National Centre for Polar & Ocean Research

(An Autonomous Society under the Ministry of Earth Sciences)
Headland Sada, Vasco-da-Gama, Goa-403804

Limited Tender No	**:**	**NCPOR/EST/EE/01/22-23**
Name of the work	**:**	**Transformer Servicing & Other Allied Works at NCPOR, Goa.**
Tender Submission Date & Time	**:**	**07.06.2022 / 11 Hrs.**
Tender Opening Date & Time	**:**	**07.06.2022 / 11.30 Hrs.**

Annexure - I

PARTICULARS OF THE TENDERER

1. Name of the Tenderer :_____

2. Office Address :_____

_____

(a) Name of the contact person :_____

(b) Telephone No. (s) : _____

(c) Fax No. :_____

(d) E-mail Address :_____

(E-mail address should be provided which will be used for official correspondence)

(e) Website Address : (if any) :_____

4. Trade Registration Licence Number :_____

(Please enclose copy)

5. PAN No. of the quoted Firm / Tenderer :_____*(Please enclose copy)*

6. Goods and Service Tax (GST) Number : _____

(Please enclose copy of registration number)

9. Have you ever Terminated/Black Listed by any organization : YES / NO

Name & Signature of the Tenderer with seal *:*

Annexure - II

TECHNICAL SPECIFICATIONS & SCOPE OF WORK

PREVENTIVE MAINTENANCE OF 750 KVA TRANSFORMER

The principal objective of maintenance is to maintain the insulation in good condition. Moisture, dirt and excessive heat in contact with oxygen, are the main cause of insulation deterioration and avoidance of these will, in general, keep the insulation in good condition. The limiting factor is the ageing of the insulation and decline in the quality of the insulation during the ageing process due to chemical and physical effects. The decay of the insulation follows the chemical reaction rate, and in case of oil-immersed transformers, if the sustained operating temperature of the insulation exceeds the normal operating temperature of 98°C, there will be a shortening of the life of the transformer.

Safety Precaution - Arrangements shall be made to carry out the maintenance of transformers in safety. Before starting any maintenance work the transformers shall be isolated from the supply and the terminals earthed. Oil level shall always be borne in mind when undoing nuts and bolts and before unsealing the tank. No fire shall be kept near the transformer while maintenance work is going on.

Oil - Transformer oil is subject to deterioration or contamination in storage and in service. Accordingly, a periodic treatment to maintain it in fit condition is required, and eventually, it may have to be replaced by new oil.

All leaks if present should be repaired as quickly as possible so as to avoid possible trouble caused by low oil level.

Oil for toppling up should comply with IS : 335(1993) and should preferably be from the same source as the original oil because the oil refined from different crudes may not be completely miscible and may separate into layers. Furthermore, there may be a greater tendency to form acidity or sludge in a mixture than in oil from a single source of supply. Used oil shall not be mixed. New oil may be added as make up only, not exceeding about 10 percent. It is desirable not to mix oil taken from a transformer with that from switchgear equipment.

It is recommended that the oil be kept under observation for acidity. If the acidity is increasing rapidly, or exceeds limits the cover should be removed to ascertain the condition of the interior of the tank and of the core and windings. Oil should be treated or discarded, if sludge or corrosion is evident, Advice should be obtained from the manufacturer.

It may be noted that reconditioning by centrifugal separation of filtration does not remove the acidity from the oil but will remove sludge, dust. dirt. etc, and will tend to retard the process of deterioration.

Filters with fullers earth will help to reduce acidity in the oils and in addition improve the resistivity.

Parameters of Oil should be checked as per IS: 1866-2017.

Dielectric strength should be measured as per IS: 6792-2017.

Dissolved Gas Analysis should be conducted as per IS: 9434-1992.

Transformer Body - The transformer tank and other parts should be inspected for any rust or leak. Rusted portions, if any, should be cleaned thoroughly and repainted with proper paints. If any leak is found, it should be investigated. Leaking Joints can be rectified by tightening the bolts to the correct pressure or by replacing the gaskets.

Cable Boxes - The seating arrangements for filling holes should be checked. When screwed plugs are seated with a bituminous compound, the compound should be examined for cracks. If the compound bas cracked it should be replaced as the cracks may lead to an accumulation of water around the plug. Gasketed joints should be examined and tightened whenever required.

