INDIAN INSTITUTE OF TROPICAL METEOROLOGY
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PS/125/33/2016 15 November 2016

Sub: Minutes of the Pre-bid meeting of the "Supply and Installationof Humidified Tandem Differential Mobility Analyzer" - Qty 01 Set (as per tender document) held on 15/11/2016 at IITM, Pune.

A Pre-bid meeting relating to the "Supply and Installation of Humidified Tandem Differential Mobility Analyzer" - Qty 01 Setheld on 15th November, 2016 at 11:30 hrs. at IITM, Pune.

In response to our Global Tender Notice No.PS/125/33/2016, representatives of the following prospective bidders / firms / companies had attended the meeting.

i) M/s. Tesscorn AeroFluids Inc., Bangalore
ii) M/s. MARS Bioanalytical Pvt. Ltd., Delhi

Representative of the prospective bidders / firms / companies were asked about any suggestion, queries or technical advancement regarding tender document & Equipment to be procured. The Institute's reply to the queries raised by M/s. Tesscorn AeroFluids Inc., Bangalore and M/s. MARS Bioanalytical Pvt. Ltd., Delhi is as given below:

1. **Condensation Particle Counter:** The Butanol based CPC can only go to 30,000p/cc in the single particle counting mode (with coincidence correction). This is more than adequate for a DMA-based measuring system because the DMA classifies the singly charged particles which are a small fraction of the total aerosol concentration. The accuracy of the measured concentration is 10% across the whole concentration range. This is very typical concentration accuracy for CPCs. It would be difficult to achieve better accuracies for all concentrations. MSP's CPC has a 5nm minimum detectable size at 50% counting efficiency.

   Condensation Particle Counter: Particle Concentration Accuracy: 5% for single particle counting **(up to 100,000 p/cm³),** Response Time: **< 4-0.25 second**

Reply: Condensation Particle Counter: Particle Concentration Accuracy: 5% for single particle counting **(up to 100,000 p/cm³),** Response Time: **< 4 second**

2. Classifying particles larger than 1um with a DMA would require very high operational voltages (10kV and higher). This is a very risky operation condition as DMAs are prone to arcing when operating at these high voltages and specially in warm and humid environments. MSP's HTDMA limits the max DMA voltage to 9,000V in the software (although is capable of going to 10 kV). If you use the DMA to classify double charged particles, it reduces greatly the number concentration of the classified aerosol (this is very non-conventional DMA operation).

Reply: *"Output of High Voltage Module:5 – 10000 V"* is removed (see reply to query number 4)

3. **Relative humidity range:** The 10-93% RH range is based on optimal safe operating conditions. Going to >93%RH is risky as a small temperature gradient in the system could lead to condensing conditions, which would deteriorate significantly the operation of the HTDMA. When conducting particle growth studies, at 93% RH hygroscopic particles already achieved deliquescence conditions (typically at 70-80% RH). Going to 98%RH is possible but very risky to reach condensing conditions.

   Sample aerosol humidifier: Direct diffusion of water vapor from sheath flow into sample flow with integrated water tank and heater, controlled by temperature and **dew point** sensor. Relative humidity range: <10% upto**93%**RH, automatic RH ramping with closed loop control (with user-selected set point in 1% intervals), Flow Rate: **0.2 to 2.0 L/min,** RH Control stability: ± 1%, Response Time: < 3 min for RH **change <,** 10% and **≤4 min** for **RH change >10%**

Reply: Relative humidity range:<10% upto 95-98%, Flow Rate: 1.0 to 9.0 L/min (Sample & Sheath flow)

4. The DMA sample flow is typically 10% of the sheath flow rate. Therefore, 1LPM is the maximum aerosol flow rate for adequate DMA flow operating conditions. Also, since the DMA RH conditioned sheath flow is used to humidify the aerosol sample flow, the 10:1 flow ratio is needed for proper aerosol flow RH conditioning to the same RH of the DMA sheath air flow.

Differential Mobility Analyzer: Size Range: **8-2000** nm, user selected; Output of High Voltage Module:5 – **6000 V,** Sensors (internal): Temperature, absolute pressure, **chilled mirror dew point sensors on sample humidifier and DMA sheath flow, differential pressure across laminar flow elements,** and pressure difference across impactor nozzle, Neutraliser Source for DMA: Should have Neutralizer source (radio-active or non-radioactive).

Reply: Removed – *"Output of High Voltage Module:5 – 10000 V",* remaining as specified in tender document.

5. Measure the growth of aerosol particles with the second DMA operating in a voltage **scanning** mode.

Reply: Measure the growth of aerosol particles with the second DMA operating in a voltage stepping / scanning mode.

6. System should be quoted with: - **Diffusion Dryer for aerosol generator, Rack mount brackets to mount HTDMA to 19''Rack, Dry air supply system and external vacuum pump, maintenance kit**

Reply: Added Maintenance Kit along with first two items mentioned in the tender document.

7. The **revised method and conditions of payment** to be made to the Supplier under this Contract shall be as follows:

(A) Payment for Goods supplied from abroad: Payment of foreign currency portion shall be made in currency of the Contract in the following manner:

(a) On Shipment: **SIXTY (60%)**percent of the Contract Price of the Goods shipped shall be paid through irrevocable letter of credit opened in favour of the Supplier in a bank in its country, upon submission of documents specified in GCC Clause 2.15.

(b) On Acceptance: **FORTY (40%)**percent of the Contract Price of Goods received shall be paid within thirty (30) days of receipt of the Goods and successful installation & commissioning upon submission of claim supported by the acceptance certificate issued by the Purchaser along with the **Performance Security**, if any.

(c) The LC for 100% value of the contract shall be established after deducting the agency commission payable if any, to the Indian agent from the FOB / FCA value.

(d) The LC will be confirmed at the suppliers cost, if requested specifically by the supplier. All bank charges abroad shall be to the account of the beneficiary i.e. supplier and all bank charges in India shall be to the account of the opener i.e. purchaser. If LC is requested to be extended/ reinstated for reasons not attributable to the purchaser, the charges thereof would be to the suppliers' account. Payment of local currency portion shall be made in Indian Rupees within thirty (30) days of presentation of claim supported by a certificate from the Purchaser declaring that the Goods have been delivered and that all other contracted Services have been performed.

(B) Payment for Goods and Services supplied from India: The payment shall be made in Indian Rupees, as follows:

(a) On shipment: **SIXTY (60%)** percent of the Contract Price shall be paid on receipt of the Goods and upon submission of the documents specified in **GCC Clause 2.15**

(b) On Acceptance: The remaining **FORTY (40%)**percent of the Contract value shall be paid to the Supplier within thirty (30) days after the date of the acceptance certificate issued by the Purchaser subject to submission of performance security, if any.

(c) In case of supplies where installation & commissioning is not required payment will be made within 30 days from receipt of items by purchaser as per purchase order contract

(d) **E-Payment:** All payments, IITM prefers to make Electronic Transfers (RTGS) / (NEFT)

8. **Revised Last date of submission of bids: 14th December 2016 upto 12:00 hrs.**
Revised Opening of bids (Technical only): 14th December 2016 at 15:00 hrs.

The Pre-bid Committee suggested continuing / keeping the tender document as it is incorporating the changes detailed at Sr. No.1, 2, 3, 4, 5, 6, 7 and 8 above.