

# **MINISTRY OF EARTH SCIENCES**

**National Center For Medium Range  
Weather Forecasting  
(NCMRWF)**

**RFP for  
OPERATION AND MAINTENANCE OF  
ELECTRICAL/MECHANICAL/CIVIL/HVAC  
SYSTEM  
AT NCMRWF**

**MARCH 2010**

**MINISTRY OF EARTH SCIENCES**  
**NATIONAL CENTRE FOR MEDUM RANGE**  
**WEATHER FORECASTING(NCMRWF)**

Govt. of India  
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**TENDER FOR OPERATION AND MAINTENANCE OF**  
**ELECTRICAL/MECHANICAL/CIVIL/HVAC SYSTEM**  
**INSTALLED IN NCMRWF CAMPUS.**

The NCMRWF is a division of the Ministry of Earth Sciences, Government of India and is a premier institute engaged in providing operational Medium Range Weather Forecasts to the various sectors of the Indian economy. The Centre is spread over an area of 10 acres of land.

Sealed tenders are invited from experienced firms/agencies/contractors in the prescribed format for MAINTENANCE OF ELECTRICAL/MECHANICAL/CIVIL/HVAC SYTEM ETC. installed in the various location/buildings of the Centre as mentioned in the tender document.

The bidders are required to visit NCMRWF to see the actual installations for themselves to assess the quantum of work involved before submitting the tender. Once the tender is submitted, it will be deemed that the bidder has seen and understood the complete work involved for each of the systems. Total estimated cost of the contract will be to the tune of Rs. 25 lakhs per annum.

For pre-qualifications(a) the firm/agency/contractor, should be presently rendering their services for operating and maintaining of works for at least one HVAC Plant/33 KVA substation/750/1500 KVA DG set system of similar capacity of reputed make, in any Government Sector or large reputed Private sector enterprises for at least last two consecutive years satisfactorily(b) also their average annual turn over during the last 3 years ending 31st March 2009 should be at least Rs. 60,000. In the last three consecutive financial years for carrying out similar nature of work namely operation and maintenance of the HVAC/Electrical system (c) Experience of having successfully completed similar works during last 7 years ending on 31st July 2009 should be either of the following ;

- (i) Three similar completed works costing not less than Rs.80,000 (Rupees Eighty Thousand) per annum or,

- (ii) Two similar completed works costing not less than Rs. 1 lakhs(Rupees One Lakh) per annum or,
- (iii) One similar complete work costing not less than 1.6 lakhs(Rupees One lakh sixty thousand) per annum.

This work will be initially awarded for a period of one year and is likely to be extended for a mutually agreed further period at the discretion of the competent authority.

The tenderers are required to deposit Demand Draft of 5,000(Rs. Five thousand only) in favour of the DDO, MoES, payable at New Delhi as Earnest Money Deposit (EMD) along with original tender document for this work. EMD will be returned to the unsuccessful tenderers after award of the contract. No interest shall be payable by NCMRWF on EMD. Further, on award of the contract, a security deposit of an amount equivalent to 10% of the total annual contract value in the form of Demand Draft/Bank Guarantee as per format enclosed (APPENDIX-A) from Nationalized Bank shall be deposited with NCMRWF as contract performance guarantee which shall be refunded within three months of date of expiry/completion of the contract. After depositing the amount of the security deposit, the EMD amount would be released to successful tenderer. In the event of the contractor failing to comply with any provision of the contract the security deposit shall stand forfeited.

Non transferable tender document containing terms, conditions and technical specifications etc. can be obtained from the NCMRWF on all working days from the date of advertisement in the national newspapers on a written request on the letter head of the firm and on payment of Crossed demand Draft/Banker's cheque(non refundable) of Rs. 500(Rupees Five Hundred Only) in favour of the DDO, MoES payable at NEW DELHI towards the cost of the tender document. Before buying the tender document, tenderer should see the document for details of the tender conditions and pre-qualification criteria in their own interest.

The tender is to be submitted in two separate sealed envelopes labeled as under:-

**1. TECHNICAL–BID (Envelope No.1):**

- (a) The tender document in original including the blank PRICE-BID Performa duly signed and stamped as a token of acceptance, along with deviation if any, from particular tender conditions in a separate sheet (**Schedule I**). The following additional documents shall also be enclosed i.e. (i) the attested copies of experience certificates of carrying out similar nature of work for at least last two consecutive years satisfactorily. (ii) The attested copy of the latest ITCC certificate (iii) The attested copies of the balance sheet/audited statement of account or any other relevant document to prove

the minimum average annual turnover of Rs.11 Lacs in the preceding three financial years of the tenderer in operation and maintenance works of similar systems.

(b) A crossed demand Draft for Rs. 5,000/- (Rs. Five thousand only) in favour of the DDO, MoES, payable at NEW DELHI, from any nationalized Bank, as Earnest Money Deposit (EMD).

**2. PRICE-BID (Envelope No:2)**

The PRICE-BID as per proforma given in the tender document as **Schedule I** shall be photo copied and then filled up and submitted in Envelope No.2. Any conditions given in the PRICE-BID may cause rejection of bid. It may also be noted that no discussion/negotiation will be held after opening of financial bid.

The Envelopes No: 1 & 2 shall be sealed separately and should be placed in a third envelope which also shall be sealed and duly super-scripted as **"TENDER FOR OPERATION AND MAINTENANCE OF ELECTRICAL/MECHANICAL/CIVIL/HVAC SYSTEM ETC. INSTALLED IN NCMRWF CAMPUS"**.

The TECHNICAL-BID (Envelope No. 1) shall be opened first. The PRICE-BID (Envelope No.2) will be opened only of those tenderers whose TECHNICAL-BID is found to be in order and for which they shall be intimated separately about date and time by fax/telephone.

**NOTE:** The tenderer who have not submitted the documents as per tender conditions, major deviations, proper Earnest Money Deposit (EMD) and experience certificates etc., their tender may be treated as non-responsive and their PRICE-BID (Envelope No. 2) shall not be opened.

