a certificate from Chartered Accountant indicating his turnover for the last three financial years.
- v) The firm should have relevant BIS/ISO/ other applicable standard certifications (wherever applicable).
- vi) It is to be ensured by the bidder that the import of parts/choosing of consortium partner will be as per the latest orders issued by Govt. of India regarding to Power sector with relation to companies based in neighboring countries and undertaking of the compliance of such orders will be submitted by the bidder.

2. (i) **Part-III i.e. Price bid of following bidders will not be opened:**

- a) Who do not supply Type Test Certificates along with the tender.
- b) Who are blacklisted, debarred by PSPCL.
- c) With whom business has been suspended by PSPCL.

- d) Who do not demonstrate the operability of power quality meter to the committee (constituted for field demonstration) as per requirement of PSPCL.
 - e) Who is not considered eligible / capable of supplying the quantity offered, based on their works appraisal in case of new firms, if the firm is in India.
- (ii) Any firm, which at the time of opening of the Tender Enquiry, falls in any of the following categories, shall be regarded as defaulter and shall not be eligible for participation in the Tender Enquiry for a period of three years from the date of issue of Purchase Order in which it has defaulted:
1. The Firm is a defaulter for the supply of 35% or more quantity on the date of expiry of the Contractual Delivery Period for the total ordered quantity.
 2. The Firm is a defaulter for the supply of any quantity for more than 6 months from the date of expiry of the Contractual Delivery Period for the total ordered quantity.

Note: This clause shall be applicable item wise (all types, sizes and ratings) against which the firm has become defaulter under the above said conditions.

3. Bidders/all consortium partners must have GSTIN registration no. failing which order will not be placed which must be supplied along with tender failing which tender will not be accepted.

4. SECURITY DEPOSIT:

- i. The successful Tenderers shall be required to submit Security Deposit for faithful execution of the Purchase Order/Contract of value exceeding Rs. 1,00,000/- at the rate of three percent (3%) of ordered value rounded off to a multiple of Rs. 10/- on the higher side. Tenderers exempted from EMD upto Rs. 5.0 Lac will have to submit Security Deposit for Purchase Orders valued above 1.0 Lac.
- ii. Ordinarily the Earnest Money received against Tenders shall be converted into Security Deposit. If the amount of earnest money received against Tenders is more than the amount of Security Deposit required against the Purchase Order/Contract, the balance shall be refunded within one month of the finalization of the Tender Enquiry and in case of shortfall, if any, the Contractor/Supplier shall be required to deposit the additional amount.
- iii. The Tenders having Permanent Earnest Money Deposit (PEMD) of Rs. 25 lac (Rs. Twenty Five Lac) with PSPCL and hence exempted from depositing Earnest Money with Tenders, shall also be required to submit Security Deposit @3% of ordered value in the form of Bank Guarantee/ Demand Draft/ Cash within 30 days from the award of Purchase Order/Contract.
- iv. The following shall be exempted from depositing Security against Purchase Orders/Contracts given to them :-

- a. Public Sector undertakings owned by Pb. Govt./Central Govt./other State Govt. supplying material directly through units owned by them subject to submission of documentary evidence of Government ownership. Exemption shall not be applicable if the Tender is submitted for supply of material through private unit/manufacturer.
 - b. Suppliers of Proprietary items/firms supplying material under DGS&D Rate Contract.
- v. On faithful execution of Purchase Order/Contracts in all respects, including Warranty period, if any, Security Deposit of the Contractor/Supplier shall be released by the Contracting/Purchasing Agency. The refund shall be made within 30(thirty) days from the issue of security release order by the concerned purchasing agency.
- vi. In the event of default on the part of the Contractor/Supplier in the faithful execution of Purchase Order/Contract his Security deposit shall be forfeited by an order of the Contracting/Purchasing Agency under intimation to o/o CE/IT who shall get the same uploaded & displayed on website of PSPCL. The forfeiture of Security Deposit shall be without prejudice to any other rights arising or accruing to the Board under relevant provisions of the Purchase Order/Contract like penalty etc. including suspension of business dealings with PSPCL for a specific period.

5. BREAK UP OF PRICES:

The breakup of F.O.R. Destination prices as quoted should be given along with the tender in the attached Schedule-‘B’. The prices given in the Schedule-‘B’ shall be final as such; any discount for any term related to price shall be specified in the schedule. The other details given in tenders anywhere will not be considered.

The tenders will be submitted as per NIT/Tender Specification complete in all respects and deviations from Notice Inviting Tenders/Tender Specification shall be clearly brought out by the tenderer in Schedule-‘D’ attached. No post tender development shall be allowed regarding any change in terms or price or Technical Specification.

6. DELIVERY:

As per attached Schedule-‘A’ i.e. Schedule of Requirements.

7. MANUFACTURER’S NAME:

The name of manufacturer and place of manufacture (for each item) shall be indicated in the tender.

8. OTHER INSTRUCTIONS:

- a) The quoted prices should only be ‘FIRM’. ‘Variable’ prices shall not be acceptable. The tenderer revising their offer or withdrawing the same within the validity period after opening of the tenders are liable to be ignored/blacklisted.

- b) PSPCL reserves the right to place the order as a whole or part and to reject any or all tenders received without assigning any reason.
- c) The firm will have to submit hard copy of the tender documents in this office also.
- d) The tenderers should fill the self-appraisal Performa attached as Schedule-C-1 clearly indicating the information asked for.
- e) Tenderer will have to give an undertaking that they will not pay any commission etc. or engage any commission agent or liaison agent for dealing with the PSPCL in any matter including purchase of specification etc. This undertaking is required to be supplied along with the offer failing which the offer is likely to be ignored.
- f) Page marking of tender should be done and index with page nos. shall be provided.
- g) Tenderers should submit their offer in unambiguous wording, failing which PSPCL's interpretation will be final.
- h) Any deviation in Technical and General conditions must be indicated in Schedule-D only, otherwise it would be assumed that the material offered is entirely as per enclosed Technical Specification and general terms & conditions and acceptable to the tenderer in toto.
- i) Works of the firms, which shall be new to PSPCL or new firms for the tendered item shall be appraised. For the works appraisal, the bidders, whose works are situated in India shall have to deposit the following charges through demand draft in favour of Accounts Officer/CPC(M), PSPCL, Patiala at the time of opening of Part- I& II of Tender Enquiry:

Rs. 50,000/- +GST from the firms located outside Punjab.

Rs. 25,000/- +GST from the firms located within Punjab.

Works appraisal of overseas manufacturer is not required.

1. **Bid Evaluation Criteria:** All the bids shall be evaluated on the basis of prices quoted by the bidder. All the qualifying (techno/commercially qualified) bid prices shall be compared and evaluated amongst themselves to determine the lowest bid.
2. **Award Criteria:** The purchaser reserves the right to split and award the quantities between more than one bidders in line with the terms and conditions specified in the accompanying Technical specifications at lowest quoted/negotiated rates.

NOTE: -In case of conflict between these Special Instructions and General Instructions(Schedule-'E'), former will prevail.

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PSPCL, Patiala**

(SCHEDULE A)**SCHEDULE OF REQUIREMENT****Tender Enquiry No. MQP- 194/PO(M)**

Particulars and Quantity of Material required

Description of Material	Qty. in Nos.*
Supply, Testing, Commissioning, Reading, Analysis and 1 year O&M of Power Quality Meters complying to IEC 61000-4-30 class A.	114

***Note: The above requirement is tentative and can be changed at the time of finalization of tender enquiry.**

DELIVERY SCHEDULE: Supplies of power quality meters shall commence within two month (including one month preparation period) from the date of issue of Letter of Award/Letter of Intent i.e. if the Letter of Award/Letter of Intent is issued on 10.06.2021 then the first lot must be supplied by 09.08.2021. The complete material shall be supplied within THREE monthly installments from the date of issue of Letter of Award/Letter of Intent.

