0Tender Enquiry No IITD/SCFBio/Data Centre/Part1

Indian Institute of Technology Delhi

Hauz Khas, New Delhi - 110 016

(Ph. No. 011-26596786; FAX No. 011-26582037)

Due Date: 23rd Jan, 2009

Subject: Creation of a Data Center at Supercomputing Facility for Bioinformatics & Computational Biology, IIT Delhi

1. Background:

Supercomputing Facility for Bioinformatics & Computational Biology (SCFBio) IIT Delhi intends to create a Data Centre for its computational resources located at 3rd floor, Synegry Building,IIT Delhi. The Data Centre solution consists of Precision Air Conditioning, Fire Detection & Suppression System, and all the Electrical & Civil works required for the Data Centre.

Sealed tenders (technical & commercial are to be provided in separate sealed envelopes) are, therefore invited from reputed vendors for the aforesaid purpose as per the details given in the technical specifications. These details are available on the IIT Delhi website www.iitd.ac.in and SCFBio's web site: www.scfbio-iitd.res.in

2. Eligibility Criteria of Bidders:

i) Bidder should preferably be either an **Original Equipment Manufacturer (OEM)** or should be **Authorized System Integrator Partner** having Direct Purchase and Support Agreement with the OEM. In case the tenderer is a System Integration Partner of the Principal Manufacturer, a Certificate from the Principal Manufacturer clearly stating the relationship with the Partner and authorization to the Partner to quote for this Specific tender Enquiry is to be furnished.

ii) All **Components** offered in the Bill of Material should be covered under OEM support enabling program so that to get back end support / benefits from Principles / OEM in terms of Free Support / Maintenance, if any, Access to 24 x 7 x 365 online support from Technical Assistance Center of OEM for resolution of problems with the help of their technical team onsite/offsite, advance defective part replacement during warranty period (3 years) within a period of two working days and OEM Login Access. The undertaking from the OEM for the same should be enclosed with the technical bid.

iii) a). Bidder should have supplied and installed similar type of equipment mentioned in the technical specification in the last 24 months

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b) At least one similar completed work costing not less than the amount equal to 80% of the estimated cost.

c). At least two similar completed works costing not less than the amount equal to 50%

of the estimated cost, **or**

d) At least three similar completed works costing not less than the amount equal to 40% of the estimated cost,

e) Copies of work orders for Data Centres successfully executed during last three years, out of which at least one order should be of value not less than 80% of estimated cost

f) Financial standing through latest ITCC, Annual Report (balance sheet and Profit and Loss Account) of last 3 years

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iv) In this bid, the bidder should submit complete technical details of the proposal, including all plans, layout, drawings, makes, models and other relevant details. The bidder should also, as part of the technical bid, submit the company profile, organizational setup, list of plant, machinery & tools in his possession; copies of work orders for power, cooling, and associated works for data centre, successfully executed during last three years, No deviations in respect of Notice Inviting Quotation (NIQ) conditions are acceptable.

3. Obtaining Bid Documents:

The bid documents can be downloaded from IIT Delhi website www.iitd.ac.in or SCFBio website www.scfbio-iitd.res.in.

i) The bidder for this solution must deposit a non-refundable fee of Rs.200/- in the form of Demand Draft of any scheduled bank payable at New Delhi in favor of "Registrar IIT Delhi" by **23rd Jan 2009**.

4. Submission of Proposals:

i) The bidder shall go through the entire document and must comply with all the terms and conditions. A Compliance statement in the form of 'Complied' or 'Not Complied' shall be given against each item and specification of the tender documents. The compliance statements should be supported by authentic documentation. **Please note that any deviation from the laid down requirements/specifications shall be duly signed and stamped by the bidder.**
Failing to comply with this requirement may result in the bid being rejected.

ii) The proposals shall be submitted in two parts and should be super-scribed as **"PART-I: COVER FOR TECHNICAL BIDS"** and **"PART-II: COVER FOR COMMERCIAL BIDS".**

iii) **Part-I** shall be a Technical Offer with full details including description of Hardware / equipments so as to enable technical assessment of the proposal. This shall also include Earnest Deposit Money as per **Para 5.**

iv) **The Technical bid** must be submitted in an organized and structured manner. No brochures/leaflets etc. should be submitted in loose form. The Technical Offer should consist of the following:

a. A letter of authority duly signed by an authorized signatory.

b. Complete Technical Specification along with Make, Model, Manufacturer and Part Number.
c. Technical Documentation [Product brochures, leaflets, manuals etc.]
d. Delivery and implementation schedule.
e. Compliance of terms with any deviation clearly indicated in remarks.
f. Warranty and AMC (Comprehensive Annual Maintenance) details.
g. **Do not fill any column related to commercials.**

v) **Part – II** should contain **The Commercial Bids** for the entire proposal. The rates should be quoted in Indian Rupees/USD. All prices shall be fixed and shall not be subject to escalation of any description. Also following details should be provided:

a. A letter of authority duly signed by an authorized signatory.
b. All costs should be given in Figures and Words.
c. Govt. Levies like Sales Tax, Octroi, Excise Duty, Work Contact Tax (WCT) and Education cess etc., if any, shall be paid at actual rates applicable on the date of delivery. Rates should be quoted accordingly giving the basic price, duties and taxes etc., if any.
d. Include information as to Technical offer.
e. Itemizes prices for each equipment, cabling, and installation, and total cost.(Prices should be quoted as CIF New Delhi, for items to be imported, inclusive of sales tax / Vat if suppliers are local.
f. Terms of Payment.
g. Period of validity of Bid.

vi) **Both the covers should be first sealed separately** and then both the cover should be kept **in a single sealed bigger cover.** This envelope should be duly signed by an authorized signatory and should bear the inscription as given in tender notice.

vii) **Bids Acceptance:** The bid must reach

Supercomputing Facility for Bioinformatics & Computational Biology, 3rd Floor (above Sip n Bite), Synergy Building, IIT Delhi, Hauz Khas, New Delhi -110016, Phone +91-11-26596786

on or before **23rd Jan 2009 at 3pm**. Bids received after the due date and time are shall be rejected. In the event of due date being a closed holiday or declared holiday for Central Government offices, the due date for submission of the bid will be the following working day at the appointed time and venue.

viii) **Validity of bids:** Bids should be valid for a minimum period of 90 days after the due date.