Successful firms/agencies/contractors will be intimated and contact agreement will be entered into initially for a period of one year. The preparation of the contract agreement with proper stamp etc. would be done by the tenderer in consultation with NCMRWF. If the firm's services/performance is found to be satisfactorily, in the sole opinion of NCMRWF, the contract may be extended on the same terms and conditions for a further period of one year or any period which may be decided by NCMRWF.

**The Head, NCMRWF reserves the right to accept/reject any or all the tenders without assigning any reason.**

**Yours faithfully**

**Head, NCMRWF**

## NCMRWF COMPLEX AT SECTOR-62, NOIDA

Schedule of events is as under:

Events	Date
Likely date of publication of press advertisement	15.03.2010
Site Visit (at NCMRWF) with NCMRWF representatives	17.03.2010 (2:30 p.m. to 4:30 p.m.)
Date of Tender Submission	5.04.2010(3:00 p.m.)
Date of opening of the Pre-qualification documents Technical Bids and Commercial Terms at NCMRWF's premises	5.04.2010 (3:30 p.m.)
Validity of the Tender	120 days from the date of submission

### 1.0 GENERAL

The National Centre for Medium Range Weather Forecasting (NCMRWF) has been constructed in A-50, Sector-62, Noida, Gautam Budh Nagar.

The Power Supply to NCMRWF campus has been provided from UPPCL. The water supply to the campus is through NOIDA water supply authority but an independent bore well has also been constructed to augment the water supply and meet fire water requirement of the campus.

The campus sewage network has been connected to the sewer line of NOIDA municipal authority at the campus boundary.

Incoming power supply has been taken to the HT Switch gear room through underground buried 33kV cables Voltage of 33 kV supply is step-down through three number 1250 kVA indoor type transformers. There is a provision of in plant generation of power through Diesel Generating set to meet the requirement due to non-availability of grid power.

### 2.0 INTENT OF SPECIFICATION

This specification is intended for appointment of a competent bidder to carry out operation and maintenance (Round the clock Operation & Maintenance) of Electrical/Mechanical/HVAC installations and their General House keeping, at NCMRWF campus, Sector-62, Noida.

### 3.0 INSTRUCTION TO BIDDERS.

- 3.1 This specification describes the technical specification & general terms and conditions for Operation and maintenance of Electrical/Mechanical/HVAC installations at NCMRWF, Noida.
- 3.2 Bidders are advised to visit site to assess the quantum of work for electrical, Mechanical and HAVC work before submitting the offer.
- 3.3 The work shall be done as per standard specification of Bureau of Indian Standards, other National /International Standards, IE rules and statutory requirement of Govt. of India as may be applicable at the work site.
- 3.4 The work shall be done as per direction of supervising personnel of NCMRWF.
- 3.5 All parts of the specification shall be read in conjunction with each other. In case where requirements given in different parts differ, the most stringent shall govern.
- 3.6 The specification states the scope and requirements as completely and clearly as possible. Any additional work/equipment or technical requirement not mentioned in the specification but required to make the system operative shall be deemed to be included in the offer.
- 3.7 Bidders may contact and obtain clarifications required (if any) at any stage, before submission of offer from NCMRWF, Sector-62, NOIDA.
- 3.8 The bidder shall provide all necessary manpower, tools and tackles, consumables etc. required to carry out work as per this documents/direction of supervising personnel of NCMRWF. The bidder shall also provide site transport, power tools, movable ladders/any other device to approach the equipment/fittings to be operated/maintained (in required quantity as well as height) etc. as required.
- 3.9 The manpower deployed shall have minimum working experience of two years after acquiring professional qualification. Manpower deployed shall also have experience in IR/HV testing, checking of panels, handling of structured cables, other jobs which may be required to be undertaken.

- 3.10 The Bidder shall have on their rolls/appoint full time supervisor(s) and depute him/them at site to supervise the work. All work shall be done under direct supervision of this supervisor(s). Supervisor(s) shall be at least Diploma Holders in Electrical/Mechanical Engineering or possess certificate of competency for the work (which they would be assigned) issued by competent authority. Electrician/mechanical operator shall possess ITI certificates/valid license issued by competent authority. The manpower deployed shall also have at least five years experience of carrying out similar work. The qualifications of such Supervisors are liable to be checked by NCMRWF Supervising staff.
- 3.11 The bidder shall carry out all types of co-ordination with other agencies operating at site as well as Power/water supply authority, Telephone authority etc. for carrying out the work in their scope of work/services.(Sanitary, Sewage Deptt., UP Pollution Control Board, Waste Disposal Deptt.)
- 3.12 Where the proper execution of the work depends upon the performance of the other agencies or where the bidder considers that his work is being unreasonably interrupted by the activities of the other agencies he shall so notify to NCMRWF immediately. If the bidder fails to do so, it shall be deemed that he is satisfied with the prevailing conditions.
- 3.13 All work shall be carried out to the satisfaction of the supervising personals of NCMRWF. Any work found to be carried out without the approval of the supervising personnel or work which is considered to be unsatisfactory and of poor quality of workmanship, shall be rectified by the bidder without any additional cost to NCMRWF.
- 3.14 The requirements about shutdowns to carryout the work shall be optimally planned and shall be informed in writing to the supervising personnel well in advance and approval obtained. The responsibility of co-ordination with other agencies sharing the work area shall also be the responsibility of the bidder.
- 3.15 Work permits shall be issued while giving shut downs to other agencies/deputing the persons for carrying out job taking full care of safety and security of equipment and personnel. Records of issue of work permits and their release shall be maintained.

