DEENDAYAL PORT AUTHORITY

An ISO 9001 : 2008 & ISO 14001 : 2004 Certified Port

Office of Chief Mechanical Engineer,
First Floor, Annex Building, A.O. Building,
Gandhidham, Kutch 370210
Email:cme@deendayalport.gov.in

No.: EL/WK/2917 Date: 04.06.2026

BUDGETARY ENQUIRY

for

"Design, Supply, Installation, Testing & Commissioning of 21 Nos Containerized Substations at Deendayal Port Authority (DPA)"

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1. Introduction

Deendayal Port Authority (DPA) intends to strengthen and modernize its electrical distribution infrastructure by deploying Containerized Substations (CSS) at various locations within the port premises.

The proposed system shall consist of factory-built, compact, outdoor-type 11/0.433 kV substations, designed for reliable operation in coastal and high humidity environments. The substations shall integrate HT switchgear, transformer, LT distribution system, and monitoring facilities within a single enclosure.

The proposed system shall support:

- Compact, plug-and-play installation
- High reliability using SF6 RMU with VCB protection
- Safe and segregated LT distribution system
- Remote monitoring and data acquisition (SCADA/RTU compatible)
- Suitability for industrial, port, and EV load applications

2. Purpose of Budgetary Enquiry

This budgetary enquiry is issued solely for the purpose of obtaining indicative cost estimates for planning and budgeting. This document shall NOT be treated as a Tender or Request for Proposal (RFP). Submission of budgetary offers does not confer any right for award of work. Deendayal Port Authority (DPA) reserves the right to initiate a separate tendering process in future. No contractual obligation shall arise from this enquiry.

3. Scope of Work (Brief)

The work shall be executed on a turnkey basis and shall include, but not be limited to:

- Site survey and finalization of installation locations
- Incoming 11 kV power supply shall be extended from existing DPA network. Vendor scope shall include termination and integration within CSS
- Detailed design and engineering of CSS
- Supply of complete Containerized Substation (HT RMU + Transformer + LT Panel)

- Supply of all accessories, interconnections, and protection systems
- C5-M grade anti-corrosion treatment suitable for coastal environment
- Transportation, unloading, and placement at site
- Installation, cable termination, and commissioning
- Integration with existing electrical network
- Supply, installation and commissioning of monitoring & communication system including RTU/PLC, SCADA integration, communication hardware, and configuration
- Testing (Factory & Site) and final handover

4. Estimated Quantities (Summary)

Sr. No.	Description	Qty
1	Containerized Substation (11/0.433 kV)	21 Sets
2	HT RMU Panel (SF6 insulated)	18 Sets
3	Transformer	23 Nos
4	LT Panel	24 Sets
5	RTU / PLC based Monitoring System	21 Set
6	SCADA Integration & Communication System	1 Lot

(Detailed specifications enclosed separately)

5. Technical Standards

All equipment shall conform to latest applicable Indian and International standards, including but not limited to:

- IS 13118 / IEC 62271 – HT Switchgear (RMU)
- IS 1180 – Distribution Transformers
- IS 8623 / IEC 61439 – LT Panels
- IS 3043 – Earthing
- IEC 60529 – IP Protection
- ISO 12944 – Corrosion Protection (C5-M)

The design shall also comply with applicable CEA regulations and utility practices.

6. Submission of Budgetary Offer

Interested firms are requested to submit their budgetary quotation including:

- Indicative project cost
- Detailed cost break-up
- Technical assumptions and deviations (if any)

7. Submission Deadline:

On or before: 25.06.2026

8.Mode of Submission:

Email: cme@deendayalport.gov.in
Hard copy: Office of Chief Mechanical Engineer, DPA

9. Time period:

Project completion period shall be 12 months.

10.General Notes

- Prices shall be reasonable and competitive inclusive all taxes, duties and incidentals, excluding GST.
- GST applicability shall be clearly mentioned
- Any assumptions/conditions shall be clearly stated
- DPA may seek clarifications, if required

11.Contact for Clarification

Office of Chief Mechanical Engineer
Deendayal Port Authority
Email: cme@deendayalport.gov.in

Enclosures:

- Detailed Scope of Work (Annexure-I)
- Details of Proposed Containerized Substations (Annexure-II)
- Details of Existing Equipment (Annexure-III)
- Detailed Price Break up (Annexure-IV

-Sd/-
Chief Mechanical Engineer
Deendayal Port Authority

Annexure I

Detailed Scope of work

1. General Scope of Work

The scope of work encompasses the complete design, engineering, manufacturing, assembly, factory testing, supply, transportation, unloading, erection, testing, and commissioning of 21 Nos. Containerized Substations (CSS) of rating 11/0.433 kV each. The CSS shall be delivered on a turnkey, plug-and-play basis, complete in all respects with HT RMU, distribution transformer, LT panel, interconnections, protection systems, and all auxiliary components required for safe and reliable operation.