5. Earnest Money Deposit:

i) Each bid for this Purchase must be accompanied by Earnest Money Deposit of 2.5 % (Two and a half percent) of the quoted price in the form of Demand Draft/Pay Order/Bank Guarantee of any Indian Nationalized Bank taken in the name of 'Registrar, IIT Delhi'. Bank Guarantee should be valid for a minimum period of 60 days from due date of the quotation. **Quotations received without Earnest Money Deposit shall be rejected. It should be a part of Technical Bid**

ii) Earnest Money shall be forfeited and bid is liable to be rejected, if the bidder withdraws or amends or impairs or derogates from the tender in any respect within the period of validity of the tender.

iii) The Earnest Money of unsuccessful bidder shall be returned within one week of finalization of purchases.

iv) The earnest money shall be liable to be forfeited upon non supply of order.

v) No interest will be payable by IIT Delhi on the Earnest Money Deposit returned to the unsuccessful bidder.

6. Rejection of Bids:

i) IIT Delhi reserves the right to accept or reject any bid or cancel the tender proceedings without assigning any reason whatsoever.

ii) If a bidder gives wrong information in their bid, IIT Delhi reserves the right to reject such bid at any stage and forfeit the Earnest Money Deposit / Performance Guarantee / Security Deposit and cancel the contract, if awarded.

iii) Incomplete quotations are liable to be rejected.

iv) **If the technical offer contains any price information the offer will be summarily rejected.**

v) Canvassing in any form in connection with the tenders is strictly prohibited and the bids submitted by the bidders who resort to canvassing are liable for rejection.

vi) IIT Delhi may not pay any costs incurred towards preparation and submission of the bid of any other expenditure in this regard.

vii) Unsigned tenders, unattested corrections and over writing by bidders are also liable for rejection.

7. Evaluation Process:

For the bidders satisfying the Qualifying Criteria and Technical Specifications, the price comparison shall be made over the total cost of the project with three years of comprehensive warrantee. The lowest price in terms of cost to performance ratio will be selected.

8. Payment Terms:

Payment for this Data Centre proposal shall be made in INR/USD including all taxes and levies except custom duty and excise duty since the Institute is exempt from CD & ED. Vendor must indicate their preferred mode of payments in the price bid.

9. Clarifications:

In case the bidder requires any clarification regarding the tender documents, they are advised to submit their question in writing to **SCFBio, 3rd Floor, Synergy Building, IIT Delhi.**

10. Quantity Variations:

The proposed solution is subject to change depending on requirement.

11. Inspection:

IIT Delhi shall have the right to inspect or to test the items after delivery to confirm their conformity to the required specifications. The supplier shall provide all reasonable facilities and assistance to the inspector at no charge to IIT Delhi. In case any inspection of tested service fail to conform the specifications, IIT Delhi may reject them and supplier shall make all alterations necessary to meet specification required free of cost to IIT Delhi.

12. Performance Bank Guaranty: A Bank guaranty of 5% of the total amount should be given by the vendor on whom the order is placed. It should be for a period of two months beyond the date of completion of performance obligations under the contract. The amount and the validity period are to be specified in the bidding documents itself.

13. Warranty:

i) **Three Years comprehensive warranty** should be given by the vendor. Warranty shall include free maintenance of the whole equipment supplied including free replacement of part. The defects, if any shall be attended to on immediate basis but in no case any defect should prolong for more than 24 hours. No separate payment shall be made for the maintenance of equipment / hardware and software during the warranty period.

14. Supply and Installation:

i) This is a time bound and high priority project. It must be understood that the bidder has made the proposal after fully considering all such factors, which may have any bearing on the time schedule. The bidder will be required to supply, install and enable services at all the locations **within 8 weeks** from the date of placement of work order in the order of priority as will be decided by IIT Delhi.

ii) The bidder will have to arrange for all the testing equipment & tools required for installation, testing & maintenance etc. at his own cost.

iii) IIT Delhi will have the right to reject the component /equipments supplied, if it does not comply with the specifications at any point of installation/inspections.

15. Liquidated Damages:

If the supplier fails to deliver any or all of the goods or complete the installation within the period specified in the purchase order, IIT Delhi shall without prejudice to its other remedies, deduct as liquidated damage **0.5 percent** of the price of the delayed goods for every week or part thereof while making the initial payment itself.

16. Force Majeure:

If there is a delay in performance of schedules of contract due to event of Force Majeure, IIT Delhi may deal with the case differently.

17. Arbitration and Laws:

Except where otherwise provided for in the contract, all questions and disputes relating to interpretation and application of the provisions of the contract shall be settled mutually within thirty (30 only) days (or such longer period as may be mutually agreed upon) for the date that either party notifies in writing that such dispute or disagreement exists, under the Rules of India Arbitration and Conciliation Act, 1996. The venue of Arbitration shall be New Delhi, India. The arbitration resolution shall be final and binding upon the parties and judgment may be entered thereon, upon the application of either party, by any court having jurisdiction. The Indian laws shall govern this contract.

Technical Specification for the Proposed Data Centre for SCFBio, IITD

1.1 Air Conditioning

Since Data Center is a critical area, a separate air conditioning system (precision air conditioning) should be exclusively installed to maintain the required temperature for Data Center

Data Center – should be provided with precision air conditioning on a 24 x 7 x 365 days operating basis at least meeting with Tier – II having n + 1 redundancy architecture requirements and having enough provision to scale it to next level as may be required in a later stage. The units should be able to switch the air conditioner on and off automatically and alternately for effective usage in pre defined sequence. The units should be down-flow fashion, air-cooled conditioning system. Precision Air Conditioning systems specifically designed for stringent

environmental Control with automatic monitoring and control of cooling, heating, humidification, dehumidification and air filtration function should be installed.

