

Consolidated Pre-Bid Queries For Tender No: GEM/2023/B/3807669, IIT Bombay				
Name of the Bidder:- M/s. Prasa Infocom and Power Solutions Private Limited				
Sr.No	Ref No.	Section / Page/ Clause Reference /Description	Query from bidder	C-DAC Response
1	Technical Specification -	Clause 7.6 Page 18/63	We hereby request CDAC to accept Acoustic Enclosure provided as per CPCB II Norms & OEM Standard.	Refer Page no 35 of 99 Clause no 7.6 as -"7.6 Supply, installation and commissioning of Diesel Generator Set with acoustics enclosure " and as per CPCB norms.
2		General	Please share the input/ouput cable details for Existing UPS System	Input and Output cabling for existing UPS is part of scope of this tender.
3		Make list	Being the approved UPS OEM in make list we hereby request CDAC to allow "Delta" make in Lithium Ion batteries also	Offered proven product should match product safety requirement, tender specifications, terms and conditions.
4	Page-50-VESDA-	The air sampling detectors shall provide a nominal obscuration level range from .0015 to 6% /ft.,	Requesting CDAC to approve 0.002 to 10%/ft.	As per Tender
5	Page 50-VESDA-	Pt. 9.6- 18000 Event logs required.	This feature specific to one OEM, request to approve 400 event and addon memory card for additional event.	As per Tender
6	Page 49- CCTV Camera	- In case of network or power failure, camera can automatically switch to auxiliary (local) power source & start recording on the memory card inside the camera & can push the recording back network once the network is up in the same time frame without any loss of recording.	Camera storage card to NVR is possible in manual mode only. Requesting CDAC to amend the Clause.	As per Tender
Name of the bidder: M/s.Aurionpro Limited				
Sr.No	Ref No.	Section / Page/ Clause Reference /Description	Query from bidder	C-DAC Response
1	Page 3 Clause No 3.6GENERALPower and water	Electrical power and water during construction will be provided at one location.	Please confirm whether we will get separate power provisioning in each floor ( Basement, ground, third floor and terrace) or we will be getting power at one location	Refer Corrigendum
2	Page 3 Clause No 3.6GENERALPower and water	Electrical power and water during construction will be provided at one location.	We presume that power will be provided free of cost. Please confirm	Refer Corrigendum
3	GENERALPower and water	Water provisioning	Please clarify whether we have to consider water for construction and testing in our scope or whether same shall be provided by Client? ( Treated water will be required for chilled water testing)	Treated water needs to be in the scope of Bidder whereas construction water requirements will be provided by IIT Bombay Free of Cost
4	GENERALSite establishment	Site office and store	Please presume that space for site office and store will be provided free of cost	Only space available will be at basement area .
5	GENERALSite establishment	Toilets	Please clarify whether our staff and Labour can use the existing toilets in the building	Yes, but cleanliness needs to be maintained
6	GENERALSite establishment	Drinking water	Please clarify the availability of drinking water for staff and Labour in the premises	Yes
7	GENERALSite establishment	Freight Lift	Request you to allow us to use freight lift in the building for the shifting of materials and equipment. Also permission to position crane for heavier equipment	There is no freight lift . Positioning of crane outside building will be allowed on the road for lifting and shifting of goods from ground floor to terrace. Bidder to take all safety measures while doing so. Bidder to take utmost care as this being academic campus where students movement will be there all the time.
8	GENERALSite establishment	Working Hours	We understand that bidder's staff and labour can work in site premises 24/7 including holidays	Yes with prior approval from IIT Mumbai. Work related with heavy noise like cutting , drilling etc work will be carried out on off days i.e. Saturday and Sunday.
9	GENERALFloor Height	Floor Height is mentioned as 4.5 m in Layout shared along with RFP	During site visit it was noticed that floor height is 4.2 m with beam height of 0.7 m. Layout also shows false ceiling with 1 m above and raised floor with 0.6 m below. This will result a clear height of 2.8 m . Request you to cross check the feasibility with respect to rack height and space required for wire mesh cable tray for network cables at the top of the racks	Refer Corrigendum
10	Page 19 Clause no 7.6GENERALStatutory approvals	All necessary statutory approvals including, but not limited to, CEIG approval, Fire authority approval, etc. as applicable to DG System.	As per the clause , ASL shall consider the CPCB approval for DG set installation only.	As per tender, All permissions and approvals applicable for DG system is part of scope of Bidder.
11	Page 3 Clause no 3GENERALDesign responsibility	The proposed designs and indicative drawings enclosed in the RFP document are for reference and for the purpose of bidding. The vendor so finalized would be required to make the necessary shop drawings within the layouts so as to arrive at a final scheme in line with the requirements and in accordance with the requirements of Indian standards, IEC, IS,IEEE,NBC etc	We understand that bidder is responsible for the detailed design based on the concept design we received through RFP. Variation shall be applicable in case of any changes in the input parameters and details given in RFP. Request you to clarify	This is a lumpsum turnkey tender, all requirement has been given in the tender as well as in the Drawing.
12	Page 18 Clause No 7.5 ElectricalExisting UPS relocation	Battery backup required will for 10 minutes for individual UPS, bidder to consider at .9 power factor for battery sizing.	We need additional parameters like DC bus voltage/ UPS efficiency etc of existing UPS for battery sizing .Hence request you to share the data sheet of the existing UPS	Liebert RG -40 KVA , DC bus Voltage 576 V DC ,
13	Page 17Clause No 7.4 and approved makesElectricalIT UPS	Approved makes mentioned for Lithium ion battery are Samsung and LG where as Chemistry of lithium ion battery is mentioned as LFP and NMC	LG and Delta are having NMC chemistry and Samsung is having LMO Chemistry. Request you to approve Delta make with NMC chemistry	Offered proven product should match product safety requirement, tender specifications, terms and conditions.
14	Page 23 Clause 7.12ElectricalCable tray	Stainless steel (SS) cable tray to be considered above each row of the Rack.. Cable tray Grid above the rack to be provided and cable tray should be in SS. Rack Interconnecting cables mostly will be fibre, Bidder to take care utmost care as 90 Deg C bend will not be accepted.	We understand that this clause is applicable only for wire mesh cable tray laid at the top of the racks . Please confirm	Yes
15	Page 8 Clause no 6.12CIVILStructural foundation	Bidder need to consider Tie bracing of existing column by MS structure ,so that entire weight will be transferred to column footing. Necessary calculations and structural stability needs to be certified by certifying agency /structural consultant. Refer attached drawing for reference only. The said drawing of structure needs to be approved/vetted by IIT Bombay	We understand that IIT certification will be free of cost .	Yes
16	Page 24 Clause No 7.14ElectricalBus duct	Bus Duct Sandwich Type for IT load -- Copper/Alluminium Sandwich Type Construction 3P4W 100% N with body Enclosure as Integral Earth. The Earthing shall be Aluminium and it shall be one continuous piece, integral earth rated at min 50% of phase. Earthing shall be factory fitted factory tested and lcv rating for the earthing shall also be declared on Type Test Certificate produced by manufacturer.	We understand that busduct enclosure shall be used as integral earth and no separate earth bus to be considered in bus duct. Please confirm	Refer Page no 40 Clause no 7.14 as "The Earthing shall be Aluminium and it shall be one continuous piece, integral earth rated at min 50% of phase. Earthing shall be factory fitted factory tested and lcv rating for the earthing shall also be declared on Type Test Certificate produced by manufacturer." Enclosure can not be integral earth.
