DEENDAYAL PORT AUTHORITY
ISO 9001:2008 | ISO 14001 | ISPS Compliant Port

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No.: EL/WK/2847 Date:06/08/2024

EXPRESSION OF INTEREST [EOI] for "Supply, Installation, Erection, Testing and Commissioning of 66KV metering CT`s and PT`s along with SITC of GETCO approved ABT Meters at 66KV IOCL Receiving Yard at Kandla."

(This EOI is issued to elicit Expression of Interest from the parties interested in the work and does not constitute any binding commitment from the Deendayal Port Authority to proceed with the work or invite any or all the parties in the subsequent bidding process. The Open Tenders will be issued subsequently.)

Executive Engineer (Electrical), DPA invites Expression of Interest for the work of "Supply, Installation, Erection, Testing and Commissioning of 66KV metering CT`s and PT`s along with SITC of GETCO approved ABT Meters at 66KV IOCL Receiving Yard at Kandla." from the reputed GETCO Vendor firms those who have executed similar work. The Expression of Interest (EOI) documents containing details of Scope of Work is enclosed herewith.

The interested firms are requested to submit their expression of interest for the said work in BOQ format at Annexure – I. The completed EOI (Expression of Interest) shall be submitted to the office of the undersigned on or before 16/08/2024. A soft copy of EOI is also acceptable through e-mail Ids. xenedpa@gmail.com.

-/sd

Executive Engineer (E)
Deendayal Port Authority

Scope of work and Technical Specifications

SCOPE OF WORK:

TECHNICAL SPECIFICATION FOR Supply, Installation, Erection, Testing and Commissioning of 66KV metering CT`s and PT`s along with SITC of GETCO approved ABT Meters at 66KV IOCL Receiving Yard at Kandla.

SCOPE OF WORK:

All the material shall be supplied and the work shall be carried out as per GETCO norms.

As per GETCO Requirement, at IOCL receiving end the 66KV Metering CT`s and PT`s are to be replaced with ERTO tested equipment`s and Consumer end metering is to be done with main and check ABT meters. So, the scope of work is to supply GETCO approved 66KV CT`s and PT`s duly tested at ERTO Lab in presence of GETCO Representative and SITC of GETCO Main and check ABT meters duly tested at NABL Lab in presence of GETCO Representative.

The work is to be executed inside IOCL substation premises as per Standard norms. The contractor has to follow up and take necessary approvals from GETCO/DPA authorities and also carry out the work as per GETCO/DPA norms under the supervision of GETCO/DPA engineers. All the equipments and other accessories to be supplied are to be got approved from concerned GETCO/DPA authorities.

The metering CTs and PTs are required to be tested at supplier premises and GETCO approved laboratories in presence of GETCO engineers. Any other testing/approval as may be required by GETCO is also in the scope of contractor. The material shall be from approved vendor/make of GETCO

Any miscellaneous items not covered in the BOQ of this tender but required are for completion of the work to be supplied and erected by the contractor to complete this job. Liasoning with GETCO offices and any other govt. agency as may be required is in the scope of contractor.

All the material should be installed/erected in highly humid, saline & corrosive environment. Accordingly, design shall be made and material shall be selected.

The replacement work is to be done inside existing 66KV Yard of IOCL so the contractor has to take all necessary safety precaution as per rules.

The scope of work covers dismantling of existing 3 Nos. 66KV metering CT`s/PT`s and erection of newly supplied CT`s/PT`s along with Cable terminations and at site testing and commissioning of these equipment's. Also, 2 Nos. of ABT Meters (1 main, 1 Check meter) duly tested at NABL Laboratory are to be supplied, installed, tested and commissioned inside IOCL yard at Kandla.

The Dismantled CT`s/PT`s are to be carted and stacked at IOCL yard/DPA store.

Technical Specifications of Current Transformers

Supply, Installation, Erection, Testing and Commissioning of 66 kV Metering CT at 66/11 kV Receiving Substation of DPT. The current transformer should be outdoor, oil impregnated paper, single phase, 50 Hz, oil immersed, self-cooled suitable for operation in the climate conditions specified. The current transformers shall be complete in all respects.

A. STANDARDS:

1. CURRENT TRANSFORMERS:

SR. NO.	STANDARD NO.	TITLE
1	IS:2165	Insulation co-ordination for equipment of 100 KV and above
2	I18S:2705 (I to IV)	Instrument Transformers
3	IS:2099	High voltage porcelain bushings
4	IS:3347	Dimensions of porcelain transformer bushings
5	IS:2071	Method of high voltage testing
6	IS:335	Insulating oil for transformers and switchgears
7	IS:2147	Degree of protection provided by enclosures for low voltage switchgear and control.
8	IEC-61869-2	Instrument Transformers
9	IEC-270	Partial discharge measurement
10	IEC-44(4)	Instrument transformer measurement of PDs
11	IEC-171	Insulation co-ordination
12	IEC-60	High voltage testing techniques
13	IEC-8263	Method for RIV test on high voltage insulators
14	--	Indian Electricity Rules 1956

2. Equipment meeting with the requirement of other authoritative Standards, which ensure equal or better performance than the standards mentioned above, shall also be considered. When the equipment offered by the Bidder conforms to other standards, salient points of difference between standard adopted and the standards specified in this specification shall be clearly brought out in the relevant

schedule. Four copies of such standards with authentic translation in English shall be furnished along with the bid.