Installation, Commissioning and Integration of all the lots will be done latest by 4 months from the date of commencement of supply. Assuming the date of issue of Letter of Award/Letter of Intent be 10.06.2021, the delivery and commissioning schedule is amended as under:

LOT	PERIOD FOR SUPPLY	DEADLINE OF COMMISSIONING
FIRST (10 meters only)	10.07.21 TO 09.08.21	10.07.21 TO 09.09.21
SECOND	10.08.21 TO 09.09.21	10.08.21 TO 09.10.21
THIRD	10.09.21 TO 09.10.21	10.09.21 TO 09.11.21

NOTE: The tenders will be submitted through e-tendering. Document fees, EMD/PEMD Certificate and one hardcopy of tender documents must be submitted in hard form (i.e. Demand draft etc.) in this office before the last date and time of bid submission.

This is a three part bid:

a) **Part-I-Earnest Money and cost of tender document.**

The first part will consist of earnest money submitted via e-payment gateway on the e-tendering portal or valid PEMD certificate for PSPCL. However, a manual

photocopy of proof of submission of EMD/ PEMD certificate shall be submitted in a separate envelope. On the envelope, the bidder should clearly specify the items & quantity quoted, else the tender shall not be accepted.

b) **Part-II-Technical/Commercial bids**

The second part will consist of technical details/GTPs, schedule of deliveries and all other terms and conditions including discount, if any, GST etc., except the rates and other incidentals relevant to the price

c) **Part-III-Price Bids. (Schedule-‘B’).**

The third part will only contain the rates quoted for each item.

The document fees envelope will be opened first followed by EMD/PEMD envelope. Part-II of the bids shall be opened only if the Document fees has been submitted by the bidder as per requirement of specification.

After opening part-II of the bids (Technical/Commercial), the bids will be evaluated by PSPCL. The Price Bids of the tenders of all the eligible bidders shall be opened at the pre-notified date and time. Thereafter, the Reverse Auction process (for online tenders) shall start on the e-tendering portal of PSPCL as per the procedure laid down in the Clause No. 30 of Schedule-E of these Regulations.

The date and time for opening part-III of the bids will be intimated to the qualifying firms. The price bids (Part-III) will be opened in the presence of the representatives of the qualifying bidders who choose to attend.

NOTE:- The particulars of the firm/consortium i.e. Names & addresses of Directors of the firm, their income tax permanent Account Number, Income tax return & turnover of the firm for the last three years and any other specific allied information on the following Performa shall be uploaded along with the Part-II of tender:-

Name of the firm	Name of Directors/Partners	Income Tax PAN of firm	Turnover of the firm (Last three years)
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**Dy.CE/HMC
PSPCL, Patiala**

SCHEDULE-'B'**PUNJAB STATE POWER CORPORATION LTD.
UNIT PRICE SCHEDULE****Tender Enquiry No. MQP-194/PO(M)**

(Please read carefully clause-5 'PRICES' of General Terms and Conditions attached herewith).

Sr. No	Item Description	Quoted Quantity	Per unit Ex works rate ex-works price inclusive of packing & forwarding charges forming part of production cost (in Rs.)	F&I	GST (in %)	GST (in Rs.)	Per Unit FOR Destination rate in Rs.	Total cost b*g
	a	b	c	d	e	f	g	h
1	Power Quality Meters							
2	Modems for quoted quantity of meters							
3	IT infrastructure (HES, MDM & Cloud) per meter	Number should be equal to the number of meters quoted.	Ex-works cost of IT infrastructure divided by quantity in cell 3b					
4.	Cost of installation, commissioning and integration of unit power quality meter including installation of modem, its commissioning and integration with MDM system via							

	HES							
5.	SIM charge per meter for operation period of 1 year i.e. 12 months							
6	FMS (O&M) per meter for 12 months							
7.	Per node cost for evaluation of tender and Reverse Auction [1g+2g+ 3g + 4g+5g+6g]							

Seal & Signature of the tenderer

IMPORTANT NOTE:

1. For the purpose of evaluation, tender L-1 cost shall be arrived at by summing up Total costs of column 9g (as per formula at Sr. No. 7) and is reproduced as under:
Per node cost = [1g+2g+ 3g + 4g+5g+6g]. Thus, L-1 bidder shall be decided based on this formula and not on rates quoted for individual items.
2. The project may be awarded to multiple bidders. The L-1 bidder has to accept the quoted/ordered quantity (to be decided by PSPCL) at its own quoted/negotiated L-1 rates.
3. Quoted prices should be 'FIRM'. Offers of 'Variable' prices shall be out rightly rejected.
4. Split up of Ex-Works price indicating cost of Raw material (PCB, Meter Body, CTs & communication ports etc.), labour component and overheads, which are not to be considered for the purpose of comparative statement, shall also be supplied separately.
5. Price schedule shall be duly typed. Hand written prices, any cutting on price schedule shall not be accepted and tender shall be rejected.
6. The bidder shall not be allowed to indicate overall discount on the quoted prices for which split up has been given as per Para-1 above. However, quantity /payment discount can be given by the tenderer in the main tender (i.e. part-II relating to General Terms & Conditions). Any firm offering discount on quoted prices or after opening of tenders will be out rightly rejected.
7. The tenderers must note that minimum period of 120 days is required to finalize the case. It is, therefore, in their own interest, to give validity for 120 days.
8. The tenderers are required to quote price per unit.

9. Tenders without break up of prices are liable to be rejected.
10. This Performa must be filled in the e-tender only.
11. Whether the firm indicate NIL or concessional rate of GST in their tenders they will have to absorb the GST up to full rate applicable at the time of opening of tender. The firms which don't agree to this condition or indicate GST as extra without indicating the applicable rate or remain silent then the tenders of the firm will be loaded with applicable rate of GST for evaluation purpose.
12. If rates of GST have not been quoted, then maximum applicable rate of GST, prevailing at the time of opening of tender, shall be taken into consideration.
13. In case of any concessional rates of taxes and duties, the bidder shall clearly indicate reasons of concession and its validity in Part-II of the bid. For this, bidders shall furnish documentary proof for concessional tax rates applicable on his manufacturing unit.
14. In case quoted prices or any other declaration/statement given in this annexure do not tally with the ones given in the main tender or elsewhere, the ones given here shall be considered as final.
15. The provisions of GST acts shall prevail upon wherever applicable in the terms and conditions of these specifications.
16. No correspondence shall normally be made regarding schedule-B and tender shall be evaluated as per information furnished by bidders.
17. Input Tax Credit (ITC): The firms should quote their rates after taking into account the Input Tax Credit available to them. If the firms don't mention clearly about ITC, then it will be assumed that they have quoted the rates after taking into account the ITC available to them.

Signature of Firm With stamp.

