Maharashtra State Electricity Distribution Company Limited

Tender No: MSEDCL/HO/CGM-IT/Substation Monitoring System/22-23/1 Version 1.0

Date : 25.08.2022

BID NOTICE

Chief General Manager (IT), on behalf of Maharashtra State Electricity Distribution Company Limited (the Employer), hereby invites sealed bids from eligible bidders for "**Tender for Implementation of Substation Monitoring System for 33/22/11 kV substations and switching stations across MSEDCL**". Entire bidding document is available on MSEDCL e-Tendering Website **https://etender.mahadiscom.in** as per date indicated below. Any changes in the Bid Schedule, corrigendum etc. shall also be notified via MSEDCL's website. Prospective bidders are therefore requested to regularly check the website for any updates.

Timelines of tender	Date and Time
Tender Document Sale/download	25.08.2022
Date and time of online Pre-bid Meeting Link for Pre-Bid meeting: https://meet.google.com/ong-cndw-fti	06.09.2022 at 16:00 Hrs.
Due date and time of submission of Bids	23.09.2022 at 17:00 Hrs.
Date of Technical Bid Opening	23.09.2022 at 17:15 Hrs.

Tender Fee: **Rs. 29,500/-** incl. 18% GST via online payment only (Non-Refundable)

Interested parties may register on MSEDCL E-tendering website: "http://etender.mahadiscom.in" and purchase Tender by online payment of Tender fees Rs.29,500/- including GST.

Bid Security:

The bid must be accompanied with Bid Security (EMD) for an amount in Indian Rs. 4,50,40,991/- (Rupees Four Crore Fifty Lakh Forty Thousand Nine Hundred and Ninety One only) by way of **online payment** through e-tendering website or be **in the form of an unconditional Bank Guarantee** from any Nationalized / Scheduled Bank in favour of Maharashtra State Electricity Distribution Company Limited, payable at Mumbai**, if bidder bids for all 4 Regions**.

If bidder bids **for less than 4 Regions then EMD is to be submitted online payment** through e-tendering website **or offline** in form of an Unconditional Bank Guarantee from any Nationalized / Scheduled Bank in favour of the Maharashtra State Electricity Distribution Co. Ltd., payable at Mumbai as mentioned below:

Region wise Bid Security:

Option is given to bidders for quoting Region wise, accordingly Region wise EMD will be accepted as per below table. For eg. if the bidder is opting for Aurangabad & Pune Region out of 4 regions then the bidder has to submit the bid security of total Rs. 1,20,30,193+ Rs. 1,01,61,826 =Rs. 2,21,92,019/-

Region Name	EMD (in Rs.)
AURANGABAD	1,20,30,193
KOKAN	1,22,65,540
NAGPUR	1,05,83,433
PUNE	1,01,61,826

Region wise EMD is to be submitted online/ offline in form of an Unconditional Bank Guarantee from any Nationalized / Scheduled Bank in favour of the Maharashtra State Electricity Distribution Co. Ltd., payable at Mumbai as mentioned in details in Tender Document. The original hard copy of the EMD should be submitted before tender opening date.

QUALIFICATION CRITERIA:

The bidder (individual or JV or members of Consortium collectively unless explicitly mentioned) should meet the Qualification Criteria as mentioned in below table:

Sr.no	Type	Description	Evaluation
1	Definition of Bidder	**1] Bidder**: • The bidder can be an individual entity or a JV or consortium of maximum two (2) entities registered in India under companies Act 1956 or Companies Act 2013, or Firm registered with Registrar of firms in India who fulfils the eligibility criteria. **Lead Bidder/ Lead Consortium Member:** • In case of consortium, one of the consortium members responsible for performing key components of the contract shall be designated as Lead Bidder. Evidence of this authorization shall be provided by submitting a power of attorney signed by legally authorized signatories of all consortium members along with the bid. • The lead bidder shall have a registered office and operations in India for at least one year prior to submission of the bid. Also each member of consortium shall have registered office in India. • Lead partner in the JV/consortium should have minimum 51% stake. 2] The Bidder (individual/ all members of consortium) shall have a valid PAN and GSTIN Number if applicable. 3] The Bidder (individual/ all members of consortium) should not have been blacklisted or barred by any of the Government/Public Sector Undertaking (s) (PSUs), Regulatory Agencies and private entities.	1] Certificate of Incorporation issued by Registrar of Companies or Article of Association or certificate issued by Registrar of Firms 2] Copy of relevant certificates indicating PAN number, GST registration number (GSTIN). 3] Undertaking signed by its Authorized Signatories that bidder (individual/ all members of consortium) is not blacklisted. In case of consortium, each member should submit separate undertaking.

2	Experience in implementation	**A] Part 1** • Experience of having successfully completed SCADA system/ Substation monitoring system / RT-DAS project by bidder during last 7 years ending last day of month previous to the one in which bids are invited and should be either of the following: - a. Three successfully completed SCADA system projects / Substation monitoring systems projects / RT-DAS projects costing not less than the amount equal to Rs.48.12 Crores for Aurangabad Region, Rs.49.06 Crores for Kokan Region, Rs. 42.33 Crores for Nagpur Region and Rs.40.65 Crores for Pune Region. Or b. Two successfully completed SCADA system projects / Substation monitoring systems projects / RT-DAS projects costing not less than the amount equal to Rs.60.15 Crores for Aurangabad Region, Rs.61.33 Crores for Kokan Region, Rs. 52.92 Crores for Nagpur Region and Rs.50.81 Crores for Pune Region. Or c. One successfully completed SCADA system projects / Substation monitoring systems projects / RT-DAS projects costing not less than the amount equal to Rs.96.24 Crores for Aurangabad Region, Rs.98.12 Crores for Kokan Region, Rs. 84.67 Crores for Nagpur Region and Rs. 81.29 Crores for Pune Region. • The SCADA system/ Substation monitoring system / RT-DAS projects should be in successful operation for at least 1 year post commissioning such projects. • The SCADA can be of other sector such as gas/water or industrial sector etc. **AND** **B] Part 2** • The SCADA system/ Substation monitoring system / RT-DAS projects should have been successfully implemented by bidder in at least as many number of sub-stations as mentioned in table-A for the Region for which the bidder has quoted. The experience should be of power distribution/transmission companies in India during last 7 years ending last day of month previous to the one in which bids are invited. • To qualify for Experience in implementation, highest nos. of substations amongst all the opted Regions will be considered as per Table-A.	• References along with requisite contract/ Purchase Order (PO)/ Work Order (WO)/ Letter of Award (LOA)/ Work completion certificates from clients. The references should indicate client name, scope of work, Project start date and date of completion, cost of the project/ LoA price in all respect. • Documentary evidence of completion of the Project or completion of Go-live status (i.e. Go-live certificate, UAT testing certificate etc.) or other documentary evidence indicating completion (e.g. proof of payment received/ proof of asset capitalized in books of accounts (as applicable) and client certificate for supply of material or similar proofs) along with contact details of the client. • Client certificate and other documentation for implementation performance/ operation