3. The Instrument Transformers covered by this specification shall comply with the requirement of the latest edition of IEC Publication No. 61869-2 / 60044-1 &/ or Indian Standard No. 2705 Parts – I to III (as amended upto date) but the Instrument Transformers for the accuracy class 'PS' shall confirm to Part - IV of IS : 2705 except where specified otherwise in the specification.

4. The core shall be high grade, non – ageing, silicon laminated steel of low hysteresis loss and high permeability. The core material used in case of metering core shall be stated in the tender.

5. The current transformers shall be hermitically sealed to eliminate breathing and entering of air and moisture in the tank. Provision of pressure releasing device is not permitted.

6. For compensation of variation in volume of oil due to temperature variation, stainless steel bellows shall be provided. The successful bidder shall have to submit calculations of volumetric expansion and contraction. These calculations shall be submitted along with the basic parameters of SS bellow used in CT.

7. Rubber bellow or Nitrogen gas cushioning for above purpose shall not be permitted.

8. The current Transformers provided with stainless steel bellows for compensation of oil volume variation shall be provided with a suitable oil level indicator at suitable location to enable an observer to see the oil level of the C.T. from the ground level. Oil level indicator shall be provided with fluorescent green colored floating ball of non oil reacting material. All parts of bellow shall be of stainless steel only.

9. The core of current transformers to be used for metering shall have saturation factor, low enough to avoid damage to the instruments, in the event of maximum short circuit current.

10. The C.T. core, to be used for protective relays shall be of 0.2s accuracy class, specified or appropriate class suitable for back up, over current and earth fault, differential and busbar protection.

11. The tenderer shall give assurance for trouble free and maintenance free performance for a period of 60 months from the date of receipt at store; during which period, the CTs shall be repaired / reconditioned / replaced free of cost, immediately in case of any trouble. Therefore, the tenderer shall ensure that

sealing of current transformer is properly achieved. In this connection, the arrangement provided by the tenderer at various locations including the following ones shall be described supported by sectional drawings.

i. Location of emergence of primary and secondary terminals.
ii. Interface between porcelain housing and metal tank.
iii. Cover of the secondary terminal box.
iv. G.A. drawing complete with details of primary and secondary

windings overall dimensions, weight, nameplate, porcelain insulator, primary & secondary terminals, terminal connectors, etc.

12. Nuts and bolts (or screws used for fixation of interfacing porcelain bushings for taking out terminals) shall be provided on flanges, cemented to the bushing and not on the porcelain i.e. Flange type 66 KV bushing for CT, shall be provided.

13. For gasket joints, wherever used, Nitrile Butyl rubber NBR/Viton shall be used. No CORK gaskets shall be used. All gaskets/O rings shall be fixed in a machine groove.The gaskets shall be securely fitted for perfect sealing.

14. The bolts required for fitting the dome shall be of stainless steel of minimum 6 mm dia.

15. The outer surface of metal tank shall be Hot Dip Galvanized, whereas, the inner portion shall be painted with oil resistive, insoluble paint. The GETCO reserves right for stage inspection during manufacturing process of tank / CT. The galvanizing shall be as per applicable standard IS:2629 and minimum thickness of zinc coating shall be 800 gm/sqmt.

16. The tank of CT shall be provided with pressboard of 2 mm thickness inside and at bottom.

17. Provision of drain valve for sampling / draining of oil purpose at the bottom of tank is not permitted.

18. The minimum thickness of flange & gasket provided on tank shall be as follow:

(1) Flange thickness of tank - 8 mm
(2) Top plate thickness - 5 mm
(3) Gasket thickness - 6 mm

19. The current transformers shall be suitable for mounting on steel structures or concrete pedestals.

B. **WINDING AND TERMINALS:**

1. The rating of the secondary winding shall be as specified under Section V (technical specification of CT) of this specification. Single core single ratio of 60/1 A is to be provided.

2. Primary and secondary windings shall be of electrolytic grade copper and shall have continuous thermal rating as specified for all ratios. The primary winding is to be designed for continuous extended primary current at 120 % of rated primary current. The secondary winding wherever tapped, shall be adequately reinforced to withstand normal handling without damage.

3. The primary terminals shall be of standard size of 30 mm dia x 80 mm length for all CTs rated upto60 Amps. The primary terminals shall be of heavily tinned electrolytic copper. The maximum thickness of tinning shall be 15 microns.

4. The secondary terminals shall be brought out in a compartment for easy access. Secondary terminal studs shall be provided with at least three nuts and adequate plain and spring washers for fixing the leads. The studs, nuts and washers shall be of brass, duly nickel-plated. The minimum outside diameter of the studs shall be 6mm. The length of at least 15mm shall be available on the studs for inserting the leads. The horizontal spacing between centers of the adjacent studs shall be at least 1.5 times the outside circum dia. of the units.