SCHEDULE-'C'

GUARANTEED TECHNICAL PARTICULARS FOR POWER QUALITY METERS
GUARANTEED TECHNICAL PARTICULARS

S.N	Technical Specification Requirements	Bidder's Offer
1.	Manufacturer's name & Country	
2.	Type of Meter	
3.	Name and model no. of offered product	
4.	Standards to which meter complies IEC 62053-22/23, IEC 61000-4-30, EN 50160, IEC 61000-4-7, IEC 61000-4-15, IEEE 1159, IEEE 519, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-12, CISPR 22, IEC 62052-11	
5.	Power quality Class "A"	
6.	Accuracy class: 0.2S	
7.	Metrology indicator provided on meter and switching facility for reactive & apparent energy	
8.	Cyber security as per IEC62443	
9.	Voltage and frequency range Nominal - 57 V to 277 V L-N rms 100 V to 480 V L-L rms	
10.	Maximum current	
11.	Variation of voltage at which system functions normally	

	<p>HV</p> <p>3x110V/$\sqrt{3}$ V Phase to Neutral (3P4W)</p> <p>3x110V V Phase to Neutral (3P3W)</p> <p>Variation -30% to +20%</p>	
12.	Minimum Starting current	
13.	P.F. range	
14.	<p>Power consumption per phase</p> <ul style="list-style-type: none"> ● Voltage Circuit ● Current Circuit 	
15.	<p>AC and DC Auxiliary supply ratings for powering up the metering system</p> <p>120-277 V L-N RMS (-15 %/+20 %) 47-63 Hz</p>	
16.	Sealing arrangement	
17.	<p>Size (W x H x D) in mm</p> <p>Weight</p> <p>Mounting</p>	
18.	Digital input/output	
19.	Communication ports i.e. Optical, USB, RS232, RS485 and Ethernet etc.	
20.	Communication protocol MODBUS	
21.	HTTPS web server	
22.	<p>Power quality report</p> <ul style="list-style-type: none"> ● Harmonics limit report (IEEE 519 -2014) ● Voltage quality report (EN50160) ● PQ event report (Sag, Swell, Interruption, Rapid voltage change) 	

23.	10 minute aggregated data as per IRC 61000-4-30	
24.	Sampling rate	
25.	Time syncing options	
26.	Memory	
27.	<p>Power quality parameters:</p> <ul style="list-style-type: none"> ● Supply Frequency ● Magnitude of supply Voltage & Current ● Flicker ● Voltage & Current harmonics ● Voltage & Current inter harmonics ● Over & Under voltage deviation ● Voltage Unbalance ● Mains signaling voltage 	
28.	<p>Power quality displays</p> <ul style="list-style-type: none"> ● Flicker ● TDD ● Current sequence component ● Voltage unbalance ratio ● Current unbalance ratio ● Voltage deviation ● Voltage sequence component ● Voltage harmonics ● Current harmonics ● THD 	
29.	Trends (up to 50th order) on meter display	
30.	Individual Harmonics (both Voltage and Current): Up to 63 rd order	

31.	<p>Anomaly detection features.</p> <p>It is clarified that anomalies related to power quality events is to be detected.</p>	
32.	<p>Energy parameters recorded in meter</p> <ul style="list-style-type: none"> ● Active Import /Export Total ● Active Import /Export Fundamental ● Reactive Energy Q1,Q2,Q3& Q4 ● Reactive Import /Export ● Apparent Import /Export 	
33.	TOD compatibility	
34.	MD Reset provisions: Auto or Manual	
35.	Demand integration period	

PROFORMA FOR APPRAISAL OF FIRM'S CAPABILITY AND CAPACITY TO MANUFACTURE ITEM (S) AS PER REQUIREMENTS OF PSPCL TENDER ENQUIRY NOS.MQP- 194/2021-22/PO(M)

1. (A) i) Name of the tendering Firm.
 - ii) Complete address of the office.
 - iii) Telephone Number(s).
 - iv) Fax Number.
- (B) i) Name of the Responsible Officer with designation along with Mobile No. (Managing Director/Partner/Chief Engineer/Works Engineer etc.)
 - ii) Day on which weekly holiday is observed.
- (C) Complete Address of the works.
 - i. Telephone Number(s)
 - ii. Names of two responsible persons with designation along with Mobile No. (Managing Director/Partner/Chief Engineer/Works Engineer etc.).
 - iii. Day on which weekly holiday is observed.
2. Year of Establishment.
3. Constitution of the firm.
 - a. Private or public limited.
 - b. Registered under the companies ACT or any other ACT. Give Registration No. & Date.
4. FINANCIAL POSITION:
 - i)
 - a) Land (Area & Value)
 - b. Building (Covered Area & Value).
 - c. Plant & Machinery.
 - d. Total drawing limit from Banks.
 - ii) Annual Financial turnover duly audited for the last two years.
 - iii) Latest Income Tax clearance certificate.
5. MAN POWER:
 - a. Graduate Engineer(s).
 - b. Diploma Holder(s).
 - c. Skilled work.
 - d. Non-skilled workers.
6. PRODUCTION CAPACITY PER MONTH OF THE ITEM COVERED IN YOUR QUOTATION AND JUSTIFICATION FOR ASSESSMENT.
 Production capacity per month of quoted item.
 Details of plant and machinery installed (please attached separate sheets, if necessary).

Details of raw material required.

Source of raw material.

Place of manufacturing of equipment

Stock in hand.

In case, any raw materials are required to be imported, indicate arrangement of raw material procurement.

Quality controls exercised in procurement of its materials.

7.
 - a) Details of manufacturing process.
 - b) Scheme of quality controls.
 - c) Whether any records being maintained in respect of quality controls exercised during the manufacturing process and at the finished stage.
8. Details of testing facilities available with the firm. (Information may be supplied in the enclosed Performa as per annexure-A).
9. Details of orders executed/under execution during the last three years (including quantity and value).
 - a. With PSPCL.
 - b. Other State Electricity Boards (SEBs) /Govt. of India and their institutions/undertakings.
 - c. Other important customers.
10.
 - a) Whether the item(s) are on Punjab Govt./DGS&D/Central Govt. approved Rate Contracts (Attach copies of rate contracts).
 - b) Whether the firms works is having ISO for the item quoted, if yes, please mention ISO No. and validity.
 - c) Whether the firm is licenses to use ISI mark or any other Govt. quality Mark for the item quoted. Please specify No. and validity of license. (Copies of latest test certificates issued by Govt. Laboratories/any recognized Test House be attached).

Signature of authorised Signatory of the firm

Seal of the firm.

- NOTE: -
1. Please attached additional sheets, where required.
 2. Copies of documents attached with the Performa should be attested by the firm's authorised representative with stamp mark of the firm.

PUNJAB STATE POWER CORPORATION LTD.

T.E.NO. MQP- 194/2021-22/PO(M)

SCHEDULE OF DEVIATION.

Tenderers shall carefully state below any and all points in this tender which are not in accordance with technical specifications and the general conditions.

Sr. No.	Para No. & Page.	Deviations, if any.
i. TECHNICAL		
1.		
2.		
3.		
ii. GENERAL		
1.		
2.		
3.		

Tenderer hereby certifies that the above mentioned are the only deviations from Purchaser's afore-mentioned specification and general conditions.

SIGNATURE:
NAME:
DESIGNATION:

DATE:

SEAL OF COMPANY.

PUNJAB STATE POWER CORPORATION LIMITED**GENERAL INSTRUCTIONS TO BE OBSERVED BY BIDDERS:**

1. The following points shall be carefully studied /complied in order to ensure submission of a complete and comprehensive Tender. Quotations/bids not strictly in accordance with these instructions are liable to be rejected.
 - i. The Tender must be complete in all respects.
 - ii. In case of e-Tendering, Part-I shall be submitted manually till e-payment gateway is made operational. When e-payment gateway is made operational, then the EMD/PEMD shall be submitted online only. Part-II and Part-III shall be submitted online through e-Tendering portal only. While opening the Tenders, Earnest Money deposit shall be evaluated first and in case the deposit of Earnest Money is in accordance with the terms of Notice Inviting Tender only then Part II of the Tender shall be opened.
2. The Officer inviting Tenders, Contracting/Purchasing Agency/PSPCL (herein after referred to as "purchaser") reserves the right to modify the schedule of requirements, technical particulars and the specifications at any time before the opening of the Tender enquiry and to place the order as a whole or in parts, and to reject any or all the Tenders received without assigning any reasons. He will not be responsible for expenses or losses that may have been incurred by the bidder in the preparation of it's Tender and nothing shall be paid on this account.
3. Quotations/Tenders shall be received in the office of CE/Metering, PSPCL, C-3, Shakti Vihar, Patiala and shall be opened. in the presence of bidders or their authorized representatives who wish to be present.
4. In case the due date of opening of the Tender enquiry happens to be a holiday, Tenders shall be received and opened on the next working day.

