

PROJECT: 3 x 800 MW PVUNL PATRATU TPP PHASE-1

AMBIENT AIR QUALITY MONITORING SYSTEMS (AAQMS) - MAIN PACKAGE

Ambient Air Quality Monitoring System		
S.No.	Scope of Supply	Qty.
1.	SO2 Analyser	04 No.
2.	NOX Analyser	04 No.
3.	CO Analyser	04 No.
4.	Mercury Analyser	01 No.
5.	Ozone Analyser	04 No.
6.	a. Suspended Particulate Monitors b. Sampling Inlet Heads (PM 10, PM 2.5 & TSP – 04 Each)	08 No. 12 No.
7.	Multi gas Calibration system	4 sets
8.	PC based Data logger for individual stations	4 sets
9.	UPS for analyzers & DAS	4 sets
10.	PC Based Data Logger for Central Station With A4 Laser Printer Along With UPS	1 set
11.	Meteorological Monitoring System a) Wind speed sensor; b) Wind direction sensor; c) Air temp. sensor; d) Relative Humidity sensor; e) Solar radiation sensor; f) Rain gauge g) Meteorological Mast	1 set
12.	Sample Handling System Including Compressed Air For Purging	4 sets
13.	RF Connectivity between AAQMS Stations	1 Lot
14.	Window A/C for AAQMS Stations (1.5 Tons Each)	8 nos.
15.	AAQMS Shelter with Accessories (3m x 3m x 2.5m)	4 sets
16.	Consumables & Spares for 2 year operation after commissioning	1 set
17.	Installation & Commissioning*	1 set
18.	Any Additional items required for “Installation”, “Commissioning” and “Operation of 04 AAQMS” which in not covered from S.N. 1 to 17	1 set

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19.	Annual Maintenance Contract after completion of warranty period post commissioning	
A	1st Year	1 Set
B	2nd Year	1 Set
C	3rd Year	1 Set

*Only one-point power supply would be made available near to AAQMS Locations by End User. All other items/works e.g. shifting of material at AAQMS locations from site stores, installation, commissioning, Handing Over to end user etc. would be in bidder's scope.

AMBIENT AIR QUALITY MONITORING STATION (AAQMS)

1.0 General Specifications for AAQMS

The Analysers / Monitors would be 19" Rack Mounted with the ON / OFF switch and display of all important status signals including Lamps, etc. would be preferably on the front panel.

The system must function properly in the weather and atmospheric conditions, in view of ambient temperature, relative humidity and high dust levels for instruments / equipment housed in an enclosure.

ENVIRONMENTAL CONDITIONS

Instruments, devices and equipment for location in outdoors/indoor/air-conditioned areas will be designed to suit the environmental conditions indicated below and will be suitable for continuous operation in the operating environment of a coal fired utility station and also during periods of air conditioning failure without any loss of function, or departure from the specification requirements covered under this specification.

Ambient Temp. (outside cabinets)	Pressure	Relative humidity	Atmosphere	Required protection Class of panels/cabinets / desks to be provided by bidder
Outdoor Location				
55° C max.	Atmosphere	100 % Max.	Air (dirty)	IP 55
4° C min.	Atmosphere	5 % Min.	Air (dirty)	IP 55
Indoor Location				
55° C max.	Atmosphere	95 % Max.	Air	IP 54**
4° C min.	Atmosphere	5 % Min.	Air	IP 54**
Air Conditioned Areas				
24° (+/- 5°) C Normal	Atmosphere	95 % Max.	Air	IP 22***
50° C max.*	Atmosphere	5 % Min.	Air	IP 22***

* During air conditioning failure.

**For non-ventilated enclosures. For ventilated enclosures, protection class will be IP 42.

***With a suitable canopy at the top to prevent ingress of dripping water.

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The system would function without frequent servicing / maintenance. The parts requiring regular service / maintenance must be easily accessible.

All ambient Gas Analysers and Dust Monitor will conform to the US EPA reference or equivalent method. A proof of approvals and certificates of the above compliance along with copy of the Test Report (in English) from internationally reputed agencies such as US EPA, TUV / UAB of Germany, Env't Canada, Env't. Japan, EEC etc. will be furnished.

All Analysers will be micro-processor controlled with automatic calibration. All Analysers, Monitors and Sensors would be fully integrated in the 19" Rack Cabinet, fully calibrated and tested before supply.

The vendor will provide warranty for the entire system as defined in the documents.

Vendor will give complete list of spares, consumables etc. required for trouble-free operation.

The system will be supplied with all ancillaries and consumables necessary for trouble free operation during the Warranty period. In case self-life of any consumable is shorter, such supplies to be done in suitable phases. Vendor will give details of self-life, quantity of consumables required etc. to last the warranty period.

O&M Manuals will be supplied indicating details of installation, operation and calibration; preventive, routine & corrective maintenance.

A Sampling System compatible with the Analysers / Monitors for Total Suspended Particulates (TSP), PM10, PM2.5, NO_x, SO_x, CO, Mercury and Ozone will be provided by the vendor. The system, wherever applicable, will also be compatible with Analysers for Pb (which the End user may procure in future). The system, wherever applicable, will have the facility for moisture removal.

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Minimum requirements like power supply, space & approach road required for installation and commissioning of the AAQMS will be specified by the vendor in the offer. Vendor will obtain statutory and other clearances for purchase, commissioning and operation & maintenance of the AAQMS.

Vendor will furnish, along with the bid documents, the details of calibration system provided with each Analyser / Monitor.

In addition to connection with respective local data logger and central data logger as defined in subsequent clauses, AAQMS analysers will have provision for bidirectional connectivity with NTPC central cloud server as defined in specifications.

1.1 SPECIFICATIONS OF CONTINUOUS MONITORING AMBIENT AIR ANALYSERS**1.1.1 Oxides of Nitrogen (NO-NO2-NOX) Analyser**

1.	Principle	Chemi-luminescence
2.	Measurement	NO, NO ₂ , NO _x in Ambient Air
3.	Display	LCD
4.	Ranges	0-1000 PPB in multi-ranges (minimum four selectable ranges) Preferably as below: 0-100 PPB, 0-200 PPB, 0-500 PPB and 0-1000PPB
5.	Minimum Detectable Limit	1 PPB
6.	Noise Level	0.5 PPB or less
7.	Zero Drift at Lowest Range	<1PPB in 24 hours
8.	Span Drift at Lowest Range	+ 2% in 7 days of full scale
9.	Response Time at Lowest Range	2 minutes or less
10.	Linearity	+ 1% of full scale
11.	Calibration	Built-in Calibration Facility
12.	Consumables and spares	Recommended requirements of 3 years of continuous operation
13.	Digital Signal Transmission	RS 232 link. Analyser will be capable to transfer all the data through RS 232 link to a PC based data logger.

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1.1.2 Sulphur Dioxide (SO₂) Analyser

1.	Principle	UV Fluorescence
2.	Measurement	Sulphur Dioxide in Ambient Air
3.	Display	LCD
4.	Ranges	0-1000 PPB in multi-ranges (minimum four selectable ranges) Preferably as below: 0-100 PPB, 0-200 PPB, 0-500 PPB and 0-1000PPB
5.	Minimum Detectable Limit	1 PPB
6.	Noise Level	0.5 PPB or less
7.	Zero Drift at Lowest Range	<1 PPB in 24 hours with automatic zero Compensation.
8.	Span Drift at Lowest Range	+ 2% in 7 days of full scale
9.	Response Time at Lowest Range	2 minutes or less
10.	Linearity	+ 1% of full scale
11.	Calibration	Built-in Calibration Facility
12.	Consumables and spares	Recommended requirements of 3 years of continuous operation
13.	Digital Signal Transmission	RS 232 link. Analyser will be capable to transfer all the data through RS 232 link to a PC based data logger.