The design should ensure that the PAC provided can deliver high density cooling for typical rack loads of around 10 KVA. The design should ensure uniform cooling of the racks while maintain proper CFM.

1.2 Natural Convection

As the conditioned air is supplied through the grills, the cold air-cools the component in a much faster and efficient manner as it does moves up, after extracting heat from the component. This follows the natural convection path of the air. The warm air should be sucked at the top by machine, air-conditioned and then supplied back to the room. A typical cold aisle and hot aisle model is desired.

1.2.1 Flexibility

The system should give the flexibility of discharging air at wherever point required even if the furniture is relocated. Changing the grill/tiles carrying grills, at suitable location does this.

1.3 Rodent Repellant

The entry of Rodents and other unwanted pests shall be controlled using non-chemical, non-toxic devices. Ultrasonic pest repellents shall be provided in the false flooring and ceiling to repel the pests without killing them. However periodic pest control using Chemical spray can be done once in 3 months as a contingency measure to effectively fight the pest menace.

- Configuration : Master console with necessary transducer
- Operating Frequency : Above 20 KHz (Variable)
- Sound Output : 50 dB to 110 dB (at 1 meter)
- Power output : 800 mW per transducer
- Power consumption : 15 W approximately
- Power Supply : 230 V AC 50 Hz
- Mounting : Wall / Table Mounting

1.4 False Ceiling

The top false ceiling would have 1’ 6” feet of space from the actual Room ceiling. This false ceiling will house AC ducting (if required) and cables of Electrical lighting, Fire fighting and Rodent Control.

1.5 UPS Requirements & Features

UPS System design concept is based on redundancy and availability with true online system. To support the dual bus system configuration three units of UPS should be installed. The Zone A area should have three parallel redundant UPS and other areas like NOC, BMS and Staging Area should have a separate UPS system. Dual redundant UPS systems will take care of following needs –

- Servers
- Access Control / Fire Detection, suppression / surveillance system

The solution should be automatic with power supply from the transformer as the primary source and automatic switchover to DG set as a secondary source for the data centre. Earthing should be provided from the electrical room control panel to the Earthing pits.

It is recommended to have one set of 2 X 40 KVA UPS working in parallel redundant mode. The UPS system shall be provided for the Server Farm with a capacity to accommodate 6 racks.

UPS Modes of Operation

- The UPS shall operate as an ON LINE reverse transfer system using IGBT /PWM technology.
- The UPS system shall comply to the below mentioned norms –

1. Inbuilt Isolation Transformer with each UPS unit
2. 6 pulse Rectifier Passive I/P filter
3. Input TDS > 0.92 , SNMP/EMS Optional compatibility
4. Inbuilt provision to configure Parallel Redundant Configuration up to 8 sets for future expansion without want of any extra cubicle/circuitry

- The UPS to function under the below mentioned modes.

- Normal - The UPS inverter continuously supplies the critical AC load. The rectifier / charger derives power from AC Input source and supplies DC power to the Inverter while simultaneously load charging power reserve battery.
- Emergency (Failure of AC Input) – Upon failure of AC Input power, the critical AC load will be supplied by the Inverter, which without any switching obtains power from the battery. There shall be no interruption in power to the critical load upon failure or restoration of the AC input source.
- Recharge – Upon AC power restoration the rectifier / charger shall automatically restart and supply power to the inverter and start charging the batteries.
- Bypass – A static transfer switch should be provided for performing reverse transfer of the load from the inverter to bypass source with no interruption in the power to the critical AC load. A manually operated maintenance bypass switch should be incorporated with the UPS that will connect the load to AC power source bypassing the rectifier charger inverter and static transfer switch. The battery circuit breaker MCCB shall have O/L and U/V protection.
- Paralleling Operations: The output of all the three UPS systems should be directly connected at the load distribution panel through individual circuit breakers (part of the distribution panel). The load at the output should be shared equally by all the UPS systems. The paralleling control mechanism should be available with individual UPS. There should not be any single point of failure which can lead to collapse of all the UPS systems.

Battery Requirements

Battery Bank should be designed to provide 30 minutes back up at full load for Server Farm Area. Battery should be sealed and maintenance free type. The plates shall be designed for maximum durability during all service conditions including high rate of discharge and rapid fluctuation of load. The UPS Module should have the battery circuit breaker mounted near to the batteries. When this breaker is opened no battery voltage should be present in the enclosure. The battery breaker should be automatically disconnected when the battery reaches to minimum discharge voltage level or when signaled by other control functions. Remote tripping of Battery circuit breaker facility shall be also incorporated. The batteries should be housed in suitable Racks. Battery installation shall be outside the data center area to avoid fire hazard as recommended by NFPA guidelines.
Power Distribution

• Power cabling inside the STIL shall be of copper. The cables used inside the Data Center shall be of FRLS quality.

1.6 Civil & Architectural work

The scope for civil work in this NIQ is to furnish the data center area in all aspects. The furnishing includes but not limited to the following

- False Flooring
- False Ceiling
- Partitioning (if required)
- One Door and Locking
- Painting (if required)
- Insulating

The selected bidder should adhere to the following civil and interior specifications:

1.6.a Raised Flooring

• Providing & fixing steel cementitious raised access floor of FFH upto 450mm finished with antistatic high pressure laminate in size 600 x 600 mm x 35 mm with point load 450 kg and uniform distribution load (UDL) 1350 kg per sq. metre as per following specifications: Panel Type - M 1000, Understructure- Edge Support Rigid Grid, Wear resistance (g / cm2) - < 0.08, Bottom profile - Hemispherical shape, Pedestal -all steel construction & silver zinc plated, Exposed surface- Special weather coating on entire surface of the tiles. The same should also be provided with wire manager and tile lifter etc.