17	Page 3 Clause no 2Racks and PDU/UPS	All Racks are not part of the scope of this GeM Bid.	It is clarified that racks will not part of the bid. We understand that IPDU/rack PDU also will not be part of the bid . Request to clarify . If IPDU to be supplied , Please share the configuration and specification for the same	Rack and PDU are not part of this Tender scope
18	HVACPipes and Valve fittings		It was clarified in site visit that grooved fittings to be considered only in Shaft and inside the building. Welded joints shall be considered for terrace and outdoor piping . Request to confirm	Yes

19	Page 2 Clause 2 Racks and PDU	Efficient, flexible and scalable 24 KW, +12 VDC @ 2 X1100 Amperes integrated Power System containing a module mounting assembly/ chassis of size not more than 3U form factor, rectifiers, intelligent control monitoring, 45 U rack of size 800 mm width, 1400 mm depth with both front and back hinged perforated doors, DC bus bars of 2 X 1100 Amps rating etc. The power supply should comply with OCP V1 standard (Updated to V1.2). Two power shelf each of rating maximum 24 KW per rack with 3/3.3 KW each rectifier module rating operating in N+ 1 (6 + 1). CU Bus Bar @ 1100 Amps rating, two no's in each power zone. Each rack will have dual power zones. Each power zone will provide maximum rated output up to 24 KW with two no's of OCP bus bars.	We understand that this DC power supply is not part of the bid and same will be supplied by rack vendor . Request to clarify	Yes
20	SLDElectricalBus duct tap off box		Request share the type of socket to be considered in tap off box .Request to provide detailed specification of tap off box with requirement of communication and monitoring requirement if any	Refer Electrical SLD drawing , MCB Tap off box and rating is provided. Tap Off boxes communication and monitoring is not Tender requirement
21	SLDElectricalBus duct tap off box	Quantity of tap off box	We understand that bidder has to consider the tap off box qty as per the SLD . Please clarify	Yes
22	SLDElectricalBus duct tap off box	Cabling from tap off box to racks	Please clarify whether bidder should consider the cabling between tap off box and rack PDU	Cabling from Tap Off Box to Rack is not part of this tender scope
23	SLDElectricalBus duct tap off box	Male socket of tap off box	Please clarify whether bidder should consider the male socket in tap off box	Yes as per rating provided in the SLD
24	SLDElectricalLT panel bus bar	Alumilum bus bar is mentioned in DC LT panel New . MOC for bus bar is not mentioned for other panels	We understand that we can consider Aluminium bur bar for all the panels	As per Electrical SLD drawing
25	Page 23 Clause 7.12ElectricalWire mesh cable tray	Stainless steel (SS) cable tray to be considered above each row of the Rack.. Cable tray Grid above the rack to be provided and cable tray should be in SS. Rack Interconnecting cables mostly will be fibre, Bidder to take care utmost care as 90 Deg C bend will not be accepted.	Please clarify the no of waterfall drops to be considered per rack	Three nos per server rack , two numbers per storage rack and spare rack
26	Page 20 Clause no 63ElectricalLT panel MFM	Panels feeders should have rated capacity of Load manager with RS 485 communication port	We will consider the Load manager (DLM) requirement as per the SLD provided in the RFP . Please confirm	Yes
27	Clause No 9.4ELVFire Alarm System	The system and its components shall be Underwriters Laboratories, Inc. listed, and FM APPROVED under the appropriate testing standard, for fire alarm systems and the installation shall be in compliance with the UL 10th Edition listing.	Please confirm can we consider only UL listed Fire alarm system complying NFPA standards.	Yes
28	Clause No 9.4ELVFire Alarm System	The system and its components shall be Underwriters Laboratories, Inc. listed, and FM APPROVED under the appropriate testing standard, for fire alarm systems and the installation shall be in compliance with the UL 10th Edition listing.	As per site visit able to see beam pockets. Kindly confirm do we have to consider detectors in each pocket or based on area only?	Refer Corrigendum
29	Page 58 Clause No 13.4ElectricalDemonstration of UPS system	Demonstration of Battery backup under full load condition. For IT as well as NON IT UPS	Please clarify whether this demonstration to be done using actual IT Loads or should we consider heat load banks for the same	This is to be done on the actual IT Load during Linpack testing
30	Page 27 clause 8.1HVACExisting cooling Equipment	In description it is mention as chiller 1,2,3 & in quantity it is mention as 4.	Kindly confirm 4 no's of chillers are existing.	Yes Existing chiller quantity are four numbers
31	Piping & instrument schematicHVAC	Dry cooler pump, secondary chilled water pump head is required for selection of the pumps.	Please provide pump head for all the pumps.	Bidder to calculate pump head based on flow rate requirement given in P & ID and height of building section as provided .
32	Piping & instrument schematicHVAC	Dry cooler capacity selected is 200 kw. However total rack KW is 202 kw plus spare rack which is exceeding dry cooler capacity.	please confirm dry cooler capacity is selected considering all the loads. Request to share capacity calculation.	As per tender requirement
33	Piping & instrument schematicHVAC	In specification thermal tank capacity is mentioned as 16KL & in schematic it is mentioned as 15 KL.	please provide actual capacity of thermal storage tank.	Refer Corrigendum-As per P & Id Drawing as 15 KL
34	Piping & instrument schematicHVAC	Thermal storage tank normal, discharging & charging operation is not clear from schematic as well as technical specification.	Please provide detail thermal storage tank operation for normal, discharging & charging modes.	Provided in P & ID of tender
35	Page no 43 clause 8.22HVACThermal storage tank	It is not specified in the specification as which type of thermal storage tank is required either buffer tank or stratified tank.	Request you to clarify on type of tank.	Buffer Tank, Refer Page no 57 clause no 8.12
36	Page no 43 clause 8.22HVACThermal storage tank	Backup time considered for thermal storage tank capacity is not mention in tender specification.	Request you to provide thermal storage tank capacity for reference.	Capacity will 15 KL
37	HVACVentilation	Is smoke exhaust & make up air system required?	Please provide specification for smoke exhaust & makeup system in case it is required.	Not in tender scope
38	Annexure G - Sr No 17	PUE at different IT Load	For PUE calculation – Existing Chilled water system will be utilised & DCLC System details are not available for power & HVAC Load estimates. Hence, PUE for the system will not be derived for tender submission. This Point was also discussed during PreBid meeting held at IIT Powai.	Submission of PUE at different IT loads is not required.

Name of the Bidder:- M/s.Kyndryl Solutions Private Limited

Sr.No	Ref No.	Section / Page/ Clause Reference /Description	Query from bidder	C-DAC Response
1	SECTION IV – SCHEDULE OF REQUIREMENT	6 Requirements towards Civil/Interior work - Page no. 23	Please confirm whether existing doors in IT & non-IT UPS room are 2 hour fire rated or same shall be replaced with 2 hour fire rated steel door	Replacement of existing Doors in UPS room is not part of this tender scope.
2	SECTION IV – SCHEDULE OF REQUIREMENT	6 Requirements towards Civil/Interior work - Page no. 24	As per tender bidder to consider chain link fencing for these equipment along with concrete foundation for Pumps, thermal storage tanks, etc . But as both 750 kVA DG set are also proposed in ground floor pls confirm whether bidder need to consider chain link fencing for DG sets equipment along with concrete foundation	Concrete foundation is required where as chain link fencing is not required.