1.1.3 Continuous ambient air measurement of TSP, PM 10 & PM 2.5

1.	Principle	The suspended Particulate Matter (SPM) Monitor for monitoring ambient air will be based on the principle of beta attenuation by particulates sampled through the instrument and collected on movable filter tape. Before and after sampling, beta radiation will be measured by appropriate counter. An internal microprocessor will handle all sequences and automatically calculate the concentration of the particulate matter being measured. Contractor will provide two nos. SPM analysers in each AAQMS station for continuous measurement of suspended particulate matter. Each analyser will be designed for measurement of TSP, PM 10 & PM 2.5 so that any analyzer can be freely configurable at site for either TSP, PM10 & PM 2.5. These analysers will be provided with sampling heads suitable for continuous measuring of TSP and PM10.
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		Additional sampling arrangement for PM 2.5 will also be provided and it will be possible to easily connect it to the Analyser normally measuring TSP.
2.	Measurement	Continuous ambient air measurement of TSP, PM10 & PM 2.5.
3.	Sampling System	System for sampling of particulates of following Sizes (i) Total Suspended Particulates (TSP) (ii) 10 microns or less. (iii) 2.5 microns or less. The system will have provision for removal of moisture from the sample, wherever applicable.
4.	Measurement Range	0-2000 microgram per cubic meter (microgram/m ³) in programmable multi-ranges
5.	Display	LCD
6.	Resolution	1% of the concentration
7.	Minimum Detectable Limit	2 micrograms/m ³
8.	Filter material	glass fiber filter
9.	Roll length	Approximately 30 meters
10.	Measurement result	1 hour average of or shorter
11.	Digital Signal Transmission	RS 232 link. Analyser will be capable to transfer all the data through RS 232 link to a PC based data logger.

1.1.4 Multi-Gas Calibration System

To cross check the built-in-calibration facility of the Analysers/Monitors, a standard Multi-Gas Calibration System for each AAQMS station with fast response time will be offered by the Vendor for SO₂ and NO_x (Vendor to give complete details) which can be used as manual or remote multi-point generation of gas concentrations from one to several high concentration Span Gas Cylinders. The Multi-Gas Calibration System will meet the USEPA or TUV/UAB of Germany, Env't Canada, Env't Japan, EEC etc. requirements.

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1.1.5 Mercury Analyser

1.	Principle	Atomic Absorption/Atomic Fluorescence
2.	Measurement	Elemental Mercury in ambient air
3.	Display	LCD
4.	Ranges	0.5-2000ng/m ³ / 5-10000 ng/m ³ (selectable)
5.	Calibration	Built-in calibration facility
6.	Digital Signal Transmission	RS 232 link. Analyser will be capable to transfer all the data through RS 232 link to a PC based data logger.
7.	Accessories	To be provided

1.1.6 Ozone Analyser

1.	Principle	UV Photometric / Chemiluminescence
2.	Measurement	O ₃
3.	Display	LCD
4.	Ranges	0-100 ppb to 0-10 ppm.
5.	Minimum Detectable Limit	0.6 ppb (RMS)
6.	Zero Drift	< 1.0 ppb
7.	Span Drift	±1% of measured value /week
8.	Response time (upto 95% of full scale)	20 Seconds.
9.	Linearity	± 1% of full scale
10.	Calibration	Built-in Calibration Facility
11.	Consumables and spares	Recommended requirements of 3 years of continuous operation
12.	Digital Signal Transmission	RS 232 link. Analyser will be capable to transfer all the data through RS 232 link to a PC based data logger.
13.	Accessories	To be provided.

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1.1.7 Carbon Monoxide (CO) Analyser

1.	Principle	NDIR spectroscopy
2.	Measurement	CO
3.	Display	LCD
4.	Ranges	0-1 PPM to 0-100 PPM selectable.
5.	Minimum Detectable Limit	0.05 ppm
6.	Zero Drift at lowest range	< 0.1 ppm/day
7.	Span Drift at lowest range	< 1% of reading per day
8.	Response time at lowest range	<60 sec.
9.	Linearity	1% of full scale
10.	Precision	0.5% of reading
11.	Calibration	Built-in Calibration Facility
12.	Consumables and spares	Recommended requirements of 3 years continuous operation
13.	Digital Signal Transmission	RS 232 link. Analyser will be capable to transfer all the data through RS 232 link to a PC based data logger.

1.2.0 SPECIFICATIONS OF METEOROLOGICAL SENSORS

1.2.1 Specifications of Wind Speed Sensor

1.	Principle	Frequency proportional to wind speed
2.	Range	0-60 m/ sec
3.	Accuracy	2 % of full scale
4.	Threshold	0.3 m/ sec
5.	Operating Temperature	0 to 50 deg C

1.2.2 Specifications of Wind Direction Sensor

1.	Principle	Potentiometric type Sensor (Resistance proportional to Wind direction)
2.	Range	0-360 deg
3.	Accuracy	±3 degrees
4.	Operating Temperature	0 to 50 deg C

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1.2.3 Specifications of Air Temperature Sensor

1.	Principle	RTD (Platinum) Resistance proportional to temperature
2.	Range	0-50 deg C
3.	Accuracy	± 0.2 deg C
4.	Operating Temperature	0 to 50 deg C
5.	Radiation Shield	Non-aspirated Radiation Shield

1.2.4 Specifications of Relative Humidity (RH) Sensor

1.	Principle	Thin film capacitance type sensor
2.	Range	0-100% RH
3.	Accuracy	3 % for range 10% to 90%
4.	Sensitivity	0.2% RH
5.	Operating Temperature	0 to 50 deg C
6.	Radiation Shield	Non-aspirated Radiation Shield

1.2.5 Specifications of Solar Radiation Sensor (Solarimeter)

1.	Principle	Thermopile/Thermo couple based with appropriate Wind Shield
2.	Range	0.3 to 60 microns
3.	Measurement Range	0-1500 watt/m ²
4.	Accuracy	± 3.5 %
5.	Operating Temperature	0 to 50 deg C

1.2.6 Specifications of Rain Gauge

Rain Gauge will be of Self Recording Type and of reputed make & recording facility will be provided in Electronics. The Gauge will be rugged having material of construction resistant to atmospheric corrosion. The Instrument will have automatic functions for computing rainfall for pre-set time periods.

1.	Accuracy	± 1% to ± 5% for rainfall rates Ranging from the lowest to 125 mm/hr or more
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2.	Sensitivity	0.5 mm
3.	Operating Temperature	0 to 50 deg C

1.2.7 Meteorological Mast

One Meteorological Mast of telescopic type and 10 m height to be placed adjacent to AAQMS so that height of the Meteorological Sensors from the Ground Level (GL) is 10 meters. The Mast is required for mounting the Meteorological Sensors. Necessary Hangers and Holders along with electrical Grounding Set will be provided by the vendor for installation of the Sensors. Material of Construction of the Mast will be metallic and robust and will be resistant to atmospheric corrosion.

