

Scope of Work

Name of Work: Supply, Installation, Commissioning of CONTINUOUS AMBIENT AIR QUALITY MONITORING STATION (CAAQMS) with Comprehensive Annual Maintenance Contract for 03 years after warranty.

SCOPE OF WORK:

1.0 Intent

The scope includes Engineering, Supply, Erection, Commissioning & testing works for Continuous Ambient air quality monitoring station (CAAQMS) at Kerandari Coal Mining Project, shall be on the basis of single point responsibility, completely covering the following activities and services in respect of all the equipment & works specified and covered under the specifications and read in conjunction with "Scope of Supply & services" elaborated elsewhere.

2.0 BASIC DESIGN CRITERIA

General Requirements

- a) Contractor should note that he has to supply system complete in all respects with all software, hardware, accessories, interfacing equipment required, etc., whether specifically stated herein or not, to make the system operational and fully meeting the functional, parametric, hardware, software, interfacing, quality assurance & testing requirements within the quoted price.
- b) The Contractor shall provide all material, equipment and services so as to make a totally integrated Continuous Ambient air quality monitoring system together with all accessories, auxiliaries and associated equipment ensuring operability, maintainability and reliability. This work shall be consistent with modern CAAQMS practices and shall be in compliance with all applicable codes, standards, guides, statutory regulations and safety requirements in force.
- c) Further Bidder shall also include in his proposal and shall furnish all equipment devices and services, which may not be specifically stated in the specification but are needed for completeness of the equipment/systems furnished by the Bidder and for meeting the intent and requirements of the specification.
- d) Bidder shall include in his bid a detailed Bill of Material (BOM) for each of the systems.
- e) In addition to requirements specified under Basic Design Criteria, all CAAQMS systems/subsystems/ equipment/ devices shall also meet other requirements stipulated under other Sub- sections/ parts/ sections of specification.

Reliability and Availability

Each component and system offered by the Bidder shall be of established reliability. The minimum target reliability of each piece of equipment like each electronic module/card, Power supply, Peripheral etc. shall be established by the Bidder, considering its failure rate/mean time between

failures (MTBF), meantime to repair (MTTR), such that the availability of the complete CAAQMS system is assured.

Operability & Maintainability

The equipment shall employ latest state of the art technology to guard against obsolescence. In any case, Bidder shall be required to ensure supply of spare parts for lifetime of the plant / (10 Years). In case, the Bidder feels that certain equipment/component is likely to become obsolete, the Bidder shall clearly bring out the same in his Bid and indicate steps proposed to deal with such obsolescence. ***In case the bidder is the authorized representative of the OEM, OEM shall provide declaration on OEM letterhead providing necessary spares and consumables for at least 10 years of operation from the date of commissioning at prevailing market rates in case bidder is unable to provide the same.***

General Information

The Contractor is advised to visit the site in order to acquaint himself with all the necessary information such as existing system, transportation facilities, etc. for the proper execution of the work. Ignorance of the site conditions will not be accepted as a basis of claim for any compensation whatsoever.

Grounding System

Bidder shall provide necessary grounding arrangement for offered system. Agency has to provide electronic & electrical earth pit as per system requirements.

3.0 Scope of Work & Basic Engineering of The Systems:

Supply, Installation, commissioning & Testing of Continuous Ambient air quality monitoring station (CAAQMS) as per specifications for CAAQMS issued by Central Pollution Control Board expect for NH₃, O₃ & BTX analyzer. "TECHNICAL SPECIFICATIONS FOR CONTINUOUS AMBIENT AIR QUALITY MONITORING (CAAQM) STATION (REAL TIME) with 03 years on-site warranty enclosed at Annexure. At least one manpower must be available at CAAQMS site during erection, commissioning.

4.0 NTPC's scope:

Following will be provided by NTPC. All other requirement that arises for fulfillment of the contract has to be arranged/supplied by the agency.

a) Land will be provided by NTPC to the Agency for CAAQMS installation at Kerandari Coal Mining Project. Civil works required for foundation preparation for placing of CAAQMS & electrical work including Earth pit (for CAAQM stations as well as Data Display Boards) shall be provided by the NTPC based on design provided by the bidder.

b) Electrical Power Supply at site shall be provided by NTPC up to CAAQMS station on single point.

c) Internet connectivity for data transfer through DAS system will be provided by NTPC. However, the DAS system shall be provided with firewall (hardware) and proper configuration by agency along with block diagram.