Note:-In case any dispute arises while opening the tender then to sort out the dispute, concerned CE shall be the competent authority.

GENERAL TERMS AND CONDITIONS**5. PRICES :**

- i. The unit rates shall be quoted F.O.R. destination at any Railway Station in Punjab/PSPCL Railway siding, where ever existing or at the stores of PSPCL through road transportation, which will be treated at par with F.O.R. destination. The break-up of the F.O.R. destination price shall be given as under :-

- a. The price of the material inclusive of packing and forwarding charges forming part of production cost.
 - b. Packing cost not forming part of production cost, handling charges, cartage, freight charges and transit risk insurance etc.
- ii. All taxes and duties leviable on the price of finished goods as per sub-clause (i) (a) shall be paid extra and the same should be shown separately as prevalent on the date of opening of the Tenders enquiry, to be paid at the rate as may be actually prevalent at the time of supply, otherwise these elements shall be deemed to be included in the quoted prices and will not be paid extra. No taxes and duties will be payable on the element of cost quoted under sub-clause (i)(b) except freight & insurance.
 - iii. In case rates are quoted ex-works/ ex-godown only & for imported material, freight charges, transit risk insurance, handling and clearance charges, F.O.B.& C.I.F. commission of clearing agents at Ports should also be indicated in Part-III of the Tender.
 - iv. The quoted prices shall be 'FIRM'. Variable prices shall not be acceptable.

6. VALIDITY

The offer should preferably be valid for 120 days from the date of opening of the Tender enquiry or as specified in NIT and any withdrawal or modification of the offer shall not be permitted.

7. TERMS OF PAYMENT

The payments shall be made as under:

(a) Cost of Power Quality Meters and Modems (as per Schedule-B):

Payment of contract value pro-rata for each consignment (as per Sr. no.1 & 2 of Part -1 of Schedule-B) of operationally complete equipment dispatched after approval of Inspecting Authority/Test Certificate etc. along with taxes & duties and Other Statutory levies as per contract shall be paid within 45 days (circular 15/2011) against receipted challans & submission of requisite documents as per schedule below:

- i) 95% payment of 40% of Cost of Power Quality Meter and Modem (as per Sr. no. 1 & 2 of Part -1 of Schedule-B) shall be released after successful receipt of the material in ME labs of PSPCL.
- ii) The balance 5% Payment of 40% of Cost of Power Quality Meter and Modem shall be kept as performance Guarantee which shall be released after due receipt

of Goods Receipt Note from the concerned consignee(s) or expiry of three months from the date of receipted challans & submission of requisite documents, whichever is earlier

iii) 40% of Cost of Power Quality Meter and Modem shall be released after installation of power quality meter its and accessories, its commissioning and integration of power quality meter and data availability on HES on monthly pro rata basis for that calendar month.

iv) 20% of Cost of Power Quality Meter and Modem shall be released after 3 months of successful operation of meters on monthly pro rata basis for that calendar month.

b) Cost of installation, commissioning and integration (as per Sr. no 4 , Part -1 of Schedule-B) :

(i) 80% payment of cost of installation, commissioning and integration (as per Sr no 4 , Part -1 of Schedule-B) shall be made for power quality meter after successful installation, commissioning and integration of the meters and data availability on HES/MDM on monthly pro rata basis for that calendar month. The number of power quality meters who have been commissioned and integrated in the system shall be intimated by the office of CE/IT, PSPCL, Patiala and payment shall be released accordingly. Integration of the same will also be in the scope of bidder.

(ii) 20% of cost of installation, commissioning and integration (as per Sr. no 4 , Part -1 of Schedule-B) shall be released after 3 months of successful operation of power quality meters on monthly pro rata basis for that calendar month.

c) After successful commissioning of particular power quality meter, the rental of SIM and FMS (O&M) (as per Sr. no. 5 & 6 of Part-1 of Schedule-B) shall be payable by PSPCL after two months from the commissioning of power quality meter. In case, Meter is commissioned from 1st to 10th of calendar month, the 2 months time shall be deemed to be current month and next month (e.g. meter commissioned on 06/06/2021, the payment shall be due after 31.07.2021) However if meter is commissioned from 11th of calendar month to the end of the month, the 2 months time shall be deemed after next 2 months. (e.g. meter commissioned on 11/06/2021 or 28/06/2021, the payment shall be due after 31.08.2021. The payment shall be made on monthly basis subject to SLA as applicable after confirmation from the office of CE/IT, PSPCL, Patiala.

In case the due date of payment in terms of payment schedule falls on a holiday including Sunday or holiday is subsequently declared on that date, the payment shall be released on the first working day falling next to the due date.

d) 50% of the IT infrastructure (as per Sr. no. 3 , Part-1 of Schedule-B) will be made after the availability of data of first meter.

20% of the cost of IT infrastructure (as per Sr. no. 3 , Part-1 of Schedule-B) will be made after the availability of data for 6 months.

Remaining 30% of the cost of IT infrastructure (as per Sr. no. 3 , Part-1 of Schedule-B) will be made after the integration of the data for all meters.

e) For delay in payments made by PSPCL beyond the stipulated period i.e. 45 days then simple interest @ 10% shall be given to the suppliers for delayed period subject to the condition that the delay in payment is more than seven days after the stipulated period i.e. 45 days. However, all-out efforts shall be made to prioritize the payment to all suppliers those come under MSMED Act-2006

8. DELIVERY SCHEDULE

The delivery schedule is as per Schedule-A. Purchase Orders shall be strictly placed on the above understanding. Ex-stock and earlier deliveries may be preferred, if required. However, The Purchaser reserves the right to defer the supplies of material, whenever deemed necessary. The necessary extension of Contractual Delivery Period for this period of deferment shall be granted to the firm on the same terms and conditions as contained in the Purchase Order-cum-contract agreement.

9. PENALTY FOR DELAY IN DELIVERY

If the supplier fails to deliver the material/equipment within the stipulated delivery period of purchase order/contract, the same is liable to be rejected and if accepted, the supplier shall be liable to pay penalty @ ½% (half of one percent) of the cost of undelivered supply/incomplete equipment per week of delay or part thereof not exceeding maximum limit of 10% of the cost of complete unit of undelivered equipment/material so delayed.

There will be no slack period.

10. EXTENSION IN DELIVERY PERIOD

“Any genuine delay in the approval of technical details, drawings, samples; issuance of amendment to Purchase Order; carrying out inspection; approval of Test Reports/Test Certificates issuance of dispatch instructions/ stations etc. will count towards extension of the delivery period by corresponding period other than that admissible under Force Majeure conditions, if any substantiated by the suppliers, and duly accepted by the Purchaser. No extension in delivery shall be granted in case of delay in payment.

11. NEGLIGENCE & DEFAULT

In case of any negligence on the part of a Supplier/Contractor to execute the Purchase-order/Contract with due diligence and expedition and to comply with any reasonable orders, pertaining to any contravention to the provisions of the Purchase-order/Contract, given in writing by the purchaser, the purchaser may give a 21 days-notice in writing to the Supplier/Contractor to make good the failure/neglect/contravention. In the event the Supplier/Contractor fails to comply with the notice within a timeframe considered to be reasonable by the purchaser, the business dealings shall be suspended/terminated with the firm by the purchaser for a minimum period of three years or in extreme cases, the firm shall be blacklisted forever by the purchaser.

Apart from the suspension/termination of business dealings/blacklisting of the supplier/contractor, the purchaser shall also forfeit the security & other pending payments of the Purchase Order/ Contract against which the supplier has defaulted, in addition to PEMD/ EMD lying with the concerned organization.