1.3.0 DATA LOGGER AT AAQMS & METEOROLOGICAL STATION

- a) There will be one PC based Data Logger for each AAQMS and Meteorological Station. The entire data capture and mean value calculation as well as control of Analyzers would be through user-friendly software and operate on the latest Windows software system. Connection of Analyzers with serial Interface would be done through standard Connectors. Diagnostic features would be clearly indicated by the system and any unauthorized access would be protected by a pass word. PPB to micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) conversion factors would be part of the system.
- b) The Data Logger will be provided with at least 8 Analog and 24 Digital Inputs and internal memory for all collected parameters. The Data Logger will have ability to log Channels at different intervals and would have capability of averaging and displaying real time data and averaged data over selectable periods (minutes, hours, days, months and years) such as 1 min, 10 min, ½ hr, 1 hr., 4 hrs., 8hrs., 24 hrs., 1 month, 3 months, 6 months, year etc. It will have adequate capability of connecting to all Analysers/ Monitors including the optional Analysers and Sensors for meteorological parameters.

PROJECT: 3 x 800 MW PVUNL PATRATU TPP PHASE-1**1.3.1 Functional Requirements of Data Logger**

1. Calculate vector mean of wind direction and wind speed
2. Graphic & tabular display of the current air quality monitoring data.
3. Generation of Wind Roses, Pollution Roses etc.
4. Data reports, calibration reports and status reports for user selectable time period (instantaneous or averaged over a period of ½ hr, 1 hr, 4 hrs, 8 hrs, 24 hrs, weekly, monthly or yearly).
5. Control panel window for controls of each Analyser, including calibration.
6. Alarm for all parameters.
7. Real time multi-curves/graphs over user selectable time period.
8. Historic multi-curves/graphs over user selectable time period.
9. Real time status and diagnostics for maintenance people.
10. Programmable down loading of data.
11. Diurnal variation, standard deviation, regression and other statistical parameter reporting possibilities with various available models.
12. Possibility to export the data files in other formats.

Data Representation of AAQM Station:

Data logger with driver software should be provided with PC based data acquisition system suitable for storing, logging, reporting and printing data from the analysers.

PC should have Minimum configuration as mentioned below: -

- Intel i7 or higher
- RAM: 8 GB or higher
- Hard Disk: 1 TB or higher
- OS: Windows 10 or Latest
- Monitor: 17" color monitor
- Keyboard: Standard Windows Keyboard
- Mouse: Mouse + Pad
- Software: Windows based data logging/driver software with a provision to averaging out data at selectable interval and graphical representation of data.
- A4 B&W Laser Jet printer

PROJECT: 3 x 800 MW PVUNL PATRATU TPP PHASE-1**1.4.0 Central Station for AAQMS**

There will be separate Data Logger for the Central Station having configuration similar to the individual AAQMS. Location of central station will be in one of the unit control room.

1.4.1 Data Communication System for The Central Station

Data Communication system will handle the data transmission of an ambient air quality network and receive incoming messages/ signals from remote Stations. The following additional features would be part of the system:

- 1.To collect all the data from the remote Stations at prescribed time or on request.
2. Manage at least 3 or more remote air quality-monitoring Stations.
3. Would have the remote control facilities for calibrations (Zero & Span) and Measuring Range.
4. Would display multiple Stations on-line data (momentary values) in tabular text and graphic format.
5. Would connect the remote stations through Wireless Communication link.

1.4.2 Additional features of the Data Logger at Central Station

- 1.Data Management, analysis and reporting
2. Latest Microsoft Windows operating System
3. Standard 32/64-bit application
4. Data collection from remote stations via Data communication Server
5. Inter-comparison of data between monitoring stations
6. Comparison of data of various parameters for the same monitoring station.
7. Integrates charts, tables and graphics.
8. Would support primary and secondary mean values of user defined time interval.
9. Would have data backup facilities
10. Would have the facilities for calculation of Arithmetic mean values, average ½ hr, 1hr, 2 hrs, 3 hrs, 4 hrs, 8 hrs, 12 hrs, 24 hrs, weekly monthly and yearly
11. Minimum, Median, percentile, Maximum, standard deviation frequency analysis and cumulative frequency analysis
12. Calculation of pollution load and Wind Roses

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13. Reports of daily, weekly, annual and user defined period
14. Reports of Pollution load and Wind Roses, frequency analysis, and calibration
15. Would have the facilities of the following chart types:
 - Line & column chart
 - Simple 3 D, line & column chart
 - Polar diagram and 3 D perspective column chart

Data Representation at Central Station:

Data logger with driver software should be provided with PC based data acquisition system suitable for storing, logging, reporting and printing data from analyzers.

PC should have Minimum configuration as mentioned below: -

- Intel i7 or higher
- RAM: 8 GB or higher
- Hard Disk: 1 TB or higher
- OS: Windows 10 or Latest
- Monitor: 17" color monitor
- Keyboard: Standard Windows Keyboard
- Mouse: Mouse + Pad
- Software: Windows based data logging/driver software with a provision to averaging out data at selectable interval and graphical representation of data.
- A4 B&W LJP

1.4.3 Data Communication System

Each AAQMS station will be connected to Central Data Acquisition station through a two way wireless communication link. This will allow for wireless transmission of data periodically to individual and central DAS & do the necessary communication between stations. Bidders will determine the optimal antenna type required to achieve data transfer rate between all wireless access points. Bidder will use for this purpose, approved and standard equipment like antennas and/or amplification devices etc. required to achieve the above and will provide agreement of technical support and support availability.

AAQMS instruments will be provided with provision for bidirectional connectivity over ModBus/RS-232/RS-485 with NTPC central cloud server for real time data monitoring,

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remote diagnostics & remote calibration checks, etc., complying with CPCB IT Division document or the latest regulatory requirement related to AAQMS data connectivity prevailing at the time of execution of the contract. All necessary hardware and software required at instrument end shall be provided by the bidder. Necessary details like scheme, register addresses of analyzer, etc. will also be provided by the bidder for implementation of above. The bidder will fully assist NTPC's agency involved in implementation of above connectivity.

Bidder will obtain necessary approval for Licenses authorizing the use of communication equipment specified frequencies.

In addition to above requirement, analysers shall be connected to respective local data logger and central data logger by the bidder as stipulated in other part of specification.

CDAS will further transmit the data to pollution control boards server. Necessary hardware for Internet connectivity at CDAS would be in bidder's scope. Recurring bills, if any, for Internet connectivity at CDAS for one-year post-commissioning is covered under scope. Data Acquisition System (DAS) would be equipped with wireless connectivity based on RF modems. Vendor shall obtain necessary approval for licenses authorizing the use of wireless communication equipment with specified frequencies.

1.5.0 MULTI-POINT GAS CALIBRATOR:

To cross check the built-in-calibration facility of the analysers/Monitors, a standard Multi-Gas calibration system for each AAQMS Station with fast response time shall be offered by the vendor for SO₂ and NO_x (Vendor to give complete details thereof) which can be used manual or remote multi-point generation of gas concentrations from one to several high concentration span gas cylinders. The multi gas calibration system shall meet the USEPA or TUV Germany, Enut Canada, Enut Japan, EEC etc. requirements.

PROJECT: 3 x 800 MW PVUNL PATRATU TPP PHASE-1**1.5.1 Specifications:**

Flow Measurement Accuracy: $\pm 2\%$ of reading or 1% of full scale, whichever is less
(20 to 100% FS)

Operating Temperature Range: 0 to 50 degree Celsius

Power Requirement: 230 VAC $\pm 10\%$

1.5.2 Sampling System: Gas Sampling system - Gas sampling system with tubes connection from gas manifold to analysers, moisture trap to remove moisture condensate and sampling hood made of SS.