- 3.16 Care shall be taken not to expose panels, static converters and sensitive electronic equipment to undue vibration during handling.
- 3.17 Care shall be taken so that during welding and/or high voltage testing, current does not pass or voltage do not appear across terminals/components either directly or otherwise which may cause damage to them
- 3.18 The bidder shall complete and fulfill all formalities with the statutory authorities having jurisdiction in the area.
- 3.19 The bidder shall attend review meetings and all other meetings called by the NCMRWF.
- 3.20 The bidder shall provide the monthly progress report in duplicate. The report shall clearly define all major activities completed during the previous month and identify programs that are proposed to be undertaken incoming month etc. The report format shall be finalized after discussion with the supervising engineer.
- 3.21 The bidder shall be given all project drawings with "As Built" information to the extent possible and shall maintain the installation accordingly. Modification made, if any, shall be recorded.
- 3.22 All faults, discrepancies failure shall be promptly attended and preventive maintenance shall be done regularly so that break-downs are minimized. Response time should be less than one hour. Preventive Maintenance schedule to be workout out mutually.
- 3.23 In case of non-deployment of manpower and/or service is not provided to the satisfaction of NCMRWF, NCMRWF reserves the rights to rectify the problem through other agency at the risk and cost of the bidder and suitable amount shall be deducted from the payment of the bidder.
- 3.24 The rates quoted by the bidder shall be inclusive of all payments to be made by the bidder to the labour and all costs toward workmen compensation, PF, insurance etc. There should be no delay in making the system up for want of spares. The responsibility of spares planning rests with the bidder.

- 3.25 Rates of Items quoted shall be inclusive of all taxes, duties, levies, payments etc.
- 3.26 No Sales Tax exemption forms shall be issued by NCMRWF to the successful bidder.
- 3.27 The Unit rates shall remain firm for a period of One year from the date of order.
- 3.28 Assessment of Performance:-
  - 1) Bidder shall note that the system of the campus which are to be operated have been designed to operate at the rated parameters as per the drawing and documents available with NCMRWF and the performance test.

The bidder should have the capability and suitable manpower to ensure operation of the system at the rated parameters. If rated parameters are not achieved due to deficiency in the services of contractor and results in loss to the NCMRWF for want of not maintaining of rated conditions, the bidder shall bear the cost of deficient services. The deficient services could be for example:-

- a) Non starting of DG set automatically within stipulated time on power failure.
- b) Non –availability of power due to shortage of spare, manpower etc.
- c) Increase in rated temperature in computer room or other areas.
- d) Cleanliness not upto the requirement and repeated complaints from the officers.
- e) Quality of water non-cleaning of tanks etc.

Assessment of performance with respect to deficient services may be ascertained by mutually agreed timeframe.(for example DG set not starting within 30 second in twice during contract period or temperature in computer room rises more than once in six months causing system crash etc.)

Based on this mutually agreed verifiable indicator performance assessment, the liquidated damages or termination of contract as per the stipulations in contract may be applicable.

#### **4.0 SUBMISSION OF OFFER**

4.1 The offer shall be submitted in two parts. The technical part shall not contain any prices or commercial conditions. The offer shall comply with all the requirements of the specifications.

The following information's shall be furnished with the technical part of the offer:-

- (a) Clause wise information of the specification by signing the documents.
  - (b) List of deviations, if any.
  - (c) Unpriced schedule of quantities.
  - (d) List of employees proposed to be posted with their respective bio-data.
  - (e) List of similar works carried out by the bidder since last three years with certifications from the clients.
- 4.2 Any variation in the bid as compared to this RFP/NIT would render bid invalid.

#### **5.0 SCOPE OF WORK**

The scope of work/ services to be provided by the bidder shall be inclusive of the following but not limited to:-

- 5.01 Setting up furnished office/storage facilities (at space to be provided by NCMRWF at NCMRWF) for manpower, drawings, documents, tools and tackles, spares etc., like:
- \* Supervisor(s), electrician(s) etc. helper (s) deputed.
  - \* Communication facilities with offices of NCMRWF.
  - \* Storing and issuing spares required for operation & maintenance. All the responsibility of spares should rest with bidder only (Ref 5.12)
  - \* Maintaining and storing drawings/documents, tools and tackles, checking/testing instruments etc. as required.
- 5.02 Transport facilities for attending the work, arranging resources coordinating with concerned official of NCMRWF, Power and Water Supply Authorities/ Telephone Authority/State Administration and meeting emergencies round the clock.
- 5.03 Deployment of supervisor(s)/Technical(s), skilled and semi-skilled labourers for carrying out the work as per specification/ direction of supervising personnel.

- 5.04 Operation, switching & preventive maintenance as per recommendation of manufacturer/operation & maintenance manual and direction of supervising personnel. Breakdown maintenance and modification to installation as and when required. The work shall also include temporary lighting and any other arrangement as per direction of supervising engineer. Where modification to the existing structure is required NCMRWF will do the procurement and the bidder will have the responsibility for installation and commissioning at no Extra Cost.
- 5.05 Making available checking, testing, measuring equipment /sets/instruments/tools meters etc. as required.
- 5.06 Carrying out work as described in specification, schedule of items and direction of supervising personnel.
- 5.07 Planning, scheduling and carrying out preventive maintenance of Electrical/Mechanical/HVAC installation.
- 5.08 Attending breakdowns, faults and restoring the operation of electrical /mechanical /HVAC system within minimum possible time.
- 5.09 Repair/replacement of faulty/unusable items and keeping record thereof.
- 5.10 Maintenance of daily logbook of events, complaints register, spares consumption register etc.
- 5.11 Advising of procurement of spares in time so that maintenance/operation is not held up for want of spares.
- 5.12 A tentative list of spares is given in schedule-II for maintenance repair and breakdown maintenance. In case of HAVC-the cost of Gas, Compressor Oil, Compressor spares, panel, AHU spares, Motor Windings etc. shall be reimbursed by NCMRWF. The NCMRWF shall reimburse CPWD/DSR rates wherever applicable. In case such rates are not available the bidder should provide spares at the OEM rates/ Consumable material such as re-wirable fuses, porcelain fuse base and carrier, locks for padlocking of switches, nuts, bolts, washers, screws, insulation tapes, PVC sleeves, CTC, welding electrodes, rubber items like belt etc. required for maintenance job should be included in the bidders quote and the NCMRWF shall not be liable for any payment.
- 5.13 Co-ordination with Power/Water Supply Authorities/Telephone Authority /Statutory Authorities/State Administration and other agencies working in the area/having jurisdiction in the area.
- 5.14 Watering of earth electrodes checking earth resistances and checking earth continuity periodically every six month and the report should be made available to NCMRWF.
- 5.15 Oiling, greasing and lubricating all the rotating equipment, valves, fittings and mechanical equipments etc. as per instruction of Operating Manual and Schedules. In case the bidder is advised to

provide the material the bidder shall be paid cost of material on actual basis.