• At least 1' 6” High from existing floor level using antistatic laminated tiles.

• Supply & Fixing of 1.5 mm Laminate skirting matching with floor tiles with 8mm thick MDF Board / Bison Board up to a height of 4".

• Supplying and fixing vinyl flooring with homogeneous flexible vinyl flooring of approved shade 2.0 mm thick in roll forms and manufacturers specification over the existing floor. Before laying, the existing flooring should be made free from dust and undulations. The finished flooring should be free from air bubbles and thoroughly cleaned without undulations.
• Providing and fixing floor insulation below the false flooring and joints should be finished properly as per manufacturer's specification.

1.6.b False Ceiling

- Providing and fixing grid false ceiling . The same shall be inclusive of cut outs for lighting, AC grills, Fire detectors, nozzles.

- Providing and fixing 12 mm thick fire line Gypsum false ceiling and lighting troughs

1.6.c Partitions

- Providing and fixing in position full height partition wall of either 125 mm thick gyp-board

partition / Interlocked panel using 12.5 mm thick double gyp-board on both sides with GI steel metal vertical stud frame of size 75 mm fixed in the floor and ceiling channels of 75 mm wide to provide a strong partition or by using interlocked compressed material from Areocon Instawall.

- All doors should be minimum 1200 mm (4 ft) wide
- Providing & fixing one half high Glass minimum 6 mm thick for the partition wall between the Server Farm Area of approx. 282 sq.ft.

1.6.d Painting

- Providing and applying paint of approved make and shade to give an even shade over a primer coat as per manufacturers' recommendations after applying painting putty to level and plumb and finishing with 2 coats of fire retardant paint. Base coating shall be as per manufacturer's recommendation for coverage of paint.
- For all vertical Plain surface
- For gyp-board ceiling

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1.7 PVC Conduit

- The conduits for all systems shall be high impact rigid PVC heavy-duty type and shall comply with I.E.E regulations for nonmetallic conduit 1.6 mm thick as per IS 9537/1983.
- All sections of conduit and relevant boxes shall be properly cleaned and glued using appropriate epoxy resin glue and the proper connecting pieces, like conduit fittings such as Mild Steel and should be so installed that they can remain accessible for existing cable or the installing of the additional cables.
- No conduit less than 20mm external diameter shall be used. Conduit runs shall be so arranged that the cables connected to separate main circuits shall be enclosed in separate conduits, and that all lead and return wire of each circuit shall be run to the same circuit.
- All conduits shall be smooth in bore, true in size and all ends where conduits are cut shall be carefully made true and all sharp edges trimmed. All joints between lengths of conduit or between conduit and fittings boxes shall be pushed firmly together and glued properly.
- Cables shall not be drawn into conduits until the conduit system is erected, firmly fixed and cleaned out. Not more than two right angle bends or the equivalent shall be permitted between draw or junction boxes. Bending radius shall comply with I.E.E regulations for PVC pipes.
- Conduit concealed in the ceiling slab shall run parallel to walls and beams and conduit concealed in the walls shall run vertical or horizontal.
- The chase in the wall required in the recessed conduit system shall be neatly made and shall be

of angle dimensions to permit the conduit to be fixed in the manner desired. Conduit in chase shall be hold by steel hooks of approved design of 60cm center the chases shall be filled up neatly after erection of conduit and brought to the original finish of the wall with cement concrete mixture 1:3:6 using 6mm thick stone aggregate and course sand.

1.8 Wiring

- PVC insulated copper conductor cable shall be used for sub circuit runs from the distribution boards to the points and shall be pulled into conduits. They shall be stranded copper conductors with thermoplastic insulation of 650 / 1100 volts grade. Color code for wiring shall be followed.

- Looping system of wring shall be used, wires shall not be jointed. No reduction of strands is permitted at terminations. No wire smaller than 3.029 sq.mm. shall be used.

- Wherever wiring is run through trunking or raceways, the wires emerging from individual distributions shall be bunched together with cable straps at required regular intervals. Identification ferrules indication the circuit and D.B. number shall be used for sub main, sub circuit wiring the ferrules shall be provided at both end of each sub main and sub-circuit.

- Where, single phase circuits are supplied from a three phase and a neutral distribution board, no conduit shall contain wiring fed from more than one phase in any one room in the premises, where all or part of the electrical load consists of lights, fans and/or other single phase current consuming devices, all shall be connected to the same phase of the supply.

- Circuits fed from distinct sources of supply or from different distribution boards or M.C.B.s shall not be bunched in one conduit. In large areas and other situations where the load is divided between two or three phases, no two single-phase switches connected to difference phase shall be mounted within two meters of each other.

- All splicing shall be done by means of terminal blocks or connectors and no twisting connection between conductors shall be allowed.

- Metal clad sockets shall be of dia cast non-corroding zinc alloy and deeply recessed contact tubes. Visible scraping type earth terminal shall be provided. Socket shall have push on protective cap.

1.9 Cable Work

- Cable ducts should be of such dimension that the cables laid in it do not touch one another. If found necessary the cable shall be fixed with clamps on the walls of the duct. Cables shall be laid on the walls/on the trays as required using suitable clamping/ fixing arrangement as required. Cables shall be neatly arranged on the trays in such manner that a crisis crossing is avoided and final take off to switch gear is easily facilitated.

- All cables will be identified close to their termination point by cable number as per circuit schedule. Cable numbers will be punched on 2mm thick aluminum strips and securely fastened to the cable. In case of control cables all covers shall be identified by their wire numbers by means of PVC ferrules. For trip circuit identification additional red ferrules are to be used only in the switch gear / control panels, cables shall be supported so as to prevent appreciable

sagging. In general distance between supports shall not be greater than 600mm for horizontal run and 750mm for vertical run.

- Each section of the rising mains shall be provided with suitable wall straps so that same the can be mounted on the wall.