1.5.3 Air compressor**1.5.4 Zero Air Generator**

1.5.5 Calibration Gas Cylinders: Calibration Gas cylinder for NO_x, SO₂ & CO of 10 lit. capacity, N₂ of 47 liter capacity with SS316 regulator.

1.6.0 AAQMS SHELTER

1.6.1 Cabin: Duly welded CRCA quality sheet metal is to be used for the manufacturing of the cabin. It comprises base frame, self -draining roof, peripheral structure, windows (as per requirement) and entry doors. All the eight corners of cabin to be completely strengthened to assist in lifting, transportation and placing.

- a) External dimensions: Approximate 3000 mm (L) X 3000 mm (W) X 2500 mm (H).
- b) Canopy: Metal canopy
- c) Thickness of outer and inner sheet of the cabin shall be minimum 2.0 mm and 2.0 mm respectively. One (01) no. of door in the cabin to be provided. Flooring of cabin shall be provided with Aluminum checkered sheet of minimum 4.0 mm. The cabin walls and roof shall be insulation suitably of minimum 100 mm thickness.

1.6.2 Accessories:

- a) Air conditioners window module type - 2 Nos., 1.5-ton capacity of standard make.
(The Voltage Stabilizer and Change over unit will remain common)
- b) Furniture including 2 nos. high back cushioned wheeled chairs, cupboard and desk for mounting PC and printer.
- c) Carbon monoxide Detector hooked up for the External Hooter – 01 No.
- d) Internal and External Lighting – 01 Lot.
- e) Fire Extinguisher – 02 No
- f) Steel/ Aluminum Ladder
- g) Lock and Key Door.
- h) Light arrangement
- i) Lying of cables / cable trays outside/Inside Analyzer room.

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j) Trenching of cables outside/inside Analyzer room.

One-point power supply would be provided near AAQMS Shelter and inter distribution of power supply will be done by the Vendor.

1.6.3 Rack Cabinet: Standard 19” rack cabinet made of heavy grade aluminum profiles with a facility of telescopic slides overload protection, power distribution box to accommodate “Monitoring analyzers” should be provided.

1.6.4 AAQMS Foundation

Cement Concrete foundation/ Platform of suitable size and Height would be constructed by the Vendor at each AAQMS location. Shelters would be installed at platform of each AAQMS Station as part of scope of supply.

1.6.5 Earth Pit for AAQMS.

The Supplier shall provide suitable earth pit for AAQMS.

1.6.6 UNINTERRUPTED POWER SUPPLY

The AAQMS system shall be powered from AC Single Phase 230 V 50Hz uninterrupted power supply. The system shall be provided with power back up in the form of UPS for 60 Minutes of backup. UPS shall be installed in the closed confinement of Shelter. (UPS is only for Analyzers and DAS & not for AC).

1.7.0 ELECTRONIC DISPLAY BOARD SPECIFICATION:

A LED display board to display the parameters of the AAQMS from central station with specification as below:

- Type : LED display
- No. of Lines : 04 Lines
- Size : 3 feet x 6 feet
- Enclosure : IP-65
- Protection : Canopy
- Visibility : 50m during daytime
- Platform, Mounting structure and Interfacing of centralized AAQMS DAS with electronic display board through suitable wireless communication link, necessary Hardware and Software for the same is also to be included.

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Recommended requirements during warranty period post-commissioning for Continuous Operation for all AAQMS stations would be supplied by vendor. All consumables and replaceable as required during warranty period will be provided by vendor.

1.8.1 Comprehensive Annual Maintenance Contract

Comprehensive Annual Maintenance Contract (CAMC) for three (03) years after commissioning and completion of warranty period will be provided by the bidder. All consumables and replaceable as required during CAMC period will be provided by bidder. Minimum one visit of service engineer would be made at site in each quarter to check the operational performance of AAQMS.

In case of any operational issue, End User/BHEL shall issue call for service with 10 days' notice. Bidder shall provide confirmation to visit BHEL project site within above notice period.

1.8.2 Other Requirement

- a. Two years' warranty, meeting the contract specification is in scope of bidder.
- b. Three (3) years comprehensive AMC (post commissioning) is in the scope of bidder. CAMC will start post commissioning after completion of warranty period.
- c. All consumables and replaceable as required during warranty period (2 years) & CAMC period (3 years) will be provided by bidder.
- d. Offered CAAQMS system would fully meet the requirement of technical specification and fully comply the CPCB requirements and guidelines (as on bid opening date). In case of any deviation w.r.t. technical specification or non-suitability to process requirement, bidder will take full responsibility and corrective action without any cost implication to end user.
- e. Bidder will be responsible for installation, commissioning of the wireless communication system and bidder will also cover RF survey, system design, frequency liasoning, frequency license & royalty charges from the date of commissioning. License & Renewal charges upto CAMC period would be in bidder's scope. Necessary documents for the same would be provided by End user.

PROJECT: 3 x 800 MW PVUNL PATRATU TPP PHASE-1**2.0 Other Terms & Conditions**

2.1 Document: Hard copy of O&M Manual in English language giving complete technical information for operation and maintenance of the equipment.

2.2 Installation and Commissioning: The supplier shall install & commission the equipment at site. Supplier should demonstrate the performance of the Equipment and all its accessories to ensure compliance with complete specifications & parameters quoted by them to the satisfaction of BHEL/end user. Training to End User at site during installation should be provided for routine maintenance, operation and safety purpose.

2.3 Warrantee: The equipment shall be warranted for satisfactory performance for a period of 24 months from the date of installation and 30 months from the date of dispatch, whichever is earlier.

2.4 Packing & Dispatch: The equipment / accessories shall be packed in a suitable water proof/vibration proof packing box capable of bearing air and road transit hazards. Packing box shall be properly identified and marked with BHEL's (India) Purchase Order Number. Also, "PCRI HWR" should be written in bold letters on all four sides of the packing box.

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AMBIENT AIR QUALITY MONITORING SYSTEMS (AAQMS) – MANDATORY SPARES

Ambient Air Quality Monitoring System		
S. No.	Scope of Supply	Qty.
1.	Mandatory Spares as per Annexure-2	1 set

Annexure-2

Mandatory Spares against 04 Sets of AAQMS Package

S.N.	Particulars	Quantity
A	Analyzer for following: i. SO ₂ , ii. NO _x , iii. CO, iv. Dust Monitor	One Number complete instrument of each type and model as offered in main supply
B	Spares for SO ₂ , NO _x , CO, Mercury, Ozone, Dust Monitor Analyzer as below:	
B.1	Electronic Card assemblies/PCBs, Power Supply Modules	10% of each type and Model (Minimum 2 Nos. for each analyzer)
B.2	Sets of Gaskets/"O" rings/Seals	200% of each type, Model, rating and size (Minimum 8 Sets for each analyzer)
B.3	Heater assembly	20% of each type and Model
B.4	Temperature Sensor	20% of each type and Model
B.5	Solenoids	2 Nos. of each type, Model and rating
B.6	Filter, light source etc.	100% of each type, Model and rating
B.7	Calibration gases, Calibration Cell and other consumables for Calibration (all types and ranges)	One Year Supply
B.8	Pump Repair Kit (If applicable)	One Set
	Wireless Equipment	
C.1	Electronic modules including power supply unit	10% of each type and Model
C.2	Modem	1 No. of each type and Model
C.3	Connectors / patch cord	2 Nos of each type and length

PROJECT: 3 x 800 MW PVUNL PATRATU TPP PHASE-1

C.4	Media Converter (if applicable)	2 Nos of each type and Model
C.5	Antennae	2 Nos of each type and Model

Note:

1. Mandatory spares percentage calculation for electronic cards, power supply modules, gaskets. "O" rings, heater assembly, temperature sensor, filter, light source would be based on 04 sets of AAQMS.
2. In case the main population of any item is only one no., then the mandatory spare quantity shall also be one no., overriding requirements indicated in above table.
3. Wherever the quantity is given only in percentage, the spare quantity shall be distributed into various ranges/size/rating/type (as the case may be) in the same proportion of the main population. For the quantities coming less than 1, shall be treated as 1 only.