3	SECTION IV – SCHEDULE OF REQUIREMENT	7 Requirements towards Electrical Work Page no. 34	Please confirm ECV for SMF batteries proposed for 40 kVA UPS system	Liebert RG -40 KVA , DC bus Voltage 576 V DC ,
4	SECTION IV – SCHEDULE OF REQUIREMENT	7 Requirements towards Electrical Work Page no. 34	Please confirm whether bidder need to consider floor strengthening for UPS and battery room or existing floor loading is sufficient.	Existing floor to be used
5	SECTION IV – SCHEDULE OF REQUIREMENT	7 Requirements towards Electrical Work Page no. 34	As per tender 2 nos. 750 kVA DG set are required. During main power failure both the DG set shall provide emergency power to Data Center load. If yes that means there is no redundant unit proposed. Pls confirm and also share total load in KW that shall be connected to DG set.	Yes Both The DG will be in operation and there will not be any redundancy at DG level during EB failure. Estimated maximum Load on DG set will be 1. NSM - IT + NON IT = 650 KVA , 2. One Chiller load + Chiller Pump Load + Chiller Cooling Tower Load + Load on existing 320 KVA DG set = 490 KVA , Total Maximum Load on DG set will be 650+490 = 1140 KVA
6	SECTION IV – SCHEDULE OF REQUIREMENT	7 Requirements towards Electrical Work Page no. 35	Please confirm location for earthpits required for Data Center	At Ground floor near to the Thermal storage Tank area
7	SECTION IV – SCHEDULE OF REQUIREMENT	7 Requirements towards Electrical Work Page no. 37	ATS with overlapping neutral is OEM specific. Request you to omit same from specification for better competition	Overlapped neutral is tender technical requirement.
8	SECTION IV – SCHEDULE OF REQUIREMENT	9 Requirements towards IBMS work Page no. 56	Please confirm if smart card reader with biometric is required for sever room entry only.	Yes
9	SECTION IV – SCHEDULE OF REQUIREMENT	9 Requirements towards IBMS work Page no. 57	Please confirm whether HVAC system shall be only monitored or both monitored & controlled via BMS system	Refer clause no 9.3 page no 59
10	SECTION IV – SCHEDULE OF REQUIREMENT	9 Requirements towards IBMS work Page no. 57	Please confirm new BMS system shall be integrated with new equipment supplied by bidder only.	Yes
11	SECTION IV – SCHEDULE OF REQUIREMENT	9 Requirements towards IBMS work Page no. 57	Please include DG set area under CCTV surveillance.	Refer Corrigendum

12	SECTION IV – SCHEDULE OF REQUIREMENT	9 Requirements towards IBMS work Page no. 57	As per third floor layout total 8 doors are visible in UPS and battery room. Pls confirm smart card reader and camera are required for all the door or only at entry of UPS & battery room	At third floor existing access control to be used where as CCTV is required for UPS room IT as well as NOT IT . Refer clause no 9.5 page no 62
13	SECTION IV – SCHEDULE OF REQUIREMENT	14 DC Acceptance Criteria Page no. 69	Please confirm diesel and load bank required during testing shall be provided by customer or bidder	Refer page no 36 Clause no 7.6 ". First fill of oil and diesel is part of scope of the bidders scope". DG FAT test report will be accepted . Load bank is not tender requirement
14		ANNEXURE D - LIST OF RECOMMENDED MAKES	Please include M/s Jaksan make for DG sets	This should match tender specification requirement
15	ANNEXURE H –	SERVICE LEVEL AGREEMENT (SLA) 3. Uptime Requirements:	As per SLD DG set panel, main LT panel & UPS output are proposed in N configuration but per Annexure H uptime requirement it is mention as N+1. Pls reconfirm	It is in " N "configuration
16		General	Please confirm whether door, partition & ceiling shall be fire rated or non-fire rated. If fire rated is required please confirm no. of minutes/hours fire rating is required	Refer clause no 6.5 page no 24 as "Two hours fire rated double skin steel door ". Refer clause no 6.6 page no 25 as "Fire rated Partition/ Walls: Partition walls within the data centers should have 2-hour fire rated". It is in " N "configuration6.2 Refer clause no 6.2 page no 24 METAL GRID CEILING: The drop ceiling shall be provided with Armstrong Lay "
17	Section II-c.	Copies of at least one purchase orders or contracts completed and successful installation and completion reports in the name of bidder from the end client / end user, during last Five years for Data Centre work, as per para. 3.3 of Section II. Self-declarations will not be entertained. Page 4	Kyndryl Solutions Private Limited is a demerged organization and the PQ for Porject experience is novated from IBM to Kyndryl, Hope it is not an issue	Bidder needs to provide documentary evidence showing their demerge.
18		Clause 3 Project Timeline Page 13	4 Months is very tight schedule we need minimum 16 weeks to complete the project, as most of the OEM products have 12-16 weeks delivery lead time, and further we need handling and installation of these equipments	No change
19		4, Payment Terms Page 13	We request to make 90% payment of the equipment on Delivery and 90% of Installation of the same , remaining 10% shall be given against PBG	NO change
20		13 Risk and OwnershipPage 16	Contractually once goods are delivered , title of ownership gets transferred to the receiving party, we can do the liasning for Insurance in the name of customer please clarify	No change
21		17. C-DAC reserves the right to terminate the contract / cancel order with or without cause/ reason, by giving 90 days' notice to the successful bidder. Page 17	Request to omit this clause, Termination for convenience shall not be part of the contract, termination shall only happen in case of default or bankruptcy of the Client. Also Successful bidder shall get the payment within 30 days in case of termination as per the standard payment terms of CDAC	In case of such type of termination, the amount under undisputed invoice shall be paid at the earliest.
