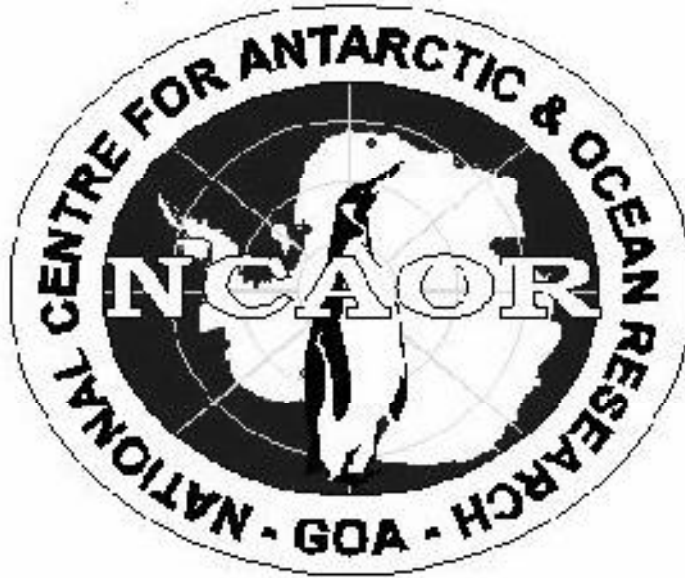


NATIONAL CENTRE FOR ANTARCTIC & OCEAN RESEARCH

(An Autonomous Society under the Ministry of Earth Sciences)

HEADLAND SADA, VASCO-DA-GAMA, GOA 403 804.



TENDER NO: NCAOR/EST/EE/05/17-18

Name of The Work: Annual Operation and Comprehensive Maintenance Contract of HVAC, Cold room, AHU, Clean room, VRF/VRV etc. at NCAOR

TENDER DOCUMENT

NATIONAL CENTRE FOR ANTARCTIC & OCEAN RESEARCH
Headland Sada, Vasco-da-Gama, Goa ó 403 804

NOTICE INVITING TENDER

Tender No: NCAOR/EST/EE/05/17-18

The Director, NCAOR, Goa invites sealed Tenders in one cover for the following work from the eligible Electrical Contractors of Government/PSU/Reputed Organizations for the below mentioned work.

| Description of work | Tender Fees (Rs) | EMD (Rs) |
|--|------------------|------------|
| Annual Operation and Comprehensive Maintenance Contract of HVAC, Cold room, AHU, Clean room, VRF/VRV etc. at NCAOR | 1000/- | 1,07,500/- |

The tender document & other details may be obtained from the Estate Division, NCAOR on all working days between 10.00 hrs to 16.00 hrs on or before 20-11-2017 by a written request along with the tender cost in form of DD drawn in favour of NCAOR, Vasco-da-Gama. Tender document can also be down loaded from NCAOR Website www.ncaor.gov.in and submitted along with the cost of tender document in form of DD drawn in favour of NCAOR, Vasco-da-Gama. Tender duly completed in all respect should be dropped in the tender box kept in the office of Estate Section on or before 21-11-2017, 11.00 hrs. Date of opening of tender is 21-11-2017 at 11.30 hrs. in presence of the tenderers, if any.

DIRECTOR

NATIONAL CENTRE FOR ANTARCTIC & OCEAN RESEARCH

(An Autonomous Society under the Ministry of Earth Science)

HEADLAND SADA, VASCO-DA-GAMA, GOA 6 403 804

Tender No.: NCAOR/ EST/EE/05/17-18**- CONTENT -**

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ANNEXURE - I

TENDER TERMS AND CONDITIONS

1. The Director, NCAOR, Goa invites sealed Tenders in one cover for the work of **Annual Operation and Comprehensive Maintenance Contract of HVAC, Cold room, AHU, Clean room, VRF/VRV etc. at NCAOR** from the eligible Contractors of Government/PSU/Reputed Organizations. The eligibility criteria is as below.
2. Eligibility Criteria:- The bidder should have,
 - (a) Executed at least one single AMC of HVAC and Cold Room units amounting not less than Rs. 30 lakh per annum Or two AMC of HVAC and Cold Room units amounting not less than Rs. 17 lakh per annum Or three AMC of HVAC and Cold Room units amounting not less than Rs. 13 lakh per annum, of any Govt/PSU/reputed organization, company during last seven years ending October 2017.
 - (b) Valid Electrical Contractor License of minimum 11KV, issued by a Competent Licensing Authority of Electricity Department of Government of any State/UT, on his name.
 - *AMC of HVAC and Cold Room units means Annual Maintenance Contracts of both Heating-Ventilation- Air Conditioning units and Cold Rooms of below zero degree celsius temperature.*
 - *The Contractor should have his Registered office in Goa.*
 - *Self attested copies of all above documents should be enclosed. The original documents should be presented for verification as & when asked.*
 - *A contractor who is either terminated or black listed from any institute or who has been denied/ not granted extension of contract by NCAOR or any other institute for poor/non satisfactory performance is not eligible for this tender.*
3. The Contract period is initially for ONE YEAR extendable on yearly basis for a further period of Two Years on the same Rates, Terms & Conditions of the agreement based on the satisfactory performance assessed by NCAOR.

Rates ó While quoting rates for manpower, the bidder should strictly consider Minimum Wages regulations as per the prevailing State/ Central Government Labour Laws, ESI, EPF, Bonus Rules & Regulations. *(Note : Pl refer Order No./F.No.1/13(3)/2017-LS-II of Ministry of Labour & Employment, Office of the Chief Labour Commissioner (C) dated 20/4/2017 and The Gazette of India Extraordinary [part II-Sec3(ii)] and subsequent orders issued in the same regard or the orders issued by the Labour Department of Goa State Govt in this regard)*

After award of Contract, the Contractor will have to submit Bank a/c statements of previous month of all staff for the monthly bill for payment. The Contract is liable for termination if it is observed that payment made is less than the prevailing 'Minimum Wages' as prescribed by Ministry of Labour Employment.

4. Tenders may be obtained from the office of **Estate Section, NCAOR** during office hours between 10.00 hrs. to 16.00 hrs on or before 20-11-2017, with a written request and a Tender Fees of Rs. 1000/- (Rupees One Thousand) by Demand Draft drawn in favour of Director, NCAOR, payable at Vasco-da-Gama, Goa. Those who are submitting tender by downloading from the web site should invariably enclose DD of Rs. 1000/- (Rupees One Thousand) as Tender Fees, drawn in favour of Director, NCAOR, payable at Vasco-Da-Gama, Goa.
5. Entire tender document (signed and stamped on all pages) should be submitted in a sealed cover, super scribed with the tender number & name of the work, date and time of opening. **Tenders will be**

received up to 11.00 a.m. on 21.11.2017 and will be opened at 11.30 a.m. on the same day. Tenders should be dropped in the tender box kept in the Estate Section before the closing date and time. In case Tenders are sent by post/courier it should be addressed to **The Director, NCAOR.** Tenderers are to ensure that they post the tender well in advance so as to reach before the closing time and date. NCAOR is not responsible for any postal/transit delay. If the Tender Opening day happens to be a holiday then tenders will be opened on the next working day on the same time.

6. The Earnest Money Deposit (EMD) : EMD is **Rs. 1,07,500 (Rupees One Lakh Seven Thousand Five Hundred only)** in the form of a Demand Draft from any schedule bank, drawn in favour of **Director, NCAOR, payable at Vasco-Da-Gama, Goa** should be enclosed with the tender documents. EMD of a successful bidder will be converted in to security deposit & EMD DDs of unsuccessful bidders will be returned as it is. **Tender received without EMD will be rejected outright.**
7. It is mandatory to quote all items of the price bid. If all items are not quoted then tender is liable for rejection.
8. NCAOR does not bind to accept the lowest or any tender and reserves the right of accepting the whole or any part of the tender and the tenderer shall be bound to perform the same at the rates quoted.
9. Tender submitted shall remain valid for 90 days from the date of opening for the purpose of acceptance and award of work. The extension of validity beyond 90 days from the date of opening shall be by mutual consent.
10. The Tenderer shall quote rates both in figures and words against each item. Correction, cutting, omission, overwriting should be avoided. However even if any correction is made, it should be endorsed with signature. Use of correction fluid is not allowed & should be strictly avoided.