12.FORCE MAJEURE

During the pendency of the Contract/Purchase Order, if the performance in whole/part by either party or any obligation there under, is prevented/delayed by causes arising out of any natural calamity, war, hostilities, civil commotion, acts of the public enemy, sabotage, fire, floods, explosion, epidemics or non-availability of Government controlled raw material under orders/ instruction of Central/State Government regulations strikes, lock-outs, embargo, acts of Civil/Military authorities or any other causes beyond their reasonable control, neither of two parties shall be made liable for loss or damages due to delay or failure to perform the contract during the currency of Force Majeure conditions, provided that the happening is notified in writing (with documentary proof) within 30 days from the date of the occurrence.

The supplies shall be resumed under the contract as soon as practicable after the happening (event) ceases to exist.

13. EARNEST MONEY DEPOSIT (EMD)

- i. The Tenderers shall be required to submit Earnest Money @ 2% of Tender value rounded off to a multiple of Rs 10/- on the higher side subject to a minimum of Rs 1,97,010/- and maximum of Rs.7,88,030.
- ii. The following shall be exempted from depositing the Earnest Money:-
 - a. Public Sector Undertakings owned by Pb. Govt./Central Govt./Other State Govts. supplying material directly through units owned by them subject to submission of documentary evidence of Government ownership. Exemption shall not be

applicable if the Tender is submitted for supply of material through private unit/manufacturer.

b. Suppliers having Permanent Earnest Money Deposit of Rs.25 lac with the PSPCL provided that a certificate to this effect issued by the Nodal Authority i.e. AO/CPC(MM) of PSPCL, during six months immediately preceding the due date for Tender opening and showing the Serial. No./Account No. allotted in the Permanent Earnest Money Deposit Register shall be submitted by the Tenderers in the envelope for Earnest Money.

c. Suppliers of Proprietary items/ firms supplying items under DGS & D rate contract.

(iii)(a) In case of Tenders not accompanied by full amount of Earnest Money for the items Tendered but not less than 25% of the amount due, the order/contract shall be awarded only for part of material/equipment/service limited to a value corresponding to the actual amount of Earnest Money submitted with the Tender provided the placing of such part order is otherwise feasible and is in the interest of the PSPCL, otherwise such Tenders shall be ignored.

(iii)(b) The amount due, as referred to in clause 13(iii) (a) shall be calculated @ 2% of the Tender value and shall not be taken as 20,00,000/-i.e. the maximum amount payable as Earnest Money. Therefore 25% of earnest money shall thus be worked out on the basis of the entire amount so calculated, which shall, of course, be subject to maximum of Rs. 20,00,000/- and minimum of Rs. 10000/-.

iv. Earnest Money shall be forfeited in case of withdrawal/modification of an offer within the validity period, as required in the NIT/Tender Specification after opening of Tender.

v. In case of successful Tenders, Earnest Money shall be converted Security Deposit and shortfall, if any shall be got deposited for faithful execution of Purchase Order/Contract.

vi. In case of Tenders not accepted, the Earnest Money shall be refunded within 30 days of the award of order/contract of the successful Tenders.

In case of firms not falling within the zone of consideration earnest money may be refunded immediately wherever possible.

14. INTIMATION TO CHIEF ACCOUNTS OFFICER/DY. CHIEF ACCOUNTS OFFICER& CONSIGNEES

The Suppliers will intimate in advance the probable date of dispatch through fax/ email regarding the actual date of R.R. to the Financial Advisor-cum-Chief Accounts Officer/ Chief Accounts Officer/Deputy Chief Accounts Officer to enable him to

arrange payment, failing which demurrage, wharfage etc. will be to Supplier's account. A copy of such intimation shall also be immediately sent to the consignees and concerned Chief Engineer for reference, immediately. The material shall be consigned to any office including offices subordinate to them out of following which shall be indicated at the time of dispatch clearance:-

- i) Sr. Xen/ME Division, PSPCL, Patiala.
- ii) Sr. Xen/ME Division, PSPCL, Amritsar
- iii) Sr. Xen/ME Division, PSPCL, Jalandhar
- iv) Sr. Xen/ME Division, PSPCL, Ludhiana
- v) Sr. Xen/ME Division, PSPCL, Bathinda

1. GOODS AND SERVICE TAX:-

PSPCL is registered centrally in the state under GSTIN 03AAFCP5120Q1ZC.

- i. GST, as applicable, will be paid as per prevailing provisions of GST Act & Laws against submission of documentary proof at rate(s) prevailing during the contracted delivery period on the basis of actual. The following certificates shall have to be furnished along with invoice –cum-gate pass duly signed by the authorized agent /signatory. The first invoice should accompany the specimen signatures of the authorized signatory duly attested by the Managing Director of the factory with a copy of orders regarding his appointment as authorized signatory.
 - Certified that the transaction on which the GST is claimed has been/shall be included in the return submitted / to be submitted to the GST Authorities and the amount claimed from the Punjab State Power Corporation Ltd. has been / shall be paid to the GST Authorities.
 - Certified that the goods on which GST has been charged have not been exempted under GST Act or rule made there under and that the GST charged on these goods is not more than what is payable under the provisions of relevant act.
 - Certified that we shall indemnify the Punjab State Power Corporation Ltd. in case, it is found, at a later stage that wrong or incorrect payment had been received on account of GST; the same will be refunded.
 - Certified that we are registered dealer under the GST Act and our Registration No. is_____

- ii. In case the GST is applicable and is required to be paid extra as referred to Para-(i) above, the tenderer should clearly indicate HSN code of item along with present rate (in percentage) applicable to their company.
- iii. The maximum rate (in percentage) up-to which the GST may become leviable/ payable under the prevailing Rules & Regulations applicable to their company, should also be clearly indicated in their tender.
- iv. In case the GST is applicable /payable, necessary certificate of GST claimed / GST Gate Pass duly authenticated by the authorized representative of GST Authorities, shall however, be furnished by the supplier along with each consignment. The supplier should, therefore, clearly indicate in their tender that whether such GST Gate Passes/Certificates shall be furnished by them or not.

NOTE: The firms indicating nil or concessional rate of GST in their tenders (if any) will have to absorb GST up to the full rate applicable at the time of tendering.

- v. FURTHER any loss due to non-availability of ITC or levy of penalty/ interest payable by PSPCL on account of non-filing of return or non-compliance or any miss-statement given under the provisions of GST ACT by the firms shall be recoverable from them.
- vi. Further GST at applicable rates on principal supply shall be payable on Freight and Insurance.

16. INSURANCE

- i. The rates are required to be quoted F.O.R. destination and it is the responsibility of the Supplier to deliver the material FOR Destination in good condition. Supplier at his option may insure the material against all risks during transit at his own cost for full delivered value of the material upto destination. All works in connection with making and settling of claim, with Railway Authorities and/or Insurance Company, if any, shall be carried out by the Supplier for which no extra payment shall be made by PSPCL. However, necessary assistance required in connection with making and setting such claims, if any, shall be provided by the consignees.
- ii. All damages and/or shortages during transit as covered by the Insurance, shall be made good by the supplier immediately on receipt of such information from the consignees without, waiting for settlement of claims. However, in case of apparent damages and/or shortages, the consignees shall obtain the loss/damage certificate from the Concerned Authorities and send the same to the Contractor within a period of thirty days from the date of receipt of material. A certificate shall be submitted by

the Suppliers/Contractors with each bill to the effect that the material has been duly insured.

- iii. The consignees shall report losses damages to the supplier within 30 days of the arrival of the equipment. It will, however be the responsibility of the supplier to timely lodge claims on the insurance under writers and to arrange replacement there of.
- iv. The suppliers shall be wholly responsible for the loss, shortages, damages etc. during transit. Such short supplied, damaged material etc. will have to be replaced/repared by the Supplier/Contractor free of cost immediately without waiting for maturing of the Supplier's/Contractor's Claims with the Road Transport/Railway Authorities regarding insurance.
- v. In case replacement/repair of defective material is not carried out within six months of intimation of damages, supplier shall have to pay interest @12% per annum on the payments made by PSPCL, if any, from the date of its payment upto the date of the re-commissioning of the equipment after replacement/repair or to the date the default is made good.