Annexure-3

Pre- Qualifying Requirement (PQR):

1. The bidder shall offer analyzers (i.e. PM10, PM2.5, SO₂, NO_x, CO, O₃ and Hg) whose trouble free performance has been proven at-least for one year's satisfactory operation for ambient air monitoring application at one Thermal Power Station having unit rating of 200 MW or above. The bidder shall submit supporting documents, e.g. copy of PO placed/ Commissioning Report/Experience Certificate and details of end user concerned official for supply, satisfactory operation of the commissioned analyzer.
2. For Bidders offering upgraded / latest models of analyzer in point-1 above, PQR of equivalent previous models is acceptable. For offered analyzers, OEM shall certify that offered model is upgraded version of earlier model meeting PQR in point 1 above. The bidder shall submit Reference List of Projects wherein offered analyzers are supplied & commissioned.
3. The bidder shall have experience for installation, execution & commissioning of similar type of system in last 5 years in 02 No. thermal power stations of capacity of 200 MW or above. The bidder shall submit copy of "PO placed on bidder, Dispatch documents, Commissioning Report with details of end user concerned official".
4. In case bidder is sourcing analyzers from an OEM, Tender specific authorization letter is required from manufacturer, clearly indicating contact details like Name, Email and address of manufacturer.
5. The bidder shall furnish an agreement with OEM for providing services and supply of spare parts for 5 years from the date of commissioning of items. In case OEM is bidding, he shall provide a certificate for providing services and supply of spare parts for 5 years from the date of commissioning of items.
6. The bidder shall furnish "OEM Technical literature/Manuals of offered Analyzers/ Accessories and all major items forming part of BOM".
7. Bidder's Registered address of India office and Name of representative for technical support for E&C and after sales service at project site.
8. The firm of Bidder should have in existence in past 3 years as on date of bid opening. Bidder Average Annual Turnover (Last 3 Years): 2.0 Crore. Supporting documents certified by CA to be provided.

Important note: In case Bidder does not submit details required in all the above clauses or meet the requirements of Pre-qualification requirements, such offers will be summarily rejected and Bidder's Technical offers/proposals will not be evaluated.

INTEGRITY PACT**Between**

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at "BHEL House", Siri Fort, New Delhi - 110049 (India) hereinafter referred to as "The Principal", which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the ONE PART

and

_____, (description of the party along with address), hereinafter referred to as "The Bidder/ Contractor" which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for _____

_____ (hereinafter referred to as "Contract"). The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal will appoint panel of Independent External Monitor(s) (IEMs), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

Section 1- Commitments of the Principal

- 1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles: -
 - 1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.
 - 1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential/ additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.
 - 1.1.3 The Principal will exclude from the process all known prejudiced persons.
- 1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section 2 - Commitments of the Bidder(s)/ Contractor(s)

- 2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. The Bidder(s)/ Contractor(s) commits himself to observe the following principles during participation in the tender process and during the contract execution.

- 2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he/ she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.
- 2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.
- 2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant Indian Penal Code (IPC) and Prevention of Corruption Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.
- 2.1.4 Foreign Bidder(s)/ Contractor(s) shall disclose the name and address of agents and representatives in India and Indian Bidder(s)/ Contractor(s) to disclose their foreign principals or associates. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.
- 2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.
- 2.3 The Bidder(s)/ Contractor(s) shall not approach the Courts while representing the matters to IEMs and shall await their decision in the matter.

Section 3 - Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process, terminate the contract, if already awarded, exclude from future business dealings and/ or take action as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 4 - Compensation for Damages

- 4.1 If the Principal has disqualified the Bidder (s) from the tender process before award / order acceptance according to Section 3, the Principal is entitled to demand and recover the damages equivalent to Earnest Money Deposit/ Bid Security.
- 4.2 If the Principal is entitled to terminate the Contract according to Section 3, or terminates the Contract in application of Section 3 above, the Bidder(s)/ Contractor (s) transgression through a violation of Section 2 above shall be construed breach of contract and the Principal shall be entitled to demand and recover from the Contractor an amount equal to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee, whichever is higher, as damages, in addition to and without prejudice to its right to demand and recover compensation for any other loss or damages specified elsewhere in the contract.

Section 5 - Previous Transgression

- 5.1 The Bidder declares that no previous transgressions occurred in the last 3 (three) years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.
- 5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason or action can be taken as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors", framed by the Principal.

Section 6 - Equal treatment of all Bidder (s)/ Contractor (s) / Sub-contractor (s)

- 6.1 The Principal will enter into Integrity Pacts with identical conditions as this Integrity Pact with all Bidders and Contractors.
- 6.2 In case of Sub-contracting, the Principal Contractor shall take the responsibility of the adoption of Integrity Pact by the Sub-contractor(s) and ensure that all Sub-contractors also sign the Integrity Pact.
- 6.3 The Principal will disqualify from the tender process all Bidders who do not sign this Integrity Pact or violate its provisions.

Section 7 - Criminal Charges against violating Bidders/ Contractors /Subcontractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section 8 -Independent External Monitor(s)

- 8.1 The Principal appoints competent and credible panel of Independent External Monitor (s) (IEMs) for this Integrity Pact. The task of the IEMs is to review independently and objectively, whether and to what extent the parties comply with the obligations under this Integrity Pact.
- 8.2 The IEMs are not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.
- 8.3 The IEMs shall be provided access to all documents/ records pertaining to the Contract, for which a complaint or issue is raised before them as and when warranted. However, the documents/records/information having National Security implications and those documents which have been classified as Secret/Top Secret are not to be disclosed.
- 8.4 The Principal will provide to the IEMs sufficient information about all meetings among the parties related to the Contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the IEMs the option to participate in such meetings.

- 8.5 The advisory role of IEMs is envisaged as that of a friend, philosopher and guide. The advice of IEMs would not be legally binding and it is restricted to resolving issues raised by a Bidder regarding any aspect of the tender which allegedly restricts competition or bias towards some Bidders. At the same time, it must be understood that IEMs are not consultants to the Management. Their role is independent in nature and the advice once tendered would not be subject to review at the request of the organization.
- 8.6 For ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process or during execution of Contract, the matter should be examined by the full panel of IEMs jointly, who would look into the records, conduct an investigation, and submit their joint recommendations to the Management.
- 8.7 The IEMs would examine all complaints received by them and give their recommendations/ views to the CMD, BHEL at the earliest. They may also send their report directly to the CVO, in case of suspicion of serious irregularities requiring legal/ administrative action. Only in case of very serious issue having a specific, verifiable Vigilance angle, the matter should be reported directly to the Commission. IEMs will tender their advice on the complaints within 30 days.
- 8.8 The CMD, BHEL shall decide the compensation to be paid to the IEMs and its terms and conditions.
- 8.9 IEMs should examine the process integrity, they are not expected to concern themselves with fixing of responsibility of officers. Complaints alleging mala fide on the part of any officer of the Principal should be looked into by the CVO of the Principal.
- 8.10 If the IEMs have reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant Indian Penal Code / Prevention of Corruption Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the IEMs may also transmit this information directly to the Central Vigilance Commissioner, Government of India.
- 8.11 After award of work, the IEMs shall look into any issue relating to execution of Contract, if specifically raised before them. As an illustrative example, if a Contractor who has been awarded the Contract, during the execution of Contract, raises issue of delayed payment etc. before the IEMs, the same shall be examined by the panel of IEMs. Issues like warranty/ guarantee etc. shall be outside the purview of IEMs.
- 8.12 However, the IEMs may suggest systemic improvements to the management of the Principal, if considered necessary, to bring about transparency, equity and fairness in the system of procurement.
- 8.13 The word 'Monitor' would include both singular and plural.