On checking if there are differences noticed between the rates quoted by the tenderer in words and figures or in the amount worked out by him, the following procedure will be followed:
 - a) If there is a difference between the amount of rate in figure and in words of an item, and the total amount is worked out, then the rate which corresponds to the amount worked by the bidder shall be taken as correct.
 - b) If the bidder has not worked out the amount of an item, or the same does not correspond with the rates written either in figures or in words, then the rate quoted by him in words shall be taken as correct.
 - c) If the rate quoted by the bidder in figures and in words tallies, but the amount is not worked out correctly, the rate quoted by the bidder shall be taken as correct and not the amount.
11. Before submission of tender, interested tenderer may inspect the site to acquaint himself about the condition in regard to accessibility of site, nature and extent of ground, working condition of site and locality including stacking of materials, installations of tools and plants (T&P) etc., conditions affecting accommodations and movement of labour etc. required for the satisfactory execution of work contract. No claim whatsoever on such account shall be entertained by NCAOR under any circumstances.
12. Except writing rates and amount, the tenderer should not write any conditions or make any changes, additions, alterations and modifications in the Price bid of the tender. Tenders with conditional prices will not be considered.
13. To assist the process of examination, evaluation and comparison of the tender, NCAOR may ask the bidder individually for clarification if so required.
14. In the event of any tenderer withdrawing/modifying his tender during the validity of tender, EMD of such bidders will be forfeited.

15. Successful bidder should commence the work within 15 days from the date of issuance of Work Order, failure of which the Earnest money will be forfeited.
 16. Director, NCAOR reserves the right to accept or reject any or all bids in full or part, or the right to not to accept lowest offer without assigning any reasons thereof, whatsoever. In case of any dispute, decision of Director, NCAOR shall be final and legally binding on the bidders.
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ANNEXURE – II

SCOPE OF WORK

Comprehensive Annual Maintenance includes maintenance of of HVAC, Walk -in ófreezer room (Cold Room) with refrigeration equipment, Clean room, Air Shower, VRF/VRV system with indoor units, Remote control, Reefer Container and related installations.

1. Continuous Operation and Comprehensive Maintenance of ice core lab (Walk-in-Freezer rooms maintained at -20⁰C x 2, -15⁰C & -5⁰C), clean room, HVAC, etc.
2. The Walk-in-Freezer room will be housing highly critical ice samples from Antarctica and should be operational continuously on a 24x7 basis.
3. The HVAC and clean room systems need to be operated on all days for at least 12 hrs per day, or as per the requirement of the research work at the labs on recommendation from Lab In-Charge.
4. The comprehensive AMC will be carried out systematically. The Class 100 Clean Room Temp. should be maintained at 24⁰C (+/- 1⁰C) and accordingly the activity chart as per schedule enclosed should be maintained by the contractor through his/her agency for the entire satisfaction of NCAOR. The AMC activity charts should be produced on demand as well to be submitted along with the monthly bill.
5. Maintenance register and all log books consisting of, (Room temperature of all the rooms/Cold room & HVAC Log book voltage/ampere of machine of including reefer container ,VRF/VRV, reefer container etc.), and submit weekly report.etc.), and submit weekly report.
6. Air filter for all the machines to be cleaned regularly at certain intervals for the better cooling system and to avoid low pressure tripping relay.
7. Any fault in the system, should be repaired immediately and to be reported to Electrical Engineer or Estate In-Charge / P.D.Labs NCAOR immediately.
8. Only qualified and authorized operator/technicians are allowed to operate and maintain the system.
9. Attending complaints of the system which include routine as well as breakdown maintenance of all the system, repair the system immediately and replace the unserviceable electrical/mechanical parts with new one as per the requirement. The contractor/agency should maintain stock of all essential parts, components, spares & consumables for safe maintenance.
10. If there is any fault in the electrical cable lines/wiring of the control pannels or any other electrical/mechanical problems, the Contractor shall attend and replace the same immediately.
11. The electrical faults at sub-distribution panel for HVAC plant and cold rooms should be attended and rectified by the contractor immediately. The failed panel parts should be replaced by the contractor.
12. The comprehensive AMC contract is 24 hours a day, 7 days a week and year round.
13. All stand by equipments to be operated as per mutually agreed programme.
14. Proper housekeeping of all areas which are under the contract. Maintenance of the corridors and clean room, HVAC plant, Compressor room etc.
15. The clean room HEPA filters should be maintained in such a way that the class 100 room complies to its certification.
16. Reefer container : of óCareer Incö make which is to be kept on or in running condition for 24x7 period. Its maintenance is limited to monitoring, recording readings, cleaning of its exterior etc. However in case of its break down, the Contractor has to repair or get it repaired & make it functional at the extra charges which will be reimbursed as per the actuals.

The above guide lines for maintenance are just illustrative & not limited to any other activity which is essential for maintenance.

ANNEXURE – III

QUALIFICATION, DUTIES AND RESPONSIBILITIES (of Contractor & his staff)

a) Contractor :

Qualification : Qualified as per the eligibility criteria mentioned in the tender.

Duties & Responsibilities :

1. The contractor shall visit the site and inspect all work, plant installation at least once in a week & report to Engineer.
2. The Contractor should depute competent personnel as below to conduct the maintenance work,
 - a) 01 no. of Qualified Diploma Holder (3 years course) Engineer as Supervisor having minimum 3 years experience in HVAC maintenance, for 8 hours duty during office hours (on all days except on Sundays)
 - b) 03 nos. of ITI Qualified Senior Technicians with 3 years of experience in HVAC/AHU maintenance (each one on shift basis for 8 hrs duty for 24 hrs.)
 - c) 03 nos. of ITI Qualified Junior Technicians having minimum 1 years experience in HVAC/AHU/Electrical maintenance (each one on shift basis for 8 hrs duty for 24 hrs).
3. Weekly verification, sign & submission of registers.
4. Providing all essential tools to his staff for day to day maintenance & emergency.
5. Providing all safety equipments, material to his staff. Providing uniform, safety shoes, insulated gloves, raincoats, caps, umbrellas, torch etc. to his all staff.
6. Provide necessary training to his staff on quality, safety & technology.
7. If any staff is on leave/absent for more than 24 hours, the contractor should provide immediate replacement with equally qualified & experienced person.
8. To arrange transport, loading, unloading if compressor or any other part, equipment is to be sent out for repairs.
9. **Payment to his staff :** The Contractor shall make payment to his staff as per the prescribed rates of Minimum Wages Act for Area B (Goa). The Junior Technician is to be considered as semi skilled worker, the Senior technician to be considered as skilled worker. The Supervisor should be paid as highly skilled & at par with the corporate salary structure.

Salary of all staff should be directly deposited to their bank a/c after deduction of ESI, EPF, perks etc. Bank a/c statement of a previous month of all staff should be enclosed with the monthly bill for payment. The Contractor shall be liable for strict action if it is observed that payment made to his staff is less than the prevailing minimum wages.

b) Supervisor:

- Qualification :** (i) should have minimum qualification of Diploma in Electrical/Mechanical/Electronics Engineering, 3 years course from Govt. recognized Institution.
(ii) should have relevant work experience of minimum three years.

Duties & Responsibilities :

1. He should get the work done from the deployed staff of the contractor to the satisfaction of the Electrical Engineer / Estate In-Charge.

He is responsible for normal operation in the campus, planning & execution of work.