- Whenever the rising mains pass through the floor they shall be provided with a built-in fire proof barrier so that this barrier restricts the spread of fire through the rising mains from one section to the other adjacent section.

1.10 Temperature Requirements

The environment inside the STIL shall need to be continuously maintained at 21 ± 1^{o} Centigrade. It is advised that the temperature and humidity be controlled at desired levels. The necessary alarms for variation in temperatures shall be monitored on a 24x7 basis and logged for providing reports.

1.10.1 Relative Humidity (RH) requirements

Ambient RH levels shall need to be maintained at 50% ± 5 non-condensing. Humidity sensors shall be deployed. The necessary alarms for variation in RH shall be monitored on a 24x7 basis and logged for providing reports.

1.10.2 Temperature & Relative Humidity Recorders

Temperature and Relative Humidity Recorders shall preferably be deployed for recording events of multiple locations within the STIL. Records of events for about past 7 days shall be recorded and presentable whenever required by STIL. Automatic recording of temperature and humidity using sensors located at various locations within the STIL is necessary.

1.10.3 Air quality levels

The STIL shall be kept at highest level of cleanliness to eliminate the impact of air quality on the hardware and other critical devices. The STIL shall be deployed with efficient air filters to eliminate and arrest the possibility of airborne particulate matter which may cause air-flow clogging, gumming up of components, causing short-circuits, blocking the function of moving parts, causing components to overheat etc. Air filters shall be 95% efficiency & provide up-to 50 Micron particulate shall be deployed

1.10.4 Additional Points on PAC

- The precision air-conditioners should be capable of maintaining a temperature range of 21 degree with a maximum of 1 degree variation on higher and lower side and relative humidity of 50% with a maximum variation of 5% on higher and lower side.

- The precision air-conditioners shall have 2 independent refrigeration circuits (each comprising 1 no scroll compressors, refrigeration circuit and condensers) and dual blowers for flexibility of operations and better redundancy.

- For close control of the STIL environment conditions (Temp. and RH) the controller shall have proportional integration and differential (PID).

- The precision unit shall be air cooled refrigerant based system to avoid chilled water in

critical space.

- The internal rack layout design shall follow cold aisle and hot aisle concept as recommended by Ashrae.

- The refrigerant used shall be environment friendly HFC, R-407-C/ equivalent in view of long term usage of the data center equipments, availability of spares and refrigerant.

- Fully Deployed Dynamic Smart Cooling with Auto sequencing Provision and Auto Power Management Features

- The fan section shall be designed for an external static pressure of 25 Pa. The fans shall be located downstream of the evaporator coil and be of the electronically commuted backward curved centrifugal type, double width, double inlet and statically and dynamically balanced. Each fan shall be direct driven by a high efficiency DC motor.

- The evaporator coil shall be A-shape coil (for down flow) incorporating draw-through air design for uniform air distribution. The coil shall be constructed of rifled bore copper tubes and louvered aluminum fins, with the frame and drip tray fabricated from heavy gauge aluminum. Face area of coil shall be selected corresponding to air velocity not exceeding 2.5 m/sec.

- Dehumidification shall be achieved by either reducing effective coil area by solenoid valve arrangement or using Dew point method of control. Whenever dehumidification is required, the control system shall enable a solenoid valve to limit the exchange surface of the evaporating coil, thereby providing a lower evaporating temperature.

- The humidifier and heaters shall be a built in feature in each machine individually. Humidification shall be provided by boiling water in a high temperature polypropylene steam generator. The steam shall be distributed evenly into the bypass airstreams of the environment control system to ensure full integration of the water vapor into the supply air without condensation. The humidifier shall have an efficiency of not less the 1.3 kg/kw and be fitted with an auto flush cycle activated on demand from the microprocessor control system. The humidifier shall be fully serviceable with replacement electrodes. Wastewater shall be flushed from the humidifier by the initiation of the water supply solenoid water valve via a U-pipe overflow system. Drain solenoid valves shall not be used. Microprocessor should be able to control the humidification and heating through suitable sensors

- Microprocessor Controls: Following features should be displayed on the units

  - Room temperature and humidity.
  - Supply fan working status
  - Compressor working status
  - Condenser fans working status
  - Electric heaters working status
  - Humidifier working status
  - Manual / Auto unit status
  - Line voltage value
  - Temperature set point
  - Humidity set point
  - Working hours of main component i.e. compressors, fans, heater, humidifier etc.
  - Unit working hours

- Current date and time
- Type of alarm (with automatic reset or block)
- The last 10 intervened alarms

- Following alarms shall be displayed on screen of microprocessor unit:

  - ✓ Air flow loss
  - ✓ Clogged Filters
  - ✓ Compressor low pressure
  - ✓ Compressor high pressure
  - ✓ Smoke - fire
  - ✓ Humidifier Low water level
  - ✓ High / Low room temperature
  - ✓ High/Low room humidity
  - ✓ Spare External Alarms
  - ✓ Water Under floor

The unit shall incorporate the following protections:

- ✓ Single phasing preventors
- ✓ Reverse phasing
- ✓ Phase imbalancing
- ✓ Phase failure
- ✓ Overload tripping (MPCB) of all components

12.11 Fire Suppression Systems

The Clean Agent Fire Suppression system cylinder, CCOE, Nagpur approved seamless cylinders, discharge hose, fire detectors and panels and all other accessories required to provide a complete operational system meeting applicable requirements of NFPA 2001 Clean Agent Fire Extinguishing Systems, NFPA 70 National Electric Code, NFPA 72 National Fire Alarm Code or ISO standards must be considered to ensure proper performance as a system with UL/FM approvals and installed in compliance with all applicable requirements of the local codes and standards.

- The Clean Agent system considered for Total flooding application shall be in compliance with the provisions of Kyoto Protocol.
- Care should be taken that none of the Greenhouse Gases identified in the Kyoto Protocol is used for fire suppression application.