3	Financial Strength	• The bidder should have minimum average annual financial turnover of at least Rs.36.09 Crores for Aurangabad Region, Rs.36.80 Crores for Kokan Region, Rs.31.75 Crores for Nagpur Region and Rs.30.49 Crores for Pune Region for the last three financial years ending 31st March of the previous financial year (i.e. FY 2019-20, 2020-21 and 2021-22 or FY 2018-19, 2019-20 and 2020-21 in case audited statements are not available for FY 2021-22) for the Region for which the bidder has quoted. • To qualify for Financial strength, addition of Average annual Financial turnover of all the opted Region will be considered. • Net Worth for the each of the last three Financial Years should be positive. Net worth means the sum total of the paid up capital and free reserves (excluding reserves created out of revaluation) reduced by aggregate value of accumulated loses (including debit balance in profit and loss account for current year) and intangible assets. • In the event Bidder is a Consortium, the financial requirement shall be met individually and collectively by all the Members in the Bidding Consortium as below: • The Lead Consortium Member/ Lead Bidder shall meet not less than 51% of the minimum financial requirement criteria as given above. • While, the other Consortium Member individually shall meet not less than 30% of the minimum financial requirement criteria.	1. Copy of the Audited Annual financial statements, Balance Sheet and P&L Account for the respective financial years. 2. Net worth certificate duly certified by Chartered Accountant to be submitted as a proof of net worth.
4	Employee Capability	• Power Sector Experts (2 nos.)- Degree in Electrical / Electronics / Instrumentation Engineering with minimum 7 years of experience in Power Sector having knowledge of substation monitoring system/SCADA system/ RT-DAS. Minimum one person to have Degree in Electrical Engineering is mandatory. • The bidder should submit detailed resumes with contact information for all experts as above who are proposed to be deployed in this project.	Self-Certification from Authorized Signatory along with names of the experts Signed resumes of the employees
5	Quality Certification	ISO 9001:2015 and CMMI Level 3 Certification and ISO 27001 Certification	Copy of relevant Certificate

Table-A:

Sr. no.	Name of Region	No. of s/s	SCADA system/ Substation monitoring system/ RT-DAS implemented in number of substations	Minimum average annual financial turnover in Rs Crores
1	Aurangabad	916	92	36.09
2	Kokan	864	86	36.80
3	Nagpur	770	77	31.75
4	Pune	707	71	30.49
Total		3257		

Multiple POs for same contract from same client will be considered as a single project. In such case, cost of project will be sum of value of all such POs in a project.

Any removal/ change/ replacement of Key Personnel (as provided in Employee Capability) shall be notified to MSEDCL within 7 (seven) working days along with the Curriculum Vitae (CV) of the personnel replacing the previous personnel.

Please note that to qualify for Experience in implementation, highest nos. of substations amongst all the opted Regions will be considered as per Table-A and to qualify for Financial strength, addition of Average annual Financial turnover of all the opted Region will be considered as per Table-A.