2. He should have strict supervision on all his staff & maintain discipline.
3. He should keep record of daily functioning of AHU/HVAC units & record timely temperature.
4. He should frequently visit HVAC plant, AHU rooms, Compressor rooms, cold rooms, Clean rooms, reefer container etc. take a round to the campus on regular basis, inspect the electrical, water arrangements and inform/attend problems if found any.
- 5 He should give all shifts report to the Engineer and get it signed in the Shift Log Register.
6. He should monitor input voltage to the plant & take necessary measurements in case of power failure.
7. Supervisor shall co-ordinate with his staff of all shifts & properly distribute work.

c) Senior Technician:

Qualification : (i) should have minimum qualification of ITI Refrigeration & Air-conditioning trade of any Government recognized Industrial Training Institute.
(ii) should have relevant work experience of minimum Three years.

Duties & Responsibilities :

1. He will visit the problem area, plan action & execute under instructions from Supervisor/ Engineers.
2. He should assist the Supervisor in work
3. He should take all readings like water meter, electricity meter, DG, Transformer etc.
4. Make Entries in the register.
5. He should attend the complaints.

d) Junior Technician:

Qualification : (i) should have minimum qualification of ITI Refrigeration & Air-conditioning/ Electrician trade of any Government recognized Industrial Training Institute.
(ii) should have relevant work experience of minimum One year.

Duties & Responsibilities :

- 1) He will visit the problem area, plan action & execute under instructions from Supervisor/Estate Engineer/Senior Electrician.
- 2) He should assist the Supervisor /Senior Electrician in work.
- 3) He should attend the complaints.
- 4) Assist Estate Office in day to day work.

ANNEXURE – IV

TERMS & CONDITIONS FOR OPERATION & MAINTENANCE

- 1) The cold room or walk-in-freezer room in NCAOR is made to preserve precious samples from Antarctic & Arctic region for the purpose of research. Therefore, its smooth & non-stop functioning on 24 x 7 throughout the year is an important aspect of this contract.
- 2) The contract is comprehensive including all labour and all major- minor electrical & mechanical parts, consumables, wear & tear items, coils, relays, gas filling, lubricants etc. but it is excluding new Compressors & Hepa Filters. However, in case if any compressor fails, the contractor will have to immediately arrange a temporary standby compressor of the same capacity at his own cost till the original one gets repaired by him or purchase of new Compressor by NCAOR if the original one is beyond repairs, as certified by the NCAOR Engineer .
- 3) The contract is initially for a period of one year, which is extendable up to next 2 years on yearly basis depending upon the performance of the contractor, on the same rates and terms and conditions.
- 4) All welfare measures of the contractor's personnel will have to be borne by the contractor only.
- 5) The NCAOR will not provide any accommodation and transportation facilities to contractor's persons.
- 6) Any lapse of the duty from the part of operation & maintenance as well as any damage of official equipment will be taken very seriously and the loss will be made good by the contractor. And in the event of any loss, damage, theft or encroachment of the NCAOR property, due to negligence of the work / duty etc. the agency shall indemnify the NCAOR and reimburse the actual loss so caused.
- 7) The contractor shall be responsible for compliance with the provision of the Contract Labour Act including Contract Labour Registration and Abolition Act, 1970, the Indian Contract Act : The Industrial Disputes Act 1947 : The payment of wages Act : The minimum wages Act etc.
- 8) The contractor shall be deemed to have satisfied himself before entering into the contract as to the correctness and sufficiency of his offer for the work and of the rates and prices quoted in the schedule of works. These rates and prices shall cover all his obligations under the contract and all matters and things necessary for proper completion and maintenance of work.
- 9) The contractor at his own cost should arrange the sitting arrangement for the staff engaged by him. The space, water, electricity shall be made available by NCAOR at free of cost.
- 10) The Contractor has to keep all the equipment neat and clean at site to avoid any accident or fire hazards.
- 11) All operation and maintenance work should be documented as per ISO standards. All data loggers and instruments like temperature sensors, airflow meters, etc should be calibrated at every 6 months and data log should be maintained.
- 12) The contractor should have round the clock contact telephone numbers of its responsible persons. In case of any emergency, contractor and authorized engineer/supervisor should make themselves available at site on a short notice and make all efforts to make the situation normal at the earliest, by taking all possible precautionary measures.
- 13) To facilitate the proper and smooth functioning of the comprehensive AMC, the contractor should have a local office in Goa, with competent technical/service personnel. All repair should be made at the NCAOR premises as much as possible. In case any parts has to be taken outside NCAOR for repair, then the same should be taken by a written request and issue of necessary gate pass. The contractor shall replace/return the parts within two working days.
- 14) The trained persons should be placed round the clock at site who could take initial steps under emergency situation.
- 15) A complaint book shall be kept up to date at site (separate for each component of work) by the contractor and the same shall be made available for checking and verification.

- 16) NCAOR shall neither be responsible for any causality/death/ injury/accident/ damage/risk to the Contractor's staff which may arise out of and in the course of their duties nor be liable to pay any damage or compensation to such person or persons or their kin in this regard. The Contractor shall be wholly responsible for such eventualities/ injuries/death etc of his person on duty & their compensation.
- 17) The staff appointed by the contractor shall be under the direct and exclusive control and the supervision of the Contractor. However, such staff should comply with the direction and instructions issued by the Estate In-Charge /Engineer. The staff deployed for the work of NCAOR shall not be allowed to take any other work, contract or sub-contract during this period/contract.
- 18) The Contractor shall have all necessary equipments at its own expenses necessary for operation & maintenance and also safeguarding the NCAOR premises. At any point of time, it shall not be the responsibility of the NCAOR to bear these expenses.
- 19) The NCAOR shall have the exclusive right to terminate the services of any person appointed by the Contractor if found unsatisfactory and ask the contractor to provide other substitute qualified person. The decision of NCAOR in this regard shall be final and binding on the Contractor at any point of time. The duty register for a month with the names of the Contractor staff shall be provided by the Contractor to the NCAOR well in advance.
- 20) Contractor should provide Photo Identity Cards to all their employees.
- 21) The Contractor has to provide Bio-datas of all his staff while appointing & while change of staff.
- 22) The Contractor shall provide all safety gadgets like shock/heat resistant Hand Gloves, Safety shoes, Raincoats, Torches etc. to the each staff. engaged by him during Operation and Maintenance services at site.
- 23) The contractor's staff should attend their duties in uniform. The contractor should provide them at least two pairs of uniforms & one pair of safety shoes per year. The material of uniform is generally natural cotton/tericot. The design, colour, quality of uniform will be approved by Estate In-Charge.
- 24) If any personnel of the contractor found absent from the duty, the payment of the respective personnel will be deducted on pro-rata basis of the quoted rate. If any staff observed with non performance or performance below par, the contractor/agency shall be fined accordingly as per the tender terms.
- 25) Contractor to provide everything necessary :
 - a. The contractor shall provide at his own cost all materials, (except such materials, if any as may in accordance with the contract, be supplied by the Employer). Plants, tools, tackles, appliances, ladders, scaffolding, temporary works , manpower, transportation and other etc. requisite for the proper execution of the work whether original, altered or substituted and whether included in the specifications or other documents forming part of the contract or which may be necessary for the purpose of satisfying or complying to the requirements of Engineer, as to any manner as to which under these conditions he is entitled to be satisfied together with carriage therefore to and from the work. No extra charges will be paid by the authority regarding tools & tackles, manpower, transportation etc The contractor shall also supply without charge the requisite number of persons with means and materials necessary for the purpose of setting out works and counting, weighing and assisting in the measurement or examination at any time and from time to time of the work or materials. Failing his so doing, the same may be provided by the Engineer at the expense of the contractor and the expenses may be deducted from any money due to the contractor under the contract and /or from his Security Deposit.
 - b. The Contractor may frequently require to arrange i)Refrigerant Gas ii)Lubricating oil for compressor systems iii)Packing / Couplings / gaskets / insulation material / other general spares. iv)All electrical spares e.g. Fuses / Relays, contactors, Condensers etc. v)Indoor units Filter /Belts / Bearings / Valves / Other spares etc.
 - c. Following parts are covered under CAMC scope for VRF SYSTEM 6 compressors,Spares of compressor, Software ,control relay,control panel cards,blower

motor,thermostat,actuators,magnetic contactors,3 way/2 way valves,blower assy,v-belts,sensor lightø, control relay,timerø,magnetic switch,capacitors,refrigerant,Remotes,valves,filters,strainer,NRV,cooling coils, condenser coils, copper/MS piping/insulation ,grlls, diffusers, temp/pressure guages etc.which may be required during maintenance of the all the system will have to be supplied by the contractor as per instruction of the Authority.