22		8Comprehensive Warranty Page 14	We request bto provide a pass through warranty for OEM products, in the MAF it shall be included that OEM shall be responsible for provding the comprehensive warranty, SI will coordinate and provide PO to them	As per Tender
23		10Penalties page 15	Request to add , delays solely attributed to Bidder	No change
24		14Indemnity Page 16	Indemnification is repsonibility of bidder against third party losses , please remove Point 3 3.Violation of any law/rule/ act, omission/performance/under or none or part performance/failure of the bidder. From this section also request to all infringement sahl be for the supplied products , please remove etc.	No change
25		18Limitation of Liability Page 17	Request to amend the clause " The entire liability of the Bidder / Contractor for all claims arising out of breach of any terms/conditions of the tender / contract/work order and addendums/amendments thereto, misconduct, willful default will not exceed the amount of any actual direct damages incurred by C-DAC up to the amounts paid for the Services (if recurring charges, up to 12 months' charges apply) and will be limited to the total contract value. However, liability of the bidder in case of death/injury/damage caused to the personnel/property due to/arising out of/incidental to any act/omission/default/deficiency of bidder/contractor resulting in such death/injury/damage will be at actual. In no event shall either Party, its officers, directors, or employees be liable for any form of incidental, consequential, indirect, special or punitive, indirect damages, economic consequential damages, or lost profits, business, value, revenue, goodwill, or anticipated savings of any kind. These limitations apply collectively to Bidder, its affiliates, contractors, and suppliers.	No change
26		22Interpretation of the clauses in the GeM Bid Document / Contract Document Page 18	It shall be mutually agreed interpretation, or shall be as per final submission of the bid	As per Tender
27		15Safety Regulations Page 70	Please include "C-DAC shall take necessary steps to enable Bidder to comply with its obligations under the Contract Labour Act, 1971, including issuing of relevant statutory forms to Bidder. " Also amend competent authority certificate in place of Govt Certified agency for the tools and machines to be used during the poroject	As per Tender

Name of the Bidder:- M/s.Schneider Electric

Sr.No	Ref No.	Section / Page/ Clause Reference /Description	Query from bidder	C-DAC Response
1	Page No. 32 - 8.8.6	The cabinet should be designed to fit the air baffles which helps in modularity design. The design should fit 4 (four) symmetrical air baffles that can be changed to LEFT or RIGHT direction and each baffle is assumed technically to be 25% of capacity cooled. During modular designs, each unit can be configured using the air baffle to divide capacities per 25% range.Inrow Cooling	As per Inrow cooling requirement, lateral flow is technically not recommended as it creates more pressure loss and nrow should be free flow to the room and servers shall take the intake as per load pattern/requirement freely. Hence, we request you to reconsider this point of baffles for lateral flow and allow us to propose Inrow units as per our Design	The tender requirement is "Each In Row should throw the cold air in room void, room void needs to be pressurized, pressured air will get sucked in the server by pressure difference and suction created by server fan. " OEM design will be accepted for baffle design, rest will be as per tender technical requirement, terms, and conditions.
2	General	Inrow Cooling	Which is the BMS protocol to be considered? RS485 or IP based?	This is a lumpsum turnkey tender. Bidder to decide the communication protocol.
3	General	Inrow Cooling	we shall be proposing 2 way modulating valve and request you to approve the same.	Refer Page no 46 as per clause no 8.8.4
4	13	7 Requirements towards Electrical WorkDETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	Request to amend Transient output voltage variation got 100% black loading as +/-5%	Refer Corrigendum
5	13	7 Requirements towards Electrical WorkDETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	Request to amend recovery time for 100% block load <50 msec	Refer Corrigendum
6	13	7 Requirements towards Electrical WorkDETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	Request to amend Total Voltage distortion output side <5% for non-linear load	Refer Corrigendum
7	13	7 Requirements towards Electrical WorkDETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	Request to amend phase displacement for Balanced Load as 120+/- 1 Deg and 100% unbalanced load as 120 +/- 3 Deg	Refer Corrigendum
8	15	7 Requirements towards Electrical WorkDETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	Amend the acoustic noise as <70 dB as per ISO 3746	As per tender
9	16	7 Requirements towards Electrical WorkDETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	Request to amend the event logs as 1500 Events	Refer Corrigendum

10	17	7 Requirements towards Electrical Work DETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	Request to include LMO-NMC Chemistry for LIB Batteries	As per Tender
11		7 Requirements towards Electrical Work DETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	General Query - Kindly Specify the warranty on UPS and batteries	Refer Corrigendum
12		7 Requirements towards Electrical Work DETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	General Query - Kindly include very important standard compliance of UL RP 2986 for UPS and UL 9540A for LIB Batteries	As per Tender
13	Page no. 2. Point 2	RackRack	Kindly confirm Storage Rack Dimensions	Refer DC layout drawing
14	Page no. 2. Point 2	RackRack	Kindly confirm Storage Rack Airflow pattern	Refer DC layout drawing
15	2/Page 1/63	CDU	Request you to let us know about the pressure drop across the CDU in primary loop (dry cooler water circulation circuit)	Maximum pressure drop will be 22 psi
16	2/Page 1/63	CDU	Request you to let us know the power consumption of the CDU unit.	7.5 KW Maximum
17	2/Page 2/63	CDU BMS Monitoring	Pls let us know the BMS protocol for the CDU which needs to be monitored thru BMS.	Modbus RTU (RS485) and TCP/IP protocols
18	6.17/Page 8/63	Removal of existing HVAC equipments	While removing the HVAC equipments and piping, pls clarify the responsibility for draining of water in the system / refilling of the water and recommissioning of the HVAC system.	The scope is tapping from the existing system. The valve will be shut, and some quantity of water will get drained. Filling in the existing system will be done by IIT, whereas after tapping entire scope is with Bidder. For removing the equipment, the valve needs to be shut off. Water drainage, flushing, and refilling will be required along with removing airlocks at various spots. On duty, HVAC operators will be available for necessary support.
19	6.17/Page 8/63	Removal of existing HVAC equipments	In case HVAC system shut down is required (during removal of AHU & Piping), request you to arrange for the same.	Yes, IIT Bombay will arrange with proper planning and approval.
20		Removal of existing equipments / pipes/ducts	Kindly clarify the place at which dismantled equipments to be relocated. (how much distance from the server building)	At a dump yard inside the campus (about a kilometre away)
21		Cooling equipments for UPS room	To clarify the scope and type of cooling equipments for both UPS rooms	Existing cooling will be used
22		ADC Design parameters	To clarify the ADC design parameters for inlet / outlet water temperature. Should we consider 32 deg C as Leaving water set point and 42 deg C as return water temperature ?	As per P & ID drawing
23	8.14	Pump specification	Request you to allow for IE3 and above for pumps since IE5 delivery period is longer	Refer Corrigendum
24		Pump specification	Request you to allow stainless steel impeller along with bronze impeller.	As per Tender
25	8.16	Working pressure	To Clarify whether to design the system for PN 10 or PN16 basis?	PN10
26		General IBMS	Request you to clarify regarding whether bidders need to consider any furniture and cooling arrangement for BMS ? If yes, pls provide details of the same.	Furniture is not required. But all the necessary accessories to install and commissioning of the equipment to be delivered
27	Section 7 / Page 9 of 63	7 Requirements towards Electrical Work	Transformer rating is 2500 KVA, 22 KV/433 V Dry type, Is supply of transformer is part of this tender. Transformer indicated under electrical works, but in BOQ transformer is not part of his tender, So need clarity.	HT Breaker , HT Cable , Transformer ,LT panel after transformer is not part of this tender scope, as per provided Electrical SLD
28	Section 7 / Page 23 of 63	7.12 Stainless steel (SS) cable tray to be considered above each row of the Rack.. Cable tray Grid above the rack to be provided and cable tray should be in SS. Rack Interconnecting cables mostly will be fibre, Bidder to take care utmost care as 90 Deg C bend will not be accepted.	Kindly confirm required cable tray size & no of parallel runs of SS Cable tray for Racks.	Refer Drawing DC layout Raceway
29	Section 7 / Page 24 of 63	Existing DG set of rating 1 X 320 KVA DG set is with AMF panel . The outgoing cables 2 X 300 Sq mm A2XFY needs to be removed from AMF panel and to be connected to the feeder as defined in Electrical SLD drawing . Bidder	Kindly confirm the existing cable length can be sufficient to terminate to the new panel, suppose the length is not sufficient the new cables need to be consider or Jointing is allowed or can we provide a busbar panel.	Cable will be sufficient , In case some short fall cable jointing will be allowed, additional cable will be part of tender scope .