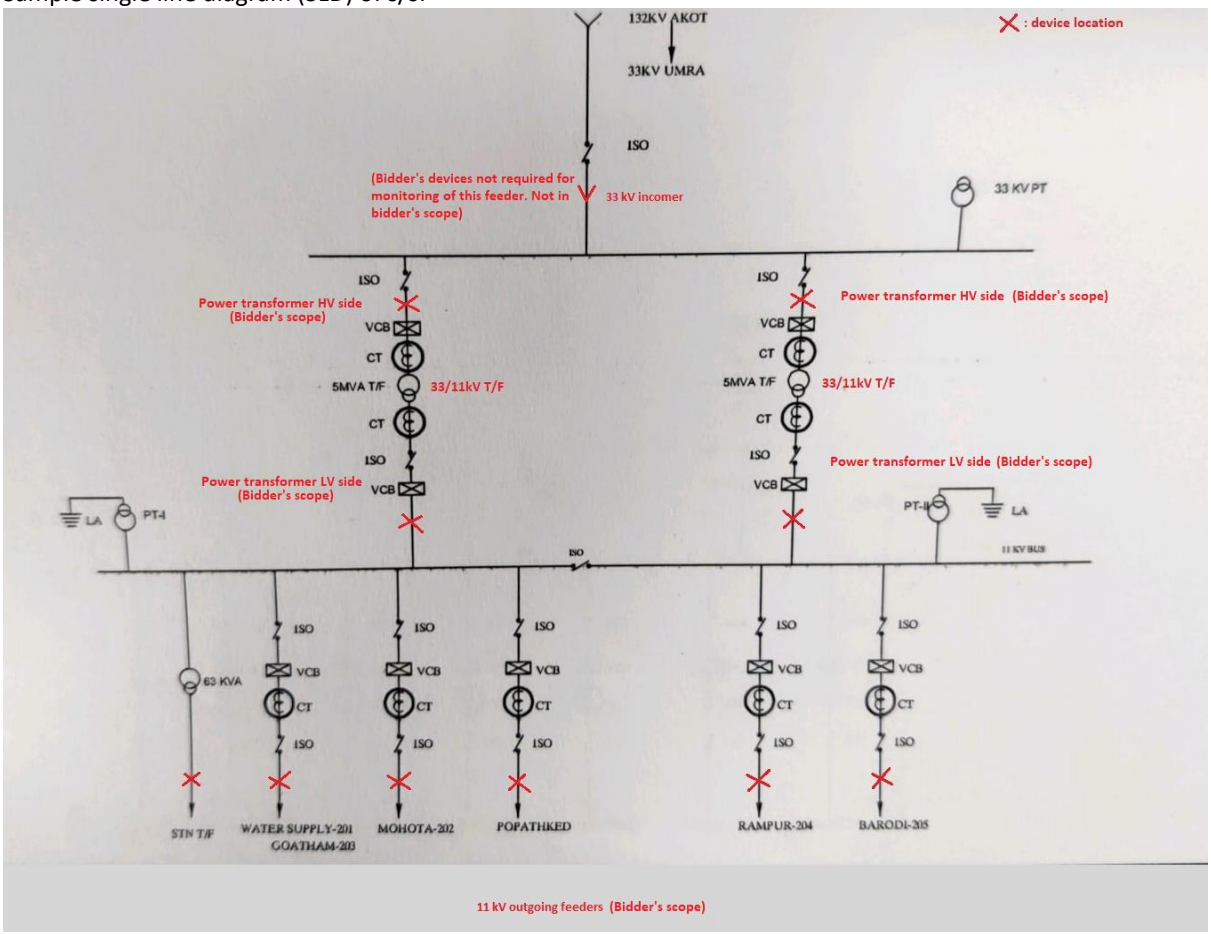
Please refer below examples for more clarity:

1) If the bidder is opting for Kokan Region only out of 4 Regions then the bidder should have experience of implementing SCADA system/ Substation monitoring system / RT-DAS projects in total 86 nos. of substations and average annual financial turnover of the bidder should be Rs. 36.80 Crore.
2) If the bidder is opting for Aurangabad & Nagpur Region out of 4 Regions then the bidder should have experience of implementing SCADA system/ Substation monitoring system / RT-DAS projects in total 92 nos. of substations and average annual financial turnover of the bidder should be Rs. 67.84 Crore (i.e. Rs. 36.09 crore + Rs31.75 crore).

BRIEF SCOPE OF WORK:

1) Supply, customization, installation, deployment and maintenance of necessary hardware, centralized software and communication equipment at 3257 nos. of 33/22/11 kV Substations and switching stations across MSEDCL and necessary HES/DAS software at cloud to facilitate monitoring of Power Transformer, incoming and outgoing feeders, capacitor bank, station distribution transformer and substation DC auxiliary power supply in project area of MSEDCL for the purpose of Monitoring, data logging and data analysis.

   Sample single line diagram (SLD) of s/s:



   Device location given in SLD is only for illustration purpose. Bidder is required to do monitoring of the equipment and install their devices based on the site survey. Further, for switching station monitoring of incoming feeder to switching station is also to be done.

2) Along with the monitoring of feeders, feeder control action (ON/ OFF) is also required under ADMS (Automatic Demand management Scheme) for all feeders.
3) One computer with required software, hardware, one computer Table and one Chair is to be supplied per sub-station compulsorily. Also, this local PC is required to fetch the data from the devices installed by the bidder and not from the cloud.
4) Alert message indicating which feeder is tripped under ADMS should be displayed on local PC at substation immediately.
5) Proposed substation monitoring scheme shall monitor all parameters on real-time basis at the substation and feeder level, and provide the reports at the Substation, Sub-Division, Division and Circle/Zone/Region/HO level.
6) Contract period will be 9 years with 1 year period for installation. Operations and Maintenance of the system for the period of 8 years. The required manpower is to be deployed by bidder for Operations and Maintenance activity for smooth functioning of the system.

