

NOTICE INVITING BUDGETORY OFFERS

Name of Work	Replacement of HT breakers of 33 KV substation
Budgetary Quotation no:	CME/XEN (E-HR)/ 24/H6/B9
Date of submission of budgetary quotation	On or Before 15/01/2025 at 15:00 Hrs-
Address for communication:	Executive Engineer (E-HR), 2nd floor, Mechanical Engineering Department, Mormugao Port Authority, Admin. Building, Headland sada Vasco-de-Gama Goa - 403804
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**EXECUTIVE ENGINEER (E-HR)
MORMUGAO PORT AUTHORITY**

TECHNICAL SPECIFICATION

1.0 GENERAL

Mormugao Port Authority intends to refurbish its 33 KV substation by replacing the existing HT breakers with new ones with Guarantee period of 5 years .

2.0 SCOPE OF WORK:

I : Installation Testing & Commissioning

The work includes following

- 2.1** Disconnection and dismantling of existing 11 nos. 33 KV circuit breakers & 2 nos. Annunciation panel from the 33 KV substation.
- 2.2** Disconnection and dismantling of existing 14 nos. 3.3 KV circuit breakers from 33 KV substation.
- 2.3** Supply, Installation, Testing and Commissioning of 01 no incomer panel and 3 no outgoing panels of 33 KV, as per the technical specifications provided below.
- 2.4** Supply, Installation, Testing and Commissioning of, 02 no incomer panels, 6 nos. outgoing panels and 1 no bus coupler panel along with 1 no bus riser panel of 3.3 KV, as per the technical specifications provided below.
- 2.5** The contractor shall supply and execute 3.3 KV cable joints if required.
- 2.6** The contractor shall properly terminate the cables by supplying suitable termination kit and glands as per IS standards, cost of which shall be included in the panel pricing.
- 2.7** Necessary modification of the foundation if required should be carried out by the contractor before Installation of panel at no additional cost to Port.
- 2.8** Contractor shall supply and install SCADA system, all the required cable other material required for SCADA system in the scope of contractor.
- 2.9** Dismantled HT panels should be shifted to M.M scrap yard at the risk and cost of the contractor.

3. TECHNICAL SPECIFICATIONS:

3.1 33 KV incomer panel

- 36 KV, 1250 A (busbar current 1250A), 26.3 KA, 3 sec, 3 phase indoor type VCB with spring type operating mechanism mounted on rack out type trolley along inbuilt earth switch, Tulip contacts, 3 nos 36 KV CT , 3 core , 400-200/5-5A, 33 KV/110/ $\sqrt{3}$ /110/ $\sqrt{3}$ line potential transformer, LV compartment with breaker control panel consisting of Voltmeter, Ammeter, Copper Busbar, MFM, Numerical relay IEC 61850 protocol with master trip & trip circuit supervision relay, VPIS, LED type indication lamp . TTB annunciation 3 phase, 4 wire, DLMS Energy meter.

3.2 33 KV Outgoing panel

- 36 KV, 1250 A (busbar current 1250A), 26.3 KA, 3 sec, 3 phase indoor type VCB with spring type operating mechanism mounted on rack out type trolley along inbuilt earth switch, Tulip contacts, 3 nos 36 KV CT , 3 core , 200-100/5-5A, LV compartment with breaker control panel consisting of Voltmeter, Ammeter, MFM, Copper Busbar , Numerical relay IEC 61850 protocol with master & trip circuit supervision relay, VPIS, LED type indication lamp . TTB annunciation 3 phase, 4 wire, DLMS Energy meter complete.

3.3 3.3 KV incomer panel :

- 3.3 KV, 1250 A (Busbar Current -1250 A), 26.3 KA, 3 sec, 3 phase indoor type VCB with spring type operating mechanism mounted on rack out type trolley along inbuilt earth switch, Tulip contacts , 3 nos 3.3 KV CT 3 core, 1200-800/5-5A, 3.3 KV/110/ $\sqrt{3}$ /110 $\sqrt{3}$ line potential transformer, Copper Busbar, LV compartment with breaker control panel consisting of Voltmeter, Ammeter, MFM, Numerical relay 61850 protocol with master & trip circuit supervision relay, VPIS, LED type indication lamp. TTB annunciation 3 phase, 4 wire, DLMS Energy meter.