30	SLD		Kindly confirm as per SLD HT PANEL , HT CABLE , TERMINATION ,TRANSFORMER AND LT PANEL AFTER TRANSFORMER IS IN SCOPE OF IIT MUMBAI- NOT PART OF SCOPE OF THIS TENDER.	Not Part of scope of this tender
31	SLD		There are 4 nos of feeders are shown in the LT panel, kindly confirm these feeders cables & termination's are not part of this tender.	Only the Supply, installation, termination, and commissioning of new cables for the Feeder of 2000 Amps from the LT panel to the DC LT panel is part of the scope. The location of the transformer and this LT panel is in the transformer room on the ground floor.
32	UPS	General	Offered model msut have installation base of 500units along with LIB, documentary proof need to be submitted along with bid must be signed by Director or VP of the organisation.	As per Tender
33	UPS	General	Offered model msut have installation base of 500units along with LIB, documentary proof need to be submitted along with bid must be signed by Director or VP of the organisation.	As per Tender
34	Limitation of Liability	The liability of the Bidder / Contractor arising out of breach of	Kindly cap the same with 100% value of the proejct cost.	No change
35	UPS	Battery Back up calculation for 500kVA	Kindly confirm it should be calculated on EOL.	Refer Corrigendum
36	UPS	System AC-AC efficiency Online Double Conversion	Kindly include ≥96 at 20% loading and ≥97% from 50% to 100% loading along with PF Correction to Unity at Input & Harmonic Correction (THDI) to < 5% at Input	As per tender specifications
37	UPS	Static Bypass Mode of Operation along with Battery Charging	Kindly include ≥98.5% from 50% to 100% loading along with PF Correction to Unity at Input & Harmonic Correction (THDI) to < 5% at Input and simultaneously Battery Charging also. In case Vendor does not comply; additional Harmonic Filters and Power Factor Improvement Unit shall be provided at UPS Bypass Circuit. It shall be a standardized solution. UPS vendor to submit UL Certification for the same	As per tender specifications
38	UPS	Phase Correction/Corrector required (Inbuilt or External)	Kindly include this features	As per tender specifications
39	UPS	Energy Meter for displaying kWh consumption (Inbuilt / External)	Kindly include this features	As per tender specifications
40	UPS	UPS shall be capable to test at 100% Load without the need of any external load bank. In case this feature in not built-in, a external fully rated load bank of UPS capacity along with breakers and cables shall be considered which will be kept at site till the commissioning /Handover of the UPS.	Kindly accept this point	As per tender specifications
41	General	Kindly share the schedule for Site visit	For measurement of the cable & Pipes, Loading and unloading	Visit Carried out as per schedule and communication
<b>Name of the Bidder:- M/s.GRID2CHIP</b>				
<b>Sr.No</b>	<b>Ref No.</b>	<b>Section / Page/ Clause Reference /Description</b>	<b>Query from bidder</b>	<b>C-DAC Response</b>
1	Page No. 32 - 8.8.6	The cabinet should be designed to fit the air baffles which helps in modularity design. The design should fit 4 (four) symmetrical air baffles that can be changed to LEFT or RIGHT direction and each baffle is assumed technically to be 25% of capacity cooled. During modular designs, each unit can be configured using the air baffle to divide capacities per 25% range.Inrow Cooling	As per Inrow cooling requirement, lateral flow is technically not recommended as it creates more pressure loss and Inrow should be free flow to the room and servers shall take the intake as per load pattern/requirement freely. Hence, we request you to reconsider this point of baffles for lateral flow and allow us to propose Inrow units as per our Design	The tender requirement is "Each In Row should throw the cold air in room void, room void needs to be pressurized, pressured air will get sucked in the server by pressure difference and suction created by server fan. " OEM design will be accepted for baffle design, rest will be as per tender technical requirement, terms, and conditions.

2	General	Inrow Cooling	Which is the BMS protocol to be considered? RS485 or IP based?	This is a lumpsum turnkey tender. Bidder to decide the communication protocol.
3	General	Inrow Cooling	we shall be proposing 2 way modulating valve and request you to approve the same.	Refer Page no 46 as per clause no 8.8.4
4	13	7 Requirements towards Electrical Work DETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	Request to amend Transient output voltage variation got 100% black loading as +/-5%	Refer Corrigendum
5	13	7 Requirements towards Electrical Work DETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	Request to amend recovery time for 100% block load <50 msec	Refer Corrigendum
6	13	7 Requirements towards Electrical Work DETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	Request to amend Total Voltage distortion output side <5% for non-linear load	Refer Corrigendum
7	13	7 Requirements towards Electrical Work DETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	Request to amend phase displacement for Balanced Load as 120+/- 1 Deg and 100% unbalanced load as 120 +/- 3 Deg	Refer Corrigendum
8	15	7 Requirements towards Electrical Work DETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	Amend the acoustic noise as <70 dB as per ISO 3746	As per Tender
9	16	7 Requirements towards Electrical Work DETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	Request to amend the event logs as 1500 Events	Refer Corrigendum
10	17	7 Requirements towards Electrical Work DETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	Request to include LMO-NMC Chemistry for LIB Batteries	As per tender
11		7 Requirements towards Electrical Work DETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	General Query - Kindly Specify the warranty on UPS and batteries	Refer Corrigendum
12		7 Requirements towards Electrical Work DETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	General Query - Kindly include very important standard compliance of UL RP 2986 for UPS and UL 9540A for LIB Batteries	As per Tender
13	Page no. 2. Point 2	RackRack	Kindly confirm Storage Rack Dimensions	These are not part of scope of this tender , Refer DC layout drawing
14	Page no. 2. Point 2	RackRack	Kindly confirm Storage Rack Airflow pattern	Refer DC layout drawing
15	2/Page 1/63	CDU	Request you to let us know about the pressure drop across the CDU in primary loop (dry coler water circulation circuit)	Maximum pressure drop will be 22 psi
16	2/Page 1/63	CDU	Request you to let us know the power consumption of the CDU unit.	7.5 KW Maximum
17	2/Page 2/63	CDU BMS Monitoring	Pls let us know the BMS protocol for the CDU which needs to be monitored thru BMS.	Modbus RTU (RS485) and TCP/IP protocols
18	6.17/Page 8/63	Removal of existing HVAC equipments	While removing the HVAC equipments and piping, pls clarify the responsibility for draining of water in the system / refilling of the water and recommissioning of the HVAC system.	The scope is tapping from the existing system. The valve will be shut, and some quantity of water will get drained. Filling in the existing system will be done by IIT, whereas after tapping entire scope is with Bidder. For removing the equipment, the valve needs to be shut off. Water drainage, flushing, and refilling will be required along with removing airlocks at various spots. On duty, HVAC operators will be available for necessary support.
19	6.17/Page 8/63	Removal of existing HVAC equipments	In case HVAC system shut down is required (during removal of AHU & Piping), request you to arrange for the same.	Yes, IIT Bombay will arrange with proper planning and approval.