- 5.16 Maintaining logbook, status of power supply, switching, shut-down, work-done, quantity of items used in the maintenance/modification, instruction for deployment of manpower on all days, holidays, weekly off days and beyond normal working hours, etc. shall be entered in the log book. Weekly holidays and working beyond office hours is the bidder's programme. As for NCMRWF concerned the deployment should be uniform throughout.
- 5.17 In case the bidder is advised to provide the material the bidder shall be paid cost of material on actual basis.
- 5.18 Any other minor works requested by client.
- 5.19 The employees deployed shall have neat/clean/washed uniforms with visible identification badge. The employees deployed shall be certified persons suitable for the work allotted and shall have requisite certificate.
- 5.20 **Switching off of the lights/exhaust fans/fans etc. during non-working hours or where not required shall be in the scope of the bidder.**

#### 5.1 Scope of works for electrical/mechanical installations

Major installation included in the scope of work for operation maintenance comprise the following but not limited to:-

- i) 33 kV VCB panel comprising Four VCBs.
- ii) 3 Nos. 1250 kVA, 11/0.433 kV Power Transformers(Indoor type) with OLTC.
- iii) 2 x 2000 A TPN Aluminum bus ducts & 1 X 1600 A TPN Aluminum bus duct.
- iv) Main LT Panel (2000 A, 415 V, TPN)
- v) Lead-Acid battery (200 Ah. 110 V)with Battery Charger (20A, 110 V) and DC Distribution Board for HT and LT panel.
- vi) AC Distribution Board
- vii) Main Lighting Distribution Board
- viii) 750 (1 No.)/1500 kVA DG sets (2 Nos.) with AMF Panel, & Accessories, Diesel Loading and unloading
- ix) 3 Pole structure inclusive of G.O. Switch, LAs, PT, CT and Drop out fuses.
- x) Earthing Grid and Earthing stations in entire building complex
- xi) 33 kV cabling network.
- xii) LT panels in HVAC room and AHU rooms.

- xiii) One Borewell, Two Nos. Drinking Water pumps with Chlorinator, Fire water jockey and main pumps and DG Operated Fire water pump, water Pond pumps, valves, Sump pump etc. and their Electrics.
- xiv) LT power and control cabling emanating from & inside of substation building.
- xv) HVAC system, York Chiller of Capacity 90 Ton (three working, two standby) including AHUs, Duct, Piping, valves etc. complete.
- xvi) Drinking water, Borewell, Garden Hydrant pipe network.
- xvii) The NCMRWF has 18 Nos. of split AC located at different parts of the building. Maintenance of these Acs shall be bidder responsibility.

The scope shall also include electrification of following facilities after their commissioning:-

- i. Internal & External electrification, Telephone Network (Landline connection)
- ii. Fire Detection and Alarm System FM200 installed for the Computer Centre.

Minimum Manpower to be deployed for electrical/mechanical work/civil work

The rates quoted shall be inclusive of cost towards deployment of following manpower. Bidders may suggest additional manpower if required. Bidders may assess the manpower required by visiting the site and assessing the scope of work.

Sl.No.	Manpower	Shift of operation & maint.			
		General	A	B	C
1.	Supervisor		1		1
2.	Electrician			1	1
3.	Helper		2	2	2
4.	Pump cum HVAC Operator	1	1	1	1
5.	Mason	1			
6.	Plumber	1			
7.	General cleaning	1	-	-	-
8.	Helper for Mason	1			
9.	Helper for Plumber	1			

**Supervisor-I timings ( 9:am to 7pm)**

**Supervisor-II timings ( 7:pm to 8am)**

List of instruments to be arranged by the bidder

The successful bidder shall either have in **possession** or shall arrange following instruments for checking/testing electrical installation at NCMRWF as and when required:-

- \* Primary current injection set upto 2000 Amps.
- \* Secondary current infection set
- \* Relay testing kit.
- \* LV testing kit upto 415 V AC
- \* LV testing kit upto 220 V DC
- \* HV testing kit upto 33 KV AC
- \* IR Testers 500 V, 1000 V, 2500 V
- \* Earth continuity testers.
- \* Earth resistance tester
- \* Phase to earth loop impedance testers
- \* millivolt drop tester
- \* Phase sequence tester
- \* Clip on Ammeters
- \* Portable Voltmeter
- \* Protection relay test plugs
- \* Portable earthing device
- \* Schematic diagram
- \* Bill of Materials
- \* Equipment layout drawings
- \* Cable layout drawings
- \* Earthing and lightning protection layout drawings.
- \* Operation & Maintenance Manuals
- \* List of spares required for maintenance. Bidders should provide the list of spares which he thinks is essential for 24 hrs. operation
- \* Results of test done at sit after erection and during commissioning.

In case any of the above drawings are not available, the bidder shall assist NCMRWF in compiling/checking data for development of drawings. However development of drawings shall not be in the scope of the bidder.

Variation in quantities

Quantities actually required shall be executed. Payments shall be made on the basis of actual work done/services provided certified by supervising personnel of NCMRWF.

### **Schedule of quantities**

Equipment /materials to be supplied /services to be rendered by the bidder have been broadly described below for furnishing break-up of process. Although every required item may not be explicitly described herein, the bidder shall include everything required for completion of the work unless specifically excluded from scope of work/service. While quoting the price, the bidder shall take into consideration NIT document and reference indicated therein as a whole and not merely the description indicated below.

- Cable crimping tools/device
- Welding machines
- spanner sets
- Screw driver sets
- Testers, test lamps etc.