- The minimum criterion for the selection of the Clean Agent will be on the following parameters

  - Zero Ozone Depleting Potential.
  - Global Warming Potential not exceeding one.
  - Atmospheric Lifetime not exceeding one week.

  - The clean agent fire suppression system with Novec1230 and Inert Gas based systems are accepted as a replacement of HCFC and HFC as per Kyoto Protocol.
  - The Clean Agent considered for the suppression system must be suitable for manable occupied areas with NOAEL Level (No observable adverse effect level) of 10% as compared to the design concentration to ensure high safety margin for the human who might be present in the hazard area.

- The minimum design standards shall be as per NFPA 2001, 2004 edition or latest revisions.
- Care shall be given to ensure proper early warning detection system with minimum sensitivity of 0.03% per foot obscuration as per NFPA 318 & NFPA 72 to ensure that one gets a very early warning to investigate the incipient fire much before the other detectors activate the fire suppression system automatically.
- All system components furnished and installed shall be warranted against defects in design, materials and workmanship for the full warranty period which is standard with the manufacturer, but in no case less than five (5) years from the date of system acceptance
- Additionally, Portable Extinguishers (CO_2 or Halon based Extinguishers are not acceptable) shall be placed at strategic stations throughout the Data Centre.

Important

All works shall be designed and executed to conform with layout of server room including placement of racks. Placement and routing of all equipment, pipes, cables and other items, including items to be placed outside the data centre, shall be done in consultation with and with the approval of SCFBio, IIT Delhi. Site constraints including dimensions, location and nature of existing construction, and all safety criteria are to be taken account of by the vendor. The vendor is obligated to **conduct necessary site inspection before submission of bid**. Detailed design, drawing and layout plans for all equipment, cables, pipes and other items must be provided by the bidder along with the technical bid. All requirements of space, cooling and other infrastructure for equipments quoted by bidder must be clearly mentioned in the technical bid.

A three year comprehensive onsite warranty is to be provided for a period of three years; in addition, AMC rates for subsequent two years shall be quoted in the price bid. Pricing information should be provided separately for each section below in the price bid.

Air Conditioning

Section A - SUPPLY PART			
SL No.	**Description of Item**	**Unit**	**Qty**
1	**Air cooled Precision AC units :**		
	Supply of **9.5TR actual Cooling capacity units @ 20Deg±1degC, RH 50%±5% and at 44 deg C Ambient** Precision Air conditioning units, Complete **with EC Fans for power** savings, In built Sequencing. units should have **sensible heat ratio of more than 93% & CFM range from 13500/unit.** EU4 filters are required.hydrauphilic treatment of coils is required. unit should have 2 set points return air sensors. unit dimenssions are W - 2582 X D - 865 X H - 2175-	nos	2
2	**Active tile for high density racks**		
	Active tiles should be able to deliver 3000CFm at full speed. This should have modulating damper for the airflow diversion & it should also include the sensors for sensing the hot aisle temperature.	nos	3
3	**Automatic Floor pressurising systems (AFPS) :**		
	This system should sense the pressure below the floor and it should give command to units to increase or decrease the flow of cold air inside the false floor. **(for 5 units of Ist floor and 3 units of 2nd floor)**	nos	1
4	**Master controller :**		
	Master controller should collect the data from PAC units & Active tiles . It should be able to compatible to BMS . **(1 no. for 1st floor and 1 no. for 2nd floor)**	nos	1

Section B - Low Side & Installation			
SL NO.	**Description of items**	**Unit**	**Qty**
A	**INSTALLATION, TESTING & COMMISSIONING OF DX Type PAC UNITS**		
1	Indoor/outdoor stand for the PAC units, adjustable height suitable for 600mm floor height	Nos	3
2	Power cabling from MCCB board to PAC units up to 5Rmt each unit	RMT	10
3	Control cabling assuming 5 meter each unit	RMT	10
3	Drain line 40mm insulated with 9mm nitrile & upto 5 RMT/unit (assuming drain point available within room)	RMT	10
4	Humidifier line, 25mm, upto 5 RMT/unit (assuming make-up connection available within room)	RMT	10
5	Ref cu piping with support	Nos	2
5	Installation, testing and commissioning of Precision AC unit as per following scope: Unloading & shifting at site **(including crane requirement)**, **(but excluding service cat walk/any scaffolding if required for outdoor placing & service feasibility as per site conditions),** First Charge of R-407 Refrigerant & Oil	Nos	2

Rodent Repellent

Description	Qty	Unit
Rodent Repellent one Console Units with three Transducers Suitable to cater to data Center	1 Set	No

GAS SUPRESSION SYSTEM

80 lit Seamless cylinder with valve assembly	1 (Nos)
FM 200 FE 227, etc gas (In Kg)	53 kg (aaprox)
Solenoid Actuator Assy 24V DC Manual actuator Pneumatic actuator Assembly Discharge Hose Assy Pilot Hose Assy 725mm Master cylinder adaptor(ENOT) Mainfold Nozzles 80 lit cyl strap Warning sign & instruction	

WATER LEAK DETECTION

1	Supply, installation, testing and commissioning of water leak detection unit	1 Nos.
2	Santrol make water Leak Analyser	
3	Supply and laying of Water Leak Detection spot type detectors.	3 Nos.
4	2X1.5 sq mm FRLS cable	10 Nos.