- d. In case of breakdown of any system, the Contractor should personally present & supervise each work till its completion.
- e. NCAOR shall provide requisite quantity of water, electricity for carrying out the work free of cost, subject to availability in the NCAOR campus.
- f. NCAOR on no account shall be responsible for the expenses incurred by the contractor for anything hired, which the contractor needs to complete the ordered work.

ANNEXURE – V

Standard Terms and Conditions

1. INTERPRETATION:

In construing these conditions the Specifications , the Schedule of Quantities, additional Conditions and Agreement, the following words shall have the meanings herein assigned to them except where the subject or context otherwise requires. í

WORK OR WORKS: shall mean all work or works defined in schedule of quantities. Specifications and such other work or works as the contractor may be entrusted with for carrying out under this contract.

EMPLOYER: shall mean the Director, NCAOR (National Centre for Antarctic & Ocean Research) or any other officer authorized by the Director for the purpose.

ENGINEER: shall mean the Engineer designated by the Employer to superintend and perform other duties as indicated in the contract.

CONTRACTOR: shall mean the individual or Firm or Company, whether incorporated or not, undertaking the work and shall include the legal personal representative or such individual or the persons composing such Firm or Company or the successors of such Firm or Company and the permitted assignees of such individual or Firm or Firms or Company.

SITE: shall mean the site of the contract works including any buildings and erections thereon and any other land adjoining thereto (inclusive) as aforesaid allotted by the Employer or the Engineer for the contractor's use.

COMPENSATION: shall mean all sums payable by way of compensation under any of the conditions shall be considered as reasonable compensation without reference to the actual loss or damage sustained and whether or not any damage sustained and whether or not any damage shall have sustained.

Words imputing persons include firms and corporations, words imputing the singular only also include the plural and vice versa where the context so required.

The headings are given to the clauses for convenience and they will not limit the meaning or scope of the clauses in any way.

2. CONTRACTOR TO PROVIDE EVERYTHING NECESSARY

- a. The contractor shall provide at his own cost all materials, (except such materials, if any as may in accordance with the contract, be supplied by the Employer). Plants , tools , appliances, implements, ladders, scaffolding, temporary works etc. requisite for the proper execution of the work whether original, altered or substituted and whether included in the specifications or other documents forming part of the contract or which may be necessary for the purpose of satisfying or complying to the requirements of Engineer, as to any manner as to which under these conditions he is entitled to be satisfied together with carriage therefore to and from the work. The contractor shall also supply without charge the requisite number of persons with means and materials necessary for the purpose of setting out works and counting, weighing and assisting in the measurement or examination at any time and from time to time of the work or materials. Failing his so doing, the same may be provided by the Engineer at the expense of the contractor and the expenses may be deducted from any money due to the contractor under the contract and /or from his Security Deposit.
- b. The Contractor should personally supervise each work till completion or may appoint a qualified Supervisor, pre-approved by the Engineer till the completion of work. No separate supervision charges will be paid.

- c. NCAOR shall provide requisite quantity of water, electricity for carrying out the work free of cost, subject to availability in the NCAOR campus.
- d. The Employer on no account shall be responsible for the expenses incurred by the contractor for anything hired, which the contractor needs to complete the ordered work.

3. DUTIES & TAXES

Rates quoted by the contractor shall include all duties, octroi, toll tax, levies, royalties and all other taxes with respect to this contract. **Goods and Service Tax (GST)** as applicable is to be stated specifically in the prescribed columns of the price bid. In absence of any such stipulation, it will be presumed that rates quoted are inclusive of all taxes and no claim whatsoever in this regard will be entertained later.

4. PAYMENTS TERMS :

- a. NCAOR will release the payment to the party against submission of Monthly Bill in duplicate after satisfactory completion of monthly work after deduction of statutory taxes. No part payment/advance will be made.
- b. The copies of deposit challans of EPF and ESI and Bank Statements of previous month of all personnel is the pre-requisite for processing payment.
- c. The contract is a fixed price contract & no escalation will be permissible during any stage of contract.

5. SECURITY DEPOSIT (SD): This is security cum performance guarantee deposit. EMD of the successful bidder will be converted into Security Deposit and 10% amount of every monthly bill will be deducted as SD. It is an interest free deposit and will be refunded on successful completion of the contract period. In the event of contractor fails to comply the terms and conditions of the contract the Security Deposit will be forfeited.

6. TESTING OF MATERIALS

The contractor shall provide assistance, instruments, materials, labour and any other arrangement normally required for testing, checking of materials and workmanship as stipulated in the specifications and by statutory authority, at his own cost. The Employer has the right to appoint the testing authorities. The contractor shall pay for the cost of test samples, its packing, transportation including testing fees. Failing so doing the same shall be provided by the Engineer at the expense of the contractor and the expenses may be deducted from any money due to the contractor under the contract and/or from the Security Deposit or proceeds thereof or of a sufficient portion thereof.

7. CONTRACTOR'S ENGINEERS/FOREMAN & WORKMEN

- a. The contractor shall give all necessary personal superintendence during the execution of the work and as long thereafter as the Engineer may consider necessary until the expiration of the Defects Liability Period. The contractor shall employ competent Site-Engineer/Foreman as per CPWD norms and as approved by the Engineer whose qualification must conform to the requirement specified by the Engineer who shall be constantly in attendance of the work while the men are at work. Any directions, explanations, instructions or notices given by the Engineer to such Site-Engineer or Foreman or any other authorized agent shall be held to be given to the contractor.
- b. The contractor shall on the request of the Engineer immediately dismiss from the works any person employed thereon who may in the opinion of the Engineer be unsuitable or incompetent or who may in the opinion of the Employer misconduct himself.

8. ACCESS

- a. The Engineer and the Employer or its representative shall at all reasonable time have free access to the works and /or workshops, factories or other places the materials are being prepared or constructed for the contract and also to any place where the materials are lying or

from which they are being obtained and the contractor shall give every facility to them for inspection. Except the representatives of statutory authorities and those mentioned above no other person shall be allowed on the works at any time without the permission of the Engineer.

- b. If any work is to be done at a place other than the site of works, contractor shall obtain written permission of the Engineer.

9. VALUATION & PRICE FOR VARIATION

The Engineer with the approval of the Employer shall have power to make any alterations/omissions/additions and /or substitutions from the original specifications, drawings, designs and written instructions and such alterations, omissions, additions, substitutions shall not invalidate the contract and any altered , additional , or substituted work which the contractor may be directed to do, in the manner specified above as part of the work shall be carried out by the contractor on the same conditions in all respects on which he agreed to do the main work. The rates for such altered additional or substituted work under this clause shall be worked out in accordance with the following provisions in their respective order,

- a. If the rates for the altered, additional, or substituted work are specified in the contract for the work the contractor is bound to carry out the altered additional, or substituted work at the same rates as are specified in the contract for the work.
- b. If the rates for the altered, additional or substituted work are not specifically provided in the contract for the work the rates will be derived from the rates for a similar class of work as are specified in the contract for the work.
- c. Under no circumstances the contractor shall suspend the work on the plea of non-settlement of rates of items falling under the clause.