### **documents to be maintained**

- log book of daily event
- Complaints registers
- Planning and scheduling of preventive maintenance
- Reports of preventive maintenance done
- Daily breakdown maintenance/status reports
- Work permit issue/released
- reports of testing/checking done
- Consumables & spares consumption register/reports
- Reports of modification done
- Attendance sheet.

Formats for above report shall be finalized in consultation with supervising personnel of NCMRWF.

### **Drawings/documents of existing installation to be maintained.**

One set of following "As built" drawings/documents shall be handed over to successful bidder. The successful bidder shall maintain these drawings /documents in proper manner in bound volumes duly numbered & indexed and use for operation & maintenance as reference documents. These documents shall be returned to NCMRWF on expiry of the contract period or termination of contract whichever is earlier.

- GA drawings
- Single line diagrams

## **5.2 Maintenance of Main water Supply System/Building Maintenance/Sewage**

Scope of work for maintenance of main water supply system work shall include supply of regular maintenance material, manpower with tools & tackles etc.

- i) All the plumbing work required to maintain the main water supply system in hygienic conditions.  
The scope of work shall include maintenance/replacement of any of the standard fittings provided to make the main supply system work including repair of leakage.
- ii) To attend plumbing work to ensure water supply to overhead tanks and user ends.
- iii) The scope of work shall also include general maintenance of building.
- iv) The scope of work shall include maintenance of any of cast iron sewerage lines and main water supply including repair of leakage. The supply of material like lead, cement soda, special rope etc. for repair work shall be included in scope without any additional cost including Maintenance, repair of sewer lines.  
  
- the scope of work includes the periodic cleaning of OHT underground reservoir, annually once. The cleaning of ponds shall be considered once in a month.
- v) The scope of work mentioned above is indicative only. The agency shall have to carry out any other activity required for proper maintenance of the water and sewage system.

Cost of the any fittings, spares/consumables etc. shall be reimbursed by NCMRWF based on actual cost/OEM.

### **Supply**

The successful bidder shall have to maintain adequate stock of grease, oil, bearings, belts and any other item of reputed make, as directed by officer in-charge NCMRWF. The cost of procurement of these items shall be borne by the bidder.

### 5.3 Operation and maintenance of HVAC System

#### Description of HVAC system

Chilled water system has been adopted for air-conditioning. 5 Nos. of chilling machines each of 90 TR capacity (3 Nos. working and 2 Nos. stand by) have been installed for air conditioning. Refrigeration plant is mainly comprising refrigeration compressors, screw condensers, shell and tube chillers; condenser water and chiller water pump sets, necessary controls and instruments electrical works including electrical panels etc. Chilled water from the chillers shall be pumped to the cooling coils of various air handling units through mild steel pipes duly insulated to prevent any rise in temperature of chilled water. Return water from AHUs is taken through insulated M.S. Pipes to the chillers.

The central refrigeration plant is housed in near to the main block. AHUs for the various areas are installed on the respective floors in a separate room. Proper drainage system is provided for each AHU and is connected to the main drains of the building. Proper facility for attending to maintenance and repair of the AHUs are provided. The system designed to attain the inside conditions within 2 hours after switching on the A.C. system.

Each AHU comprises filter section, humidification and cooling section, blower section, damper section and electrical strip heaters section etc.

Conditioned air from AHUs is distributed to the conditioned areas through grillers and diffusers fitted with insulated GI ducts installed in the return air boxing or over false ceiling. Return air from the conditioned area is taken to the AHUs through R.A. boxing or over false ceiling.

To have more detailed idea about the equipment installed at NCMRWF for the air conditioning purpose, the bidder may make a visit to said premise and satisfy himself before submitting his offer.

#### Design basis for air-conditioning

The basis of design for air-conditioning system of NCMRWF Complex NOIDA is as follows:-

#### Out Side Design Condition:

<u>D</u>	<u>B</u>	<u>W</u>	<u>B</u>
Temp( <sup>o</sup> c)		Temp( <sup>o</sup> c)	

Summer	:	45	23.9
Winter	:	7.2	5.0

Inside Design Condition

Summer	:	18 <sup>0</sup> C on GF Main Block
Monsoon		21 <sup>0</sup> ± 1 <sup>0</sup> C in other areas Relative Humidity 55% ± 5%
Winter		Temp. not less than 20 <sup>0</sup> c Relative Humidity 55% ± 5%

Scope of work

The scope of work for the agency for operation & maintenance of AC plant and AC distribution system shall include the deployment of qualified skilled manpower with all necessary tools & tackles and day-to-day Operation and maintenance of the complete system. The manpower shall be deployed in three shifts to operate the plant and machinery round the clock basis or as decided by NCMRWF. For meeting the present air-conditioning needs of various constituents, only two/three chillers are to be operated depending on the requirement on rotation basis. However, the regular maintenance shall be carried out for all the chillers, pumps, AHUs, ducting and piping etc. The remaining AHUs operated on regular basis only as and when the premises are occupied by constituents.

The bidder shall depute adequate no. of supervisors, technicians, operators and semi-skilled/un-skilled labour to take overall responsibility of satisfactory O&M services at various levels of operation as per requirement. However, bidder shall indicate the minimum no. of supervisors, technicians, operators and semi-skilled/un-skilled labour to be deputed in each shift at present level of operation as well as when all the AHUs and FCUs will operate. In addition to regular O&M staff, the bidder shall also arrange to depute any manpower/expert service for carrying out any job not specifically mentioned abut necessary to carry out overall O&M function without any price implication.

### Daily checks

1. Daily operation of the AC plants as per the requirements of NCMRWF /the instructions of the Officer In-charge. The Operation of individual equipment shall be strictly as per manufactures recommendations.

Before starting the AC plant, the agency shall ensure that;

All the valves in the chiller system, Condenser water and chilled water lines are open except those of the stand by equipment.

There is sufficient water supply to the cooling towers & make-up water system is working satisfactorily.

That the make-up water system to the expansion tank of the chilled water system is working and there is regular water supply.