5. The current transformer shall be provided with suitable test tap for measurement of capacitance, tan delta as well as partial discharges, in factory as well as at site. Provision shall be made of a screw on cap for solid and secured earthing of the test tap connection, when not in use. A suitable caution plate shall be provided duly fixed on the cover of the secondary terminal box, indicating the purpose of the test tap and necessity of its solid earthing as per prescribed method, before energizing the CT.

C. **TERMINAL BOX OF CURRENT TRANSFORMERS:**

1. The exterior of the secondary terminal box shall be hot dip galvanized. A cable box along with necessary glands for receiving control cables suitable

for mounting on bottom plate of the terminal box shall be included in the scope of supply. A door with locking arrangement shall be provided on the front of the terminal box. The secondary terminals shall be taken out through composite epoxy or FRP mould having single gasket packing & shall be provided by suitable link with dummy secondary leads. For control cable connections, separate terminal connector block to be provided. Secondary jumpers shall be terminated at one side of this terminal connector block. The secondary terminal box shall comply with Degree of Protection (IP-55) standards and type test report shall be furnished with technical bid.

D. **TEMPERATURE RISE:**

1. The maximum temperature rise of the current transformer and its oil, winding and external surface of the core and other parts shall be as specified in Table I of IS: 2705 (Part I) 1981.

E. **BUSHING AND INSULATORS:**

1. The porcelain hollow insulator used shall be homogenous, free from lamination cavities and other flaws or imperfection that might affect the mechanical or dielectric qualities. The hollow insulator shall conform to the latest edition of IS: 5621.The puncture strengths of the hollow insulator shall be entirely free from external and internal corona. The total creepage distance of the hollow insulator shall be suitable for heavily polluted atmosphere i.e. the total creepage distance shall be 2247.5 mm (minimum).

   Suitable means shall be provided to accommodate conductor expansion and there should not be any undue stress on any part of the equipment due to temperature changes. The bidder may provide packing between insulator and tank. This packing shall be preferably Nylon Bush of minimum 3 mm thickness.

   The exterior, upper and lower joints of insulator bushing shall be sealed with suitable sealant.

2. The hollow porcelain bushings conforming to the latest edition of IS: 5621 shall be used for current transformers. The insulation of bushings shall be coordinated with that of the instrument transformer such that the flashover, if any, will occur only external to the current transformers. The bushings should not cause radio interference, when operating at rated voltage.

3. The quantity of insulating oil for the first filling of oil in each CT and the complete specifications of the oil shall be stated in the tender. The oil shall

conform to the requirements of latest edition of IS: 335. The actual oil to be used shall be of the following approved make.

Sl.no	Names
1	Apar, Mumbai
2	Madras petroleum, Chennai,
3	Savita Chemicals,
4	Sarabati Petrochemical
5	Raj Lubricants, Chennai
6	Rinki Petrochemical, Baroda
7	Amod Petrochem, Samiyala; Dist. Baroda
8	Raj Petroleum, Panoli
9	Tashkent Oil Co. ltd.

The manufacturer of CT shall measure the PPM value of oil before filling inside the CT and shall keep record of the same.

F. **TERMINAL CONNECTORS AND EARTHING TERMINALS:**

Compression joint type bimetallic terminal connectors suitable for existing conductors (with 510 amps.) shall be supplied for CTs having ratio 60/1 Amp.
The terminal connectors shall be suitable for 31.5 KA for 3 sec. They shall be suitable for vertical & horizontal connections of the transmission line conductors or station bus bar. The bolt and nuts shall be of stainless steel and one SS washer and two SS nuts (including lock nut) for each bolt shall be supplied. Two grounding terminals suitable for receiving connections for grounding shall be provided for the current transformers.

GALVANIZING:

All ferrous parts of current transformers including bolts, nuts etc. shall be hot dip galvanized as per IS: 2629 – 1966 with (latest edition) and the minimum thickness of zinc coating shall be 800 gr/sqmt.

G. **TESTS AND TEST REPORTS:**

1. Reports of all type tests as stipulated in the latest edition of IS:2705 &IEC 60044-1 for current transformers shall be submitted along with the tender.

2. The type test reports for the type tests carried out as per IS: 2705 (latest edition) & IEC 60044-1 for specified CTs and those for offered insulatorsshall be submitted. **The type test reports shall not be older than Five years and shall be valid up to expiry of validity of offer. Following test reports shall be submitted**:

   1. Lightning chopped Impulse voltage withstand test on Primary winding
   2. High voltage power frequency wet withstand test on Primary winding
   3. High voltage power frequency dry withstand test on primary winding
   4. Temperature rise test
   5. Short Time Current withstand test
   6. Determination of Errors & other characteristics
   7. Measurement of dielectric dissipation factor
   8. Degree of protection IP55 for secondary terminal box
   9. STC test on primary terminal connector
   10. Mechanical Load test on primary terminal
   11. Thermal stability test
   12. Thermal coefficient test

   The type test reports for offered terminal connectors (confirming to IS: 5561 (latest edition), but not older than five years prior to the date of bid opening and those for offered insulators confirming to the applicable standard shall, also, be submitted along with the offer.