Section 9 - Pact Duration

- 9.1 This Integrity Pact shall be operative from the date this Integrity Pact is signed by both the parties till the final completion of contract for successful Bidder, and for all other Bidders 6 months after the Contract has been awarded. Any violation of the same would entail disqualification of the bidders and exclusion from future business dealings.
- 9.2 If any claim is made/ lodged during currency of this Integrity Pact, the same shall be binding and continue to be valid despite the lapse of this Pact as specified above, unless it is discharged/ determined by the CMD, BHEL.

Section 10 - Other Provisions

- 10.1 This Integrity Pact is subject to Indian Laws and exclusive jurisdiction shall be of the competent Courts as indicated in the Tender or Contract, as the case may be.
- 10.2 Changes and supplements as well as termination notices need to be made in writing.
- 10.3 If the Bidder(s)/ Contractor(s) is a partnership or a consortium or a joint venture, this Integrity Pact shall be signed by all partners of the partnership or joint venture or all consortium members.
- 10.4 Should one or several provisions of this Integrity Pact turn out to be invalid, the remainder of this Integrity Pact remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- 10.5 Only those bidders / contractors who have entered into this Integrity Pact with the Principal would be competent to participate in the bidding. In other words, entering into this Integrity Pact would be a preliminary qualification.
- 10.6 In the event of any dispute between the Principal and Bidder(s)/ Contractor(s) relating to the Contract, in case, both the parties are agreeable, they may try to settle dispute through Mediation before the panel of IEMs in a time bound manner. In case, the dispute remains unresolved even after mediation by the panel of IEMs, either party may take further action as the terms & conditions of the Contract. The fees/expenses on dispute resolution through mediation shall be shared by both the parties. Further, the mediation proceedings shall be confidential in nature and the parties shall keep confidential all matters relating to the mediation proceedings including any settlement agreement arrived at between the parties as outcome of mediation. Any views expressed, suggestions, admissions or proposals etc. made by either party in the course of mediation shall not be relied upon or introduced as evidence in any further arbitral or judicial proceedings, whether or not such proceedings relate to the dispute that is the subject of mediation proceedings. Neither of the parties shall present IEMs as witness in any Alternative Dispute Resolution or judicial proceedings in respect of the dispute that was subject of mediation.

 For & On behalf of the Principal
 (Office Seal)

 For & On behalf of the Bidder/ Contractor
 (Office Seal)

Place _____
 Date _____

Witness: _____
 (Name & Address) _____

Witness: _____
 (Name & Address) _____

Certificate

In line with Government Public Procurement Order No. P-45021/2/2017-BE-II dt. 15.06.2017 & P-45021/2/2017-PP (BE-II) dated 28.05.2018, we hereby certify that we M/s _____(supplier name) are local supplier meeting the requirement of minimum local content (50%) as defined in above orders for the material against Enquiry No. _____

Details of location at which local value addition will be made is as follows:

We also understand, false declarations will be in breach of the Code of Integrity under Rule 175(1)(i)(h) of the General Financial Rules for which a bidder or its successors can be debarred for up to two years as per Rule 151 (iii) of the General Financial Rules along with such other actions as may be permissible under law.

Seal and Signature of Supplier

**Buyer Specific ATC document for Ambient Air Quality Monitoring System (AAQMS) of
3X800 MW Patratu project site**

1.	<p>MDCC (Material dispatch clearance certificate) Clause:</p> <p>Please note that material shall be dispatched only after issue of Material dispatch clearance certificate (MDCC) by BHEL. For issue of MDCC, you are required to submit the set of documents (i.e. Packing list, Warrantee certificate, Complete test / inspection reports, Calibration certificates and copy of inspection call).</p> <p>BHEL will release MDCC within 07 days from the date of receipt of complete documents as detailed above.</p> <p>The delivery period of 150 days is inclusive of 07 days taken by BHEL to issue MDCC.</p>				
2.	<p>Quality Requirement:</p> <p>(i) Joint inspection will be witnessed by M/s BHEL and M/s NTPC at works of successful bidder.</p> <p>(ii) Successful bidder to submit quality plan in line with technical specification in prescribed format for approval of customer / BHEL within 30 days of Purchase Order. BHEL will provide approval of quality plan within 30 days from the date of submission. Any delay in submission / approval will be in respective account.</p> <p>The delivery period of 150 days is inclusive of time for quality plan submission and approval.</p>				
3.	<p>Customer Approval:</p> <p>At present, following bidders are conditionally approved by customer i.e. offering specific make of analysers, multipoint calibrators & metrological sensors. In the event of non-compliance of these approval conditions w.r.t. this bid, customer approval would also be required of below listed conditionally approved bidders.</p> <table border="1" data-bbox="261 1247 1531 1409"><thead><tr><th data-bbox="261 1247 769 1293">Item Description</th><th data-bbox="769 1247 1531 1293">Customer approved Bidders (conditionally as above)</th></tr></thead><tbody><tr><td data-bbox="261 1293 769 1409">Ambient Air Quality Monitoring System (AAQMS)</td><td data-bbox="769 1293 1531 1409">1. M/s Environment SA India Pvt. Ltd. 2. M/s Chemtrols 3. M/s Thermo Electron LLS India Pvt. Ltd.</td></tr></tbody></table> <p>Offers from bidders other than the above list are also acceptable subject to approval by End Customer. Final acceptance of all participated bidders shall be subject to approval by End Customer.</p> <p>BHEL will open the Price Bids of only those bidders who are finally approved by the end customer.</p>	Item Description	Customer approved Bidders (conditionally as above)	Ambient Air Quality Monitoring System (AAQMS)	1. M/s Environment SA India Pvt. Ltd. 2. M/s Chemtrols 3. M/s Thermo Electron LLS India Pvt. Ltd.
Item Description	Customer approved Bidders (conditionally as above)				
Ambient Air Quality Monitoring System (AAQMS)	1. M/s Environment SA India Pvt. Ltd. 2. M/s Chemtrols 3. M/s Thermo Electron LLS India Pvt. Ltd.				
4.	<p>Pre-Qualification Requirement (PQR):</p> <p>The Pre-Qualification Requirements have been made part of bid as Annexure-3. All the bidders should ensure submission of complete details and documents as called for in the same. The offers submitted by the bidders would be scrutinized with respect to Pre-Qualification Requirements first.</p> <p>Techno-Commercial offer of only those bidders shall be evaluated who meet the Pre-Qualification Requirements.</p>				