Quantities of RMU, transformers, and LT panels are based on configuration of individual CSS units as detailed in Annexure-II, as Follows:

The supplier shall be responsible for all necessary tools, tackles, and consumables required for site execution, ensuring minimal disruption to ongoing port operations.

Detailed regarding rating and number of incomers and outgoing are mentioned in annexure II

2. Operating Environmental Conditions

Given the severe coastal parameters at DPA, all equipment and enclosures must be designed to operate flawlessly under the following conditions:

- Max Ambient Temp: +55°C
- Min Ambient Temp: -10°C
- Design Temp for Electrical Equipment: +55°C
- Max Relative Humidity: 95% (Highly corrosive, salt-laden marine coastal environment)
- Seismic Zone: As per IS 1893 (latest edition)
- Wind Speed: As per relevant IS standards for coastal/cyclonic region

3. Container Enclosure Construction & Marine Painting

The enclosure shall be of robust, factory-fabricated construction suitable for coastal and high humidity environments. Detailed design and construction methodology shall be finalized during detailed engineering stage

- Compartmentalization: Separate, segregated compartments for HT, Transformer, and LT sections.
- Roof & Access: Double-sloped roof to prevent water stagnation. The roof above the transformer must be detachable to allow overhead crane access for maintenance.
- Insulation & Protection: 50mm thick fire-retardant PUF or Rockwool insulation between inner and outer skins to mitigate solar heat loading. Ingress protection shall be IP 54 for HT/LT compartments and IP 43 for the Transformer compartment (fitted with louvers and stainless-steel vermin mesh).
- Marine Grade Painting (C5-M): To combat the high salinity, the enclosure must undergo a C5-M compliant painting process as per ISO 12944:

4. HT System – 11kV Ring Main Unit (RMU)

The HT side shall be controlled by an SF6 Gas Insulated Ring Main Unit (RMU), suitable for 11kV operation, rated for 630A, and a fault level of 21 kA for 3 seconds.

- **Protection & Features:** The VCB shall be equipped with a self-powered or auxiliary-powered numerical relay providing Overcurrent (50/51) and Earth Fault (50N/51N) protection. The RMU must feature motorized operation capability, mechanical interlocks, mimic diagrams, and capacitive voltage indicators (VPIS).

5. Power Transformer

Each CSS shall house an energy-efficient, oil-filled, naturally cooled (ONAN) distribution transformer complying with IS 1180.

- Rating: 630/1000/2000 kVA, 11/0.433 kV.
- Core & Winding: High-grade CRGO silicon steel core with electrolytic grade copper windings.
- Vector Group: Dyn11.
- Tap Changer: Off-Circuit Tap Changer (OCTC) with +5% to -10% variation in steps of 2.5%.
- Safety Fittings: Buchholz relay, Magnetic Oil Level Gauge (MOG), Winding Temperature Indicator (WTI), Oil Temp Indicator (OTI), and Pressure Relief Device (PRD). All alarm and trip contacts must be hardwired to trip the HT VCB.

6. Low Tension (LT) Panel (433V Main Distribution Board)

The LT distribution panel shall be free-standing, floor-mounted, IP 54, compartmentalized (Form 3b or Form 4), and conform to IEC 61439 / IS 8623.

- Busbars: Minimum 1600A rated, electrolytic grade Aluminum alloy (E91E) or Copper, PVC sleeved and color-coded.
- Metering: Digital Multifunction Meter (Class 0.2) with an RS-485 Modbus port on the incomer, along with required CTs and indication lamps.

7. Interconnections, Wiring, and Earthing

- Power Interconnections: The connection between the transformer and LT panel shall utilize a 1600A rated bus duct or equivalent cable system. All HT/LT cable terminations require heat shrink kits, heavy-duty lugs, and proper glanding.
- Control Wiring: Minimum 1.5 sq.mm (voltage) and 2.5 sq.mm (CT circuits) multi-strand FRLS copper flexible wire. Terminations must use crimped copper lugs with interlocking ferrules and engraved nameplates.
- Earthing System: An internal copper or GI earth busbar shall span the CSS. All non-current carrying metallic parts must be bonded to this bus. The transformer neutral must have two distinct earth connections brought outside the enclosure for external grid connection as per IS 3043. Equipment, neutral, body, and lightning earthing must be comprehensively executed at the site.

