



Division of Chemical Sciences
Indian Institute of Science
Bangalore 560012

Tender No.: IISc/CSB/DC/2022/01

Date: 18th April 2022

Corrigendum - 1

Subject: Revision in the content of Chemical Sciences Building (CSB) Data Centre tender (Tender No.: IISc/CSB/DC/2022/01) for the supply and installation of data centre infrastructure with server racks, cooling and management systems

References: Tender No.: IISc/CSB/DC/2022/01

Indian Institute of Science, Bengaluru has issued the above tender on 22/03/2022. After the pre-bid meeting, which was held online using MS Teams on 04/04/2022 at 3:30 PM, revisions to the above-mentioned tender document are made as follows:

Revision-1 (Page-3, Section-2, General Information about this tender, Point-3, Schedule of events) and (Page-19, Section-17, Important Dates)

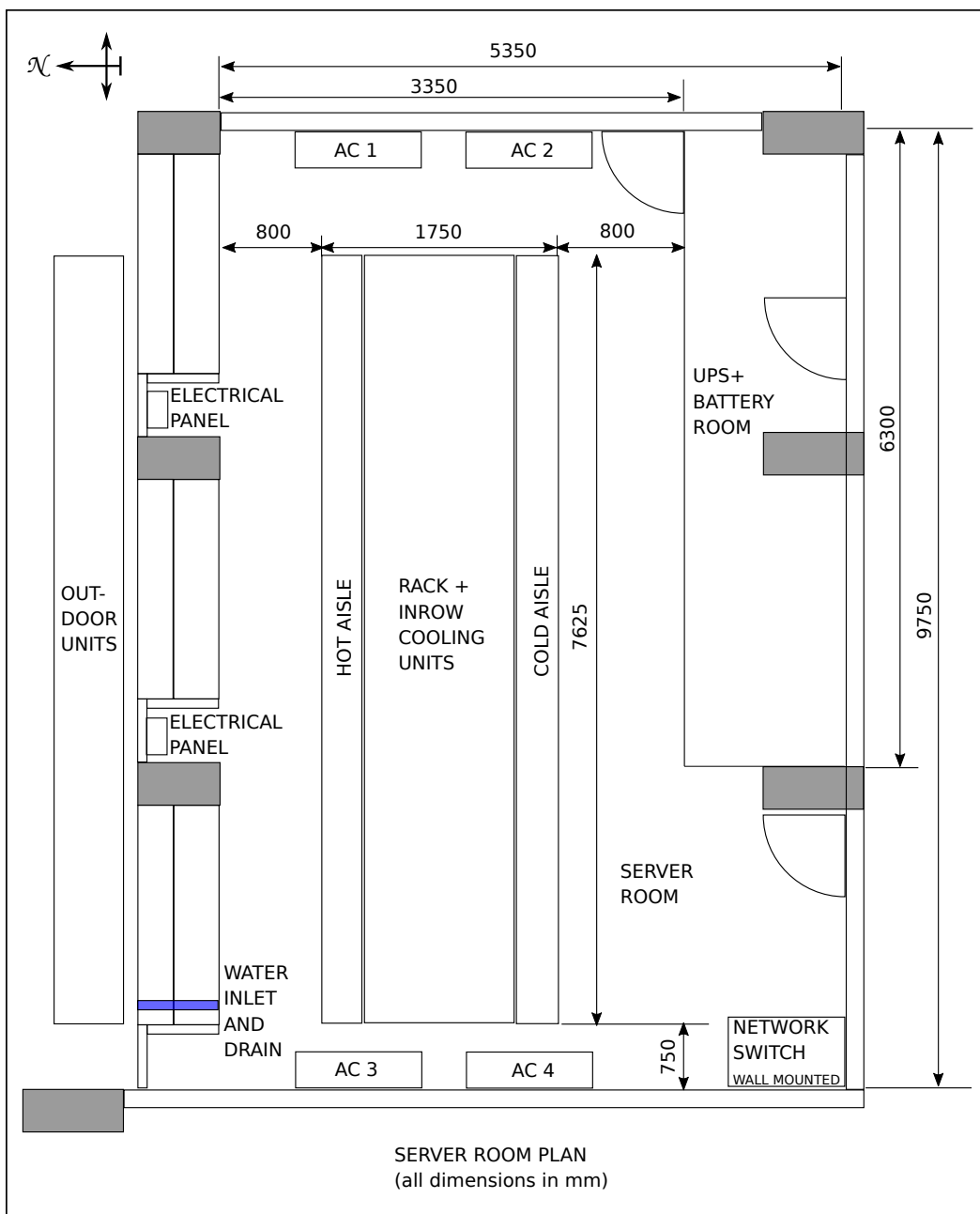
Revised Content:

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|--|-------------------------|
| Publication of Tender | 22/03/2022 |
| Deadline for submission of pre-bid queries | 31/03/2022, 5:00 PM IST |
| Pre-bid clarification meeting | 04/04/2022, 3:30 PM IST |
| Release of corrigendum | 18/04/2022, 5:00 PM IST |
| Start of submission of bids | 22/04/2022, 9:00 AM IST |
| Deadline for submission of bids | 04/05/2022, 5:00 PM IST |
| Opening of technical bids | To be declared later |
| Technical presentations | To be declared later |
| Listing of technically qualified bidders | To be declared later |
| Opening of price bids | To be declared later |

Revision-2 (Page-4, Section-4, Technical Details, Point-1, Room plan)

Previous Content: The row-based data center infrastructure is to be housed in a ground floor room of size (approximately) 3600 mm x 9750 mm. The area marked for the row-based cooling units (1800 mm x 7625 mm) is indicative.

Revised Content: The row-based data centre infrastructure is to be housed in a ground floor room of size (approximately) 3350 mm x 9750 mm. The area marked for the row-based cooling units (1750 mm x 7625 mm) is only indicative. You can exceed the indicated dimensions as long as comfortable movement for people is possible in the room and the computer cluster nodes can be installed/serviced without moving the server racks. The revised room plan is below. The UPS room is marked in the plan.



Revision-3 (Page-5, Section-4, Technical Details, Point-2b, Parameters for the PAC units)

Previous Content: Parameters for the PAC units:

- i. Supply air temperature: 20 deg C
- ii. Return air temperature: 28 deg C
- iii. Humidity: 40-65 RH
- iv. Ambient temperature: 35 deg C

Note: If both supply and return air temperatures cannot be ensured, the preference is for the return air temperature.

Revised Content: Parameters for the PAC units:

- i. Supply air temperature: 20 ± 1 deg C
- ii. Maximum return air temperature: 35 deg C
- iii. Humidity: 40-65 RH
- iv. Ambient temperature: 35 deg C

Revision-4 (Page-6, Section-4, Technical Details, Point-2.c)

Previous Content: The PAC units should be able to deliver cold air at a rate of 3200 CFM per rack. The units should automatically modulate the airflow as per the operational cooling needs of the servers, for example based upon return air temperature, at any given time. Also, the cold air delivery should be directable to the front of the racks with uniformity across the vertical height of the racks.

Revised Content: The PAC units should be able to deliver cold air at a rate of minimum 4000 CFM per PAC unit. The units should automatically modulate the airflow as per the operational cooling needs of the servers, for example based upon return air temperature, at any given time. Also, the cold air delivery should be directable to the front of the racks with uniformity across the vertical height of the racks.

Revision-5 (Page-6, Section-4, Technical Details, Point-2.j)

Previous Content: NVH level be at most 70 DB (air noise) at 1 m from each of the PAC units at the rated speed conditions.

Revised Content: NVH level be at most 70 DB (air noise) at 1 m from each of the PAC units at the rated speed conditions and doors closed.

Revision-6 (Page-6, Section-4, Technical Details, Point-2.I)

Previous Content: The monitoring and control system in the units should have a provision to switch between the units to provide N+1 redundancy in a pre-programmed manner by the user or automatically based on the cooling needs in the event of a unit failure, need for extra cooling, or in the case of high return air temperatures. OEM design in this regard is also acceptable. The details of the normal operation must be mentioned in the bid.

Revised Content: The monitoring and control system in the units should have a provision to switch between the units to provide N+1 redundancy in a pre-programmed manner by the user or automatically based on the cooling needs in the event of a unit failure, need for extra cooling, or in the case of high return air temperatures. If the working of three PAC units is not sufficient to fulfill the cooling requirements of the racks when under heavy load (above 100 kW), then four PAC units should automatically work, overriding the redundancy requirement. OEM design in this regard is acceptable. The details of the regular operation must be mentioned in the bid.

Revision-7 (Page-7, Section-4, Technical Details, Point-3.e)

Previous Content: Each rack should be provided with 2 nos. of 230 V, 32A smart PDUs, which is interfaced with the monitoring system.

Revised Content: Each rack should be provided with 2 nos. of 230 V, 32A vertical basic PDUs.