INTERIOR & CIVIL WORK

Interior joinery work

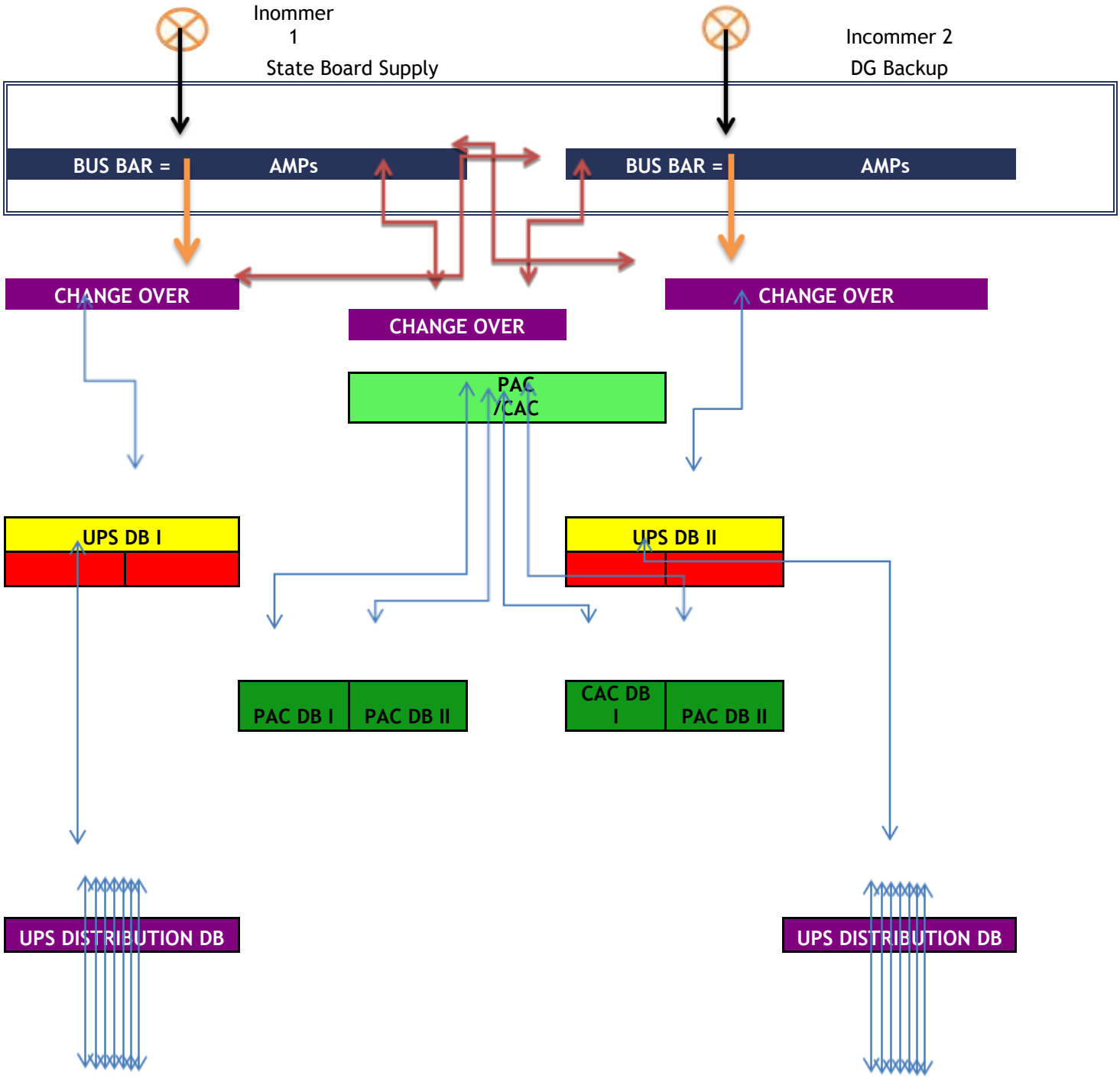
False Floor - Supply & Service Area: DC area,	Sq Ft	282.00
Grid Ceiling - Supply & Service Area: DC area	Sq Ft	282.00
False Ceiling Gypsum - Supply & Service Area: UPS Room and Electrical Room	Sq Ft	370.00
Vinyl Flooring - UPS Room, Electrical Room	Sq Ft	370.00
Anti Static Flooring - 2 X UPS Room Area: UPS Room X2.	Sq Ft	92.50

Options Should Quoted for Clean, smoothening, punning, tucking of Walls and Painting of walls for 3286 of sq ft area

ELECTRICAL WORK

The electrical work would be comprises of POINT WIRING, Proper EARTHING, SUPPLY AND FIXING OF LIGHTING FIXTURES, CABLES ,MAINS & SUBMAINS, DISTRIBUTION BOARDS/ISOLATOR and ATS, SUB DISTRIBUTION BOARDS(MAIN PANEL, UPS DB-1,2, ACDB, PAC DB, CYCLIC PABEL FOR AC 2TR 1 Phase (only one AC will be on at once), SAFTEY EQUIPMENT

Diagram for Electrical



Very Early Smoke Detection Apparatus (VESDA) for Server Room

Supply, Installation,Testing & Commissioning of **VESDA LAZER FOCUS (VLF-250) Panel** with complete accessories.	1	No
Supply of Capiliary Tube Set with complete accessories.	RO	Sets
Supply of VESDA Pipe with complete acessories.	RO	RM
Sampling Point for Capillary tube end and label	RO	Nos