7) Following reports/monitoring is to be done.
   a) Real time data for Voltage, current, Demand, Power factor, energy, frequency etc.
   b) Indicative List of electrical parameters to be captured and I/O list are listed as below:

	Data points		Type
	Real time clock , date and time (by default HH:MM:SS)		
Feeder (incomer, Transformer LV outgoing feeders and outgoing feeders)	Parameters	Ir	Analog
		Iy	
		Ib	
		Vr-n	
		Vy-n	
		Vb-n	
		Vr-y	
		Vy-b	
		Vb-r	
		Signed active power kW (+ forward; - reverse)	
		Signed Reactive power, kvar (+ lag; - lead)	
		Apparent power KVA	
		Frequency	
		Number of power failures	
		Cumulative power OFF duration in min	
		Cumulative energy , kWh (import)	
		Cumulative energy , kWh (export)	
		Cumulative energy , kvarh-Q1 (as per IS 14697)	
		Cumulative energy , kvarh-Q2 (as per IS 14697)	
		Cumulative energy , kvarh-Q3 (as per IS 14697)	
		Cumulative energy , kvarh-Q4 (as per IS 14697)	
		Cumulative energy , KVAh (import)	
		Cumulative energy , KVAh (export)	
		Maximum demand, kW	
		Maximum demand, KVA	
		Three phase power factor, PF	
		Signed Power factor , R phase (+ lag, - lead)	
		Signed Power factor , Y phase (+ lag, - lead)	
		Signed Power factor , B phase (+ lag, - lead)	
	Master trip		Digital Input
	OC		Digital Input
	EF		Digital Input
	CB OFF		Digital Input
	CB ON		Digital Input
	ADMS		Digital Output
	Local remote switch		Digital Input
	Spare		Digital I/O
DC Battery	Volt		Analog

	Current	
Substation distribution Transformer	Volt	Analog
	Current	
	kW	
	kWh	
	PF	
Capacitor Bank	V	Analog
	I	
	PF	
	MW	
	MVAR	
	Capacitor breaker Status	2 Digital Input
	Healthiness of Neutral Displacement Relay	Digital Input
	Spare	Digital I/O
Power Transformer, OLTC	OTI	Analog
	WTI	Analog
	OLTC	Analog
	OTI Alarm	Digital Input
	OTI Trip	Digital Input
	WTI Alarm	Digital Input
	WTI Trip	Digital Input
	Buchholz Trip	Digital Input
	OLTC Buchholz Trip	Digital Input
	Differential Relay	Digital Input
	Oil Level Alarm	Digital Input

c) The meters/ MFT/ MFM provided by the bidder should have accuracy class of 0.2S with certification from NABL approved agency/ lab. Existing MSEDCL meters are not to be used.

d) Energy Accounting:

1) 33 kV incomer of Power transformer HV side vs 11 kV incomer i.e. Power transformer LV side (i.e. Power transformer loss) . If there are more than 1 Power transformer then addition of input energy of all Power transformer is to be done and energy accounting to be carried out accordingly.
2) 33 kV incomer of Power transformer HV side vs 11 kV outgoing feeders (i.e. S/s loss).
3) 11 kV incomer i.e. Power transformer LV side vs 11 kV outgoing feeders (i.e. 11 kV Bus loss) .
4) Similarly for switching station 11 kV incomer vs 11 Kv outgoing feeders loss is to be calculated.
5) Additionally for each individual feeder, the corresponding consumer sale data in kwh will be given to bidder for calculation of feeder loss.

e) Average, Instantaneous, Maximum and Minimum values of voltage, current and demand and other parameters of feeders / sub-stations

f) Computation of reliability indices such as SAIDI, SAIFI etc.