10. FAULTY MATERIALS, WORKMANSHIP & DEFECTS AFTER COMPLETION

- a. The Engineer shall have powers to require the removal from the site of all materials and work, which in his opinion are not in accordance with specifications and in case of default , the Engineer shall be at liberty to employ other persons to remove the same without being answerable or accountable for any loss or damage that may happen or arise to such materials to be substituted thereof and in case of default the Engineer may cause the same to be supplied and all costs which may attend such removal and/or substitution are to be borne by the contractor.
- b. If it shall appear to the Engineer or to the Estate In-charge that any work has been executed with unsound imperfect or unskilful workmanship or with materials of any inferior description or that any materials or articles provided by him for the execution of the work are unsound or of a quality inferior to that contracted for or otherwise not in accordance with the contract any defects , shrinkage or other faults which may appear within the defects liability period of Six months from the date of completion arising in the opinion of the Engineer, the contractor shall on demand in writing which shall be made within six months of the completion of the work from the Engineer specifying the work, materials , articles defects or other faults complained of notwithstanding that the same may have been passed, certified and paid for forthwith rectify or remove and reconstruct the work so specified in whole or in part as the case may require or as the case may be removed the materials or articles so specified and provide other proper and Suitable materials or articles at his own cost. In case of any such failure, the Engineer may rectify or remove or re-execute the work or remove and replace with others, the material or articles complained of as the case may be at the risk and cost in all respects of the contractor.
- c. In lieu of rectifying the work not done in accordance with the contract, the Employer may, allow such work to remain, and in that case make allowance for the difference in value, together with such further reduction as in his opinion may be reasonable.
- d. Provided always that nothing in this clause shall relieve the contractor from his liability to execute the works in all respects in accordance with the terms and conditions of this contract,

or from his liability to make good all defects.

11. WORKS SHOULD BE OPEN FOR INSPECTION

- a. All work under or in course of execution or executed in pursuance of the contract shall at all times be open to the inspection and supervision of the Engineer and the contractor shall at all times during the usual working hours, and at all other times at which reasonable notice of the intention of the Engineer to visit the works shall have been given to the contractor.
- b. The contractor at least three days notice in writing to the Engineer before covering up or otherwise placing beyond the reach of measurement any work in order that the same may be measured and correct dimensions thereof be taken.

12. INDEMNIFYING AGAINST DAMAGES TO PERSONS, PROPERTY & STATUTES

The contractor shall take all precautions to avoid all accidents by exhibiting necessary caution boards day and night, speed limit boards, red flags, red lights and providing barriers. He shall be responsible for all damages and accidents caused due to negligence on his part. No hindrance shall be caused to traffic during the execution of work.

- a. The contractor shall be responsible for all injury to persons, animals or things and for all damage whether such injury or damage arises from carelessness or accident in any way connected therewith. This clause shall be held to include interalia any damage due to causes as aforesaid to work, building(whether immediately adjacent or otherwise) and to roads, streets, footh paths, bridges or ways as well as all damage caused to the buildings and works forming the subject of this contract by inclemency of weather. The contractor indemnifies the Employer and holds him harmless in respect of all expenses arising from such injury or damages as aforesaid and also in respect of any award of compensation or damage consequent.
- b. The contractor shall reinstate all damage of every sort mentioned in this clause so as to deliver the whole of the contracted works complete and perfect in every respect and so as to make good and otherwise satisfy all claims for damage as foresaid to the property of third Parties.
- c. The contractor also indemnifies the Employer against all claim which may be made upon the Employer for acts during the currency of this contract by any employee or representative of an employee of the contractor or any sub-contractors, employed by him for any injury to or loss of life of such employees or for compensation payable under any law for the time being in force to any workmen or to the representative of any deceased or incapacitated workmen.
- d. The Employer shall be at liberty and is hereby empowered to deduct the amount of any damages compensation costs charges and /or expenses arising or occurring from or in respect of any such claim and/or damages as aforesaid from any sum or sums due or to become due to the contractor or security deposit.
- e. The contractor shall indemnify the Employer against any action claim or proceedings relating to infringement or use of any patent or design or any alleged patent or design rights and shall pay any royalties which may be payable in respect of any article or part thereof included in the contract. In the event of any claims made under or action brought against the Employer in respect of any such matters as aforesaid the contractor shall be immediately notified thereof and the contractor shall be at liberty at his own expense to settle any dispute or to conduct any litigation that may arise there from provided that the contractor shall not be liable to indemnify the Employer if the infringement of the : patent or design of any alleged patent or design right is the direct result of an order passed by the said Employer or his authorized representative .

13. IN CASE OF DEATH OF CONTRACTOR

Without prejudice to any of the rights or remedies under this contract, if the contractor dies the Employer shall have the option of terminating the contract without compensation to the contractor.

14. COMPLIANCE TO LABOUR LAWS

The contractor shall comply with all the provisions of the Minimum Wages Act, 1948. Contract Labour (Regulation and Abolition) Act, 1970 and rules and orders framed there under and other labour laws affecting contract labour and the rules and orders framed there under that may be in force or brought into force from time to time. NCAOR will not take any responsibilities towards any injury or compensation etc.

As per the GOI enacted the Building & Other Construction Work Act 1996 (BOCW Act), Labour Welfare Cess @ 1% will be deducted before payment if, the Contractor employees 10 or more workers on any day of his work. The Contractor should make necessary registrations with the Labour Department towards fulfilment of the rules & regulations of the BOCW Act & other applicable Acts of the labour Department

15. STATUTORY VARIATION: Any statutory increase or decrease in the taxes and duties subsequent to bidder's offer if it takes place within the work completion date will be to the Employers account subject to the claim being supported by documentary evidence. However, if any decrease in taxation rates takes place within the work completion date the advantage will have to be passed on to the Employer.

16. 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 NCAOR, 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.

17. CLARIFICATIONS FROM BIDDERS: To assist the process of examination, evaluation and comparison of bids, the Employer may ask all the bidders or any bidder individually for clarification, if any, of their bids, including eligibility criteria, experience, breakdown of unit rates and price. The request for clarification and the response should be in writing by email/fax/post, 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 Employer in the course of scrutiny.

18. GUARANTEE: If the goods, stores and equipments found defective due to bad design or workmanship the same should be repaired or replaced by the Contractor free of charge if reported within one year from the date of commissioning of items/equipments whichever. The Contractor will be responsible for the proper performance of the equipments / materials for the respective guarantee period.

19. RENEWAL/TERMINATION OF THE CONTRACT

1. The contract period is Twelve months extendable on yearly basis for a further period of Two years with the same rate & same terms & conditions of the agreement based on the satisfactory performance assessed by NCAOR.
2. The work performance of the contractors & individuals service providers will be assessed periodically and if the same is found unsatisfactory the contractor should immediately replace the service provider/work force.
3. If the Contractor is found to be not performing satisfactorily during the course of the contract period, or refuses to do any part of the work or becomes bankrupt then NCAOR shall terminate the contract at any stage with a short notice.
4. At any point of time during the contract period if any malafide intention of the contractor is observed or if any fake, misleading information is submitted by the contractor then the contract will be terminated immediately & security deposit will be forfeited.