5.	<p>Technical Specification Requirement:</p> <p>1. Please quote your valuable offer as per BHEL Specification enclosed with bid documents as follows:</p> <p>Annexure-1: Specification for AAQMS Analysers (Main Package) Annexure-2: Specification for AAQMS Analysers (Mandatory Spares)</p> <p>2. Bidders are requested to upload point-wise compliance of BHEL Specifications along with the offer as token of acceptance.</p>
6.	<p>Payment Terms:</p> <ul style="list-style-type: none"> • 90% payment after receipt of material at site against submission of PBG @ 10% of Order value valid till entire Guarantee / Warranty period. The PBG will be in BHEL format and from one of the BHEL consortium banks. For name of BHEL consortium bank, please visit our website hwr.bhel.com. • Balance 10% payment after installation and commissioning at site. • Payment will be released by BHEL within: <ul style="list-style-type: none"> - 45 days for Micro and Small enterprises - 60 days for Medium enterprises - 90 days for Non MSME enterprises
7.	<p>Delivery Period:</p> <p>The material should be supplied within 150 days of purchase order.</p> <p>This period includes following:</p> <ul style="list-style-type: none"> • 30 days from the date of PO for supplier to submit the documents (drawings / datasheet & Quality Plan) for approval. • 30 days for documents approval by BHEL/ End User • 07 days for raising inspection call and witness of joint inspection by M/s BHEL and M/s NTPC • 07 days for issuing dispatch clearance from the date of receipt of documents mentioned in Clause No. 1 of this document. • 07 days for arranging dispatch of material from the date of providing MDCC by BHEL. <p>Any delay in document submission / approval / Inspection will be in respective account.</p>
8.	<p>Post Order Document approval:</p> <p>Drawings/Data sheets/Quality Plan (QP) will be submitted to BHEL for BHEL/customer approval within 30 days of purchase order. The documents shall be complete in all respects. To ensure completeness of documents (as per specifications) BHEL would have in person meeting/ video-conference within first 15 days of PO (if requested by supplier well in advance). However, delay in documents approval due to vague / in-complete submission of documents shall be on supplier's account.</p> <p>BHEL will arrange the approval of the drawings/data sheets/QP within 30 days of their receipt. In case of delay on account of BHEL, delivery shall be re-scheduled accordingly.</p>

9.	<p>Installation, Commissioning & Training:</p> <p>The supplier will supply, erect & commission all the items covered under scope of Annexure - 1 & Annexure - 2 at Patratu site to integrate the system, demonstrate the performance of the Equipment and all its accessories to ensure compliance with complete specifications & parameters of the specification to the satisfaction of BHEL/End User.</p> <p>Only one-point power supply would be made available near to AAQMS Locations by End User. All other items/works e.g. shifting of material at AAQMS locations from site stores, installation, commissioning, Handing Over to end user etc. would be in bidder's scope.</p> <p>Training to End User at site during installation should be provided for routine maintenance, operation and safety purpose.</p> <p><i>Cost of Installation, Commissioning and Training should be inclusive in the quoted prices.</i></p> <p>Installation, Commissioning and Training will be done at following address:</p> <p>GENERAL MANAGER (PROJ.), PATRATU STPP (3X800 MW), PATRATU VIDYUT UTPADAN NIGAM LTD. P.O.-PTPS, DIST- RAMGARH, JHARKHAND - 829119</p> <p><i>Failing to comply to the Installation, Commissioning and Training clause, the offer will be rejected straightaway.</i></p>
10.	<p>Validity:</p> <p>Offer will be valid for 180 days from bid end date and extensions thereof.</p> <p>BHEL will reserve the right to reject any or all quotations, quoting validity less than 180 days.</p>
11.	<p>Evaluation criteria:</p> <p>Evaluation will be done on the basis of Total Landed cost up to Patratu project site considering all items together for supply of complete scope of bid (Total value wise evaluation).</p>
12.	<p>Document:</p> <p>Hard copy of O&M Manual in English language giving complete technical information for operation and maintenance of the equipment will be provided.</p>
13.	<p>Price Basis:</p> <p>Please confirm that prices have been quoted on F.O.R. Patratu site basis.</p>
14.	<p>Packing & Dispatch:</p> <p>The equipment / accessories shall be packed in a suitable water proof/vibration proof packing box capable of bearing air and road transit hazards. Packing box shall be properly identified and marked with BHEL's (India) Purchase Order Number. Also, "PCRI HWR" should be written in bold letters on all four sides of the packing box.</p>

15. **Warrantee:**

The equipment shall be warranted for satisfactory performance for a period of 24 months from the date of installation and 30 months from the date of dispatch, whichever is earlier.

Failing to comply to the Warranty clause, the offer will be rejected straightaway.

16. **EARNEST MONEY DEPOSITE (EMD)**

13.1 Interested vendors must submit their offer along with the following Earnest Money Deposit (EMD) in a separate sealed envelope:

Details	Amount In INR	Amount in Foreign Currency	Type
EMD	INR 2,00,000/- (INR Two Lacs Only)	Equivalent Foreign currency	Refundable

13.2 EMD shall not carry any interest.

13.3 Modes of deposits will be as per General Terms and Conditions (GTC) GeM_GTC_4.0 v1.10_02May23.

The demand draft shall be in favor of "BHEL Haridwar". E-Payment is also acceptable. For e-payment, RTGS details are as mentioned below:

Bank Details	SWIFT Details of bank	Contact Details of Banker
STATE BANK OF INDIA RANIPUR BRANCH, OPP: BHEL MAIN GATE, SECTOR-5, RANIPUR, HARIDWAR, UTTRAKHAND, INDIA PIN CODE : 249403	SWIFT NO : SBININBB225 CC ACCOUNT NO : 10667995458 IFSC CODE : SBIN0000586	Chief Manager (IBD) Contact No. +91 1334 224201 +91 1334 226125 Fax: +91 1334 226512

13.4 MSE Suppliers, who are the manufacturer of offered items as per specification are exempted from submission of the EMD.

13.5 EMD exemption will be allowed as per criteria laid down in General Terms and Conditions (GTC) GeM_GTC_4.0 v1.10_02May23.

13.6 Bids not accompanied with requisite EMD or bids accompanied with EMD of inadequate value shall be liable for rejection, wherever exemption is not allowed.

13.7 The bidder whose bid is technically not accepted will be informed & EMD wherever submitted shall be refunded after the finalization of the contract. EMD shall be forfeited in the event of bidder opting out after tender opening (PART-I).