17. WARRANTY FOR METERS

The supplier/contractor shall be responsible to replace free of cost with no transportation and insurance expenses to the purchaser up to the destination of material/equipment, the whole or any part of the material; which under normal and proper use and maintenance, proves defective in material or workmanship within the warranty period provided the purchaser gives prompt written notice of such defects to the Supplier/ Contractor. Such replacement shall be affected by the Supplier/Contractor, within a reasonable time not exceeding 2 months of the intimation of defects. Supplier's/Contractor's responsibility arising out of supply of material or its use whether on warranties or otherwise shall not in any case exceed the cost of correcting the defects or replacing the defective part/material and upon the expiry of the warranty period stipulated above, all such liabilities shall terminate.

The warranty period for meters will be restricted to 5 years from their date of receipt in PSPCL ME Labs. However, this clause will not be valid if the meter gets defective in its very first year (whether once or repeatedly). In such cases, a fresh warranty of 5 years shall be applicable from the date of receipt of repaired/replaced meters in PSPCL ME Labs.

In case the replacement/repair of defective material is not carried out within two months of intimation of defects, the supplier/contractor shall have to pay interest @ 12% per annum on the value of each complete operational unit of equipment beginning from the date of becoming defective upto date of its re-commissioning after the replacement/repair.

Amount due in lieu of above interest shall be recoverable from pending amount of the concerned purchase order or any other Purchase order Work Order/Contract of the firm with PSPCL. If no payment of the firm is pending with PSPCL against any other Purchase order/Work Order/Contract then the same shall be deducted from any Security/EMD or PEMD lying with PSPCL. In case, the total amount of EMD, PMED, Security of all Purchase order/Work Order/Contract is less than the recoverable amount, action shall be taken by PSPCL as admissible under the law e.g. filing of recovery suit & lodging of FIR etc. Action as per Negligence Default Clause of the purchase order shall also be initiated. Moreover the performance of the firm regarding repair of meters within warranty shall be given due importance while placing future order on such firm.

18.CHANGES

No variation or modification or waiver of any of the terms and provisions shall be deemed valid unless mutually agreed upon in writing by both the Purchaser and the Supplier.

19. DISPATCH INSTRUCTIONS

The material will be required to be dispatched as per the dispatch instructions issued by the PSPCL. However, efforts shall be made to rationally consign the material on truck load basis to as minimum number of stores as possible.

20. RAW MATERIAL

The raw material to be used in the manufacture of the goods/equipment to be supplied against Purchase Order/Contract shall be new and of the best quality of its kind available in the market. The Supplier/Contractor shall be solely responsible for the procurement of raw material required for the purpose.

21. SAMPLES

Whenever asked for, samples must be supplied by the Contractors/Suppliers free of cost. Ordinarily samples will not be returned to the Tenderer/Supplier. However, if desired by the Supplier/Contractor and feasible for the purchaser, the sample shall be returned to him at his own risk and cost.

22. INSPECTION AND TEST

- a) PSPCL shall inspect, examine and test the equipment/material through its official (s) and/or through an outside agency nominated by the PSPCL at the manufacturer's/ supplier's work, during or after the manufacture of goods prior to dispatch, on receipt of clear notice of minimum two weeks in advance, to be reckoned from the date of receipt by the purchaser. The supplier/Contractor shall

In case, the goods have not been inspected/tested at the manufacturer's works by a representative of PSPCL, the Supplier/Contractor shall furnish the following certificates to purchaser/ consignee along with consignment.

- a. Type test certificate/ Acceptance Test Certificates
- b. Routine test certificate.

24. FAKE INSPECTION CALLS

The purchasing authority will get the material inspected and issue dispatch instructions within 20 days of the date of receipt of call offering the material for inspection or date of readiness of material, whichever is later. In case date of readiness is not mentioned in the offer letter, then date of receipt of call shall be considered as date of readiness of material. In case the inspecting officer finds on arrival at the supplier's premises that the material less than 80% of the quantity offered in the inspection call is ready for inspection or material of the firm is rejected during testing/inspection, then the call shall be treated as fake call and the firm shall be responsible to pay fake call charges @ 10% of the value of the offered lot calculated as per P.O. rate subject to a maximum of Rs. 30,000/- per such occasion. Besides this, a letter of warning shall be issued and it shall be counted towards their performance for all intents and purposes. In case multiple sizes are to be inspected against a single inspection requisition, then the fake call charges shall be applicable on proportionate basis based on the PO value of items which were offered by the firm for inspection.

25. CANCELLATION OF PURCHASE ORDER

The purchaser reserves the right to cancel the purchase order/ contract as a whole or in part at any time without any financial liability on either side prior to the receipt of intimation regarding taking in hand the manufacture of material.

During the pendency of the Purchase order/ contract, if lower rates are received against the subsequent Tender Enquiry/Enquiries, then the supplier, whose overall contractual delivery period has expired, shall be offered to supply the material at either of the following rates, whichever is lower, along with any other terms and conditions at variance from the conditions as contained in the original purchase order, if any:

- a. Rates payable as per the terms and conditions of the Purchase Order less penalty as applicable
- b. Rates received against subsequent Tender Enquiry/Enquiries

In case the supplier refuses to accept the offer, then the purchase order shall be cancelled without any financial liability on PSPCL. However, if the supplier is debarred as per Regulation 10 (x), then the cancellation of purchase order shall not have any effect on the debarred status of the supplier.

The authority to cancel the Purchase order/contract in above cases shall be the concerned Head of Department in cases decided by BoDs/ WTDs/ CPC/ PPC/ PPC(General).

26. JURISDICTION

All legal proceedings in connection with the Purchase Order/Contract shall be subject to the territorial Jurisdiction of the local Civil Courts at Patiala.

27. ARBITRATION

- a. If at any time any question, dispute or difference, whatsoever, shall arise, between the Purchaser/PSPCL and the Contractors/Suppliers, upon or in relation, to or in connection with the Purchase Order/Contract, either party may forthwith give to the other, notice in writing of the existence of such question dispute or difference and the same shall be referred for sole arbitration as per the provisions of the Indian Arbitration Act,1996 (amended upto date) who shall give a reasoned/speaking awards. The award of the Sole Arbitrator shall be final and binding on the parties under the provisions of the Indian Arbitration Act, 1996 (amended upto date) and of the rules there-under. Any statutory amendment, modification or re-enactment thereof for the time being inforce, shall be deemed to apply to and be incorporated in the Contract/Purchase Order.
- b. Upon every or any such reference, the cost and incidental expenses to the reference and award shall be at the discretion of the Sole Arbitrator so appointed who may determine the amount thereof or direct the same to be taxed as between Solicitor and Client or as between party and party shall direct by whom and to whom and in what manner the same is to be borne and paid.
- c. The work under the Contract shall, if reasonably possible, be continued during the proceedings of the arbitration and no payment due/ payable to the firm by the Purchaser/PSPCL shall be with-held on account of such proceedings.

28. ORDER PREFERENCE

PSPCL shall allow an order preference as per the procedure laid down as under to such bidders whose works are situated within the State of Punjab:-

- a. The rate of Punjab based firms shall be de-escalated by 15% for all the units (i.e. 100* Quoted Rates/115). For these firms quantity upto 50% of the total ordered

quantity may be reserved provided their de-escalated rates fall below the lowest rates considered for the placement of purchase orders/ contract. For the purpose of allocation of quantity against Order Preference, the merit position of the Punjab based eligible firms shall be prepared separately. However, where the Punjab based firms qualify amongst the lowest bidders on their own quoted rates, they shall also form part of the original merit list without order preference for the purpose of allocation of quantity.