8. Auxiliary Systems & Safety

- Internal Illumination: Minimum 20W LED batten fixtures per compartment, operated by door limit switches.
- Climate Control: Thermostat-controlled anti-condensation space heaters in HT and LT panels. Natural and forced ventilation systems to dissipate transformer heat.
- Suitable fire detection and suppression system shall be provided as per standard industry practices

9. Installation and Site Execution

The contractor shall manage complete site execution across the 15 DPA locations.

- Civil & Mechanical Works: Preparation of foundations, safe unloading, alignment, leveling, and secure anchoring/grouting of the containerized units.
- Electrical Integration: Routing, dressing, and termination of incoming source feeders and outgoing load cables. Careful dismantling of existing legacy panels or cables without damaging adjacent live infrastructure.
- Safety Compliance: Strict adherence to safety protocols, including shutdown coordination, barricading, and use of PPE.

10. Inclusion of Existing HT/LT Panels into CSS

- The contractor shall consider reutilization and integration of the existing substation equipment into the proposed Containerized Substation System (CSS). Existing HT and LT panels available at the respective substations shall be accommodated within the containerized arrangement after assessing their suitability, compatibility, and operational condition.
- The scope shall include necessary modifications, retrofitting works, interconnection, cable termination, mounting arrangements, and integration with the new CSS system to ensure safe, reliable, and seamless operation.
- Details of the existing equipment to be considered for integration are provided in **Annexure–III.**

11. Testing, Inspection, and Commissioning

- Factory Acceptance Testing (FAT): All equipment shall undergo routine and type tests at the manufacturer's works as per applicable standards prior to dispatch.
- Site Acceptance Testing (SAT): Comprehensive pre-commissioning checks including Megger/IR tests, transformer ratio and vector group verification, contact resistance, and relay secondary injection testing.
- System Validation: Interlock verification, trip circuit checks, and functional load trials to ensure end-to-end performance. Commissioning is complete only upon successful demonstration and formal approval from DPA.

12. Monitoring, Control & SCADA Communication Infrastructure

Each substation shall be integrated into a remote monitoring system

- Hardware: Supply of an RTU/PLC-based data acquisition system, industrial Ethernet switches, media converters, and fiber optic/RS485 cabling.

- Data Acquisition: Interfacing with the HT RMU, numerical relays, and LT multifunction meters to transmit voltage, current, power factor, breaker status, and trip alarms.
- SCADA Integration: Full configuration using standard protocols (Modbus RTU/TCP, IEC 60870-5-104), including tag mapping, mimic diagrams, and data logging to integrate seamlessly with the central control system.

13. Future Expansion

- Design Scalability: The CSS infrastructure shall be specifically designed with scalability to accommodate future power demand,
- Statutory Standards: Compliance with IS 13118 / IEC 62271 (RMU), IS 1180 (Transformers), IS 8623 / IEC 61439 (LT Panels), and IEC 60529 (IP Protection).

Annexure II

Details of Proposed Containerized Substations

Sr. No	Substation	Required HT Panel	Short Circuit Rating	Req. Transformer (kVA)	LT Panel	LT Panel Specification		Short Circuit Rating
						ACB/MCCB (I/C)	MCCB/ACB (O/G)	
1	Cargo Jetty	8 Way RMU	21 kA for 3s	2 x 2000 KVA	15 Way 15 Way 16 Way	3200 A 1600 A 3200 A	1200A 800A 400A 250A 125A	50 kA for 1s 26kA for 3s
2	6th Berth	11 Way RMU	21 kA for 3s	2 x 1000 KVA	18 Way 10 Way	1600 A 1200 A	400A 250A 125A	50 kA for 1s 26kA for 3s
3	TS-IV	N/A	N/A	2 x 2000 KVA	15 Way	3200A	1200A 800A	50 kA for 1s 26kA for 3s
4	7th Berth	11 Way RMU + 2 Way HT Metering Panel (11KV)	21 kA for 3s	2 x 1000 KVA	17 Way	1600A	800A 250A 125A	50 kA for 1s 26kA for 3s
5	40 Hectare	8 Way RMU	21 kA for 3s	1 x 2000kVA 1 x 1000kVA	16 Way 15 Way	3200A 1200A	800A 400A 250A 125A	50 kA for 1s 26kA for 3s
6	Old NDA	6 Way RMU	21 kA for 3s	2 x 1000 KVA	16 Way	1200A	800A 400A 250A	50 kA for 1s 26kA for 3s
7	New NDA	8 Way RMU	21 kA for 3s	2 x 1000 KVA	15 Way 16 Way	1200A	800A 400A 250A 125A	50 kA for 1s 26kA for 3s
8	Isolator	11 Way RMU	21 kA for 3s	2 x 630 KVA	20 Way	1250A	800A 400A 250A 125A	50 kA for 1s 26kA for 3s
9	13th Berth SS	11 Way RMU	21 kA for 3s	2 x 630 KVA	26 Way	1250A	400A 250A 160A 100A 63A	50 kA for 1s 26kA for 3s