All the air filters & strainers are cleaned to restrict the pressure drop within permissible limits.

All the doors and windows of the air-conditioned area to be kept closed to prevent air infiltration.

The supply of voltage is within permissible limits for operation of all the equipment including chillers, pumps, AHUs.

2. Daily operation of all AHUs and other equipment as per the requirements of NCMRWF and the instruction of Officer In-charge.
3. The agency shall maintain detailed log books and other necessary records as per the requirements of NCMRWF and instructions of officer In-charge.
4. The agency shall carry out cleaning of plant room, AHUs rooms including motors, starters, compressors, pumps, panels, pipe racks etc. All machines installed in the plant room and AHUs will be kept dust free and clean in all respect.
5. The agency shall carry out checking for over heating/abnormalities of bearings terminals connection, cables of all motors, fans, pumps compressor, starters, panels etc. and to take necessary action, if any.
6. The agency shall carry out daily psychrometer reading at different places of the air-conditioned space in all premises and record.
7. The agency shall carry out any other work required for proper functioning of the system and instructions of Officer In charge.

8. Leakage testing of refrigeration system.
9. Checking of alignment/looseness of all the belt driven equipment and to rectify if required, and also testing of nuts & bolts of mechanical equipment.
10. Checking of coupling rubber bushes of pumps.
11. Checking of pump gland/seal for leakage.
12. Checking of all drain points in plant rooms/AHU rooms.
13. Checking of leakage and operation of all valves installed in condenser/chilled water line.
14. Check oil level in the compressor.
15. Check liquid sight glasses to determine any refrigerant shortage.
16. Check oil pump discharge pressure.
17. Any other work specified by officer In-charge.
18. Any other work required for proper O&M.

### Monthly Checks

1. Checking of gland/seal, coupling of pumps and cooling towers, its filters, spray nozzles, sumps piping and general area, and to take necessary action if any.
2. Checking of all safety control, operation and also the set points of all controls.
3. Greasing of all fans, blowers and other rotary equipment.
4. Checking & setting of all fresh air dampers installed in AHU rooms.
5. Checking & settings of all Fire Dampers installed in AHU rooms.
6. Cleaning of air-filters of all AHUs.
7. Cleaning of pot/Y-strainers.
8. Any other work specified by officer In-charge.
9. Any other work required for proper O&M.

### Quarterly Checks.

1. Inspect the unit piping and cool for visible signs of leaks.
2. inspect entire system for any unusual condition such as noise, vibration etc.
3. Check the system operating pressure and temperatures to ensure proper operating conditions.
4. Check chilled water flow by checking pressure drop across the chiller.
5. Compare the chilled water temperature at full load with the chilled water temperature control.
6. Inspect and adjust all safety controls.
7. Inspect all operating controls and sequence of operating.
8. Check the foundation bolts of pumps and motors and to take necessary action if any.

9. Check the quantity of airflow from various supply grills in each rooms/areas, as per design and to adjustment of dampers etc. when required.
10. Any other work required for proper O&M.

### **Other works**

1. Oil & Refrigerant to be provided as and when required for proper functioning of the HVAC system.
2. Any other requirement to keep the whole system in proper condition.
3. Carry out O&M in accordance with Instructions/Manuals of equipment suppliers/manufacturers. Submit Maintenance Schedule to NCMRWF. Record the schedules Maintenance carried out in standardized format including the no. and category of personnel required and actually deployed, time taken, consumables/spares used and signature of technician & engineer carrying out the work & present it to Officer-In-charge NCMRWF every month for his perusal.

Maintain logbook for recording unscheduled and breakdown maintenance/defect rectification work. Maintain equipment/system operation logbook.

### **Supply**

The successful bidder shall have to maintain adequate stock of grease oil, bearings, belts and any other item of reputed make, as directed by officer in charge NCMRWF.

### **6.0 Working hours and holidays for manpower deployed**

The manpower deployed shall work 365 days in the year and 24 hours a day. General shift 09:00 hrs. to 17:30 Hrs. with half an hour Lunch break.

"A" Shift	06:00 Hrs to 14:00 Hrs.
"B" Shift	14:00 Hrs. to 22:00 Hrs.
"C" Shift	22:00 Hrs. to 06:00 Hrs.

Manpower deployed in A, B and C shifts shall not leave unless manpower for next shift arrives to relieve them. Further, manpower of previous shift shall continue the duty of next shift In case manpower for the next shift either does not report or any other alternative arrangement is not made. In all these cases overtime shall not be paid by NCMRWF. In such case, overtime payable, if any, shall be made by the bidder at his own cost and no extra payment shall be made by NCMRWF.

## 7.0 Contract period

The works shall be awarded for a period for one year from the date of order which may however be extended on the basis satisfactory performance with the same terms and condition for a period of one more year or any period may be decided by NCMRWF. NCMRWF reserves the right to terminate the contract with one month's notice without assigning any reason.

## 8.0 Commencement of the Contract

That this contract will come into force for a period of 1 year initially, after signing an agreement between the two parties. But it can be terminated by giving 1 month notice without assigning any reason by the Department.

## 9.0 Termination of the contract

That this contract may be terminated on any one of the following contingencies:-

- (a) By giving one month notice by the Department due to:
- i) The contractor not performing his duties properly.
  - ii) For committing breach of contract of any of other terms & conditions of the agreement on assigning the contract or any part thereof or benefit or interest therein or hereunder by the contractor to any third party for subletting whole or part of the contract to any third party.