- b. Purchase order on the Punjab firm claiming order preference & found eligible as per clause (a) above would be placed on the lowest rates (L-1) considered for the placement of purchase orders/ contract
- c. The Punjab based firms claiming order preference shall be required to furnish an undertaking in prescribed form (Annexure-B) on a non-judicial stamp papers of appropriate value duly notarized to the effect that they shall execute the order if placed on them under 'Order Preference' as per the Tender specification. Such undertaking shall be submitted by the Punjab based firms latest by 5:00 PM on the day of opening of price bid and duly acknowledged by the concerned office.
- d. In case no such undertaking is furnished by the Punjab based firms, who are otherwise eligible for claiming 'Order Preference' as per the Tender specification, their Tender shall not be considered for placement of any order under Order Preference. In the event of refusal by the Punjab based firms to execute the purchase order/contract at their quoted rates or offers made under Order Preference as per 'a' and 'b' above as the case may be after furnishing the above undertaking as per Annexure II their earnest money shall be forfeited apart from initiating further administrative action, such as suspending business dealings blacklisting etc.

29.CONSTITUTION, EXPERIENCE AND FINANCIAL STANDING

The Tenderers shall invariably supply the following information with the Tenders :

a. Constitution and Composition of the firms

- i. If a Joint Stock Company, copy of its Memorandum and articles of Association and other particulars.
- ii. If a partnership firm, a copy of the partnership deed and particulars of its partners.
- iii. If a proprietary concern, the standing of the proprietor and if registered with the Registrar of Companies/Firms, their registration No etc.

- iv. Documentary evidence (Latest copy of memorandum of Micro Small & Medium Enterprises filed under section-8 of MSMED Act, 2006 duly acknowledged by competent authority.) of being a Micro, Small & Medium Enterprise. If the bidder does not submit the proof at the time of submission of its bid, it shall be considered as a Large Enterprise.
- v. A certificate for the last financial year, duly signed by any Director/Partner/Proprietor and Chartered Accountant that investment in Plant & Machinery of the enterprise does not exceed Rs. 25 Lac in case of micro and Rs. 5.00 Cr in case of small enterprise as prescribed in section 7 (1) a (i) & (ii) of the MSMED Act, 2006.

b. In case of authorized representative.

- i. Name and particulars of manufacturers
- ii. Certified copy of the instrument of authorization of the Supplier/Manufacturers.
- iii. Experience and standing in the market.
- iv. Particulars of the Purchase order/ Contracts executed with PSPCL and/or performance certificates of having executed Purchase Order/Contract of other State/ Central utilities.

c. Financial Position

- i. Balance sheets etc. for the last three years, including Trading, manufacturing, Profit and Loss Account should be duly certified by the Chartered Accountant.
- ii. Copy of PAN Card of the firm and director(s) and IT returns of last 3 years
- iii. Bank references
- iv. Solvency certificate not more than 12 months old.

30. INFORMATION REGARDING LIST OF BANKERS, THE PURCHASER DEALS WITH

- a. The Railway receipt/Goods Receipt and invoice etc. to be sent to the authorities as specified in the Purchase Order.
- b. Any demurrage occurring as a result of sending Railway Receipts/Goods Receipts through a Bank as specified in the Purchase order/ contract will be to the account of the Supplier/Contractor.

- c. No goods will be accepted by the consignees unless accompanied by challan /invoices containing the prices/quantity etc.

31. REVERSE AUCTIONING (RA)

The following procedure and terms & conditions shall be applicable for Reverse Auction in PSPCL:-

- i. In case the no. of bidders are more than 3, the H1 (Highest) bidder shall not be eligible to participate in the further process of the tender and his tender shall be rejected.
- ii. All the Bidders shall be assigned a unique user name and password by e-tendering agency of PSPCL. Bidders are advised to change the password after the receipt of initial password from PSPCL to ensure confidentiality. All bids made from Login IDs assigned to bidders shall be deemed to have been made by bidders/bidders' company/ bidders' authorized representatives.
- iii. Bidders shall be required to submit their acceptance to the stipulated terms and conditions before participating in the R.A.
- iv. Online Reverse Auction shall be conducted by PSPCL on pre-specified date and time for duration of 1 Hour. The bidders may quote the bids from their own offices /place of their choice. Internet connectivity is to be ensured by bidders themselves.
- v. All bidders are required to submit their price bid along with submission of Techno-commercial bid as per schedule. Only those bidders who submit their original bids within the scheduled time and who are considered technically and commercially eligible shall be eligible to participate in RA process.
- vi. The 'Opening Price' i.e. start price for RA shall be decided by PSPCL. Bid Decrement shall be 0.1% of L-1 Bid Price obtained against a particular tender enquiry upon the opening of Price Bid of tender.
- vii. Bidders shall be able to view the following on their screen along with the necessary fields during Online Reverse Auction:-
 - a) Start Price
 - b) Decrement Value
 - c) Rank of Bidder
 - d) Current Bid value of the Bidder (Total Bid Price)
 - e) Best bid in the Auction (Current L1 price)
 - f) Next Valid Bid (Total Bid Prices to be quoted in order to become L-1)
 - g) Minimum Bid Price (Bidder to enter his minimum Bid Price here)
- viii. Bidder may become 'L1 Bidder' by offering a price equal to or lower than the 'Next Valid. Bid' and this shall continue as an iterative process.
- ix. Auction Extension Time : If a valid bid is placed within 5 minutes of End Time of the RA, then Reverse Auction duration shall get automatically extended for another 5 minutes from the existing end time. It may be noted that the auto extension will take place if a valid Bid comes in those last five minutes. If a bid does not get accepted as

the lowest Bid, the auto-extension will not take place even if the bid might have come in last five minutes. The above process shall continue till no valid bid is received in last 5 minutes which shall mark the completion of reverse auction. The bidders are advised not to wait till the last moment to enter their bid so as to avoid complications related to internet connectivity, network problems, system crash down, Power failure etc. No request for extension in time period of RA due to any of the above reasons shall be entertained by PSPCL.

x. If no bid is received within the specified time duration of the online RA, then PSPCL shall reserve the rights to scrap the online RA process and proceed with the L-1 Bid Price received through e-tendering for further processing.

xi. After completion of online Reverse Auction, the Closing Price (CP) shall be considered as L1 rate for further processing including negotiations (if required). Based on the final price quoted by bidders, the successful bidders shall be required to submit summary of Final Price in prescribed format (Summary of Final Price-Reverse auction, Uploaded by PSPCL in Excel Sheet) within 2 working days of conclusion of the RA. In case a bidder fails to submit the above Summary, then it may lead to cancellation of bid and call for action against the bidder which may include forfeiture of EMD/PEMD and suspension of business dealings etc.

xii. Proxy Bids:- Proxy bidding feature is a pro-bidder feature to safeguard the bidders' interest in event of internet failure or to avoid last minute rush. The proxy bidding feature allows bidder to place an automated bid in the system directly in an auction and bid without having to enter a new amount each time a competing bidder submits a new offer. The bid amount that a bidder enters is the minimum bid price that the bidder is willing to offer. Here, the software shall automatically bid on behalf of the bidder who has quoted the lowest "Minimum Bid Price", the price which is one decrement less than the next bidder's bid price. This obviates the need for the bidder participating in the bidding process until the minimum bid amount is detrimentally reached by other bidders. When any bidder quotes a price lower than the existing lowest bid amount, the bidder (who had earlier submitted lowest proxy bid) has an option to once again start participating in the bidding process by quoting a price equal to or lower than the next valid bid price. However it may please be noted that if the current bid matches the minimum bid of the lowest bidder submitted earlier, the bid submitted by the lowest bidder will be recognized as the L1 at that instant.