Revision-8 (Page-7, Section-4, Technical Details, Point-4.c.e)

Previous Content: Temperature & Humidity sensor (2 sensors each on the cold and hot aisle)

Revised Content: Temperature & Humidity sensor (2 sensors per rack, one sensor on the cold aisle and the other sensor on the hot aisle)

Revision-9 (Page-7, Section-4, Technical Details, Point-4.f)

Previous Content: Door access to both the front and the rear of the racks must be available. The door should be fire-resistant. Simple key-based locking is adequate; biometric access is not required. In the closed/locked position, the doors should keep the cold or hot air sealed within the enclosure. All the rack doors should open automatically in the event of a cooling failure.

Revised Content: Door access to both the front and the rear of the racks must be available. The door should be fire-resistant. Electro-magnetic locks with push buttons for manual access to the rack doors are adequate; biometric access is not required. In the closed/locked position, the doors should keep the cold or hot air sealed within the enclosure. Both the front and back rack doors should open automatically in the event of a cooling failure and when the temperature exceeds a user defined programmable threshold. The exhaust fan installed in the room should start working upon the rack doors opening. Automatic door closure on the resumption of the PAC units working is not required.

Revision-10 (Page-8, Section-4, Technical Details, Point-5.f)

Previous Content: One emergency heavy duty exhaust fan of 4000 CFM with static pressure of 10-30 mm of water column on the north side wall with exhaust shutters should be provided. The exhaust fan should be provided with a switch outside the room for manual operation.

Revised Content: One emergency heavy duty exhaust fan of 4000 CFM with static pressure of 10-30 mm of water column on the north side wall with exhaust shutters should be provided. The exhaust fan should be connected to the UPS and integrated into the monitoring system. The exhaust fan should start automatically when the rack doors open in the event of the cooling failure.

Revision-11 (Page-8, Section-4, Technical Details, Point-5.h)

Previous Content: Earthing should be provided by the bidder.

Revised Content: Dedicated earthing should be provided for all the electrical equipment installed by the bidder.

Revision-12 (Page-9, Section-5, Warranty and Maintenance)

Previous Content: Warranty and quarterly maintenance services for the whole system should be comprehensive and valid for **5 years** from the date of installation of the equipment. During the warranty period, the bidder shall attend to all the hardware problems on-site and replace the defective parts at no extra cost to the purchaser. The warranty includes the replacement of spares/labour/consumables that may be required.

Revised Content: Warranty and quarterly maintenance services for the whole system should be comprehensive and valid for **5 years** from the date of installation of the equipment. During the warranty period, the bidder shall attend to all the hardware problems on-site and replace the defective parts at no extra cost to the purchaser. The warranty includes the replacement of spares/labour/consumables that may be required. Consumables like refrigerant gas, fire suppression system NOVEC gas, batteries, emergency lights can be excluded.

Revision-13 (Page-9, Section-5, Warranty and Maintenance, Point-1)

Previous Content: The bidder must ensure that the proposed solution is a total turnkey solution operated by a single bidder to meet the stated requirements and delivers an uptime guarantee of 95% of the entire system measured on a monthly basis.

Revised Content: The bidder must ensure that the proposed solution is a total turnkey solution operated by a single bidder to meet the stated requirements and delivers an uptime guarantee of 95% of the entire system measured on a monthly basis. The downtime due to high side power distribution and UPS failures will not be considered in computing the uptime of the system.

Revision-14 (Page-9, Section-5, Warranty and Maintenance, Point-2)

Previous Content: If any sub-systems or components of the proposed solution fail, the bidder must ensure that the defects are rectified before the end of the next working day. Failure to meet the above requirement will result in an extension of the warranty services by 3 days for each day's delay during the warranty period. Therefore, the bidder along with the OEMs must put systems and processes in place to address the above during the contract period.

Revised Content: If any sub-systems or components of the proposed solution fail, the bidder must ensure that the minor defects are rectified before the end of the next working day and the major defects should be fixed in three working days. Failure to meet the above requirement will result in an extension of the warranty services by 3 days for each day's delay during the warranty period. Therefore, the bidder along with the OEMs must put systems and processes in place to address the above during the contract period.

Revision-15 (Page-13, Section-8, Bidder's Eligibility Criteria, Point-3)

Previous Content: The bidder must have installed and commissioned an HPC data center cooling system solution (at least one) during the financial years 2017 – 2022 in a reputable educational or research Institution with a budget of at least 75 lakhs. If the bidder happens to be a system integrator, either the bidder or the cooling system OEM that the bidder has indicated for the current bid should meet this condition; **Supporting Documents Needed:** 1. A copy of the P.O., 2. Completion certificate from the customer indicating the start and end date of installation and commissioning corresponding to the P.O.