- 20. PENALTY :** (a) For non deployment of Personnel 5 % of the total monthly contract amount would be levied as penalty if full strength of agreed personnel are not present for continuous 03 days in one month. (b) For non performance 5 % of the total monthly contract amount would be levied as penalty. (c) The penalty to be imposed is @5% but not limited to it. All repairs should be made at the NCAOR premises as much as possible. In case any part has to be taken outside NCAOR for repair, then the same should be taken by a written request against issuance of necessary gate pass. The contractor shall replace/return the parts within two working days. Any delay in conducting maintenance/repair/replacement of critical component which leads to malfunctioning/stoppage of any of the functionalities would be dealt seriously & treated as break-down of the entire system and the entire loss incurred due to this will be recovered from the contractor and decision of NCAOR authorities will be final in such matters
- 21. SETTLEMENT OF DISPUTES/ARBITRATION:** The decision of the Director, NCAOR 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 of NCAOR and the decision of the said Arbitrator shall be final and binding upon the parties.
- 22. RIGHT TO CANCEL TENDER/WORK ORDER:** In case of strike, accident or any other unforeseen conditions causing stoppage of work, NCAOR reserves the right to cancel and/ or modify the tender / work order without any liability for any compensation and / claim or any description.
- 23. FORCE MAJEURE :** If any time, during the continuance of this contract, the performance in whole or in part by either party under obligation as per this contract is prevented or delayed by reasons of any war or hostility, act of the public enemy, civil commotion, sabotage, fire, flood, explosion, epidemic, quarantine restrictions, strike, lockout or acts of God (hereinafter referred to as 'eventuality'), provided notice of happening of any such eventuality is given by either party to the other within 21 days of the date of occurrence thereof, neither party shall be reason of such an 'eventuality' be entitled to terminate this contract nor shall either party have any claim or damages against the other in respect of such non-performance or delay in performance and deliveries under the contract. The contract shall be resumed as soon as practicable after such 'eventuality' has come to an end or ceased to exist. In case of any dispute, the decision of Director, NCAOR, shall be final and conclusive, provided further that if the performance in whole or part of any obligation under this contract is prevented or delayed by reason of any such eventuality for a period exceeding 60 days, either party may at its option, terminate the contract. Provided also that if the contract is terminated under this clause the Employer shall be at liberty to take over from the Contractor at a price to be fixed by the Employer, which shall be final, all unused, undamaged and acceptable materials, bought out components and other stores in the course of manufacture which may be in the possession of the Contractor at the time of such termination, or such portion thereof as the Employer may deem fit except such material, as the Contractor may, with the concurrence of the Employer, elect to retain.
- 24. 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 carefully and agreed to it.

Signature of Tenderer :

Date:

Company's Round Seal

Place:

ANNEXURE – VI

SCHEDULE OF RATES (PRICE BID)

| Sr. | Particular | No. of person / Quantity | Amount per Person Per MONTH | Total | GST % | GST Amount (Rs) | Total (Rs) |
|-----------------------------------|---|--------------------------|-----------------------------|--------------|-------|-----------------|--------------|
| (a) | (b) | (c) | (d) | (e) =(c)x(d) | (f) | (g) | (h) =(e)+(g) |
| 1 | Supervisor (Highly Skilled) | 01 | | | | | |
| <i>Only Amount (d) in words –</i> | | | | | | | |
| 2 | Senior Technician (Skilled) | 03 | | | | | |
| <i>Only Amount (d) in words –</i> | | | | | | | |
| 3 | Junior Technician (Semi skilled) | 03 | | | | | |
| <i>Only Amount (d) in words –</i> | | | | | | | |
| 4 | Total Yearly charges for Comprehensive Maintenance of HVAC, Cold room, clean room, AHU, VRF/VRV, Reefer container etc as per Tender requirement & activity chart for repair/ replacement of Components, consumables, all spares etc. as assessed by the bidder, accessories, equipment for maintenance, tools, safety equipments, cost of uniforms, shoes etc as mentioned in Annex-IV. | | | | | | |
| <i>Only Amount (e) in words –</i> | | | | | | | |
| 5 | Service Charges of the Contractor | | | | | | |
| <i>Only Amount (e) in words –</i> | | | | | | | |
| 6 | Other Charges if any : | | | | | | |
| <i>Only Amount (e) in words –</i> | | | | | | | |
| A | Total GST Amount(g): | | | | | | — |
| B | Sub Total of (h): | | | | | — | |
| C | Grand Total per month (g) + (h) : | | | | | | |

Grand Total (C) Amount Per Month in words, Rupees í í í í í í í í í í í í í í í í í í í

í ..

Total Amount Per Year (C) x12 is Rs. í

Total Amount per year (C) x12 in words, Rupees í í í í í í í í í í í í í í í í í í í .

í í

Pl. note :

- The Rates for the contractor's personnel from sr.1 to 4 should be inclusive of his monthly wages, EPF, ESI, bonus & other benefits as directed by Labour Dept. The wages should be strictly as per the minimum wages act and as per the existing rates of the Labour Department of Govt of India/Goa.
- If the rate quoted for each personnel is less than the existing minimum rates of wages including Variable Dearness Allowance then the bid is liable for rejection.
- The cost of Sr. no. 4 above may be derived as a total cost for a year & then divide by twelve to quote as a lump sum per month.
- Other than the above if any cost factor which bidder wish to quote may be quoted as Any Other Charges at Sr. No. 6.
- Discount offered if any, should be included in the quoted rates & should not be shown separately.
- Contractor should quote all items given in the price bid. Tender will be rejected if all items are not quoted.
- Price Evaluation Criteria - The Lowest Evaluated Bidder (L1) would be arrived from the Grand Total (C) above.

Certificate:

It is certified that I/We _____ am/are

authorised to submit this bid on behalf of M/s. _____

I/We have read the tender document carefully, accept all the terms & conditions of the tender and submitting the duly filled Price Bid within the due date and time. It is indemnified that if the work is awarded to me/us, It will be completed as per the rates quoted, within the time & as per the terms & conditions of the Tender.

Name & Signature of the tenderer :

Date & Seal :

ANNEXURE – VII

PARTICULARS OF THE TENDERER

(Tenderer shall fill this form and enclose it with original copy of the tender with his sign)

PARTICULARS OF THE TENDERER

1. Name of the Tenderer : _____

2. Main Office Address : _____

3. Goa Office Address : _____

(Pl. enclose copy of Electricity Bill/ Telephone Bill etc. of Goa address as a proof of establishment)

(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 : _____

Registration Valid up to date : _____

5. Electrical Contractor Licence Number : _____ for KVA _____

Licence valid up to : _____

(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)

7. Whether the firm is ESI Registered? : YES / NO

(Please enclose copy of registration certificate)

8. Whether the firm is EPF Registered? : YES / NO

(Please enclose copy of registration certificate)

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

10. Have you ever denied/ not granted extension of contract
by NCAOR or any other institute for poor/non satisfactory performance : YES / NO

Name & Signature of the Tenderer with seal :

ANNEXURE – VIII**WORK COMPLETION PROFORMA**

Give details of work executed, at least one single AMC of HVAC and Cold Room units amounting not less than Rs. 30 lakh per annum Or two AMC of HVAC and Cold Room units amounting not less than Rs. 17 lakh per annum Or three AMC of HVAC and Cold Room units amounting not less than Rs. 13 lakh per annum, of any Govt/PSU/reputed organization, company during last seven years ending October 2017. Enclose self certified copies of Work Orders /Work Completion Certificates.

| Sl. No. | Name of work | Location of Site | Value of work | Date of Completion of work | Name of Organizational Executive under whom work is done |
|---------|--------------|------------------|---------------|----------------------------|--|
| | | | | | |

**Name:
& Signature of the Tenderer with Seal**

ANNEXURE – IX

DECLARATION

- I] I/we í . hereby declare that myself & my/our firm í was never terminated / Black Listed from any organization & also, we have never been denied/rejected extension of contract due to poor, non satisfactory performance.

- II] I / We have visited NCAOR site on (date) í í í í í í í . & inspected the entire HVAC, Cold Room, Clean Room set up/installations etc. thoroughly to my/our satisfaction & ready to undertake the Comprehensive AMC as per the Tender terms & conditions.

Name & Signature of the Tenderer:

Date & Seal :

ANNEXURE - X

NATIONAL CENTRE FOR ANTARCTIC & OCEAN RESEARCH

HEADLAND SADA, VASCO-DA-GAMA, GOA - 403 804

EMD & Tender Fees details

I / we have enclosed,

(1) A crossed DD No. í í í í í í í dated í í í í í í .. of Rs. 1,07,500/-
(Rs. One Lakh Seven Thousand Five Hundred only) drawn in favour of Director, NCAOR payable at Vasco-da-Gama towards **EMD**.

(2) A crossed DD No. í í í í í í í dated í í í í í í .. of Rs. 1000/- (Rs. One Thousand Only) drawn in favour of Director, NCAOR payable at Vasco-da-Gama towards **Tender Fees**.

Name & Signature of the Tenderer with seal :

Date.....