5.0 Technical Requirements of CAAQMS:

- ✓ "Technical Specifications for Continuous Ambient Air Quality Monitoring (CAAQM) Station (Real Time) for measuring SPM, RSPM, SO_x, NO_x, & CO etc. in ambient Air for NTPC Kerandari Coal Mine at Hazaribagh District, Jharkhand as per CAAQMS specifications attached which is line with CPCB specifications expect for **NH₃ Analyser, Ozone Analyser & Ambient BTX Analyser** which are not required.
- ✓ All analyzers must be USEPA approved and TUV QAL1 certified.

6.0 Tools & Tackles

The Contractor shall furnish a complete new set of all special tools and tackles of reputed make and model which are required for erection, ease in maintenance to have minimum down time, testing and calibration of all the equipment and systems to be provided by the Contractor under this specification for CAAQMS system.

7.0 Warranty of Supplied System:

The contractor has to provide on-site guarantee / warrantee for CAAQMS w.e.f. 36 months from the date of commissioning or 42 Months from Delivery to NTPC whichever is earlier. Any replacement during warranty period will be borne by vendor including manpower cost.

90% system availability is to be maintained during warranty period. During the warranty period for the CAAQMS system, the contractor shall carry out the following: -

- I. Periodic Maintenance every three months during warranty period.
- II. Attending to the problems on complaint basis.
- III. In the event of any malfunction of the analyzer system hardware/software, experienced expert service engineer shall be made available at site within 72 hours on the receipt of such information from NTPC (through any electronic media i.e. email / phone).
- IV. Free Repair/replacement for all defective items / spares to be carried out during this period.
- V. Replacement of all Consumables (as a minimum the following Items like calibration gas, roll, lamps / LEDs / fuses / filters etc. shall be included in scope) during warranty period.
- VI. Calibration as per required frequency or as mandated in guidelines of Pollution Control Boards.
- VII. Stock of consumables/parts may be maintained by agency at site or any location near to site for catering timely to defects, repairs etc.

8.0 Period of Contract:

Contract period for Supply, Installation, Commissioning will be 04 months from date of award. Party shall complete the all activities of (Supply, Installation, Commissioning) and make the system operational in all respect within the contract period.

9.0 System Testing /Commissioning

- i. The complete System shall be tested so that each of the above-mentioned functions are demonstrated to the satisfaction of the Engineer I/C. The Contractor shall make all equipment, instruments, tools and labour required to conduct the system tests available.
- ii. The contractor shall guarantee the entire system against mechanical and electrical defects for a period as described in the Conditions of Contract.

10.0 Training:

Contractor shall provide training on analyzers, data logger software and communication system for Employee personnel. The contractor scope of services shall also include imparting training as follows for required number of employees at site / or at manufacturer / supplier works, on the installed system for duration sufficient to cover all the items specified:

1. Training to maintenance engineer
2. Training to operation engineer

11.0 Special Term and Condition

- a) Contractor should note that he has to supply system complete in all respects with all software, hardware, accessories, interfacing equipment required, etc., whether specifically stated herein or not, to make the system operational and fully meeting the functional, parametric, hardware, software, interfacing, quality assurance & testing requirements within the quoted price.
- b) Installation and commissioning of CAAQMS system: The vendor shall be fully responsible for storage, unpacking, inspection, insurance, security, installation and commissioning of the supplied equipment as per the BOQ. All tools, tackles, testing instruments, miscellaneous items of consumable nature which are required for the above jobs shall be provided by bidder at no extra cost to NTPC.
- c) Safety clause: The contractor shall ensure compliance of all safety regulations related with erection, equipment handling and maintenance jobs. Any liability arising due to non-adherence of safety regulations will be the sole responsibility of the contractor.
- d) Party shall submit the dully filled & signed copy of technical data sheet with supporting product catalogue with highlighted model No./ Part No
- e) Party shall submit the Detail BOQ along with make and model number.
- f) Liquidated Damages: If the contractor does not complete the supply, erection and commissioning work within the stipulated period of erection and commissioning, the LD will be deducted @0.5% of total supply and erection commissioning value per week subject to maximum of 5% of the total supply & erection commissioning value.
- g) Party shall submit the configuration block diagram of offered system, indicating all major equipment / instrument in system.