13.8 Earnest money of successful bidder shall be returned only after receipt of Performance Bank Guarantee (PBG).

17.	<p>General Clause:</p> <p>All other commercial terms and conditions will be governed by General Terms and Conditions (GTC) GeM_GTC_4.0 v1.10_02May23.</p>
18.	<p>Conflict of Interest among Bidders/ Agents:</p> <p>"A bidder shall not have conflict of interest with other bidders. Such conflict of interest can lead to anti-competitive practices to the detriment of Procuring Entity's interests. The bidder, found to have a conflict of interest shall be disqualified. A bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if:</p> <ul style="list-style-type: none"> a) they have controlling partner (s) in common; or b) they receive or have received any direct or indirect subsidy/ financial stake from any of them; or c) they have the same legal representative/agent for purposes of this bid; or d) they have relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the bid of another Bidder, or e) Bidder participates in more than one bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all bids in which the parties are involved. However, this does not limit the inclusion of the components/ sub-assembly/Assemblies from. one bidding manufacturer in more than one bid; or f) In cases of agents quoting in offshore procurements, on behalf of their principal manufacturers, one agent cannot represent two manufacturers or quote on their behalf in a particular tender enquiry. One manufacturer can also authorize only one agent/dealer. There can be only one bid from the following: <ul style="list-style-type: none"> 1. The principal manufacturer directly or through one Indian agent on his behalf; and 2. Indian/foreign agent on behalf of only one principal, or g) A Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid, or h) In case of a holding company having more than one independently manufacturing units, or more than one unit having common business ownership/management, only one unit should quote. Similar restrictions would apply to closely related sister companies. Bidders must proactively declare such sister/ common business/ management units in same/ similar line of business. "
19.	<p>E-invoicing:</p> <p>E-invoicing under GST has been implemented w.e.f. 01.10.2022 for all the taxable persons having turnover more than Rs. 10 cr. it has been specified by the govt that it is mandatory to mention a valid unique invoice reference no. (IRN) and QR code as generated from govt. portal on a tax invoice. Based on such information, GST ITC as claimed by BHEL in GST returns shall be matched with the corresponding details uploaded by supplier in E-invoicing system.</p> <p>In case the vendor / contractor delays or fails to provide all the documents as per the purchase order / work order at the time of submitting tax invoice to BHEL, any subsequent financial loss to BHEL on account of vendor/contractor shall be to vendor's / contractor's account. BHEL has further right to take necessary steps to protect its interest at the time of release of payment. this further requires inclusion of IRN and QR code on tax invoice as announced by govt. of india w.e.f. 01.10.2022.</p>

20. **Integrity Pact:**

(a) IP is a tool to ensure that activities and transactions between the Company and its Bidders/ Contractors are handled in a fair, transparent and corruption free manner. Following Independent External Monitors OEMs) on the present panel have been appointed by BHEL with the approval of CVC to oversee implementation of IP in BHEL.

Sl.	IEM	Email
1.	Shri Otem Dai, IAS (Retd.)	iem1@bhel.in
2.	Shri Bishwamitra Pandey, IRAS (Retd.)	iem2@bhel.in
3.	Shri Mukesh Mittal, IRS (Retd.)	iem3@bhel.in

(b) The IP as enclosed with the tender is to be submitted (duly signed by authorized signatory) along with techno-commercial bid (Part-I, in case of two/ three part bid). Only those bidders who have entered into such an IP with BHEL would be competent to participate in the bidding. In other words, entering into this Pact would be a preliminary qualification.

(c) Please refer Section-8 of IP for Role and Responsibilities of IEMs. In case of any complaint arising out of the tendering process, the matter may be referred to any of the above IEM(s). All correspondence with the IEMs shall be done through email only.

Note:

No routine correspondence shall be addressed to the IEM (phone/ post/ email) regarding the clarifications, time extensions or any other administrative queries, etc. on the tender issued. All such clarification/ issues shall be addressed directly to the tender issuing (procurement) department's officials whose contact details are provided below:

Details of contact person(s)-

Mr. Shashi Pal Designation: A. E. (PCRI-BOI) Pollution Control Research Institute HEEP, BHEL, Haridwar- 249403 Uttarakhand, India Email ID: palsh@bhel.in Tel: +91 1334 28 1941	Mr. Deshraj Yadav Designation: Dy. Manager (PCRI-BOI) Pollution Control Research Institute HEEP, BHEL, Haridwar- 249403 Uttarakhand, India Email ID: deshraj@bhel.in Tel: +91 1334 28 1187
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21. **Arbitration Clause:**

In case of any dispute arising out of as in connection with this contract, the same shall be referred to arbitration under Arbitration & Conciliation Act 1996 of a sole arbitrator who shall be appointed by mutual consent of the parties. The seat & venue of arbitration shall be Haridwar.

The proceedings shall be conducted in English. The Governing law of contract shall be the substantive law of India.

22. Risk Purchase:

In case of abnormal delays (beyond the maximum late delivery period as per LD clause) in supplies / defective supplies or non-fulfillment of any other terms and conditions given in Purchase Order, BHEL may cancel the Purchase Order in full or part thereof, and may also make the purchase of such material from elsewhere / alternative source at the risk and cost of the supplier. BHEL will take all reasonable steps to get the material from alternate source at optimum cost. If bidder does not agree to the above Risk Purchase Clause, BHEL reserves the right to reject the offer. In case for compelling reasons BHEL accepts the offer without acceptance of this clause by the bidder and in the eventuality of Risk Purchase, appropriate action will be taken as per BHEL extant rules. This will be without prejudice to any other right of BHEL under the contract or under General Law.

Action against Bidders / vendor / supplier / contractor in case of default:

In order to protect the commercial interests of BHEL, BHEL shall take action against supplies / contractors by way of suspension of business dealings, who either fail to perform or are in default without any reasonable cause, cause loss of business/ money/ reputation, indulge in malpractices, cheating, bribery, fraud or any other misconduct or formation of cartels so as to influence the bidding process or influence the price etc.

Suspension of Business Dealings could be in the form of "Hold" or "Banning" a supplier/ contractor or a bidder and shall be as per "Guidelines for Suspension of Business Dealings with Suppliers/ Contractors" available at BHEL's website "<https://www.bhel.com/guidelines-suspension-business-dealings-supplierscontractors>".

23. Acceptance of offers from country Sharing Land Border with India:

I. Any bidder from a country which shares a land border with India will be eligible to bid in any procurement whether of goods, services (including consultancy services and non-consultancy services) or works (including turkey projects) only if the bidder is registered with the Competent Authority. Further, any bidder (including bidder from India) having specified Transfer of Technology (ToT) arrangement with an entity from a country which shares a land border with India, shall also require to be registered with the same competent authority.

II. "Bidder" means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process.

III. "Bidder (or entity) from a country which shares a land border with India" for the purpose of this Order means: -

- a. An entity incorporated, established or registered in such a country; or
- b. A subsidiary of an entity incorporated, established or registered in such a country; or
- c. An entity substantially controlled through entities incorporated, established or registered in such a country; or
- d. An entity whose beneficial owner is situated in such a country; or
- e. An Indian (or other) agent of such an entity; or
- f. A natural person who is a citizen of such a country; or
- g. A consortium or joint venture where any member of the consortium or joint venture falls under any of the above

IV. The beneficial owner for the purpose of (iii) above will be as under:

1. In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has a controlling ownership interest or who exercises control through other means.

Explanation:

a. "Controlling ownership interest" means ownership of or entitlement to more than twenty-five per cent. of shares or capital or profits of the company;

b. "Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholders agreements or voting agreements;

2. In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership;

3. In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals;

4. Where no natural person is identified under (1) or (2) or (3) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;

5. In case of a trust, the identification of beneficial owners) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.

V. An Agent is a person employed to do any act for another, or to represent another in dealings with third person.

VI. The successful bidder shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority.

VII. The registration shall be valid at the time of submission of bid and at the time of acceptance of bid.

VIII. If the bidder was validly registered at the time of acceptance / placement of order, registration shall not be a relevant consideration during contract execution.

Note: Following declarations would be required from bidders (if applicable):

(A) "I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India; I certify that this bidder is not from such a country or, if from such a country, has been registered with the Competent Authority. I hereby certify that this bidder fulfills all requirements in this regard and is eligible to be considered. [Where applicable, evidence of valid registration by the Competent Authority shall be attached.]"

(B) "I have read the clause regarding restrictions on procurement from a bidder having Transfer of Technology (ToT) arrangement. I certify that this bidder does not have any ToT arrangement requiring registration with the competent authority.

OR

* have read the clause regarding restrictions on procurement from a bidder having Transfer of Technology (ToT) arrangement. I certify that this bidder has valid registration to participate in this procurement."