20		Removal of existing equipments / pipes/ducts	Kindly clarify the place at which dismantled equipments to be relocated. (how much distance from the server building)	At a dump yard inside the campus (about a kilometre away)
21		Cooling equipments for UPS room	To clarify the scope and type of cooling equipments for both UPS rooms	Existing cooling will be used
22		ADC Design parameters	To clarify the ADC design parameters for inlet / outlet water temperature. Should we consider 32 deg C as Leaving water set point and 42 deg C as return water temperature ?	As per P & ID drawing
23	8.14	Pump specification	Request you to allow for IE3 and above for pumps since IE5 delivery period is longer	Refer Corrigendum
24		Pump specification	Request you to allow stainless steel impeller along with bronze impeller.	As per Tender
25	8.16	Working pressure	To Clarify whether to design the system for PN 10 or PN16 basis?	PN10
26		General IBMS	Request you to clarify regarding whether bidders need to consider any furniture and cooling arrangement for BMS ? If yes, pls provide details of the same.	Furniture is not required. But all the necessary accessories to install and commissioning of the equipment to be delivered
27	Section 7 / Page 9 of 63	7 Requirements towards Electrical Work	Transformer rating is 2500 KVA, 22 KV/433 V Dry type, Is supply of transformer is part of this tender. Transformer indicated under electrical works, but in BOQ transformer is not part of his tender, So need clarity.	HT Breaker , HT Cable , Transformer ,LT panel after transformer is not part of this tender scope, as per provided Electrical SLD
28	Section 7 / Page 23 of 63	7.12 Stainless steel (SS) cable tray to be considered above each row of the Rack.. Cable tray Grid above the rack to be provided and cable tray should be in SS. Rack Interconnecting cables mostly will be fibre, Bidder to take care utmost care as 90 Deg C bend will not be accepted.	Kindly confirm required cable tray size & no of parallel runs of SS Cable tray for Racks.	Refer Drawing DC layout Raceway
29	Section 7 / Page 24 of 63	Existing DG set of rating 1 X 320 KVA DG set is with AMF panel . The outgoing cables 2 X 300 Sq mm A2XFY needs to be removed from AMF panel and to be connected to the feeder as defined in Electrical SLD drawing . Bidder	Kindly confirm the existing cable length can be sufficient to terminate to the new panel, suppose the length is not sufficient the new cables need to be consider or Jointing is allowed or can we provide a busbar panel.	Cable will be sufficient , Incase some short fall cable jointing will be allowed, additional cable will be part of tender scope .
30	SLD		Kindly confirm as per SLD HT PANEL , HT CABLE , TERMINATION ,TRANSFORMER AND LT PANEL AFTER TRANSFORMER IS IN SCOPE OF IIT MUMBAI- NOT PART OF SCOPE OF THIS TENDER.	Not Part of scope of this tender
31	SLD		There are 4 nos of feeders are shown in the LT panel, kindly confirm these feeders cables & termination's are not part of this tender.	Only the Supply, installation, termination, and commissioning of new cables for the Feeder of 2000 Amps from the LT panel to the DC LT panel is part of the scope. The location of the transformer and this LT panel is in the transformer room on the ground floor.
32	UPS	General	Offered model msut have installation base of 1000units along with LIB, documentary proof need to be submitted along with bid must be signed by Director or VP of the organisation.	As per Tender
33	UPS	General	LIB should comply NFPA 70E clause	As per Tender
34	Limitation of Liability	The liability of the Bidder / Contractor arising out of breach of	Kindly cap the same with 125% value of the proeject cost.	No change
35	UPS	Battery Back up calculation for 500kVA	Kindly confirm it should be calculated on EOL.	Refer Corrigendum
36	UPS	System AC-AC efficiency Online Double Conversion	Kindly include ≥96 at 20% loading and ≥97% from 50% to 100% loading along with PF Correction to Unity at Input & Harmonic Correction (THDI) to < 5% at Input	As per tender specifications
37	UPS	Static Bypass Mode of Operation along with Battery Charging	Kindly include ≥98.5% from 50% to 100% loading along with PF Correction to Unity at Input & Harmonic Correction (THDI) to < 5% at Input and simultaneously Battery Charging also. In case Vendor does not comply; additional Harmonic Filters and Power Factor Improvement Unit shall be provided at UPS Bypass Circuit. It shall be a standardized solution. UPS vendor to submit UL Certification for the same	As per tender specifications
38	UPS	Phase Correction/Corrector required (Inbuilt or External)	Kindly include this features	As per tender specifications
39	UPS	Energy Meter for displaying kWh consumption (Inbuilt / External)	Kindly include this features	As per tender specifications

40	UPS	UPS shall be capable to test at 100% Load without the need of any external load bank. In case this feature is not built-in, an external fully rated load bank of UPS capacity along with breakers and cables shall be considered which will be kept at site till the commissioning /Handover of the UPS.	Kindly accept this point	As per tender specifications
41	General	Kindly share the schedule for Site visit	For measurement of the cable & Pipes, Loading and unloading	Visit Carried out as per schedule and communication
<b>Name of the Bidder:- Nikom Infrasoftware Pvt. Ltd.</b>				
Sr.No	Ref No.	Section / Page/ Clause Reference /Description	Query from bidder	C-DAC Response
1	Page No. 32 - 8.8.6	The cabinet should be designed to fit the air baffles which helps in modularity design. The design should fit 4 (four) symmetrical air baffles that can be changed to LEFT or RIGHT direction and each baffle is assumed technically to be 25% of capacity cooled. During modular designs, each unit can be configured using the air baffle to divide capacities per 25% range. Inrow Cooling	As per Inrow cooling requirement, lateral flow is technically not recommended as it creates more pressure loss and Inrow should be free flow to the room and servers shall take the intake as per load pattern/requirement freely. Hence, we request you to reconsider this point of baffles for lateral flow and allow us to propose Inrow units as per our Design	The tender requirement is "Each In Row should throw the cold air in room void, room void needs to be pressurized, pressurized air will get sucked in the server by pressure difference and suction created by server fan." OEM design will be accepted for baffle design, rest will be as per tender technical requirement, terms, and conditions.
2	General	Inrow Cooling	Which is the BMS protocol to be considered? RS485 or IP based?	This is a lumpsum turnkey tender. Bidder to decide the communication protocol.
3	General	Inrow Cooling	we shall be proposing 2 way modulating valve and request you to approve the same.	Refer Page no 46 as per clause no 8.8.4
4	13	7 Requirements towards Electrical Work DETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	Request to amend Transient output voltage variation got 100% black loading as +/-5%	Refer Corrigendum
5	13	7 Requirements towards Electrical Work DETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	Request to amend recovery time for 100% block load <50 msec	Refer Corrigendum
6	13	7 Requirements towards Electrical Work DETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	Request to amend Total Voltage distortion output side <5% for non-linear load	Refer Corrigendum
7	13	7 Requirements towards Electrical Work DETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	Request to amend phase displacement for Balanced Load as 120+/- 1 Deg and 100% unbalanced load as 120 +/- 3 Deg	Refer Corrigendum
8	15	7 Requirements towards Electrical Work DETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	Amend the acoustic noise as <70 dB as per ISO 3746	As per Tender
9	16	7 Requirements towards Electrical Work DETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	Request to amend the event logs as 1500 Events	Refer Corrigendum
10	17	7 Requirements towards Electrical Work DETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	Request to include LMO-NMC Chemistry for LIB Batteries	As per tender
11		7 Requirements towards Electrical Work DETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	General Query - Kindly Specify the warranty on UPS and batteries	Refer Corrigendum
12		7 Requirements towards Electrical Work DETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	General Query - Kindly include very important standard compliance of UL RP 2986 for UPS and UL 9540A for LIB Batteries	As per Tender
13	Page no. 2. Point 2	RackRack	Kindly confirm Storage Rack Dimensions	These are not part of scope of this tender, Refer DC layout drawing
14	Page no. 2. Point 2	RackRack	Kindly confirm Storage Rack Airflow pattern	Refer DC layout drawing
15	2/Page 1/63	CDU	Request you to let us know about the pressure drop across the CDU in primary loop (dry cooler water circulation circuit)	Refer Corrigendum
16	2/Page 1/63	CDU	Request you to let us know the power consumption of the CDU unit.	Refer Corrigendum
17	2/Page 2/63	CDU BMS Monitoring	Pls let us know the BMS protocol for the CDU which needs to be monitored thru BMS.	Modbus RTU (RS485) and TCP/IP protocols
18	6.17/Page 8/63	Removal of existing HVAC equipments	While removing the HVAC equipments and piping, pls clarify the responsibility for draining of water in the system / refilling of the water and recommissioning of the HVAC system.	The scope is tapping from the existing system. The valve will be shut, and some quantity of water will get drained. Filling in the existing system will be done by IIT, whereas after tapping entire scope is with Bidder. For removing the equipment, the valve needs to be shut off. Water drainage, flushing, and refilling will be required along with removing airlocks at various spots. On duty, HVAC operators will be available for necessary support.