   IMPORTANT NOTE: In case of non-submission of some of the type test reports, the bidder shall confirm the submission of same before commencement of supply, without affecting delivery schedule, from NABL accredited laboratory, free of cost. In absence of this confirmation, the offer will be evaluated as non submission of type test report.
   If bidder has submitted all valid type / special / additional test reports as per requirement of technical specifications then the same are not required to be repeated. However, those tests which are covered under acceptance/ additional/ routine tests will be required to be carried out during the inspection, which is not a repetition.

3. Routine tests as per the latest edition of IS: 2705 for current transformers shall be carried out on each current transformer (in presence of purchaser's representative, if desired by the purchaser).
   Following tests shall be performed:
   1. Verification of terminal marking and polarity
   2. High voltage power frequency dry withstand test on primary winding
   3. High voltage power frequency dry withstand test on secondary winding

4. Over Voltage inter turn test
5. Measurement of Partial Discharge test
6. Determination of Errors & other characteristics
7. Measurement of dielectric dissipation factor **(0.*3*% max)**& Capacitance **at 10 kV and at Um/√3.**
8. Temperature Rise test (On any one unit from offered lot)

4. General points:

a) The contractor shall use 5 KV motorized megger for measuring IR valves of CTs.

b) The contractor shall carry out Partial Discharge test and tan delta test as per relevant ISS, and shall keep record of the same.

c) If so required, the purchaser shall select one CT of each ratio from the first lot or any subsequent lot of CTs, which shall be type tested in presence of purchaser's representative at third party Govt. recognized laboratory. The balance CT from the first offered lot or any subsequent lot shall be inspected and tested for routine tests.

d) The contractor shall offer CTs for routine tests / inspection in line with the requirement as per delivery schedule specified in the A/T

5. **ADDITIONAL ACCEPTANCE TEST:**

In addition to the acceptance tests indicated in IS-2705 (with latest amendment), the successful bidder has to conduct following tests on all offered lot of CTs during inspection:

<table>
<tr><td>Sl.no</td><td>Test</td></tr>
<tr><td>1</td><td>Tan Delta test (0.3% Max) (On all units) (at 10 kV & Um/√3)</td></tr>
<tr><td>2</td><td>Temperature Rise test (On randomly selected one unit)</td></tr>
<tr><td>3</td><td>Partial Discharge test (<10 pC) (On selected unit for (c), but to be carried out before and after Temperature Rise test)</td></tr>
<tr><td>4</td><td>Test on oil:
<table>
<tr><td>BDV test</td><td rowspan="6">On randomly selected unit of very first lot offered for inspection and to be conducted after HV test only.</td></tr>
<tr><td>Tan Delta test</td></tr>
<tr><td>Water PPm test</td></tr>
<tr><td>Resistivity at 90^0</td></tr>
<tr><td>Viscosity</td></tr>
<tr><td>Total acidity</td></tr>
<tr><td>DGA test</td><td>Copy of test report, received from the power oil manufacturer, to be submitted.</td></tr>
</table></td></tr>
<tr><td>5</td><td>a. Thermal stability test on CT (On any one unit)
b. Thermal coefficient test on CT (On any one unit)</td></tr>
</table>

(NOTE: If the supplier of oil is changed during execution of order, same test shall be repeated for the oil of new supplier.

All the tests reports and oscillograms shall be submitted and got approved from the purchaser before dispatching the equipment.

H. QUALITY ASSURANCE PLAN:

The tenderer shall invariably furnish following information along with his offer; failing which his offer shall be liable for rejection. Information shall be separately given for individual type of instrument transformer.

Statement giving list of important raw materials, including but not limited to:

- Primary Conductor
- Oil
- Insulator Bushing
- Sealing material
- Core
- Secondary wire

Names of sub-suppliers for the raw materials, list of standards; according to which the raw materials are tested, list of tests normally carried out on raw materials in presence of tenderer's representative, copies of test certificates or any other information required by the owner.

I. COMPLETENESS OF EQUIPMENTS:

Any fittings, accessories or apparatus which may not have been specifically mentioned in these specifications, but which are usual or necessary for the equipment of similar plant shall be deemed to be included in the contract and shall be supplied by the contractor without extra charges. All plant and equipment shall be complete in all details whether such details are mentioned in the specification or not.

J. INSPECTION:

1. The purchaser shall have access at all times to the works and all other places of manufacture, where the Instrument Transformers are being manufactured and the supplier shall provide purchaser's representative all facilities for unrestricted inspection of the works, raw materials, manufacture of all the accessories and for conducting necessary tests.

2. No material shall be dispatched without Inspection and approval of GETCO and DPA.

3. The acceptance of any quantity of the equipment shall in no way, relieve the successful Bidder of his responsibility for meeting all the requirements of this specification and shall not prevent subsequent rejection, if such equipment are found defective later.

SEAL OF THE FIRM **SIGNATURE OF THE TENDERER**

Technical Particulars of Current Transformers

A. SCOPE:

This section covers the specific technical requirements, climatic and Isoceraunic conditions and systems particulars for which current transformers shall be offered as per the general technical requirements given of this specification and the schedule of requirements specified herein for various substations.