## List of Equipment Included in Scope of Work of HVAC

PROVISION OF AIR CONDITIONING SYSTEM FOR NCMRWF SUPERCOMPUTER CENTER FOR MOES, PHASE-II, NOIDA(U.P).		
DESCRIPTION OF ITEM	UNIT	QTY.
CLOSED LOOP CHILLER - 22.4 TR Capacity	set	5
Make: Blue Star		
90TR AIR COOLED SCREW CHILLERS (R-134a)		
Supply, Installation, testing, commissioning and handing over of air	Set	5

cooled chilled water plant of 90TR capacity each including one stand by.		
<b>Make : York,</b>		
The units is complete with chiller, condenser, capacity control, purge unit, vibration isolation arrangement, control console, gear unit, motor, starter, all controls and instruments, first charge of refrigerant and oil, all accessories as specified with following characteristics.		
Semi hermetic / hermetic Screw type Compressors with motor & capacity control assembly		
Air cooled condenser with 6Nos. Fans		
Flooded /DX type shell and tube Chiller with accessories having entering /leaving conditions as 53 Deg. F/44 Deg F with maximum pressure drop of 18.4feet.		
Control panel incorporating all safety functions including HP & LP cutouts, single phase prevent or, internal control wiring, contactors for sensing flow through leaving chilled water control, compressor & expansion valve modulation with automatic capacity /load limiting devices.		
Inter connected refrigerant piping with safety controls viz. Liquid line solenoid valves, HP/LP cutouts.		
Full charge of refrigerant R-134a and Oil.		
The machine should be complete with factory wired, machine mounted control panel and star delta starter with necessary interlocking & safeties as per specifications. Unit mounted starter panel comprising of disconnect switches, star-delta starters, 3 phase current Transformers and other essential compressor motor protecting devices.		
Unit mounted Micro Processor panel having menu driven digital display including operating data points for chilled water set point, leaving chilled water & condenser air temperatures, refrigerant pressures at condenser & chillers, Heat control status, system operating schedule and current consumption data, remote operation ports etc.		
Supply, Installation, Testing, commissioning and handing over of End Suction Top discharge Horizontal Split casing Pump of capacity 250 USGPM at 40 Meters Head fitted with suitable Motor for chilled water base plate.	Nos.	4
<b>Make : Kirloskar</b>		
Supply, Installation, Testing , commissioning of primary & secondary chilled water pumps ( 2 each) capable of deliver of 155 GPM at 14 M head for server room A/C system. (Make Kirloskar)	Nos.	4

18000 LTr capacity buffer chilled water tank made of 6 MM thick MS plate, covered with 75mm thick EPS sheet of 24 Kg/M3 density and 4 1/2 " brick covering and sand cement plastering with suitable foundation for the tank.	Nos.	1
<b>Specification of AHU</b>		
Fan section with centrifugal fan outlet velocity not more than 550MPM, Cooling coil section with six rows deep chilled water cooling coil (15mm / 12mm) having 4-6 FPCM rated for 150 MPM velocity. Filter section with synthetic fiber filters in corrugated shape rated for filter face velocity 150 MPM, mixing box, TEFC induction motor (inside AHU casing), belt drive package, limit switch, marine light, vibration eliminators, air vent, neoprene pads as per specifications		
The Air handling unit has extruded aluminium framework having plasticised G.I. panels having injected 25mm PVF of 38 Kg/Cum density in between. The drain pan shall be of 16G aluminium in two layers having nitrile foam insulation in between. The frame for fan section shall be extruded aluminium. Make Zeco.		
AHU - 24000 cfm, 50mm static pressure, 6 row coil	Nos	4
AHU - 18000 cfm, 50mm static pressure, 6 row coil.	Nos	2
AHU - 14000 cfm, 50mm static pressure, 6 row coil	Nos	3
Ceiling suspended front Discharge Double skin Air Handling unit comprising of :		
Fan section with centrifugal fan outlet velocity not more than 550MPM, Cooling coil section with six rows deep chilled water cooling coil (15mm / 12mm) having 4-6 FPCM rated for 150 MPM velocity. Filter section with synthetic fiber filters in corrugated shape rated for filter face velocity 150 MPM, mixing box, TEFC induction motor (inside AHU casing), belt drive package, limit switch, marine light, vibration eliminators, air vent, neoprene pads as per specifications		

The Air handling unit has extruded aluminium framework having plasticised G.I. panels having injected 25mm PVF of 38 Kg/Cum density in between. The drain pan shall be of 16G aluminium in two layers having nitrile foam insulation in between. The frame for fan section shall be extruded aluminium.		
AHU - 4000 cfm, 50mm static pressure, 6 row coil.	Nos	3
Floor mounted top/ bottom Discharge Double skin Air Handling units comprising of :		
Fan section with centrifugal fan outlet velocity not more than 550MPM, Cooling coil section with six rows deep chilled water cooling coil (15mm / 12mm) having 4-6 FPCM rated for 150 MPM velocity. Filter section with <b>synthetic fiber filters &amp; microvee filters</b> in corrugated shape rated for filter face velocity 150 MPM, mixing box, TEFC induction motor (inside AHU casing), belt drive package, limit switch, marine light, vibration eliminators, air vent, neoprene pads as per specifications		
The Air handling unit has extruded aluminium framework having plasticised G.I. panels having injected 25mm PUF of 38 Kg/Cum density in between. The drain pan shall be of 16G aluminium in two layers having nitrile foam insulation in between. The frame for fan section shall be extruded aluminium.		
AHU - 32000 cfm, 75mm static pressure, 6 row D.coil	Nos	2
Supply, Installation, Testing & commissioning of Humidification package comprising of 6KW heaters, stainless steel ( 3mm thick) fabricated tank sockets for cold water inlet of 1/2" dia, outlet, overflow and drain connections complete with isolating Brass gate valves, heating elements, thermostat, humidity sensor, flat valve, low water level cut-off, sight glass, rotary switch complete with electrical wiring with terminal box and 50 mm thick fiber glass insulation and aluminum cladding. The humidity control shall be means of a humidity sensor.	Nos.	2
Supply, installation, testing and commissioning of plenum mounted strip heaters in 3 banks of 15KV capacity complete with thermostat, humidistats, sensors & safety Auto over temperature tripping arrangements. Complete with controls & interlocking with AHU fan, heating thermostat for temperature control Air flow switch for switching off heaters in case of no air flow, Gyser stat, terminal electrical distribution board, glass insulated flexible wires for connection of heaters, fire rated fillings at duct crossing etc. as required.	Set	2