g) Monitor Power transformer load, Oil Temperature, Oil level, Winding Temperature, OLTC position, differential relay and buchholz relay.

h) For Monitoring of capacitor bank in sub-station following parameters are to be monitored:

i. Current, Voltage, Power Factor, Under Voltage indication, Over Voltage indication, Neutral current measurement (Healthiness of Neutral Displacement Relay)
ii. Indication for taking bank in circuit depending on load condition.
iii. Measurement of instantaneous values of MW, MVAR, KV and Connected capacity of capacitor Bank.

i) Change in circuit breaker (ON/OFF position) and relay status with time stamp along with "Fault" indication shown on SLD (with specific information about EF/OC/ differential relay/ buchholz relay).
j) Status of substation DC auxiliary supply (including monitoring of voltage, current, power and energy)

8) Facility to time synchronize the events and energy recordings with GPS clock
9) Reporting of violations: Whether the feeders are tripped as per the planned outage schedule, Power transformer and feeder with load more than prescribed values, voltage variations etc. Violations, if any, should be tagged and report to be sent to the concerned with the reason (email and SMS alerts).
10) To facilitate the concerned engineer-in-charge of the substations to view the status of their feeders and other vital parameters through web browser / mobile phone/ tablet.
11) Integration of HES/DAS with MSEDCL systems. Bidder has to provide DAS/ HES and integrate the same with MSEDCL systems (deployed on AWS cloud) using Web Services/ APIs. There should be one DAS/ HES for each Region. The centralized software is to be provided by the bidder. The centralized software is to be deployed on AWS cloud. The mandatory technical requirements of the cloud are enclosed as Appendix 10.
12) Implement civil and electrical work required for all the supplied equipment including separate earthing.
13) Cyber Security-Bidder is required to take necessary cyber security measures. Bidder shall ensure device's cyber security with due consideration of authentication, data privacy, confidentiality and as per latest cyber security guidelines of CERT-In specified at http://www.cert-in.org.in. Provided devices shall have required security audit compliance/certification. CEA (Cyber Security in Power Sector) Guidelines, 2021 are also to be complied with.

    Security Management:

    - The protection from unauthorized usage, detection of intrusions, reporting as required and proactive prevention actions are to be provided by the bidder. No cyber-attack or intrusion in Substation monitoring system incident
    - Cyber security audit shall be carried out from CERT-IN empanelled agency at every six month as per CEA guidelines for cyber security in power sector.
    - No cyber-attack or intrusion in SCADA/DMS system incident

14) Bidder has to carry out all required work including supply and installation of necessary hardware/sensors/wiring for monitoring of above parameters. If Overcurrent, earth fault and differential relay are found to be non-working then the same will be replaced by MSEDCL.
15) If SIM card based solution is proposed by bidder then SIM cards are to be provided by the bidder and solution should be dual SIM based (4G SIMs, may have fall back to 2G) for redundancy. The monthly SIM charges will be borne by the bidder. It is bidder's responsibility to check the network coverage at site and they should use two SIM cards preferably from different service providers. Please note that bidder is free to use any other communication technology (such as VSAT etc.) other than SIM card so as to achieve SLA however all charges required for communication are to be borne by the bidder.

Important Note:

If Bidder has not participated in any tender of MSEDCL in the past, then it should go through 'Vendor Registration manual' for WORKS Tenders available on e-Tender portal and create the 'Contractor' Account for participating in Works tender at e-Tender portal which can be created at no cost. Vendor manuals for Registration & Bid Submission can be found at MSEDCL's eTender Portal (Download Section). Bidder will be solely responsible for any mistake in account creation/wrong category. After creation of account,

kindly go through 'Bid Submission manual' for Works Tender to understand the procedure of uploading Bids on e-Tender portal. Please note that Bidder has to purchase the tender (by paying Bid Fee) before submitting their Bid.

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