



**From:**

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**Ref.No. :** EE/EHV/O&M/DIVN/PNL/T-/No. 129

**DATE:-** 29.01.2025

**E-Enquiry (Budgetary Offer)**

**Sub:- Extension-1** to E-enquiry to submission of budgetary offer for work of supply & installation of Transformer Auxiliary Monitoring System at 220kV Tambati and 100kV Taloja Substation under EHV (O&M) Division Panvel.

**Ref:-** EE/EHV/O&M/DIVN/PNL/T-/No.40 dt.09.01.2025

**Dear Sir,**

In context to the above subject, Budgetary offer are invited by undersigned for work of supply & installation of Transformer Auxiliary Monitoring System at 220kV Tambati Substation under EHV (O&M) Division Panvel as per Technical specification attached herewith, on **before 04.02.2025 up to 18:00 Hrs.** The Other Terms and Conditions are as mentioned below.

- 1) Quotation should be duly filled in and submitted to this office via post or by hand in **closed envelope only**.
- 2) This enquiry is solely for collection of offer for estimate purpose & not for work allocation.
- 3) Taxes should be mention separately.
- 4) The offer should be submitted as per details mentioned below.
- 5) Quote rate in prescribed format & attached Specifications:
- 6) The quoted rates should be valid up to 180 days
- 7) The agency should submit work experience for similar nature of work in MSETCL/MSEDCL / any power utility or private Company related document with this offer.
- 8) GST Registration certificate.
- 9) PAN Card.

SD/-

(A.P. Joshi)

**EXECUTIVE ENGINEER  
E.H.V. (O&M) DIVN. PANVEL**

## Annexure

Sr.No.	Particulars	Specification	Units	Qty.			Rate
				Tambati	100kV Taloja	Total	
		<b>Supply Portion</b>					
1	TAMS Software with necessary Customization as per S/stn. Requirement	Compatible with IEC 61850, 104, Modbus shall be able to generate Chart, Graphs, Customized reports in PDF /Excel Format	Each	1	1	2	
2	TAMS TAP Changer Controller cum Transformer Monitoring Unit (TF IED)	IEC 61850 edition 1 &2 complied, 2x Ethernet ports, 2 x FO Port, 2x, RS 485 Port, Supply Voltage 110 or 220 VDC or 0-300 V AC/DC, 16 DI, 8 AI, 4 DO	Each	4	3	7	
3	TAMS RTU / PT IED	IEC 61850 edition 1 & 2 complied, 2X ethernet ports, Supply Voltage 110 or 220 VDC or 0-300 V AC/DC, LV PT Input Module	Each	1	1	2	
4	TAMS Terminal Board (Yard Cabinet)	IP 65 rated Panel with necessary stand	Each	4	3	7	
5	TAMS Industrial Grade PC along with Standard Kiosk in the Control Room	Fanless design, 2 X ethernet interfaces, 2.0 GHz, Windows Operating System	Each	1	1	2	
6	Armoured Fibre Optic Cable	6 Core Armoured Fiber Optic Cable	RMT	500	500	1000	
7	12 Core Copper Cable	12 Core 1.5 sqmm Copper Cable	RMT	160	120	280	
8	4 Core Copper Cable	4 Core 1.5 sqmm Copper Cable	RMT	320	240	560	
9	TAMS FO Joint Box /LIU	Convertor for Armoured to unarmoured vice versa	Each	4	3	7	
10	TAMS Managed Ethernet Switch	4x Ethernet Ports, 4x Fiber Ports, managed arch, Based communication switch	Each	1	1	2	
		<b>Service Portion</b>					
11	Configuration, Testing, Validation of T/F or ICT in TAMS Software	Cabling, Termination of OLTC DM & FCC with IED & Programming of IED as per site requirement	Each	4	3	7	
12	Installation of terminal board near T/F in yard	Ground of stand & Installation of terminal board on stand	Each	4	3	7	
13	Customization of TAMS Software as per Substation	Development of welcome screens & individual T/f screen & settings page o TAMS as per site requirement	Each	1	1	2	
14	Laying of FO Cable	Laying of FO Cable from T/f to control room using existing cable trench	RMT	500	500	1000	
15	Testing & establishment of communication using FO joint Box & managed Ethernet Switch	Installation of multiple FO Joint Box & managed ethernet switch & establishment of communication from each T/F IED & TAMS Software	Each	1	1	2	

Note :- 1) Actual quantity may vary as per site condition.  
2) Taxes should be quoted separately .