3.4 3.3 KV Outgoing panel

- 3.3 KV, 1250 A (Busbar Current -1250 A), 26.3 KA, 3 sec, 3 phase indoor type VCB with spring type operating mechanism mounted on rack out type trolley, along inbuilt earth switch, Tulip contacts, 3 nos 3.3 KV CT 3 core , 800-400/5-5A, LV compartment with breaker control panel consisting of Voltmeter, Ammeter, MFM, Copper Busbar, Numerical relay IEC 61850 protocol with master & trip circuit supervision relay, VPIS, LED type indication lamp . TTB annunciation 3 phase, 4 wire, DLMS Energy meter complete

3.5 3.3 KV Bus coupler panel

- 3.3 KV, 1250 A (Busbar Current -1250 A), 26.3 KA, 3 sec, 3 phase indoor type VCB with spring type operating mechanism mounted on rack out type trolley along inbuilt earth switch, Tulip contacts, 3 nos 3.3 KV CT 3 core , 1200-800/5-5A, 3.3 KV/110/ $\sqrt{3}$ /110 $\sqrt{3}$ line potential transformer, LV compartment with breaker control panel consisting of Voltmeter, Ammeter, MFM, Copper Busbar, Numerical relay IEC 61850 protocol with master & trip circuit supervision relay, VPIS, LED type indication lamp. TTB annunciation 3 phase, 4 wire, DLMS Energy meter complete.

3.6 3.3 KV Bus riser panel

- 3.3 kV, 1250 A bus riser panel with copper busbars, compatible with the above bus coupler panel

3.7 SCADA system

The contractor shall design, supply, install, test, and commission a fully functional SCADA (Supervisory Control and Data Acquisition) system. The SCADA system will enable remote monitoring, control, and automation of key operations, providing real-time data, alarms, reporting, and trend analysis.

3.6.1 Detail scope of work for Implementation of SCADA system:

3.6.1.1 **Site Survey and Assessment**

- Conduct a thorough survey of the substation to understand the layout, equipment's and control systems.
- Assess the infrastructure for communication channels, power supply, and other relevant factors.
- Identify the data points and parameters (e.g., voltage, current, power factor, frequency, etc.) that need to be monitored and controlled.

3.6.1.2 **Design and Planning**

- **System Architecture:** Define the SCADA system architecture, including master stations, remote terminal units (RTUs), communication protocols, and data flow.
- **Communication Design:** Specify communication methods (e.g., fiber optic, Ethernet, or wireless communication) for remote monitoring and control.
- **Integration with Existing Systems:** Plan for integration with existing substation automation systems, protection relays, and other devices.
- **Data Points Mapping:** Identify the field devices (transformers, circuit breakers, switches, etc.) which will be connected to the SCADA system for data acquisition and control.
- **Control Logic Design:** Design control and automation logic for protection, alarm handling, and load shedding, if applicable.

3.6.1.3 **Supply of Equipment**

- **SCADA Hardware:** servers, workstations, network devices, RTUs, IEDs (Intelligent Electronic Devices), PLCs (Programmable Logic Controllers), etc.
- **Field Devices:** meters, sensors, relays, communication interfaces, and control panels.
- **Software:** SCADA software platforms and HMI (Human-Machine Interface) software for user interaction.

3.6.1.4 **System Installation**

- **Field Device Installation:** Install all necessary sensors, meters, relays, and control devices at the substation.
- **RTU/PLC Installation:** Install and configure Remote Terminal Units (RTUs) or Programmable Logic Controllers (PLCs) to interface with

field devices and communicate with the SCADA master station.

- **Communication Infrastructure:** Set up communication lines (fiber optics, Ethernet, etc.) between the substation and central control station.
- **Power Supply:** Regulated power supply for the SCADA system should be provided using suitable rating UPS with minimum one hour backup.

3.6.1.5 SCADA System Configuration

- **Communication Protocol Configuration:** Implement standard communication protocols like DNP3, IEC 61850, Modbus, or IEC 60870-5-104 for data exchange between devices.
- **SCADA Software Configuration:** Configure the SCADA software to receive, process, and display data from the substation. This includes setting up graphical user interfaces (GUIs), alarm systems, data logging, and reporting functions.
- **Control and Automation Setup:** Program automation logic for controlling switches, circuit breakers, transformers, and other devices.
- **Real-Time Data Monitoring:** Set up live data monitoring to display key parameters like voltage, current, frequency, power factor, and load status.
- **Historical Data Storage:** Configure the database to store historical data for trend analysis, reports, and fault analysis.