External Connections - All connections should be tight. If they appear blackened or corroded, undo the connection and clean down to bright metal with emery paper. Remake the connection and give it a heavy coating of grease. It is particularly important that heavy-current carrying connections should be properly maintained. If the metal has the characteristic bluish tinge which indicates that it has been hot. Then in most cases the connection shall not be considered satisfactory. Either it has become loose or dirty, or the conductor is not suitable for carrying the current.

Breather ï Silica gel dehydrating breathers are fitted with a sight glass so that the colour of the crystals may be seen. The colour changes from blue to pink as the crystals absorb moisture. When the crystals get saturated with moisture they become predominantly pink and should therefore be reactivated. The body of the breather should be removed by undoing the nuts. If the crystals have been kept in an inner container, the container should be removed, but if they are not, the crystals should be removed into a shallow tray. The crystals should be backed at a temperature of about 200 deg C until the whole mass is at this temperature and the blue colour has been restored, Clean the breather and replace the dry crystals and renew the oil in the sealing cup at the bottom.

Buchholz Relay - Routine operation and mechanical inspection tests should be carried out.

Gaskets - Gaskets sometimes shrink during service. It is, therefore, necessary to check the tightness of all bolts fastening gasketed joints. The bolts should be tightened evenly round the Joints to avoid uneven pressure. Leaking gaskets should be replaced as soon as the circumstances permit.

Temperature Indicators - The level of oil in the pockets holding thermometer bulbs should be checked and the oil replenished, if required. The capillary tubing should be fastened down again if it has become loose. Dial glasses should be kept clear and if broken, replaced as soon as possible to prevent damage to the instrument. Temperature indicators should be calibrated with standard thermometer immersed in hot oil bath if found to be reading incorrectly.

PREVENTIVE MAINTENANCE OF ACBs & VCB

The maintenance of the Air Circuit Breakers & Vacuum Circuit Breaker are conducted as per IS: 10118 (Part IV)

Routine Maintenanceð The following programme should be followed:

Cleaningð All loose external dirt should first be removed. When cleaning switchgear it is most important not to use what is generally woven from loose fibres, metallic threads or similar particles. Brushes and blower nozzles should contain no metallic material. Care should be taken to prevent loose parts, tools, metal filings or dirt falling into apparatus.

Insulationð Clean and inspect. Renew where necessary. Porcelain insulation should be examined for cracks or other defects. Bonded and laminated fibrous insulation should be examined for signs of tracking, blistering or delamination. Insulation resistance tests are strongly recommended.

Contactsð Examine for burning or other damage and recondition or replace as required. Check that any backing springs are exerting proper pressure and that contacts are in correct alignment. Slight discoloration or burning of copper or copper-alloy contacts is not necessarily harmful but may be removed by using a fine file or fine glasspaper (emery or carborundum papers should not be used).
When cleaning contacts it is essential to ensure that the minimum amount of material is removed, as excessive filing of contacts may result in more rapid wear. The amount of material removed from

contacts should be kept to a minimum and it is imperative that the spring pressure between the contact surfaces should not be materially reduced.
Modern high-pressure point or line contacts will normally carry their rated current satisfactorily, even if there is some pitting of the surface. Large beads, or ridges on the contacting members that would seriously impede closing should be removed.
When contacts are replaced or renewed, contact pressures, alignment and wipe should be checked.
Any flexible braids should be examined, especially for fraying at the terminations, and renewed if necessary. In situations subject to corrosive atmosphere the braids may be provided with a protective compound.

Mechanismð During inspection or maintenance of the mechanism care should be taken to avoid the lingers being trapped in any part of the mechanism and to avoid the possibility of anyone being struck by moving parts of the mechanism or the moving contacts.
Clean, examine and renew worn parts. It is particularly important to ensure that rolling or sliding surfaces in the trip mechanism are free from dried-up lubricant. The mechanical details of the closing mechanism should be checked. Re-lubricate and adjust as required and check for correct operation.
Extreme care should be taken to verify that the adjustments conform with the manufacturersô instructions.