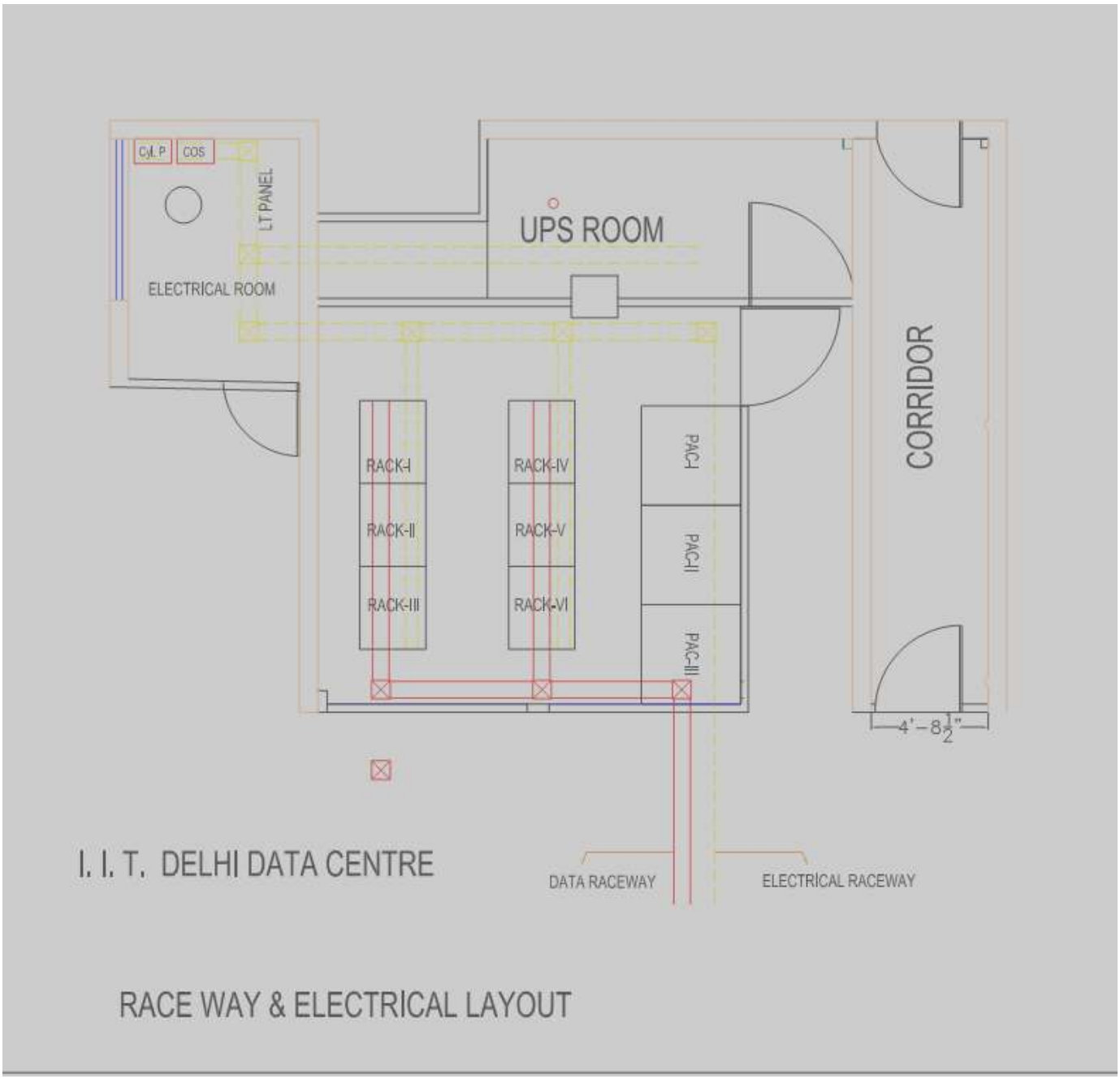
*** Vesda should also be quoted as an option.**

Cabling and Connection

All the miscellaneous Cabling and connection for the existing setup and proposed new racks should be done by the Vendor.

All other Components related to Data Centre which seems essential can be quoted by the Vendor as an option.

Layout for the Proposed Data Centre at IIT Delhi



****We are considering only two PAC at the moment but there should be provision for adding one more pack if required later. Also at present the number of rack would be 6 but only 3 or 4 racks will be populated, remaining will be placed without any server(load).**

Please Include the Following in Technical Bid :

I. **Brand and model number of each equipment along with the product brochure containing detailed technical specifications.**
II. **Compliance sheet product-wise detailing compliance with every specification or deviation therefrom.**
III. **Duly signed manufacturer authorization certificate with enquiry reference number.**
IV. **Proprietary item certificate for the manufacturer, if applicable.**
V. **Period of delivery of equipment and period of installation and Commissioning if applicable.**
VI. **List of similar projects executed in last two years, especially in and around Delhi.**

Please include the following in the Financial bid

I. **Itemizes prices for each equipment, cabling, and installation, and total cost.(Prices should be quoted as CIF New Delhi, for items to be imported, inclusive of sales tax / Vat if suppliers are local**
II. **Terms of Payment**
III. **Warranty Period**
IV. **Period of Validity of the Bid**
V. **Earnest Money Deposit of 2.5 % (Two and a half percent) of the quoted price in the form of Demand Draft/Pay Order/Bank Guarantee of any Indian Nationalized Bank taken in the name of 'Registrar, IIT Delhi'. Bank Guarantee should be valid for a minimum period of 60 days from due date of the quotation**

Check List

Please verify the following documents before submission of the tender, to avoid rejection or disqualification of your tender.

1) non-refundable fee of Rs.1000/- in the form of Demand Draft of any scheduled bank payable at New Delhi

2) Separate Sealed Envelopes containing the Technical and Commercial Bid. Technical bid should not contain any price information.

3) Earnest Money Deposit of 2.5 % (two and a half percent) of the quoted price in the form of Demand Draft/Pay Order/Bank Guarantee of any Indian Nationalized Bank

4) Price Schedule with terms and conditions

5) Statement on Compliance of the Technical Specifications with deviations, if any

6) Three Years Comprehensive Warranty on the Products along with AMC.

7) For the Commercial bid a letter of authority duly signed by an authorized signatory should be attached.

8) Delivery and implementation schedule

9) The tender document should be submitted on or before the due date.

Amendments to tender Enquiry No IITD/SCFBio/Data Centre/Part1 (Tender ID 2008/1847)

Check List

Sl. No. 1 – Should be read as

"Non-refundable fee of Rs. 1000/- in favour IRD Accounts, IIT Delhi in the form of Demand Draft of any scheduled bank payable at New Delhi."

Sl. No. 3 - Should be read as

"Earnest Money Deposit of 2.5 % (two and a half percent) of the quoted price in the form of Demand Draft/Pay Order/Bank Guarantee of any Indian Nationalized Bank in favour of IRD Accounts, IIT Delhi to be given in a separate sealed envelope along with the technical bid."