B. CLIMATIC & ISOCERAUNIC CONDITIONS:

1. The climatic conditions, under which the equipment shall operate satisfactorily are as follows:

Sl.no	Description	Values
1	Maximum ambient temperature of air in Shade (C)	50°C
2	Minimum ambient temperature of air in shade (C)	4°C
3	Maximum daily average ambient temperature (C)	40°C
4	Maximum yearly average ambient temperature (C)	30°C
5	Maximum relative humidity (%)	95%
6	Average number of thunderstorm (days / annum).	15
7	Average annual rainfall (cm)	150 cm.
8	Maximum wind pressure (kg/Mtr2)	150 kg/Mtr2
9	Height above mean seal level (Mtrs)	Not exceeding 1000M

2. All equipments offered shall be suitable for continuous satisfactory operation at the extended primary current of 120 % of full rated capacity, under the above climatic conditions.

3. Since the substations may be near seashore or industrial area, the equipment offered shall be suitable for heavily polluted atmosphere.

C. SYSTEM DETAILS:

Sl.no	Description	Values
1	Nominal system voltage	66 KV
2	Maximum rated voltage	72.5 KV
3	Frequency	50 Hz
4	Number of phases	3
5	Neutral earthing	Solidly Earthed

D. **TYPE & RATING OF CURRENT TRANSFORMER:**

The 66 KV Current transformer shall have the rating as given below:

1)	CT Ratio	60/1 AMP
2)	Core	One
3)	Purpose	Core – Tariff Metering
4)	Rated burden (VA) (Lowest Ratio) (at minimum tap)	5
5)	Class of accuracy	0.2S
6)	i) Rated accuracy limiting factor (ALF)	10 at minimum ratio for all 66 KV CTS
	ii) Instrument security factor. (ISF)	5 or less at minimum ratio for all 66 KV CTS.
7)	Minimum knee point voltage (at highest ratio)	
8)	Exciting current at knee point voltage	As per IS: 2705 (latest edition)
9)	Resistance of secondary winding	- Do -
10)	1.2 / 50 microsecond lightning impulse withstand voltage (kV peak)	350
11)	Power frequency withstand voltage for one minute (kV rms)	140
12)	Short time with stand current (kA) (corresponding to fault level in MVA for 3.0 sec.)	31.5 for 3 sec
13)	Minimum total for creepage distance for heavily polluted atmosphere: (mm)	2247.5
14)	Partial discharge level	< 10 pC
15)	Power Frequency Voltage withstand of secondary winding	3 kV for One minute.

E. **EARTH QUAKE & WIND DESIGN LOADS:**

Each CT, including its supporting structure shall be designed to withstand repeated earthquake acceleration of 0.08 x 2g with wind loads of 150 kg/m2 on the projected area (non-simultaneous) without damage to component parts and without impairment of operation.

SEAL OF THE FIRM **SIGNATURE OF THE TENDERER**

TECHNICAL SPECIFICATIONS FOR 66 kV VOLTAGE TRANSFORMERS

A. SCOPE:

Supply, Installation, Erection, Testing and Commissioning of 66 kV Metering PT at 66/11 kV Receiving Substation at DPA. This specification is intended to cover Supply, Installation, Erection, Testing and Commissioning of voltage transformers for metering and relaying service in 66 KV phase system.

B. TYPE AND RATING:

The voltage transformers shall be of outdoor, oil impregnated paper, single phase, oil immersed, self-cooled suitable for operation in 3 phase, 66 KV solidly grounded system.

The voltage transformers shall have the following ratings:

	POTENTIAL TRANSFORMER	For tariff metering purpose
i)	Nominal system voltage	66 kV
ii)	Highest system voltage	72.5 kV
iii)	Frequency	50 Hz
iv)	Earthing	Effective
v)	Number of Windings	One
	a) Ratio: Winding	38.1 kV/63.5V
vi)	a) Rated Burden, Winding	10 VA
vii)	a) Class of accuracy windings	0.2 (Tariff metering)
viii)	Over voltage factor:	1.2 continuous
ix)	1.2/50 micro sec. lightning impulse withstand voltage	350 kVp
x)	P.F. withstand voltage for one minute	140 kV rms
xi)	Total Creepage (Min) Distance	2247.5 mm
xii)	Partial discharge level	< 10 pC
xiii)	Power Frequency Voltage withstand of secondary winding	3 kV for One minute.

C. STANDARDS:

The voltage transformers shall conform in all respects to the latest issue of IEC, recommendations publication No. 60044 or British Standards No. 81 & 2046, and IS: 3156 (latest issue) except wherein specified otherwise, where the equipment conforms to any other standard, the salient points, differences between the standards adopted and the British Standards shall be clearly brought out in the tender.

Equipment meeting any other authoritative standard, which ensures an equal or better quality than the standard mentioned above, is also acceptable.

D. GENERAL:

1. The voltage transformers shall be outdoor, oil immersed and self-cooled type suitable for the services indicated conforming to the modern practice of design and manufacture.

2. The core shall be of high grade, non-ageing, electrical silicon laminated steel of low hysteresis less and high permeability to ensure high accuracy at both normal and over voltage.

3. The voltage transformers shall be hermitically sealed to eliminate breathing and entering of air and moisture in the tank. Provision of pressure releasing device is not permitted.