Auxiliary Switches, Indicating Devices and Interlocksð Auxiliary switches should be kept in clean and in sound condition because on them depends the correct functioning of other items of equipment, including protective gear.
Examine the contacts and clean or renew if necessary. Check for good contact pressure, freedom of the operating links and for correct timing of the contacts in relation to the circuit-breaker contacts.
Indicating devices, such as mechanical óONô and óOFFô indicators, semaphores, etc, should be examined to ensure that they are in good order.
Interlocks and locking devices should receive particular attention, especially those associated with earthing and testing facilities. A strained or worn locking device may result in a dangerous reduction of clearances.
Particular attention should be paid to the timing of the auxiliary contacts controlling the trip circuits to see that these make before the main contacts.

Isolating Contactsð Clean, examine for signs of overheating, recondition or renew as necessary.

Control Relay or Contactorð Check mechanical parts for free movement with control and main solenoid or motor fuses withdrawn. Clean arc chutes. Examine contacts and renew if necessary.

Main Connectionsð Ensure that all fastenings are tight, and good contact is maintained.

Secondary Wiringð Ensure that connections are tight, that good contact is maintained and that terminal boxes are free from dirt and moisture. Check insulation resistances and continuity of wiring to the time-limit fuses, instrument transformers, relays, instruments, motors and other associated items. Auxiliary plug and socket contacts should be cleaned and re-lubricated where necessary. Fuses should be tested for continuity. Fixed contacts carrying the fuses should be cleaned and tested for satisfactory contact.

Final Checkingð An insulation resistance test should be made and before the circuit-breaker and its ancillary apparatus is returned to service it should be checked for correct operation.
Where practicable, the closing and tripping of the circuit-breaker, after it has been restored to the service position, should be checked.
The correct operation of safety shutters should be checked as the breaker is restored to the service position.

Maintenance After Operation Under Fault Conditionsð After fault operation it is desirable that a complete inspection and overhaul be made as soon as possible in order to restore the making-capacity, breaking-capacity, normal-current carrying capacity and insulation level to their switch-gear.

PREVENTIVE MAINTENANCE OF AIR BREAK SWITCH

The maintenance of the Air Break Switch are conducted as per IS: 10118 (Part IV)

Routine Maintenance– The following programme should be followed:

Cleaning– All loose external dirt should first be removed.
Cloths used for cleaning purposes should be free of loose fibres, metallic threads or similar particles.
Brushes and blower nozzles should contain no metallic material.
Care should be taken to prevent loose parts, tools, metal filings or dirt falling into the apparatus.

Insulation and Bushings– Clean and inspect. Renew where necessary. Porcelain insulation should be examined for cracks or other defects. Bonded and laminated fibrous insulation should be examined for signs of tracking, blistering or delamination. Insulation resistance tests are recommended.
All insulations should be cleaned with material which is non-fluffy. For insulations which are not immersed in oil, a soft dry cloth is suitable. The only liquids allowed are benzene, trichloroethylene.

Contacts and Contact Shrouds– Examine for burning, overheating or other damage and recondition or renew as required.
Fixed and moving copper contacts may be dressed by using a fine file or fine glass paper. (Emery of carborundum paper should not be used.)
Silver or silver-plated contacts seldom require cleaning despite a black appearance. If it is required to clean them, plate polish may be used.
Alignment and wiped should be checked when contacts are replaced. Where practicable a check should be made to ensure that the contact pressure is adequate.

Mechanism– Clean, examine and renew worn parts. Re-lubricate and check for correct operation.

Final Checking– Check tightness of circuit and earth connections. Test insulation resistance.
Operation should be checked before returning the apparatus to service.

Maintenance After Operation Under Fault Conditions– After operation on a fault, the opportunity should be taken of a visual inspection and to carry out as many of the checks enumerated under routine maintenance as may be practicable.

LIGTHNING ARRESTER CONTINUITY TEST

The method of testing shall be that recommended in IS 3043 : 1987.

If the resistance to earth of a lightning protective system exceeds 10 ohms, the value should be reduced.

The inspections and tests will show what maintenance, if any, is needed. Particular attention should be given to:
a) earthing;
b) evidence of corrosion or conditions likely to lead to corrosion;
c) alterations and additions to the structure which may affect the lightning protective system (for example, changes in the use of a building, the installation of crane tracks, erection of radio and television aerials).