19	6.17/Page 8/63	Removal of existing HVAC equipments	In case HVAC system shut down is required (during removal of AHU & Piping), request you to arrange for the same.	Yes, IIT Bombay will arrange with proper planning and approval.
20		Removal of existing equipments / pipes/ducts	Kindly clarify the place at which dismantled equipments to be relocated. (how much distance from the server building)	At a dump yard inside the campus (about a kilometre away)
21		Cooling equipments for UPS room	To clarify the scope and type of cooling equipments for both UPS rooms	Existing cooling will be used
22		ADC Design parameters	To clarify the ADC design parameters for inlet / outlet water temperature. Should we consider 32 deg C as Leaving water set point and 42 deg C as return water temperature ?	As per P & ID drawing
23	8.14	Pump specification	Request you to allow for IE3 and above for pumps since IE5 delivery period is longer	Refer Corrigendum
24		Pump specification	Request you to allow stainless steel impeller along with bronze impeller.	As per Tender
25	8.16	Working pressure	To Clarify whether to design the system for PN 10 or PN16 basis?	PN10
26		General IBMS	Request you to clarify regarding whether bidders need to consider any furniture and cooling arrangement for BMS ? If yes, pls provide details of the same.	Furniture is not required. But all the necessary accessories to install and commissioning of the equipment to be delivered
27	Section 7 / Page 9 of 63	7 Requirements towards Electrical Work	Transformer rating is 2500 KVA, 22 KV/433 V Dry type, Is supply of transformer is part of this tender. Transformer indicated under electrical works, but in BOQ transformer is not part of his tender, So need clarity.	HT Breaker, HT Cable, Transformer, LT panel after transformer is not part of this tender scope, as per provided Electrical SLD
28	Section 7 / Page 23 of 63	7.12 Stainless steel (SS) cable tray to be considered above each row of the Rack. Cable tray Grid above the rack to be provided and cable tray should be in SS. Rack Interconnecting cables mostly will be fibre, Bidder to take care utmost care as 90 Deg C bend will not be accepted.	Kindly confirm required cable tray size & no of parallel runs of SS Cable tray for Racks.	Refer Drawing DC layout Raceway
29	Section 7 / Page 24 of 63	Existing DG set of rating 1 X 320 KVA DG set is with AMF panel. The outgoing cables 2 X 300 Sq mm A2XFY needs to be removed from AMF panel and to be connected to the feeder as defined in Electrical SLD drawing. Bidder	Kindly confirm the existing cable length can be sufficient to terminate to the new panel, suppose the length is not sufficient the new cables need to be consider or Jointing is allowed or can we provide a busbar panel.	Cable will be sufficient, In case some short fall cable jointing will be allowed, additional cable will be part of tender scope.
30	SLD		Kindly confirm as per SLD HT PANEL, HT CABLE, TERMINATION, TRANSFORMER AND LT PANEL AFTER TRANSFORMER IS IN SCOPE OF IIT MUMBAI- NOT PART OF SCOPE OF THIS TENDER.	Not Part of scope of this tender
31	SLD		There are 4 nos of feeders are shown in the LT panel, kindly confirm these feeders cables & termination's are not part of this tender.	Only the Supply, installation, termination, and commissioning of new cables for the Feeder of 2000 Amps from the LT panel to the DC LT panel is part of the scope. The location of the transformer and this LT panel is in the transformer room on the ground floor.
32	UPS	General	Offered model must have installation base of 1000 units along with LIB, documentary proof need to be submitted along with bid must be signed by Director or VP of the organisation.	As per Tender

33	UPS	General	LIB should comply NFPA 70E clause	As per Tender
34	Limitation of Liability	The liability of the Bidder / Contractor arising out of breach of	Kindly cap the same with 125% value of the proejct cost.	No change
35	UPS	Battery Back up calculation for 500kVA	Kindly confirm it should be calculated on EOL.	Refer Corrigendum
36	UPS	System AC-AC efficiency Online Double Conversion	Kindly include ≥96 at 20% loading and ≥97% from 50% to 100% loading along with PF Correction to Unity at Input & Harmonic Correction (THDI) to < 5% at Input	As per tender specifications
37	UPS	Static Bypass Mode of Operation along with Battery Charging	Kindly include ≥98.5% from 50% to 100% loading along with PF Correction to Unity at Input & Harmonic Correction (THDI) to < 5% at Input and simultaneously Battery Charging also. In case Vendor does not comply; additional Harmonic Filters and Power Factor Improvement Unit shall be provided at UPS Bypass Circuit. It shall be a standardized solution. UPS vendor to submit UL Certification for the same	As per tender specifications
38	UPS	Phase Correction/Corrector required (Inbuilt or External)	Kindly include this features	As per tender specifications
39	UPS	Energy Meter for displaying kWh consumption (Inbuilt / External)	Kindly include this features	As per tender specifications
40	UPS	UPS shall be capable to test at 100% Load without the need of any external load bank. In case this feature is not built-in, a external fully rated load bank of UPS capacity along with breakers and cables shall be considered which will be kept at site till the commissioning /Handover of the UPS.	Kindly accept this point	As per tender specifications
41	General	Kindly share the schedule for Site visit	For measurement of the cable & Pipes, Loading and unloading	Allowed and schedule also communicated
42	Sec. II/ Page 7/	Clause 3.4	This clause states that "The bidder should have undertaken/ completed the activities of providing on-site support and facility management / O & M services to at least one data centre. The scope of the activity should cover operation and maintenance of Electrical Systems, Cooling systems (Chillers, PAC/PAHU /In ROW/RDHX etc.) UPS and Battery, IBMS etc. Bidder to provide the documentary evidence that minimum three technical manpower had deployed at site and maintaining electrical system and cooling system. Such Data center having minimum cooling capacity of 100 Tons."  Please change this clause to "The bidder should have undertaken/ completed the activities of providing on-site support and facility management / O & M services to at least one data centre. The scope of the activity should cover operation and maintenance of Electrical Systems, Cooling systems (Chillers/Adiabatic Dry Cooler, PAC/PAHU /In ROW/RDHX etc.) UPS and Battery, IBMS etc. Bidder to provide the documentary evidence that minimum three technical manpower had deployed at site and maintaining electrical system and cooling system. Such Data center having minimum cooling capacity of 100 Tons". Note :- Project requirement is also Adiabatic Dry cooler only	As per tender requirements
43	Sec. IV/ Page 25/	Clause 7.2	This clause states that "Transformer rating is 2500 KVA, 22 KV/433 V Dry type. For selecting the source fault level bidder to consider value of transient reactance (Xd') as per IS -1180 for transformer rating."  Transformer is not mentioned in indicative Design Schematic, so please confirmed if the supply of transformer is in the scope of the bidder.	Not in the scope of this tender
44	1.1	eligibility clause 3.5	in GeM bidding turnover asked in 19.50 cr where as in ATC it is asked 19.0cr. Pl confirm which one to consider.	Please read it as 19 Cr
2	General	General	Drawings and Layouts are not given in the RFP document / portal. Please provide the layout drawings, SLD etc.	Pl. ask on mmg@cdac.in or download from <a href="https://bighome.iitb.ac.in/index.php/s/ZW3nagbQkyFA95b">https://bighome.iitb.ac.in/index.php/s/ZW3nagbQkyFA95b</a>
<b>Name of the Bidder:- M/s.Micropoint Computers Pvt Ltd</b>				
<b>Sr.No</b>	<b>Ref No.</b>	<b>Section / Page/ Clause Reference /Description</b>	<b>Query from bidder</b>	<b>C-DAC Response</b>
1		Prequalification or experience of order	MSME certification should be consider to give chance to all vendors	CDAC Purchase
2	Page No. 32 - 8.8.6	The cabinet should be designed to fit the air baffles which helps in modularity design. The design should fit 4 (four) symmetrical air baffles that can be changed to LEFT or RIGHT direction and each baffle is assumed technically to be 25% of capacity cooled. During modular designs, each unit can be configured using the air baffle to divide capacities per 25% range.Inrow Cooling	Confising point in technically not full , Please allow us to work as per OEM recommandadtions	The tender requirement is "Each In Row should throw the cold air in room void, room void needs to be pressurized, pressured air will get sucked in the server by pressure difference and suction created by server fan. " OEM design will be accepted for baffle design, rest will be as per tender technical requirement, terms, and conditions.