3.6.1.6 Testing and Commissioning

- **System Testing:** Perform factory acceptance tests (FAT) and site acceptance tests (SAT) to validate hardware, communication, and software functionality.
- **Simulation and Debugging:** Simulate real-world scenarios and validate the control logic, alarm handling, and system response.
- **Integration Testing:** Test the integration of SCADA with other substation protection and control systems.
- **Final Commissioning:** After successful testing, commission the SCADA system for live operation. Ensure proper integration with other parts of the grid and ensure remote accessibility for operators.

3.6.1.7 Training and Documentation

- **Operator Training:** Train substation personnel on using the SCADA system, including operating the system, monitoring alarms, control devices, and generating reports.
- **System Documentation:** Provide detailed system documentation, including network diagrams, control logic, user manuals, and maintenance guides.

3.6.1.8 Maintenance and Support

- **Ongoing Maintenance:** Provide ongoing maintenance services to ensure the SCADA system is running smoothly. This includes

software updates, hardware checks, and communication testing.

- **Troubleshooting and Technical Support:** Establish a support system for troubleshooting and technical assistance during operation.
- **Cybersecurity:** Implement cybersecurity measures to protect the SCADA system from unauthorized access or attacks.

3.6.1.9 Upgrades and Future Scalability

- **Scalability Plan:** Ensure the SCADA system can be expanded or upgraded to handle future upgrades in substation infrastructure, capacity, and integration with larger grid systems.
- **Software/Hardware Upgrades:** Plan for periodic software and hardware upgrades to keep the system updated with technological advancements.

3.6.1.10 Regulatory Compliance and Safety

- **Compliance with Standards:** Ensure the SCADA system complies with relevant industry standards and local regulatory requirements (e.g., IEC 61850 for communication protocols, ISO standards for safety, etc.).
- **Safety Protocols:** Ensure that safety protocols are implemented in the SCADA system, particularly for automatic isolation during fault conditions, emergency power shutdown, etc.

3.6.2 The contractor shall bear sole responsibility for the implementation of the SCADA system. This includes supplying all necessary materials and carrying out all required work for the successful implementation of the SCADA system mentioned or not in the BOQ, with no additional costs to MPA.

Note:

- The make of Vacuum interrupter, Vacuum circuit breaker, Medium voltage Air Insulated Primary (type tested) portion and Protection Relays shall be same.
- Type Test of Circuit breaker and Air Insulated Medium Voltage Switchgear shall be conducted in ERDA/STL member laboratory, certificate of which shall be furnished to Port.
- Bus coupler panel shall be provided with required bus riser as per the site condition.

4.0 INSTALLATION AND COMMISSIONING

- The Vacuum interrupter, Vacuum circuit breaker, Medium voltage Air Insulated Primary (type tested) portion and Protection Relays shall be of the same make.
- The work should be carried out with utmost safety precaution with minimum possible disruption of power supply.
- Before starting network, ~~is~~ ^{prep} of site should be carried out well in advance, action

plan is required to be furnished to EIC and proper prior arrangements are required to be made in co-ordination with the Engineer-In-Charge (EIC) of the Port..

- The Contractor shall commence and complete the work as per the BOQ. Proper safety precautions should be taken while carrying out the work.
- The work is to be carried out as per the site conditions and relevant IS standards.
- Installation and commissioning should be carried out to the satisfaction of the Engineer in charge. All left over / scrap materials etc. are to be promptly cleared and transported, wherever necessary from the work site by the Bidder at his own cost and risk as per the directions of EIC.

5.0 GENERAL TERMS AND CONDITIONS

5.1. Eligibility criteria

- i) The contractor should be experienced Electrical contractor who have executed similar works in the past. A scanned copy of completion certificate for having executed similar works shall be furnished along with the bid which shall be verified with the original before award of LOA/P.O.
- ii) Similar works implies installation, testing, commissioning of minimum 33 KV HT Panel along with SCADA system at Central Govt. / State Govt. / Port Sector / PSU or any reputed organization .
- iii) Copy of a valid Electrical Contractors License to work on HT installations minimum of 33KV should be furnished along with the bid document.

5.2 Price:

- i) The bidder shall quote the price exclusive of GST. Applicable GST shall be paid on the quoted price. The bidder shall indicate the applicable GST rate on the goods / services in the price bid.
- ii) Evaluation will be done considering only the basic price.

5.3 Completion Period:

The entire work shall be completed within **180days** from the date of receipt of LOA/Purchase order whichever is earlier. However the work of removal/dismantling of existing breaker panel and installation, testing commissioning of new VCB panel should be completed within one day/24hrs due to exigencies/criticality of the situation/circumstances.