EARTH RESISTANCE TESTING OF TRANSFORMER

Earth Resistance Testing is conducted as per IS:3043-1966 The Earthing Resistance shall not be greater than 5 ohms. Earthing Resistance of a power station shall be not more than 0.5 ohm while that of a major and minor substation shall be not more than 1 ohm & 2 ohm respectively.

Standards to be followed as provided by INDIAN BUREAU OF STANDARDS

IS: 10028 ï 3 (1981)	Code of practice for selection, installation and maintenance of transformers.
IS : 335(1993)	new insulating oils- specification.
IS: 10118 ï 4 (1982)	Code of practice for selection, installation and maintenance of switchgear and control gear.
IS: 2309 (1989)	Protection of buildings and allied structures against lightning - code of practice.
IS: 3043 (1987)	Code of practice for earthing
IS: 1866 (2017)	Mineral Insulating Oils in Electrical Equipment Supervision and Maintenance Guidance
IS: 10593 (2016)	Mineral Oil-filled Electrical Equipment in Service ð Guidance on the Interpretation of Dissolved and Free Gases Analysis
IEC: 60599 (1999)	Mineral Oil-Impregnated Electrical Equipment in Serviceð Guide to the Interpretation of Dissolved and Free Gases Analysis.
IS: 9434 (1932)	Guide for sampling and analysis of free and dissolved gases and oil from oil-filled electrical equipment
IS: 6104 (1971)	Method of test for interfacial tension of oil against water by the ring method
IS: 1448 (P:21) (2012)	Determination of flash point ð pensky-martens closed cup method
IS: 1448 (P:2) (2007)	Petroleum products and lubricants - Neutralization number - Potentiometric titration method
IS: 6792 (2007)	Method for Determination of Electric Strength of Insulating Oils
IS: 6262 (1971)	Method of Test for Power Factor and Dielectric Constant of Electrical Insulating Liquids
IS: 6103 (1971)	Method of test for specific resistance (resistivity) of electrical insulating liquids
IS: 13567 (2018)	Insulating Liquids ð Oil-impregnated Paper and Pressboard ð Determination of Water by Automatic Coulometric Karl Fischer Titration
IS: 6855 (2017)	Method of Sampling for Liquid Dielectrics

TECHNICAL DETAILS

1. 750 KVA Transformer

Name of Equipment:	Distribution Transformer
Make:	Voltamp
Voltage (HV/LV):	11KV / 433V
Capacity:	750 KVA
Serial Number:	1018
Year of Mfg:	1996

2. Air Circuit Breakers		3. Air Circuit Breakers	
Name of Equipment:	ACB	Name of Equipment:	VCB
Make:	Schneider Electric	Make:	Schneider Electric
Voltage:	430V	Voltage:	11KV
Model:	mvS12N	Year of Mfg:	2015
Quantity:	04		

Annexure - III

SCHEDULE OF RATES (PRICE BID)

(Only RATE in figures & words. Amount in figures)

Sr.	Description	Qty	Rate (Rs)	Amount (Rs)
1	Testing of transformer IR value after opening HT cable and chamber	1 Job		
2	Oil Analysis to know the healthiness of transformer/DGA analysis before oil filtration	1 Job		
3	Transformer Oil Filtration	1 Job		
4	Topping up of transformer oil	20 litres		
5	Silica Gel	1 Set		
6	Testing of Dielectric strength and issue of certificates as per NABL standard before and after filtration	2 Samples		
7	Replacing gaskets of HT/LT side terminal box covers	1 Job		
8	Testing of buchloze relay trip and oil temperature relay calibration and its operation.	1 Job		
9	Earth resistance testing and issue of test report	10 Nos.		
10	11kV A.B switch Servicing	1 Job		
11	ACB Servicing	5 Nos		
12	Servicing of 11 kV breaker	1 No		
13	Painting of transformer after thoroughly cleaning with one coat of epoxy primer and one coat of epoxy paint.	1 Job		
14	LA continuity testing and issuing certificates for building.	12 nos.		
15	Transportation of Machinery	1 Trip		
			Sub Total :	
			GST ……..%:	
			Grand Total :	

Grand Total: Rs. _____ _____

Grand Total in words: _____

1. Discount offered if any, should be included in the quoted rates & should not be shown separately.
2. Contractor should quote all items given in the price bid.
3. Price Evaluation Criteria - The Lowest Evaluated Bidder (L1) would be arrived from the Grand Total above.