- h) Offered models of all instruments shall be field proven. Performance guarantee certificate to be provided.
- i) Agency has provide firewall (Hardware Device) with updated and latest firmware's on the DAS system for secure connection and transfer to data with NTPC network. Also the end devices must have Updated OS and updated Antivirus. Agency should also provide block diagram showing the arrangement of firewall in DAS system and its interface with NTPC network.
- j) Agency has to follow all latest or revised guidelines & specification of SPCB & CPCB. Till BOD if CAAQMS, instruments, specification modifies; then same will be provided by agency; without any cost implication to NTPC.
- k) Agency has to co-ordinate with SPCB & CPCB for site visit by SPCB & CPCB persons, documents, certification, miscellaneous work if required.
- l) Bidder shall provide design and drawing of foundation required for housing of Container like, RCC foundation detail, pillars miscellaneous works including Caging and electrical work including Earth pit (for CAAQM stations as well as Data Display Boards).
- m) Bidders are requested to carefully examine and understand the specifications and seek clarifications, if required, to ensure that they have understood the specifications. Bidder's offer should not carry any sections like clarifications, interpretations and/or assumptions. However, if the bidder feels that, in his opinion, certain features brought out in his offer are superior to what has been specified, these may be highlighted and recommendation/approval of CPCB/SPCB must be attached with the offer.
- n) Evaluation criterion: The tender shall be evaluated on composite basis for entire scope of work including material supply, installation, commissioning, warranty period and CMC.

12.0 Payment Terms:

- 90% of the amount quoted/agreed for Supply, Installation & Commissioning of CAAQMS shall be paid within 30 days from the date of receipt and acceptance of the material at site or within 30 days from the date of receipt of supplier's Tax Invoice whichever is later.
- Balance 10% of the amount quoted/agreed for Supply, Installation & Commissioning of CAAQMS within 30 days from date of satisfactory commissioning and receipt of Performance Bank Guarantee (PBG). If commissioning got delayed and reason not attributed to vendor, then balance 10 % to be release after 120 days of delivery against submission of PBG.
- Contract Performance Guarantee

Bidder shall be required to furnish the Contract Performance Guarantee (CPG) for an amount equal to 10% of total quoted amount/ order value. CPG should be valid for a period

of three months (3 months) beyond CAMC period i.e. three years after warranty period. The Contract Performance Guarantee shall be reduced prorata every year on successful completion of year wise CAMC under the Contract.

13.0 NTPC General Conditions of Contract will be integral part of this contract.

14.0 Comprehensive Annual Maintenance contract:

Comprehensive annual maintenance contract for CAAQMS complete with breakdown & scheduled maintenance service support, monthly/quarterly schedule visit of engineer/technician at site during CAMC period of three years excluding warranty period. i.e for a period of **3 years after completion of Warranty Period.**

The terms and conditions for comprehensive annual maintenance contract are as below

- a) The work of CAMC for offered equipment shall be executed by the successful bidder, however the successful bidder and OEM shall be solely responsible for the satisfactory execution of the work of comprehensive Annual Maintenance contract. The successful bidder shall be fully responsible for preventive & schedule maintenance, breakdown & other repair services of offered CAAQMS on comprehensive basis in accordance with OEM recommendations in proper and professional manner.
- b) The successful bidder shall provide the schedule monthly/quarterly visit of service engineer/technician at site during the entire CAMC period and he must visit the mine site as & when required during the CAMC period.
- c) The successful bidder shall all the defective/worn-out/consumable spare parts are to be replaced free of cost as & when required during the CAMC period of three years.

Other terms and conditions:

- a) The successful bidder shall ensure and maintain insurance policy against his liability for accident or injury of their service engineer. Insurance policy shall also indemnify NTPC against any claim raised by the injured/affected workmen or his family, if any
- b) The payment for CAMC will be made on quarterly basis after successful completion of every 3 months period.

H) Instructions for quoting of Price by Bidder:

1. The Bidder is required to quote Total Lumpsum Bid Price (Including GST) in the "Offer Price" Tab at GeM website (<https://gem.gov.in/>) considering all the sub-BOQ items detailed at para 3 below.
2. Apart from GEM PO, NTPC shall also issue SAP PO for facilitating the payment. Further, item wise price breakup of the final quoted/negotiated price (including GST) shall be done as per the Table furnished below.
3. It may be noted that in SAP PO, NTPC shall provide the Basic Price and applicable GST of each sub-BOQ item separately.

S.N.	Item Description	Quantity	Unit of Measurement	Item wise Price Break up of Lumpsum Quoted Amount (in %)
(a)	(b)	(c)	(d)	(e)
10.10	Supply, Installation & Commissioning of CAAQMS	2	NO	91.42%
10.20	CAMC for 1st year	2	LPS	2.74%
10.30	CAMC for 2nd year	2	LPS	2.84%
10.40	CAMC for 3rd year	2	LPS	2.99%