ANNEXURE – XI

List of Installations, Equipments at NCAOR –Goa

1. Cooling Tower (Paharpur) Model 3831
2. Cooling Tower (Paharpur) Model 3842
3. Voltas Chiller Unit 1 With Motor capacity 60HP Make-ABB, Compressor unit of Voltas. Model WCDRO500MNSRPZ
4. Voltas Chiller 2 With Motor capacity 60HP Make-ABB ,Compressor unit of Voltas.Model WCDRO500MNSRPZ
5. Voltas Chiller Unit for Clean Room with Copeland Scroll compressor Model WCDSO36MN600006
6. AHU 4 Saveair 1200 cfm ,AHU 6 Saveair 2000 cfm
7. AHU 3 Saveair 2750 cfm ,AHU 5 Saveair 7000 cfm
8. AHU 2 Saveair 12000 cfm ,AHU 1 Saveair 16000 cfm
9. Pump Motor- 3 HP Make-Kirloskar Monoblock, Model No. KDS -335 (4 nos.)
10. Pump Motor-5 HP Make-Kirloskar Monoblock, Model No. KDS -527 (2 nos.)
11. Pump Motor - 7 HP Make-Kirloskar Monoblock, Model No. KDS -844 (2 nos.)
12. Pump Motor - 2 HP Make-Kirloskar Monoblock, Model No. KDS -225 (2 nos.)
13. Humidifier -Sant Industrial Controls 6KW
14. Hot Water Generator- Type Vertical Capacity 21 KW
15. GM Balancing Valve TAG-A-02000842(20 mm)
16. GM Balancing Valve TAG-A-0200972 (20 mm)
17. GM Balancing Valve TAG-A-0201961 (20 mm)
18. GM Balancing Valve TAG-A-0401373(32 mm)
19. GM Balancing Valve TAG-A-0603243 (50mm)
20. CI Balancing Valve size NB- 100 mm -2 Nos.
21. CI Balancing Valve size NB-125 mm - 2 Nos.
22. GM Balancing Valve size NB -50 mm TAGA 602593
23. GM Balancing Valve size NB- 65 mm TAG -0701393
24. GM Balancing Valve Tag No.A0200642- 20mm
25. Dual plate check valve
26. Dual plate check valve
27. Dual plate check valve
28. Butterfly valve
29. Cold Room - Condensing units(Indoor & outdoor- 8 sets) -5°C , -15 °C & -20°C (2 nos)
Indoor Units :PASURUAH 67154 (PT. GUNTNER INDONESIA)
CR-1: Fan type-Z.A. FANFB045-VSK.4C.6L (107123) (2 nos.)
CR-2: Fan type-EBMFAN S4E350-AA06-34 (2 nos.)
CR-3 : Fan type-EBMFAN S4E315-AA05-14 (2 nos.)
CR-4 :Fan type-Z.A. FANFB045-VSK.4C.6L (107123) (2 nos.)
Outdoor Units : Compressor type-Semi-Hermetic (Make-Bitzer)
CR-1 : Capacity 4.31 KW (2 nos.), CR-2 : Capacity 3.15 KW (2 nos.)
CR-3 : Capacity 2.14 KW (2 nos.), CR-4 : Capacity 4.13 KW (2 nos.)
30. VRF/VRV VRF / VRV airconditioning system , comprising of modular type high efficiency scroll compressors system suitable for R410a / R407c refrigerant Outdoor Unit(ODU) Capacity :16 HP X 2 + 12 HP configuration totalling 44HP (Cooling capacity 106190 KCal/Hr), Make: Toshiba (01 SET)
31. 4TR Capacity (12037 KCal/Hr) Ceiling Mounted VRF connected Cassette type Indoor Unit,T make :Toshiba MMUAP0094HP-E,(09 NOS)
32. Central remote controller for units mentioned for item no 33 & 34. Make: Toshiba (01 SET)
33. Reefer container -20degree (Make:Carrier transicold,model no:69NT40-641-503) usig R-134a refrigerant.
34. Compressor of reefer container (Make:Carrier transicold,model no:06DR241BCC06C0)

ACTIVITY CHART FOR ANNUAL MAINTENANCE OF HVAC AT NCAOR

| Sl No | Description | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
|-------|--|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1 | Weekly | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a | Air Handling Unit: | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Check filter condition | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Clean , wash, renew/replace if required | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Check Fan Belt tension , adjust if required | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Check the condition of spray nozzles and float valve in air washer | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Check condition of drains for free flow | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Check condition of resistance in electric pan humidifier | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Check conditions of access door hinges and lubricate if necessary | | | | | | | | | | | | | | | | | | | | | | | | | | |
| b | Lights | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Check fittings . Replace fused starters/Chokes bulbs as required and terminals | | | | | | | | | | | | | | | | | | | | | | | | | | |
| c | Condensing unit | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | For 30 TR Capacity | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Check amperage/Voltage | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Check LP and HP Cut out settings | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | For 50 TR Capacity | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Check amperage/Voltage | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Check LP and HP Cut out settings | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Sl. No. | Description | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 |
|---------|--|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| 1 | Weekly | | | | | | | | | | | | | | | | | | | | | | | | | | |
| a | Air Handling Unit: | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Check filter condition | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Clean , wash, renew/replace if required | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Check Fan Belt tension , adjust if required | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Check the condition of spray nozzles and float valve in air washer | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Check condition of drains for free flow | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Check condition of resistance in electric pan humidifier | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Check conditions of access door hinges and lubricate if necessary | | | | | | | | | | | | | | | | | | | | | | | | | | |
| b | Lights | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Check fittings . Replace fused starters/Chokes bulbs as required and terminals | | | | | | | | | | | | | | | | | | | | | | | | | | |
| c | Condensing unit | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | For 30 TR Capacity | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Check amperage/Voltage | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Check LP and HP Cut out settings | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | For 50 TR Capacity | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Check amperage/Voltage | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Check LP and HP Cut out settings | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Sl. No. | Description | Ist Quarter | | | II nd Quarter | | | III rd Quarter | | | IV Quarter | | |
|---------|---|-------------|---|---|---------------|---|---|----------------|---|---|------------|----|----|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 2 | Monthly | | | | | | | | | | | | |
| a | Valves | | | | | | | | | | | | |
| | Check for functioning | | | | | | | | | | | | |
| | GM Balancing Valves | | | | | | | | | | | | |
| | CI Balancing Valves | | | | | | | | | | | | |
| | Dual plate Valve | | | | | | | | | | | | |
| | Check plate valve | | | | | | | | | | | | |
| | Butterfly Valve | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| b | Cooling Tower | | | | | | | | | | | | |
| | Cleaning of sumps and cooling tower | | | | | | | | | | | | |
| | Checking/ greasing of the cooling tower fan motor bearing | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| c | Electrical Control Panels | | | | | | | | | | | | |
| | The electrical control panels shall be checked , serviced and maintained for trouble free operation . | | | | | | | | | | | | |
| | Check incoming panel and terminals/contactors | | | | | | | | | | | | |
| | Individual control panel for AHU- star /Delta Contactors | | | | | | | | | | | | |
| | Micro processor Control panel-Check programming/display | | | | | | | | | | | | |
| | Electrical panels for Humidifer and termination | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| d | Filters | | | | | | | | | | | | |
| | Filters shall be cleaned with compressed air. In case HDPE filter water washing only to be done. | | | | | | | | | | | | |