4. For compensation of variation in volume of oil due to temperature variation, stainless steel bellows shall be provided. The successful bidder shall have to submit calculations of volumetric expansion and contraction. These calculations shall be submitted along with the basic parameters of SS bellow used in PT. Rubber bellow or Nitrogen gas cushioning for above purpose shall not be permitted.

5. The Voltage Transformers provided with stainless steel bellows for compensation of oil volume variation shall be provided with a suitable oil level indicator at suitable location to enable an observer to see the oil level of the C.T. from the ground level. Oil level indicator shall be provided with fluorescent green colored floating ball. All parts of bellow shall be of stainless steel only.

6. The bolts required for fitting the dome shall be stainless steel of minimum 6 mm diameter.

7. The outer surface of metal tank shall be Hot Dip Galvanized, whereas, the inner portion shall be painted with oil resistive paint. The GETCO reserves right for inspection during manufacturing process of metal tank.

8. The tank of PT shall be provided with pressboard of 2 mm thickness inside and at bottom.

9. The bidder shall provide packing between insulator and tank. This packing shall be preferably Nylon Bush of minimum 3 mm thickness.

10. The exterior, upper and lower joints of insulator bushing shall be sealed with suitable sealant.

11. The provision of drain valve for sampling / draining of oil purpose at the bottom of the tank is not permitted.

12. The minimum thickness of flange & gasket provided on tank shall be as follow:

    a. Flange thickness of tank - 8 mm
    b. Top plate thickness - 5 mm

c. Gasket thickness - 6 mm

F. WINDINGS:

PRIMARY & SECONDARY WINDING:

The primary winding shall be of electrolytic grade copper. All primaries of potential transformers will be connected in phase to neutral with the neutral point solidly earthed. The neutral of the system is also solidly earthed.

The primary terminal shall be of heavily tinned electrolytic grade copper and shall be of standard size 30 mm dia. x 80 mm long and tinning shall be adequate.

The secondary winding shall be of electrolytic grade copper. Secondary terminal shall be nickel-plated brass.

The secondary terminals shall be taken out through composite epoxy or FRP mould having single gasket packing & shall be provided by suitable link with dummy secondary leads. For control cable connections, separate terminal connector block to be provided. Secondary jumpers shall be terminated at one side of this terminal connector block.

All potential transformers for phase to ground connection shall be provided with two separate windings rated for 110 V and 63.5 V for connection in star and delta winding respectively. The star winding, to be used for metering and relaying (distance relays) shall be of 0.2 accuracy class specified or appropriate class. The rated burden of this winding shall not be less than that specified above.

The delta winding to be used for synchronizing and relaying (directional relays) shall be of accuracy class specified or appropriate class and its rated burden shall not be less than that specified above.

G. INSULATION:

1. The potential transformer shall withstand 1.2/50 microsecond lightning impulse withstand voltage of 350 kV peak.
2. They shall withstand power frequency withstand voltage of 140 kV (rms) (dry & wet) for one minute.

H. TEMPERATURE RISE:

The potential transformers shall be designed to limit the temperature of windings and other parts as specified in the British Standards / relevant standards when corrected or the differences between the temperature prevailing at site and temperature specified by the standards. The temperature rise, at 1.2 times rated primary voltage when applied continuously at rated frequency and at rated burden, shall not exceed the limits specified above and the temperature rise at 1.5 times rated primary voltage when applied for 30 seconds, starting from previous stable operating condition at rated frequency and rated burden shall not exceed the above temperature limits by more than 10oC.

I. INSULATING OIL:

The quantity of insulating oil for the first filling of oil in each PT and the complete specifications of the oil shall be stated in the tender. The oil shall conform to the requirements of latest edition of IS: 335. The actual oil to be used shall be of the following approved make.

Sl.no	Names
1	Apar, Mumbai
2	Madras petroleum, Chennai,
3	Savita Chemicals,
4	Sarabati Petrochemical
5	Raj Lubricants, Chennai
6	Rinki Petrochemical, Baroda
7	Amod Petrochem, Samiyala; Dist. Baroda
8	Raj petroleum, Panoli
9	Tashkent Oil Co. ltd.

The manufacturer of PT shall measure the PPM value of oil before filling inside the PT and shall keep record of the same.

J. TYPE OF MOUNTING:

1. The voltage transformers shall be suitable for mounting on steel structures or concrete pedestals. The necessary flanges, bolts etc. For the base of the voltage transformer shall be supplied and these shall be galvanized. Nuts and bolts shall be provided on flanges, cemented to the bushing and not on the porcelain. i.e. flange type bushing to be provided.

K. TERMINAL BOX OF VOLTAGE TRANSFORMERS:

1. The exterior of the secondary terminal box shall be hot dip galvanized. A cable box along with necessary glands for receiving control cables suitable for mounting on bottom plate of the terminal box shall be included in the scope of supply. A door with locking arrangement shall be provided on the front of the terminal box. The secondary terminals shall be taken out through composite epoxy or FRP mould having single gasket packing & shall be provided by suitable link with dummy secondary leads. For control cable connections, separate terminal connector block to be provided. Secondary jumpers shall be terminated at one side of this terminal connector block. The secondary terminal box shall comply with Degree of Protection (IP-55) standards and type test report shall be furnished with technical bid.