10	13th Berth Jetty	6 Way RMU	21 kA for 3s	N/A	N/A	N/A	N/A	N/A
11	15th Berth	11 Way RMU	21 kA for 3s	2 x 1000 KVA	18 Way 18 Way	1600A	800 A 400 A 250 A 125 A	50 kA for 1s 26kA for 3s
12	34 Hectare	6 Way RMU	21 kA for 3s	N/A	N/A	N/A	N/A	N/A
13	Port Power House	N/A	N/A	N/A	10 Way	1600 A	800A 400A 250A	50 kA for 1s 26kA for 3s
14	Water tower 1	4 Way RMU	21 kA for 3s	N/A	8 Way	1000 A	630 A 400 A 250 A	50 kA for 1s 26kA for 3s
15	Water tower 2	4 Way RMU	21 kA for 3s	N/A	8 Way	1000 A	630 A 400 A 250 A	50 kA for 1s 26kA for 3s
16	Estate Office	N/A	N/A	N/A	12 Way	1000 A	800 A 400 A 250 A	50 kA for 1s 26kA for 3s
17	Thermal	N/A	N/A	N/A	12 Way	250 A	200 A 160 A 125 A	50 kA for 1s 26kA for 3s
18	Dry Dock	6 WAY RMU	21 kA for 3s	N/A	N/A	N/A	N/A	N/A
19	New Proposed CSS 1	6 WAY RMU	21 kA for 3s	1 x 1000 KVA	15 Way	1600 A	800 A 630 A 400 A 250 A	50 kA for 1s 26kA for 3s
20	New Proposed CSS 2	6 WAY RMU	21 kA for 3s	1 x 1000 KVA	12 Way	1600 A	800 A 630 A 400 A 250 A	50 kA for 1s 26kA for 3s

21	New Proposed CSS 3	8 WAY RMU	21 kA for 3s	1 x 1000 KVA	15 Way	1600 A	800 A 630 A 400 A 250 A	50 kA for 1s 26kA for 3s

Annexure III

Details of Existing Equipment

Sr No.	Substation	HT Panel	Transformer	LT Panel
1	Cargo Jetty	11 Way RMU	2 x 1500 KVA	2 x 15 Way 1 x 16 Way 1 x 17 Way
2	6th Berth	8 Way RMU	1 x 1000 KVA 1 x 750 KVA 1 x 500 KVA	1 x 16 Way 1 x 15 Way 1 x 8 Way 1 x 7 Way
3	TS-IV	6 Way RMU	2 x 1500 KVA	1 x 11 Way 1 x 15 Way
4	7th Berth	6 Way RMU 2 Way VCB 2 Way VCB	2 x 500 KVA	1 x 21 Way 1 x 33 Way
5	40 Hectare	4 Way VCB	2 x 1000 KVA	1 x 13 Way 1 x 5 Way APFC Panel 1 Nos.
6	Old NDA	4 Way RMU	1 x 630 KVA 1 x 1500 KVA	1 x 14 Way 1 x 7 Way 1 x 3 Way 1 x 2 Way 1 x 1 Way
7	New NDA	6 Way RMU 4 Way VCB	2 x 1000 KVA	1 x 33 Way 1 x 13 Way 1 x 9 Way C/O Panel 1 Nos.
8	Isolator	6 Way RMU	N/A	N/A
9	13th Berth SS	5 Way RMU 3 Way RMU	1 x 630 KVA 1 x 500 KVA	1 x 27 Way 1 x 7 Way
10	13th Berth Jetty	N/A	N/A	N/A
11	15th Berth	6 Way VCB	1 x 630 KVA	1 x 20 Way 1 x 6 Way 1 x 4 Way
12	34 Hectare	4 Way RMU	1 x 630 KVA	1 x 11 Way