10mm dia. Automatic air vent in brass construction complete with nipples, union etc. as required at all high points in the pipe lines. The valve shall be such as to have non-return valve as integral part of the vent.	Nos	22
Pressure gauges	Nos	48
Thermometers	Nos	32
Water flow switch	Nos	5
80mm 3 way mixing valve with actuator and temp. controller with remote sensor all complete (make Siemens)	Nos.	2
65mm 3 way mixing valve with actuator and temp. controller with remote sensor all complete (make Siemens)	Nos.	4
50mm 3 way mixing valve with actuator and temp. controller with remote sensor all complete.(make Siemens)	Nos.	5
40mm 3 way mixing valve with actuator and temp. controller with remote sensor all complete. (make Siemens )	No.	3
<b>HVAC ELECTRICALS</b>		
Plant room MCC #1 ( feeder from existing 1600amp MCCB)		
Incomer : 1250A TPN ACB, MDO having SC release and thermal over load element inbuilt with setting range between 40-100% -1 No.	Nos.	1
Busbar : 2000A TPN Aluminum Busbar -1 Set		
<b>Out Goings :</b>		
MCCB AC 3 phase 3 pole 415 volts 400 Amps 25KA- 4Nos. For 90 Ton Chiller		
63AMP MPCB TPN -4Nos.with star delta starter for Chilled Water Pump		
63AMP MPCB TPN 10KA - 1No.UPS room		
63AMP MCB TPN 10KA -1No. for spare		
32AMP MCB TPN 10KA -1No. for spare		
0-500 V digital voltmeter with selector switch.		
0-1500 A digital ammeter of size 96 x 96 mm and selector switch with CT ratio. 1000A /5A, class 1 accuracy and 15A burden.		
LED type phase indication lamps with individual fuse and control with toggle switch -1Set.		
Auxiliary terminations to terminal block with 20% spare capacity.		
Make Switch gear-L& T/Siemens/ Marin Gerin / GE & Panel fabricator will have latest CPRI Test Certificate		

Plant room MCC #2 ( feeder from existing 400amp MCCB)		
Supply, installation, testing and commissioning of starter panels in the plant rooms constructed out of 2mm thick CRCA sheet duly powder coated as per specifications. The panel shall have hinged door with on-off interlocks. The panel shall be complete with MCCB AC 3 phase 4 pole 415 volts 400amps 25KA-1Nos. for 90Ton chiller	Nos.	1
Plant room MCC #3 ( feeder from existing 250amp MCCB)		
Incomer : 250A TPN MCCB having SC release and thermal over load element inbuilt with setting range between 40-100% -1 No.	Nos.	1
Busbar : 350A TPN Aluminum Busbar -1 Set		
<b>Out Goings :</b>		
32AMP MCB TPN -4Nos.with Dol starter & Amp meter for Pumps.		
63AMP MCB TPN 10KA -1No. for spare		
32AMP MCB TPN 10KA -1No. for spare		
0-500 V digital voltmeter with selector switch.		
0-500 A digital ammeter of size 96 x 96 mm and selector switch with CT ratio. 1000A /5A, class 1 accuracy and 15A burden.		
LED type phase indication lamps with individual fuse and control with toggle switch -1Set.		
Auxiliary terminations to terminal block with 20% spare capacity.		
<b>Starter panels in the AHU rooms</b> constructed out of 2mm thick CRCA sheet duly powder coated as per specifications. The panel shall have hinged door with on-off interlocks. The panel shall be complete with incoming SFU / MCB, suitable bus bars of aluminium construction, bus links complete with 2 sets of star delta / DOL starters for UPS room AHUs panel shall be complete with starter for motor, timer, Auto Manual switch, earthing connector, indicating lights for incommer and outgoing, start/stop push button for each motor, ammeter, voltmeter etc. as required complete as per specifications.	Nos.	2
<b>CONTROLLERS:</b>		
Digital HVAC controller (imported) to carry out required control and management functions as per the data sheet attached. Including lockable mounting cabinets duly powder coated with connector terminals and internal wiring and switching relays at I/O ports without display unit. ( Make Siemens )		
AHU Controllers as per data point summary.	Nos.	1
Central Communication Unit for data gathering and PC connectivity with necessary software.	Nos.	1

Detachable Display Unit for both the controllers above	Nos.	1
Siemens Duct temperature & RH sensor with 0-10 V signal output to DDC Controller with high accuracy.	Nos	2
Siemens Room temperature & RH sensor with 0-10 V signal output to DDC Controller with high accuracy.	Nos	3
Siemens Differential Pressure switch for filter status	Nos	2

- UPS Distribution and sub distribution
- 33 KV substation ( HT Panel, 33 KV/433 volts OLTC transformer
- LT Panel
- Capacitor panel
- DG Sync Panel with PLC
- LT Cabling , Cable trays etc.
- Over head bus ducting
- Chemical Earthing
- **2x1500 KVA silent DG set**
- **Air cooled chilled water plant of capacity 90 TR**
- End suction pumps capacity 250 USG PM
- Mono block water pump
- Chilled water insulated tank capacity 1800 ltr.
- AHU of different capacity
- Insulated GI duct
- Electrical Panel &LT cables
- Control & sensors
- Fire suppression system with FM-200 Gas flooding system

33 kV TRANSFORMER PANEL	No.	1	Sciemen
33 KVA Transformer	No.	1	Kiloskar
Main LT Panel	No.	1	Adlec
Syncro Panel	No.	1	Adlec
Capacitor Panel	No.	3	Adlec
1500 KVA Silent DG Set	No.	2	Jakson
LT Cable	Lot	1	Nicco
Control Cables	Lot	1	Nicco

### Schedule I (format of Price Bid)

SI No	Description	Qty	Amount/month (inclusive of all taxes)
1	Electrical and Mechanical Operation & Maintenance	1	
2.	HVAC Operation & Maintenance	1	
3.	Closed Loop Chiller Operation & Maintenance	1	
4.	Civil work including plumbing work	1	