2. The porcelain hollow insulator used shall be homogenous, free from lamination cavities and other flaws or imperfection that might affect the mechanical or dielectric qualities. The hollow insulator shall conform to the latest edition of IS: 5621.The puncture strengths of the hollow insulator shall be entirely free from external and internal corona. The total creepage distance of the hollow insulator shall be suitable for heavily polluted atmosphere i.e. the total creepage distance shall be 2247.5 mm (minimum).

Suitable means shall be provided to accommodate conductor expansion and there should not be any undue stress on any part of the equipment due to temperature changes.

The bidder may provide packing between insulator and tank. This packing shall be preferably Nylon Bush of minimum 3 mm thickness. The exterior, upper and lower joints of insulator bushing shall be sealed with suitable sealant. The hollow porcelain bushings conforming to the latest edition of IS: 5621 shall be used for current transformers. The insulation of bushings shall be coordinated with that of the instrument transformer such that the flashover, if any, will occur only external to the current transformers. The bushings should not cause radio interference, when operating at rated voltage.

3. For gasket joints, wherever used, Nitrile Butyl rubber NBR/Viton gaskets shall be used. No CORK gaskets shall be used. All gaskets/O rings shall be fixed in a machine groove. The gaskets shall be securely fitted for perfect sealing.

L. TERMINAL CONNECTIONS:

The compression joint type terminal connector suitable for existing conductor shall be supplied. Suitable terminal earth connector for connections for earthing shall also be supplied. The terminal connectors shall be suitable for 31.5 KA for 3 secs. They shall be suitable for vertical & horizontal connections of the transmission line conductors or station bus bar. The bolt and nuts shall be of stainless steel and one SS washer and two SS nuts (including lock nut) for each bolt shall be supplied. Two grounding terminals suitable for receiving connections for grounding shall be provided for the voltage transformers.

M. TESTS:

TYPE TESTS:

1. The type test report for all the type tests as stipulated in IS: 3156 (Part – I – latest edition) but not older than FIVE years and shall be valid up to expiry of validity of offer, shall be submitted. The type test reports for offered terminal connectors (confirming to IS: 5561 (latest edition), but not older than five years prior to the date of bid opening and those for offered insulators confirming to the applicable standard shall, also, be submitted along with the offer.

    1. Lightning chopped Impulse voltage withstand test on Primary winding
    2. High voltage power frequency wet withstand test on primary winding
    3. High voltage power frequency dry withstand test on secondary winding
    4. Temperature rise test
    5. Determination of Errors & other characteristics
    6. Degree of protection IP55 for secondary terminal box
    7. STC test on primary terminal connector
    8. Mechanical load test on primary terminal

IMPORTANT NOTE: In case of non-submission of some of the type test reports, the bidder shall confirm the submission of same before commencement of supply, without affecting delivery schedule, from NABL accredited laboratory, free of cost. In absence of this confirmation, the offer will be evaluated as non-submission of type test report.

If bidder has submitted all valid type / special / additional test reports as per requirement of technical specifications then the same are not required to be repeated. However, those tests which are covered under acceptance/ additional/ routine tests will be required to be carried out during the inspection, which is not a repetition.

Each voltage transformer shall be subject to routine tests as stipulated in IS ; 3156 (latest edition) in presence of purchaser's representative, if so desired, by the purchaser. All the type test reports shall be submitted and got approved from the purchaser before the dispatch of potential transformer.

Following tests shall be performed:

1. Verification of terminal marking & polarity test
2. High voltage power frequency dry withstand test on primary winding
3. High voltage power frequency dry withstand test on secondary winding
4. Measurement of Partial Discharge test
5. Determination of Errors & other characteristics
6. Measurement of dielectric dissipation factor (0.3% max)&Capacitance at 10 kV and at Um/√3.
7. Temperature Rise test (On any one unit from offered lot)

2. **ADDITIONAL ACCEPTANCE TEST:**

In addition to the acceptance tests indicated in IS-3156 (with latest amendment), the successful bidder has to conduct following tests on all offered lot of PTs during inspection:

<table>
<tr><td>Sl.no</td><td colspan="2">Test</td></tr>
<tr><td>1</td><td colspan="2">Tan Delta test (0.3% Max) (On all units) (at 10 kV & Um/√3)</td></tr>
<tr><td>2</td><td colspan="2">Temperature Rise test (On randomly selected one unit)</td></tr>
<tr><td>3</td><td colspan="2">Partial Discharge test (<10 pC) (On selected unit for (c), but to be carried out before and after Temperature Rise test)</td></tr>
<tr><td>4</td><td colspan="2">Test on oil:
BDV test — On randomly selected unit of very first lot</td></tr>
<tr><td></td><td>Tan Delta test
Water PPm test
Resistivity at 90^0
Viscosity
Total acidity</td><td>offered for inspection and to be conducted after HV test only.</td></tr>
<tr><td></td><td>DGA test</td><td>Copy of test report, received from the power oil manufacturer, to be submitted.</td></tr>
</table>

NOTE: If the supplier of oil is changed during execution of order, same test shall be repeated for the oil of new supplier.