Sd/-  
**(A.P. Joshi)**  
**EXECUTIVE ENGINEER**  
**E.H.V. (O&M) DIVN. PANVEL**

Regd. Office : "Prakashganga" Plot NO. C-19 "E" Block, Bandra- Kurla complex,  
Bandra (E), Mumbai – 400 051

# General Technical Specifications for ‘Tap changer controller Cum Transformer Auxiliary Monitoring System’ (TAMS)

## A) General Scope:

1. The transformer auxiliary data collecting device (**IED/ RTU/ PLC controller**) is to be installed in the switch yard near transformer. The device shall be mounted in the switchyard near transformer in a separate panel (suitable for IP65) and the transformer auxiliary signals are to be hardwired-up from FCC to TAMS panel. The device shall have BO card for o/p command and BI-AI card for connecting transformer auxiliary inputs and 4-20 mA inputs from transformer/ Transducer. Suitable as per site requirement.
2. From TAMS panel (PLC controller/ IED/RTU) the data shall be routed through optic cable to the monitoring device (PC with TAMS software) in control room. The output data from the device shall be on IEC 61850/IEC 60870-5-104 and transferred to the control room via armored fiber optic cable.
3. Control room shall have a wall mounted rack for termination of communication cable from yard and for mounting other required devices. Industrial grade furniture to be provided for workstation PC or a suitable panel can be provided for the same in Control Room.
4. There shall be one device/RTU in control room having following ports – IEC 61850 x 2 ports, IEC 104 x 2 ports, Modbus x 2 ports (at least 01 serial). This device is required for configuration of transformer LV side voltage & current (for AVR & temperature curve purpose). Also it shall act as a data exchange unit on protocol such as IEC 61850, 104, Modbus.
5. The data from all transformer connected devices shall be integrated in the transformer local data monitoring system (TAMS PC) where the required software shall be installed.
6. **The MSETCL approved OEMs/ vendors for IED/RTU/Controller/SAS shall be acceptable. The vendors offering said solution with approved products are acceptable provided their solution is verified and approved at Automation Lab, ACI & P office.**

## B) Technical specifications and Test Certificate of major parts of offered product Solution:

### 1. IED/RTU/PLC controller with BI, BO & AI card :

- MSETCL approved IED/RTU/ Controller
- Protocol – IEC 61850 Edition 1 & 2
- IEC 60870-5-101/104 server & client
- IEC 61131-3 (for PLC controller)
- Modbus / TCP – 2 No’s RS485
- Memory / storage 512 MB
- Protocols supported – https, FTP, SNTP, SNMP and SMTP.
- IEC 61850 Server with GOOSE Publish/Subscribe mechanism.
- Binary Inputs – 16/24/32 – as per site requirement.
- Binary Outputs -8/16/24- as per site requirement.
- 8 Channel for Analog Input.
- Ports ----- 2 x Ethernet Port, 2 x FO port, 2 X RS485.
- Supply voltage – 110/220 V DC OR Universal 0-300V AC/DC.  
(Suitable converter can be utilized , if required)

### Cyber Security compliance :

- I. IEEE 1686
- II. IEC 62351

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## **2. Test and Standards :**

- **Electromagnetic Compatibility Test (EMC):**
  1. Electrostatic Discharge IEC 61000-4-2.
  2. Immunity Test (power frequency magnetic field) IEC 61000-4-8.
- **Environmental Test :-** As per IEC 60068
- **Mechanical Test :** Vibration test (IEC 60068-2-6)

## **3. Workstation PC :** (As per MSETCL approved make)

- Windows operating system (latest version).
- Industrial PC. FAN less design (IEC 61850-3 complied).
- 2 x Ethernet interfaces (integrated switch)
- I7, 2.0 GHz, 8GB RAM, 2x512 GB SSD, RAID 1.
- Power supply –dual power, 110/220V DC, 230 V AC.

## **4. Transformer Auxiliary Monitoring System software (TAMS) software :**

- i. MSETCL approved /verified. For new solution provider, Software functionality shall be verified at MSETCL Automation Lab, ACIP office.
- ii. Windows based software with suitable anti-virus software to be provided on PC. TAMS Software database should be binary encrypted database and it should be tamper proof.
- iii. Software display : Analytics kind of display & view like SCADA with details chart/graphs with SAS supported protocols library.

## **5. Ethernet Switch :-**

Managed Layer-2 switch, ports requirements as per site, with sufficient spare ports.

6. All other equipment's shall be MSETCL SAS standard make.

## **C) Minimum Features required in Transformer Auxiliary Monitoring System (TAMS):**

1. The Transformer Auxiliary signals are to be hardwired up in the PLC controller/IED/RTU/(to be installed in substation switch yard) and its configuration in TAMS software ( to be installed in substation control room) is to be done.

Following functionality and features are min. required in TAMS system

- i. Monitoring of FAN status, HV and LV winding temperature, Oil temperature, TAP position, Number of TAP operation, and LV voltage.
- ii. Manual & Auto operation of FAN, TAP.
- iii. BI/BO/AI/Temperature readings.
- iv. **Automatic Voltage Regulation (AVR) function required.**
- v. Auto/Manual, Master/follower mode selection for AVR/Tap operations.
- vi. Report extraction tool for temperature values, BI/BO signals values and Tap position.
- vii. Reports, trends/graphs extracted in excel sheet & pdf formats.
- viii. Time based data log record HV & LV – WTI, OTI, TAP Position, Tap Count & HV, and LV Voltage.

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- ix. Real time summary view, individual transformer screen, temperature setting, AVR setting page & Alarm pop up & master follower.
  - x. Event & Alarm list in TAMS as per operation.
  - xi. Load temperature curve (current vs Temperature graph).
2. Option for 02 types of Architecture are proposed, one with Ring topology & other with Star topology.
3. The PLC controller /IED/RTU output on IEC 61850/IEC 60870-5-104 communication protocol to be verified.

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