During the course of bidding, the bidder shall not be able to delete or increase the proxy bid amount but can always reduce the same depending upon the amount quoted by other bidders. Proxy bids are fed into the system directly by the respective bidders. As such this information is privy only to the respective bidder(s).

Note: The Procedure/system of "Proxy Bids" will only be followed if the e-tendering software system supports it.

xiii. PSPCL shall reserve the rights to cancel/reschedule the RA process/ tender at any time, with due intimation to all concerned, without assigning any reason.

xiv. Other terms and conditions shall be as per bidder's Techno-Commercial offers and as per PSPCL's bidding documents and other up to date correspondence (if any).

32. LIMITATION OF LIABILITY

Bidders maximum liability as part of this contract shall not exceed 100% of the contract value.

33. The bidder and PSPCL shall not be liable to the other party for any indirect or consequential loss or damage, loss of use, loss of production or loss of profits or interest cost, provided that this exclusion shall not apply to any obligation of the bidder to pay liquidated damages to the PSPCL.

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DETAILS OF TESTING FACILITIES.**T.E.NO. MQP- 194/2021-22/PO(M)**

Name of the Test	Detail of Testing facilities available	Remarks.
1. TEST OF RAW MATERIALS.		
i.		
ii.		
iii.		
iv. etc.		
1. ROUTINE TEST.		
i.		
ii.		
iii.		
iv. etc.		
1. ACCEPTANCE TEST.		
i.		
ii.		
iii.		
iv. etc.		
1. TYPE TEST.		
i.		
ii.		
iii.		
iv. etc.		

NOTE:-In case, testing facilities are not available for certain tests, indicate in the remarks column from which testing house(s) Institution(s) these will be got carried out.

ANNEXURE-B**UNDERTAKING FORM**

(TO BE ENTERED ON A NON-JUDICIAL STAMPED PAPER OF RS. 15/- ONLY).

We -----state that our works are situated in the state of Punjab and we claim “Order Preference” as stipulated in the PSPCL tender specification No.-----due on----- against which we have submitted our tender No.-----dated-----We undertake to execute the order/contract if placed/awarded on to us even by counter offer at the rates worked out by Punjab State Power Corporation Limited in accordance with its Purchase Regulations. It is further understood that in the event of refusal by us or failure on our part to execute the order/contract(full or part) placed/awarded on to us under “Order Preference’ on any account what-so-ever, the Punjab State Power Corporation Limited shall have the right to forfeit the earnest money deposited by us and we shall have no claim for the refund thereof. The Punjab State Power Corporation Limited shall also have the right to suspend business dealing with us and to black-list our firm, without prejudice to other rights accruing to the Punjab State Power Corporation Limited under the purchase Order/Contract, if placed/awarded on/to us.

Signature of Constituted attorney.

ANNEXURE-'C'**1. PENALTIES / SERVICE LEVEL AGREEMENT (SLA) (APPLICABLE ON O&M PART)**

The essence of the operations and maintenance period is to provide maintenance support for the designated hardware, software and field devices, with the goal of meeting the availability as set forth herein. The maintenance practices to be followed shall be as per ISO 20000 standards.

Interval and Scalar data availability shall be as per verified from HES/MDM Application in the time window for availability calculation as described below:-

Sr. No.	Description	Duration	Data Availability
1	Interval * Read + Scalar Data in HES/MDM and billing system	Monthly	>95%

*interval: Refers to 1 hour interval data.

Data availability of the field devices shall be taken from the HES/MDM, where missing interval data read report is prepared on hourly, daily, weekly and monthly basis.

Time window for availability calculation for each criterion shall be as below:

- Monthly: before 06.00 AM of 5th of every month.

For SLA calculation all exceptional cases not attributable to contractor like- power failure, sabotage, defective / disconnected meter will be excluded from the calculation and a monthly report of the same shall be submitted by the bidder which will be verified by PSPCL.

Penalty-

The following operational penalties shall be applicable on the bidder and shall be calculated as here under:-

Sr. No.	Particular	Extent of penalty/No Payment
A	Daily Reading, Availability and Analysis for each meter as per SLA tool (Penalty will be imposed on monthly rental of SIM as well as per month FMS cost per meter)	
1	Up to 95%	No Penalty

2	Below 95 % and Up to 75%	<p>No payment towards non reporting Power Quality Meters.</p> <p>Additionally penalty @ 1% by which the SLA falls below 95% and upto 90% shall be deducted from the invoice of the vendor.</p> <p>Additionally penalty @ 2% by which the SLA falls below 90% and upto 85% shall be deducted from the invoice of the vendor.</p> <p>Additionally penalty @ 3% by which the SLA falls below 85% and upto 80% shall be deducted from the invoice of the vendor.</p> <p>Additionally penalty @ 4% by which the SLA falls below 80% and upto 75% shall be deducted from the invoice of the vendor.</p>
3	Below 75%	No payment shall be made.

Note:

- i. The bidder shall ensure data availability for 100% Power Quality Meters.
- ii. The firm shall furnish the communication report as per SLA along with the payment invoices. The HES/MDM should have such feature to get date and time wise report meter communication status.
- iii. The designated officer of the PSPCL working under CE/IT shall verify and certify the invoice through system generated reports; bidder shall provide an interface for verification of the invoice in the software to facilitate the verification authority to compute the availability of meter data on system and amount of applicable penalty.
- iv. All percentage for SLA are to be calculated for a month on daily basis for which report shall be submitted by contractor & shall be verified by PSPCL.

In addition to above, other Operational SLAs are as under:

Sr. no	Service	Parameter	Service level	Validation	Penalty
	HES/MDM specific	1) On-demand	1) Action performed at 90% of meters	Monthly SLA	Penalty will be 10% of

service levels (Integration and Communication)	actions	within 1 hour:	MQP-194/2021-22/PO(M)	perform monthly O&M charges.
		2) Action performed at 95% of meters within 2 hour:	performance report	
	2) Actions carried out on predefined schedule date and time	90% completed within one hr. of scheduled date and time and 99.9% within 24 hrs. of scheduled date and time.	Monthly SLA performance report	In case 2-3 SLAs are not achieved in a given month 15% of monthly O&M charges will be levied as penalty.
	3) Recurring data delivery action	99.9% completed within 24 hrs. after midnight	Monthly SLA performance report	
Back-end applications uptime	Uptime of applications such as HES/MDM	>99.5% of the time	Monthly report	2% of monthly O&M charges will be deducted for every 0.5% decrease
Integration services uptime	Web services for integrating HES/MDM	>99.5% of the time	Monthly report	2% of monthly O&M charges will be deducted for every 0.5% decrease
Meter key information availability	Update of meter key files provided by the meter manufacturer in the Head end	100% information available before installation	Zero installation issues due to unavailability of Asset	INR 2000/- per day

Problem management	Power Quality meter shall analyze all the incidents and provide a root cause report every month if there are more than 5 incidents of the same type.	100% submission covering all incidents logged in that month	timely Root cause Incident report stating problems faced by the users. Report detailing corrective and preventive actions .	5% penalty on the monthly O&M charges, if the supplier does not submit a problem report for that month. 5% penalty on the monthly O&M charges, if the supplier does not perform the corrective action for more than one calendar month.
Release management	Release and UAT of approved software version	100%	Release on agreed date	5% of annual O&M charges if agreed software development date for final production deployment is not adhered.
Adherence of security policy	Bidder shall adhere to the security policy developed in	Quarterly	100% compliance Non compliance	No penalty 0.5% of the quarterly operations and

consultati
on with
PSPCL

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maintenance
cost for every
day's delay on
an incremental
basis.

Note: The maximum penalty in a month for O&M charges on any particular meter shall be restricted to 10% payment due to PSPCL for that meter for "Other Operation SLAs" listed above.

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