DECLARATION

1) I/We have read and understood the terms & conditions of the tender and comply to all Terms & Conditions of your Tender. (*In case of any deviation the Bidder must attach a separate sheet clearly stating the clause no. of the Tender and Deviation thereto*)
2) The undersigned is an authorized signatory and authorized to submit this bid and also certifies that the information mentioned above is true and correct.
3) If the work is awarded, I/we assure that the entire work will be completed satisfactorily within the stipulated time as per the tender terms & conditions of the tender.
4) I/We agree to accept payment through Public Financial Management System (**PFMS**).

Name: Signature of Authorised Signatory:

Date: Place:

Seal:

Terms and Conditions **Annexure – IV**

1. Tenders duly completed in all respect should be dropped in the tender box kept in the office of Estate Section on or before the due date & time. Tenders will be opened on the same date at 11.30 hrs in presence of the tenderers, if any.
2. If the last date for the submission of tender happens to be holiday then the tenders will be opened on the next working day at 11:30 hrs.
3. The Tenderer shall inspect the site and fully study the work involved, quantity and specifications before submission of tender.
4. Tender submitted shall remain valid for a minimum period of 90 days from the date of opening for the purpose of acceptance and award of work. Validity beyond 90 days from date of opening shall be by mutual consent.
5. Work Completion Period - The **Job must be completed within Two Weeks** from the date of receipt of the work order. Time is the essence of the work.
6. Defects Liability Period (DLP) is Six Months from the date of actual completion of the work. During DLP if any fault is observed then the Contractor has to repair/replace it imm. with his own cost.
7. Security Deposit is 3% of the total work value. Security Deposit will be deducted from the final bill amount & shall be released after six months from the date of completion of work if no defects are found in the work.
8. The Tenderer should quote all items of the price bid of the tender, otherwise the tender will be rejected.
9. The Rates quoted by the tenderer should be inclusive of duties, octroi, toll tax, royalties and all other taxes/charges in respect of this contract. No claim whatsoever in this regard shall be entertained after submission of tender.
10. The Job must be completed within stipulated time from the date of receiving the work order. Otherwise 2% of total work value will be deducted from your final bill for a delay of each week, subject to a maximum of 10% of total work value. If work is not completed within 30 days the contract will be terminated without any liability
11. Payment will be made within a month thruô PFMS after satisfactory completion of the total work, on the basis of actual quantity executed against submission of bill in duplicate.
12. All materials accessories required for the said work shall be arranged by the Contractor, like ladders, tools, labour, transport etc at his own cost.
13. All materials used shall be as per the IS specification and ISI marked wherever applicable.
14. The contractor shall be responsible for arranging all tools, equipments, instruments etc. required for installation, erection, testing and commissioning of all the equipments and materials at all heights covered under this tender/ contract.
15. Any damage to the property of NCPOR will have to be made good by the Contractor. The safe custody and upkeep of various items/equipments/tools & plants brought to the site is the sole responsibility of the Contractor.
16. The Contractor shall co-ordinate his work with other agencies employed by NCPOR and ensure that the works of other agencies are not hampered in any way during the Contract.
17. All necessary measurements, test reports etc. should be submitted after the completion of work.
18. After completion of work, the Contractor shall clear surroundings premise, clean all the floors, windows panes, furnitureôs, etc to the satisfaction of the Engineer Incharge at the site.
19. NCPOR reserves the right of accepting the whole or part of the tender and the Tenderer shall be bound to perform the same at the rates quoted.
20. The Tenderer shall quote RATES both in figures and words. He should also workout the amount for each item of work and write in figures and words. On checking if there are differences between rates quoted by the Tenderer in words and figures or in the amount worked out by him, the following procedure shall be followed :

    # When there is a difference between the rates in figures and in words, the rates, which correspond to the amounts worked out by the tenderer, shall be taken as correct. # When the amount of an item is not worked out by the tenderer or it does not correspond with the rate

written either in figure or in words, rate quoted by the tenderer in words shall be taken as correct. # When the rate quoted by the tenderer in figure and in words tallies but the amount is not worked out correctly the rate quoted by the Tenderer shall be taken as correct and not the amount.