| Sl. No. | Description | Ist Quarter | | | II nd Quarter | | | III rd Quarter | | | IV Quarter | | |
|---------|--|-------------|---|---|---------------|---|---|----------------|---|---|------------|----|----|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| e | Chiller Units | | | | | | | | | | | | |
| | Check operating suction and discharge pressure. | | | | | | | | | | | | |
| | Check oil level in the compressor and add oil if required to bring it to the centre of sight glass. | | | | | | | | | | | | |
| | Check the proper functioning of TXV by measuring the superheat | | | | | | | | | | | | |
| | Check the line voltage and current of compressor.It should be within the design limit permitted. If the current drawn is more than 120% of the specified value, determine the cause and immediately take corrective actions. | | | | | | | | | | | | |
| | Check proper functioning of all safety controls-like LP cutout , HP cutout, single phase preventor, water flow switch, anti-freeze thermostat etc. | | | | | | | | | | | | |
| | Check the operational of sentronic also by removing the sensor. The LED will turn red immediately and trip the compressor in two minutes. On manually pressing the reset button on the sentronic, the control circuit is reset and after the on-delay timing is completed (either through the motor protection module or additional on delay timer) the compressor should re-start | | | | | | | | | | | | |
| | Record all the system operating parameters and the range and differential setting of all operating and safety controls for future reference. | | | | | | | | | | | | |
| | Monitor the system operation on operating thermostat for few on-off cycles and ensure that everything is normal, before leaving the site. | | | | | | | | | | | | |

| Sl. No. | Description | Ist Quarter | | | II nd Quarter | | | III rd Quarter | | | IV Quarter | | |
|---------|--|-------------|---|---|---------------|---|---|----------------|---|---|------------|----|----|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| f | Cold Room | | | | | | | | | | | | |
| | Check doors for proper functioning | | | | | | | | | | | | |
| | Check heaters on door frame/Switches | | | | | | | | | | | | |
| g | Bitzer | | | | | | | | | | | | |
| | Check evaporating temperature | | | | | | | | | | | | |
| | Check suction gas temperature | | | | | | | | | | | | |
| | Check condensing temperature | | | | | | | | | | | | |
| | Check difference between condensing temperature and air admission temperature into the condenser | | | | | | | | | | | | |
| | Discharge gas temperature | | | | | | | | | | | | |
| | Check Oil temperature | | | | | | | | | | | | |
| | Check switching frequency | | | | | | | | | | | | |
| | Check power consumption of the compressor | | | | | | | | | | | | |
| | CheCk power consumption of the condenser fan(s) | | | | | | | | | | | | |
| h | HOT water Generator | | | | | | | | | | | | |
| | Check the electrical Panel for any loose connection etc. | | | | | | | | | | | | |
| | Change water, if required or top up. | | | | | | | | | | | | |
| i | Humidier | | | | | | | | | | | | |
| | Check the electrical Panel for any loose connection etc. change /add water as required | | | | | | | | | | | | |
| j | AIR Shower | | | | | | | | | | | | |
| | Check Door interlock | | | | | | | | | | | | |
| | Check door functioning | | | | | | | | | | | | |
| | Check Electricals control panel for loose connections if any | | | | | | | | | | | | |
| | Clean Pre fitler | | | | | | | | | | | | |
| | Check velocity of air flow | | | | | | | | | | | | |

| Sl. No. | Description | Ist Quarter | | | II nd Quarter | | | III rd Quarter | | | IV Quarter | | |
|---------|---|-------------|---|---|---------------|---|---|----------------|---|---|------------|----|----|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 3 | Quarterly | | | | | | | | | | | | |
| a | Water Pumps | | | | | | | | | | | | |
| | Routine Check up of pumps, glands etc | | | | | | | | | | | | |
| | Lubrication of pumps, motors | | | | | | | | | | | | |
| | Check electrical switches, gear ,cables etc. | | | | | | | | | | | | |
| b | Air Handling Unit | | | | | | | | | | | | |
| | Check fan motor runing current | | | | | | | | | | | | |
| | Check function controls | | | | | | | | | | | | |
| | Check fan and motor bearings | | | | | | | | | | | | |
| | Check electric heater battery elements | | | | | | | | | | | | |
| | Check circulating pump and motor in air washer | | | | | | | | | | | | |
| | Check the condition of inlet strainers | | | | | | | | | | | | |
| | Check the conditions of chilled/ hot water , add chemicals if required. | | | | | | | | | | | | |
| | Add water and flush condensate drain pan , trap and drain line | | | | | | | | | | | | |
| c | Condensing Unit | | | | | | | | | | | | |
| | For 30 TR capacity | | | | | | | | | | | | |
| | Check for leakage in refrigerent piping | | | | | | | | | | | | |
| | Check cable termination | | | | | | | | | | | | |
| | For 50 TR Capacity | | | | | | | | | | | | |
| | Check for leakage in refrigerent piping | | | | | | | | | | | | |
| | Check cable termination | | | | | | | | | | | | |
| 4 | Yearly | | | | | | | | | | | | |
| a | Air Handling Unit | | | | | | | | | | | | |
| | Check operation of dampers | | | | | | | | | | | | |
| | Check the filter frames for proper sealing | | | | | | | | | | | | |
| | Replace synthetic media in panel filters | | | | | | | | | | | | |
| | Check the access doors for easy operation and proper locking | | | | | | | | | | | | |

ACTIVITY CHART FOR ANNUAL MAINTENANCE OF VRF/VRV SYSTEM AT NCAOR

| Sl. No. | Description | Ist Quarter | | | II nd Quarter | | | III rd Quarter | | | IV Quarter | | |
|---------|---|-------------|---|---|---------------|---|---|----------------|---|---|------------|----|----|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| | Monthly | | | | | | | | | | | | |
| 1 | Checking all filters, fans, diffusers, cooling coils, Refrigerant Gas up etc | | | | | | | | | | | | |
| 2 | Tightening of belts, foundation bolts of equipment, alignment of belt pulleys and couplings. | | | | | | | | | | | | |
| 3 | Examining indoor/outdoor units & operating linkage for smoothness. | | | | | | | | | | | | |
| 4 | Checking and arresting any internal water leakages. | | | | | | | | | | | | |
| 5 | Check the gland /seal, coupling of units. | | | | | | | | | | | | |
| 6 | Check the safety controls mechanical, Electrical/ Electronics and inter-locking of the various equipments. | | | | | | | | | | | | |
| 7 | Check all piping/insulation/proper positioning/damage and rectifying the same where ever required. | | | | | | | | | | | | |
| 8 | Inspect/check entire line for leakage and rectification of leakage, if any. | | | | | | | | | | | | |
| 9 | check the foundation bolts of the units/motors and to take the necessary action if required. | | | | | | | | | | | | |
| 11 | Check the performance of equipment of VRF plant for proper functioning | | | | | | | | | | | | |
| Sl. No. | Description | Ist Quarter | | | II nd Quarter | | | III rd Quarter | | | IV Quarter | | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| | Quarterly | | | | | | | | | | | | |
| 1 | Checking / setting / rectification of all safety and automatic controls. | | | | | | | | | | | | |
| 2 | Complete Overhauling of indoor/outdoor units, FCU, Fans. | | | | | | | | | | | | |
| 3 | Maintenance of Fresh Air & Exhaust Air Fans and their Balancing, if required. Observe the operation of all the dampers and make necessary adjustment in linkage and blade orientation for proper operation. | | | | | | | | | | | | |
| 4 | Functional checks & calibration of all switches, thermostats, humidistat and other instruments rectification of the same if required. | | | | | | | | | | | | |
| 5 | The gas charging in VRF system will be executed by vendor, whenever required | | | | | | | | | | | | |

ANNEXURE-XIII

INSTRUCTIONS TO THE TENDERERS

Tenderers are advised to submit tender strictly as per conditions stipulated in the tender document. Please enclose the following with the tender & submit all in a **Single Sealed Cover**.

Cover (Sealed):

1. Covering letter from the Tenderer on his letterhead.
2. Tender fee in the form of DD, if down loaded from NCAOR web site.
3. EMD in the form of DD
4. Price Bid (with signature & stamp on all pages), Annexure ó VI
5. Duly signed & stamped Annexure ó VII, VIII, IX, X

All above document to be submitted in one sealed envelope (Single BID SYSTEM) superscribing name of the Tender, Tender Number and address to **Director, National Centre for Antarctic & Ocean Research, Headland Sada, Vasco-Da-Gama, Goa & dropped in the tender box kept in the office of Estate Section on or before the date & time mentioned in the tender.**

--sd--

Estate In-Charge