13	Port Power House	8 Way RMU 6 Way RMU 4 Way RMU	2 x 1000 KVA	1 x 8 Way 1 x 6 Way 1 x 7 Way AMF Panel - 1 Nos.
14	Water tower 1	2 Way VCB	2 x 500 KVA	1 x 6 Way
15	Water tower 2	3 Way VCB	2 x 500 KVA	1 x 9 Way 1 x 6 Way
16	Estate Office	4 Way VCB	1 x 750 KVA 2 x 500 KVA	1 x 18 Way 1 x 13Way
17	Thermal	6 Way RMU 4 Way RMU	N/A	N/A
18	Dry Dock	4 Way VCB	3 x 500 KVA	1 x 20 Way 1 x 15 Way 1 x 4 Way

Annexure IV

Detailed Price Break up (Schedule B)

Sr. No.	Description	Unit	Qty	Unit Rate (Supply)	Amount (Supply)	Unit Rate (Erection)	Amount (Erection)	Total Amount
1	Detailed engineering including GA drawings, SLD, schematics, control wiring diagrams, design calculations, approvals and as-built documentation for complete Containerized Substation system	LS	1	-	-			
2	Design, manufacture, testing and supply of containerized substation enclosure complete with weatherproof, insulated, ventilated construction, lighting, cable entries, doors, locks and base frame suitable for outdoor/coastal conditions	No	21					
2	Supply of HT RMU – 2 Way HT Metering Panel complete with all accessories	No	1					
3	Supply of HT RMU – 11 Way complete with all accessories	No	5					
4	Supply of HT RMU – 8 Way complete with all accessories	No	4					
5	Supply of HT RMU – 6 Way complete with all accessories	No	6					
6	Supply of HT RMU – 4 Way complete with all accessories	No	2					

7	Supply of power transformer 11kV/0.433kV complete with all fittings and accessories – 2000 kVA	No	5					
9	Supply of power transformer – 1000 kVA complete with accessories	No	14					
10	Supply of power transformer – 630 kVA complete with accessories	No	4					
12	Supply of LT Distribution Panel complete with ACB/MCCB feeders, busbars, metering and internal wiring – 10 Way	No	2					
13	Supply of LT Panel complete with ACB/MCCB feeders, busbars, metering and internal wiring – 8 Way	No	2					
14	Supply of LT Panel complete with ACB/MCCB feeders, busbars, metering and internal wiring – 12 Way	No	3					
15	Supply of LT Panel complete with ACB/MCCB feeders, busbars, metering and internal wiring – 15 Way	No	7					
16	Supply of LT Panel complete with ACB/MCCB feeders, busbars, metering and internal wiring – 16 Way	No	4					
17	Supply of LT Panel complete with ACB/MCCB feeders,	No	1					

	busbars, metering and internal wiring – 17 Way							
18	Supply of LT Panel complete with ACB/MCCB feeders, busbars, metering and internal wiring – 18 Way	No	3					
19	Supply of LT Panel complete with ACB/MCCB feeders, busbars, metering and internal wiring – 20 Way	No	1					
20	Supply of LT Panel complete with ACB/MCCB feeders, busbars, metering and internal wiring – 26 Way	No	1					
22	Supply of protection, control and metering system including relays, meters, annunciation and control accessories	No	21					
23	Supply of RTU / PLC / SCADA compatible communication system including hardware and software integration	LS	1					
24	Supply of auxiliary AC/DC system including battery, charger, lighting, ventilation and accessories	No	21					
25	Supply of fire detection and automatic fire suppression system	No	21					
26	Supply of HT power cables complete with glands, lugs, ferrules and accessories	LS	1					

27	Supply of LT power cables complete with accessories	LS	1					
28	Supply of control and communication cables complete with accessories	LS	1					
29	Supply of cable trays, ladders, supports and accessories	LS	1					
30	Supply of earthing materials including earth electrodes, GI/Cu strips and accessories	LS	1					
31	Supply of lightning protection system including air terminals and down conductors	LS	1					
32	Civil works including foundation preparation, grouting, unloading, shifting and placement of containerized substations	No	21	-	-			
33	Complete erection, installation, testing & commissioning including cable laying, termination, interconnection, earthing, system integration, testing, trial run, documentation, training and handing over	LS	1	-	-			

Amount in word in Rs.:

Note: Rates quoted shall be exclusive of GST.