21. Except writing rates, taxes and amount, the tenderer should not write any conditions or make any changes, additions, alterations and modifications in the printed form of tenders. If found any, such tender shall be rejected.
22. All measurements shall be at actual and as per site condition. Joint measurement shall be recorded with our Engineer.
23. Before submitting the tender all pages should be signed by the tenderer, including the schedule of quantities and terms and conditions and should be addressed to Director, NCPOR & to be submitted in a Single Sealed Envelope, superscribing name of the work, tender number and should be dropped in the tender box kept in the office of Estate Section at NCPOR on or before the due date & time.
24. The Contractor should provide all necessry safety items to his working staff while working on HT/LT Electrical setup, on height, with chemicals/paints & while working in any hazardous conditions. Contractor shall be fully responsible for any injury (whether fatal or otherwise) to his employees/staff/representatives/service personnel, for any loss or damage to property or for any other loss/damage. In case of any accident occurs due to any reasons during execution of work, NCPOR will not be responsible in any way for the same. No extra payments shall be made to the Contractor and No claim what so ever nature will be given or paid on this account and Contractor is fully responsible for such eventualities and indemnifies NCPOR from such events.
25. Post tender correspondence / enquiries: Any correspondence or enquiry subsequent to opening of the bids is not desirable, if the same is indulged into, it will be considered for disqualifying the tender. The Tenderer will be required to abstain from pursuing / canvassing the matter, directly or indirectly with any Officers of NCPOR, as otherwise the same would also amount to disqualification of the tender. However, bidder can ask their queries in writing regarding bidding conditions, bidding process prior to the bid opening and/ or rejection of its bid, reason for rejecting a tender after opening of bids.
26. Clarifications from bidders: To assist the process of examination, evaluation and comparison of bids, NCPOR may ask all the bidders or any bidder individually for clarification, if any, of their bids, including breakdown of unit rates and price. The request for clarification and the response should be in writing, but no change in the price or substance of the bid will be sought, offered or permitted, except as required to confirm the correction of arithmetical errors discovered by the NCPOR in the course of scrutiny.
27. Settlement of disputes/arbitration: The decision of the Director, NCPOR shall be final and binding for any dispute whatsoever. All questions, disputes or differences whatsoever which may at any time arise between the parties to this agreement touching the agreement or subject matter thereof, arising out of or in relation there to and whether as to construction or otherwise shall be referred to the decision of the Sole Arbitrator, appointed by the Director, NCPOR and the decision of the said Arbitrator shall be final and binding upon the parties.
28. Right to cancel tender/work order: In case of strike, accident or any other unforeseen conditions causing stoppage of work, NCPOR reserves the right to cancel and/ or modify the tender / work order without any liability for any compensation and / claim or any description.
29. Jurisdiction: All questions, disputes or differences arising under out of or in connection with the Tender / Contract if concluded shall be subject to the exclusive jurisdiction of the court under whose jurisdiction the place from which the tender / Acceptance of tender is issued, is situated i.e. Goa.

I/ We have read all the Terms And Conditions above and agreed to it.

Signature of Tenderer : Companyôs Round Seal :

Annexure – V

DECLARATION IN LIEU OF EMD/BID SECURITY

(To be submitted on the Bidder's Letter Head)

I/We é .é .(Name and Address of the Bidder) am/are submitting this declaration in lieu of EMD/Bid Security for the Tender é é é é .é .. (Tender Name), é é é é é é é é é é é é .. (Tender No) and thereby fully accepting that I/We will be suspended and/or black listed and/or shall not be eligible to participate in any Tenders invited by National Centre for Polar and Ocean Research (NCPOR) under the following circumstances,

a) If after opening of the Tender, I/We withdraw or modify my/our Tender bid during the period of bid validity as specified in the Tender Documents (including extended validity, if any)
b) If do not accept any Tender Terms & Condition of the Tender Document.
c) If after the award of work, I/We fail to furnish the required Security Deposit as detailed in the Tender Document.
d) If I/We do not provide any information, documents as asked by you for the bid evaluation or contract finalization or contract execution purpose.
e) If I/We fail to sign the Contract, within the stipulated time as mentioned in the Tender Document/Work Order
f) If I/We fail or refuse to execute the contract as per the Terms & Conditions of the Tender Document.

Name & Signature of the Tenderer/Authorized Signatory with seal :