Revised Content: The bidder must have installed and commissioned an HPC data center cooling system solution (at least one) during the financial years 2017 – 2022 in a reputed educational/research Institution or a reputed public/private company with a budget of at least 75 lakhs. If the bidder happens to be a system integrator, either the bidder or the cooling system OEM that the bidder has indicated for the current bid should meet this condition; **Supporting Documents Needed:** 1. A copy of the P.O., 2. Completion certificate from the customer indicating the start and end date of installation and commissioning corresponding to the P.O.

Revision-16 (Page-13, Section-8, Bidder's Eligibility Criteria, Point-5)

Previous Content: The bidder is expected to be a company with an annual turnover of at least Rs. 1 crore per year for the last 3 financial years. **Supporting Document Needed:** Annual audited balance sheet for the last 3 financial years.

Revised Content: The bidder is expected to be a company with an annual turnover of at least Rs. 1 crore per year in any of the two years in the last 5 financial years. In all the last 5 financial years the minimum annual turnover should be Rs. 50 lakhs. **Supporting Document Needed:** Annual audited balance sheet for the last 5 financial years.

Revision-17 (Page-13, Section-8, Bidder's Eligibility Criteria, Point-6)

Previous Content: The bidder should have a registered office in India and been in operation for at least 10 years as on the date of the submission of the bids. Joint ventures or consortia are not permitted. The bidder should provide relevant document to support this condition.

Revised Content: The bidder should have a registered office in India and been in operation for at least 5 years as on the date of the submission of the bids. Joint ventures or consortia are not permitted. The bidder should provide relevant document to support this condition.

Revision-18 (Page-13, Section-8, Bidder's Eligibility Criteria, Point-7)

Previous Content: The bidder should have an OEM authorized service centre located in Bangalore. Supporting documentation should be provided.

Revised Content: The bidder should have an office in Bangalore and the OEM should have an authorized service centre located in Bangalore. Supporting documentation should be provided.

Revision-19 (Page-13, Section-8, Bidder's Eligibility Criteria, Point-8)

Previous Content: The OEM must provide all technical support to the bidder for the entire duration of the contract including post warranty AMC. A support letter from the OEM to the bidder stating the above should be provided.

Revised Content: The OEM must provide a support letter stating that along with the bidder they will ensure that all the technical specifications mentioned in the tender will be met after the data center installation to the satisfaction of IISc. The OEM will also provide all technical support to the bidder for the entire duration of the contract including post warranty AMC. A support letter from the OEM to the bidder stating the above should be provided.

Revision-20 (Page-21, Section-18, Annexure-A, List of Recommended Makes)

Revised Content:

The following list is indicative only. The items offered must comply with the Public Procurement (Preference to Make in India) ORDER NO. P-45021/2/2017-PP (BE-II) dated 16th September, 2020 issued by Public Procurement Section, Department for Promotion of Industry and Internal Trade, Ministry of Commerce and Industry, GoI.

Item Recommended Makes

1. *Row-based cooling units with necessary low-side works:* Schneider Electric, Vertiv, Stultz, Bluebox, Climaveneta, Rittal, and OEM branded equipment is allowed
2. *Server racks:* APC, Legrand, Vertiv, WQ India, Netrack, Valrack, Stultz, Rittal, and OEM branded equipment is allowed
3. *Electrical Cables:* Havells, Polycab and Finolex
4. *Electrical Sockets:* Havells, Schneider, ABB and Legrand
5. *Glass for door:* Saint Gobain, Schott, and Pilkington
6. *Fire alarm system:* Tyco, Honeywell, Siemens, Schneider, and OEM brander equipment is allowed
7. *Aspiration smoke detection system:* Xtralis, ICAN, Tyco, Honeywell, Siemens, Securiton, and OEM brander equipment is allowed
8. *NOVEC 1230 based fire suppression system:* Ansul, UTC, Tyco, and Siemens
9. *Rodent Repellent System:* Maser (Torrant Range), C Systems, Verma Craft, and Star Electronics
10. *Water leak detection system:* Trancetek, Leibert, Sontay, and Star Electronics

Revision-21 (Page- 9 to 12, Section-6, Technical Details/BoQ Compliance Sheet (to be submitted with Technical Bid)

Revised Content:

Technical Details/BoQ Compliance Sheet (to be submitted with Technical Bid)

Bidders must ensure that the price is **NOT** mentioned in this table.

| S. No | Description of Requirements | Yes/No | Remarks/Make /Model |
|--------------|--|---------------|----------------------------|
| 1 | <p>Row-based integrated cooling solution with inbuilt hot and cold aisle separation and integrated BMS components. (Make and Model No.)</p> <p>The critical components like PACs, server racks, PDU, integrated BMS components, and remote monitoring should be supported by a single OEM.</p> | | |
| 2 | <p>a. PAC units (Make and Model No.)</p> <p>b. Precision Air Conditioner should have following Features:</p> <ul style="list-style-type: none"> a. PAC units should be of at least 35 kW capacity each. b. Indicate the number of PAC units c. PAC units deliver cold air at a rate of minimum 4000 CFM d. Parameters for the PAC units: <ul style="list-style-type: none"> a. Supply air temperature: 20 ± 1 deg C b. Maximum return air temperature: 35 deg C c. Ambient temperature: 35 deg C d. Humidity: 40-65 RH e. N+1 redundancy for cooling of 8 racks with a power load of up to 15 kW per rack. f. The monitoring and control system in the units has a provision to switch between the units to provide N+1 redundancy in a pre-programmed manner by the user or automatically | | |

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| | <p>based on the cooling needs in the event of a unit failure.</p> <ul style="list-style-type: none"> g. If the working of three PAC units is not sufficient to fulfill the cooling requirements of the racks when under heavy load (above 100 kW), then the four PAC units should automatically work, overriding the redundancy requirement. h. PAC units should be able to cool all racks uniformly from 1st U to 42nd U i. PAC units provide DX-based cooling j. PAC units operate using R-410A refrigerant k. PAC units consist of an inlet filter, drawn through direct-drive electronically commutated (EC) Motors and backward curved EC fans or axial fans l. PAC units have provision to collect the condensate from the units and drain it outside the data centre room using a drain present in the room. m. The Outdoor Condenser units comprise of Condenser AC/EC/DC fans & motor, Condenser cooling coil. The AC and DC fans have fan-speed controllers. n. PAC units are interfaced with the onsite/remote monitoring and control system o. Inbuilt heater and humidifier to cater IT load | | |
| 3 | <p>Server Racks</p> <ul style="list-style-type: none"> a. 8 server racks b. Each rack has at least 42U of usable space c. Each rack has 30 nos of 1U blanking panels d. 1U Rack mounted 18” foldable LCD Display (or better) with Keyboard and mouse per Rack. VGA, HDMI and USB cables of sufficient (at least 4 m) should be provided | | |

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| | <ul style="list-style-type: none"> e. Each rack has 2U closed hinged type cable manager f. Each rack has 2 nos. of 230 V, 32A vertical basic PDUs g. Each PDU has at least 30 nos. of C-13 sockets and at least 4 nos. of C-19 sockets h. The PDU supports the entire rack at full load (up to 15 kW) i. Door access to both front and back of racks j. Door is fire-resistant and has a electromagnetic locking system with push buttons for manual access k. Front and back doors open automatically in the event of power and cooling failure and when the temperature exceeds a user defined threshold l. The exhaust fan automatically starts when the rack doors open upon cooling failure | | |
| 4 | <p>Integrated BMS components</p> <ul style="list-style-type: none"> a. Smoke detector b. Fire detection and alarm system c. Fire suppression system - NOVEC 1230 based d. Water leak detection system e. Temperature & Humidity sensor (two per rack. One on the cold aisle and the other on the hot aisle) f. Door sensors for racks g. Alarm beacon h. Rodent repellent i. Exhaust fan | | |
| 5 | <p>Electrical Low Side Work</p> <ul style="list-style-type: none"> a. All electrical cabling and any additional panels as required for the solution towards power for the PAC units as well as UPS power for the racks will be provide by the bidder. | | |

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| | <ul style="list-style-type: none"> b. Dedicated earthing should be provided for the equipment installed wherever necessary by the bidder. | | |
| 6 | <p>Monitoring Row-based cooling units should have functionality to graphically monitor the infrastructure</p> <ul style="list-style-type: none"> a. Touch screen display with a user-friendly interface b. It should be menu driven system to display and control thermal management, power supply, BMS information, alarms, logs, exhaust fan, etc. c. Remote monitoring through a web-based interface d. Monitoring system is active in the event of power/cooling failure e. Access to the control system is secured preferably through a numeric passcode-based security system | | |