5.4 Guarantee Period:

The Contractor shall give the guarantee for a period of **5 years** from the date of taking over of the work. Any defect observed during the guarantee period, the same shall be set right by the Contractor, free of cost without any financial implications to the Port, whatsoever.

During the Guarantee period contractor shall carry out servicing of the breakers annually

5.5 Other terms and conditions

- i) All tools and tackles and logistics involved in the work shall be arranged by the Contractor at their own cost. The transportation cost, if any, shall be borne by the contractor.
- ii) The Bidders are advised to visit the site and get acquainted with the quantum of the work involved and site conditions before quoting for the works.
- iii) Necessary Entry passes shall be obtained by the Contractor at their own cost with prior approval of the Port Officials on Duty.
- iv) The MPA will not be responsible for any loss or damage to the materials/ tools/plants engaged by the contractor/bidder during the work at site or transportation.
- v) The Contractor shall take utmost care during the execution of the work, if any damage caused to the Port property, the cost of the damage shall be recovered from the Contractor's running A/c bill or may be recovered by the Board as deemed fit.
- vi) The power supply shall be provided by the Port free of cost for execution of the work; however, the Contractor shall take power supply from the nearest source by making suitable arrangements at their own cost and risk.
- vii) Installation and commissioning should be carried out to the satisfaction of the Engineer in charge. All left over / scrap materials etc. are to be promptly cleared and transported, wherever necessary from the work site by the Bidder at his own cost and risk as per the directions of EIC.
- viii) **The work mentioned is illustrative indicative and not exhaustive. The project is on turnkey basis and the tenderer may have to carry out any other related works, which are not included herein and the same shall be incorporated as per relevant standards in bidder's scope without any additional financial implications to the Port, whatsoever**

PRICE SCHEDULE (BILL OF QUANTITIES)

Sr No	Description of work	HSN / SAC Code	Unit	Qty	Rate/Unit		Amount	GST %
					In figure	In words		
I	SITC							
1	Dismantling of existing 33 KV panel (11 no 33KV & 2 no Annunciation panel)		LS	01				
2	Dismantling of existing 3.3 KV panel. (14 no 3.3KV panel)		LS	01				
3	33 KV incomer panel as per specification							
	Supply as per technical specifications		No	01				
	Installation, termination, testing and commissioning of 33 KV incomer panel complete in all respect by providing all materials required for installation/ commissioning including termination kit for terminating the cable.		No	01				
4	33 KV outgoing panel as per specification							
	Supply as per technical specifications		No	03				
	Installation, termination, testing and commissioning of 33 KV outgoing panel complete in all respect by providing all materials required for installation/ commissioning including termination kit for terminating the cable		No	03				
	3.3 KV incomer panel							

5	as per specification							
	Supply as per technical specifications		No	02				
	Installation, termination, testing and commissioning of 3.3 KV incomer panel complete in all respect by providing all materials required for installation/ commissioning including termination kit for terminating the cable		No	02				
6	3.3 KV outgoing panel as per specification							
	Supply as per technical specifications		No	06				
	Installation, termination, testing and commissioning of 3.3 KV outgoing panel complete in all respect by providing all materials required for installation/commissioning including termination kit for terminating the cable		No	06				
7	3.3 KV Bus coupler panel as per specification							
	Supply as per technical specifications		No	01				
	Installation, termination, testing and commissioning of 3.3 KV bus coupler panel complete in all respect by providing all materials required for installation/commissioning including termination kit for terminating the cable		No	01				
8	3.3 KV Bus riser panel as per specification							
	Supply as per technical specifications		No	01				
	Installation, termination, testing and commissioning of 3.3 KV bus riser panel complete in all respect by		No	01				

	providing all materials required for installation/commissioning including termination kit for terminating the cable								
9	Supply and making of 3.3 KV 3 core 120 sq mm heat shrinkable cable joints complete in all respect		No	08					
10	Supply of 3.3 KV 3 core 120 sqmm HT aluminum armoured XLPE cable		mtr	100					
11	SITC of SCADA system as per Technical specification at 3.6		LS						
	SUB TOTAL								

Note:

1. The bidder shall quote the price exclusive of GST. Applicable GST shall be paid on the quoted price. The bidder shall indicate the applicable GST rate on the goods/services in the price bid.
2. Items at Sr.No 9 & 10 will be executed only if required.
3. Payment will be done as per actuals