N. COMPLETENESS OF EQUIPMENTS:

Any fittings, accessories or apparatus which may not have been specifically mentioned in these specifications, but which are useful or necessary for the equipment of similar plant shall be deemed to be included in the contract and shall be supplied by the contractor without extra charges. All plant and equipment shall be complete in all details whether such details are mentioned in the specification or not.

O. INSPECTION:

1. The purchaser shall have access at all times to the works and all other places of manufacture, where the Instrument Transformers are being manufactured and the supplier shall provide purchaser's representative all facilities for unrestricted inspection of the works, raw materials, manufacture of all the accessories and for conducting necessary tests.

2. No material shall be dispatched without Inspection and approval of GETCO and DPT.

3. The acceptance of any quantity of the equipment shall in no way, relieve the successful Bidder of his responsibility for meeting all the requirements of this specification and shall not prevent subsequent rejection, if such equipment are found defective later.

SEAL OF THE FIRM **SIGNATURE OF THE TENDERER**

Commercial terms and condition

(1) The tentative period is 75 days.

(2) Payment terms

payment after deducting statutory taxes will be released after successful completion of whole work and handing over to DPA on satisfactory condition.

(3) GST will be reimbursed as per actual.

(4) The contractor/service provider/supplier etc. has to ensure timely and proper filling of GSTR1 so that Deendayal Port Trust can avail input tax credit in timely manner. In case DPA not allowed input tax credit due to failure on part of the contractor/service provider/supplier etc., it will be a financial loss to the DPA and therefore same shall be recovered from the payment/deposit of the contractor/service provider/supplier

(5) **Taxes:**

GST Clause :
The contractor shall quote the price exclusive of GST. The contractor shall quote prevailing GST rate separately, which shall be reimbursed by DPA after ascertaining necessary compliance as per Goods & Service Tax, 2017.
All other duties, taxes, cesses applicable if any, shall be borne by the contractor.

Deduction of Income-Tax and GST:

Income-Tax deductions and surcharge and GST+TDS under GST Act as applicable thereon shall be made good while making payments due to the contractor for carrying out the work and only net amount shall be paid as directed by the Central Board of Direct Taxes, Ministry of Finance, Government of India.

Tax: The rates quoted (except GST) by the contractor shall be deemed to be inclusive of the taxes, duties etc. which the contractor will have to pay for the performance of this contract. The employer will perform such duties in regard to the deduction of such taxes at sources as per applicable law.

(6) Deduction:

Deduction of taxes/income tax at source, TDS on GST etc. shall be made from the any bill of the Contractor in accordance with the prevailing rules of Govt.

While performing under the contract, the damages caused by the Contractor or his workers to any of the Port Trust property shall be promptly made good by the Contractor at his own cost. In case the Contractor fails to repair/replace the damage, DEENDAYAL PORT TRUST shall have the right to take steps to make good the damages and all the cost on this account shall be recovered from the bills of the Contractor or any money due to the Contractor from this contract or any other contract or any other transaction. In determination of the damage, the opinion of the Engineer-In-charge (EIC) shall be conclusive.

Any dues arising out of failure on the part of the Contractor to carry out any obligation under the contract shall be deducted from the bills of the Contractor or from any money due to the Contractor from this contract or any other contract.

(7) Security deposit shall consist of performance guarantee to be submitted at award of work. Performance guarantee should be 3% of the contract price which should be submitted in form of Bank Guarantee or Demand draft within 07 days from the date of issue of work order which will be refunded immediately not later than 14 days from completion of defect liability period of six months.

Failure of the successful bidder to comply with the requirements as mentioned above shall constitute sufficient grounds for cancellation of the award of work and the bidder can be disqualified from bidding for any contract with DPA for a period of three years from the date of notification.

-sd/

Signature & Seal of Contractor

Executive Engineer (E)
Deendayal Port Authority

Name of work: - REPLACEMENT OF 66KV METERING CT`S/PT`S AND SITC 2 NOS. ABT METERS AT IOCL YARD KANDLA

Sr. No.	Description	Unit	Qty	Supply Rate	Amount	Services Rate	Amount
	66 kV System Equipments						
1	Supplying, Installation, Testing and Commissioning incl. replacement of 66 kV Outdoor Live/Dead tank, oil filled, Oil filled 0.2s metering Current Transformer with 60/1 as per GETCO specifications including loading/unloading, receiving from stores, testing & commissioning along with replacement of existing CT`s	No.	3.00				
2	Supplying, Installation, Testing and Commissioning incl. replacement of 66 kV Outdoor Live/Dead tank, oil filled,0.2 metering Potential Transformer as per GETCO specifications including loading/unloading, receiving from stores, testing & commissioning along with replacement of existing PT`s	No.	3.00				
3	Supply, Installation, testing and Commissioning of ABT Meters, as per GETCO Approved specifications Duly tested at NABL lab and approved by GETCO along with cubicle, test terminal block and all accessories required to complete this job	No.	2				
4	Testing & Commissioning	Job	L.S				
				Total Amount(Excluding GST)			

Signature & Seal of Contractor

-sd/
Executive Engineer (E)
Deendayal Port Authority