3	General	Inrow Cooling	Which is the BMS protocol to be considered?	This is a lumpsum turnkey tender. Bidder to decide the communication protocol.
4	General	Inrow Cooling	we shall be proposing 2 way modulating valve and request you to approve the same.	Refer Page no 46 as per clause no 8.8.4
5	13	7 Requirements towards Electrical WorkDETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	Request to amend Transient output voltage variation got 100% black loading as +/-5%	Refer Corrigendum
6	13	7 Requirements towards Electrical WorkDETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	Request to amend recovery time for 100% block load <50 msec	Refer Corrigendum
7	15	7 Requirements towards Electrical WorkDETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	Amend the acoustic noise as <70 dB as per ISO 3746	As per Tender
8	16	7 Requirements towards Electrical WorkDETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	Request to amend the event logs as 1500 Events	Refer Corrigendum
9	17	7 Requirements towards Electrical WorkDETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	Request to include LMO-NMC Chemistry for LIB Batteries	As per Tender
10	17	7 Requirements towards Electrical WorkDETAILED SCHEDULE OF REQUIREMENT-CATALOG (I.I.T.-BOMBAY, POWAI, MUMBAI)	General Query - Kindly include very important standard compliance of UL RP 2986 for UPS and UL 9540A for LIB Batteries	As Per Tender
11	Page no. 2. Point 2	RackRack	Kindly confirm Storage Rack Airflow pattern	Refer DC layout drawing
12	2/Page 1/63	CDU	Please confirm pressure drop across the CDU in primary loop	Maximum pressure drop will be 22 psi
13	2/Page 1/63	CDU	Request you to let us know the power consumption of the CDU unit.	7.5 KW Maximum
14	2/Page 2/63	CDU BMS Monitoring	Pls let us know the BMS protocol for the CDU which needs to be monitored thru BMS.	Modbus RTU (RS485) and TCP/IP protocols
15	6.17/Page 8/63	Removal of existing HVAC equipments	While removing the HVAC equipments and piping, pls clarify the responsibility for draining of water in the system / refilling of the water and recommissioning of the HVAC system.	The scope is tapping from the existing system. The valve will be shut, and some quantity of water will get drained. Filling in the existing system will be done by IIT, whereas after tapping entire scope is with Bidder. For removing the equipment, the valve needs to be shut off. Water drainage, flushing, and refilling will be required along with removing airlocks at various spots. On duty, HVAC operators will be available for necessary support.

16	6.17/Page 8/63	Removal of existing HVAC equipments	In case HVAC system shut down is required (during removal of AHU & Piping), request you to arrange for the same.	Yes, IIT Bombay will arrange with proper planning and approval.
17		Cooling equipments for UPS room	To clarify the scope and type of cooling equipments for both UPS rooms	Existing cooling will be used
18		ADC Design parameters	To clarify the ADC design parameters for inlet / outlet water temperature. Should we consider 32 deg C as Leaving water set point and 42 deg C as return water temperature ?	As per P & ID drawing
19	8.14	Pump specification	Request you to allow for IE3 and above for pumps since IE5 delivery period is longer	Refer Corrigendum
20		Pump specification	Request you to allow stainless steel impeller along with bronze impeller.	As per tender
21	8.16	Working pressure	To Clarify whether to design the system for PN 10 or PN16 basis?	PN10
22		General IBMS	Request you to clarify regarding whether bidders need to consider any furniture and cooling arrangement for BMS ? If yes, pls provide details of the same.	Furniture is not required. But all the necessary accessories to install and commissioning of the equipment to be delivered
23	Section 7 / Page 9 of 63	7 Requirements towards Electrical Work	Transformer rating is 2500 KVA, 22 KV/433 V Dry type, Is supply of transformer is part of this tender. Transformer indicated under electrical works, but in BOQ transformer is not part of his tender, So need clarity.	HT Breaker , HT Cable , Transformer ,LT panel after transformer is not part of this tender scope, as per provided Electrical SLD
24	Section 7 / Page 23 of 63	7.12 Stainless steel (SS) cable tray to be considered above each row of the Rack.. Cable tray Grid above the rack to be provided and cable tray should be in SS. Rack Interconnecting cables mostly will be fibre, Bidder to take care utmost care as 90 Deg C bend will not be accepted.	Kindly confirm required cable tray size & no of parallel runs of SS Cable tray for Racks.	Refer Drawing DC layout Raceway
25	Section 7 / Page 24 of 63	Existing DG set of rating 1 X 320 KVA DG set is with AMF panel . The outgoing cables 2 X 300 Sq mm A2XFY needs to be removed from AMF panel and to be connected to the feeder as defined in Electrical SLD drawing . Bidder	Kindly confirm the existing cable length can be sufficient to terminate to the new panel, suppose the length is not sufficient the new cables need to be consider or Jointing is allowed or can we provide a busbar panel.	Cable will be sufficient , In case some short fall cable jointing will be allowed, additional cable will be part of tender scope .
26	UPS	General	LIB should comply NFPA 70E clause	As per Tender
27	UPS	Battery Back up calculation for 500kVA	Kindly confirm it should be calculate as per Standard	Yes
28	UPS	System AC-AC efficiency Online Double Conversion	Kindly include ≥96 at 20% loading and ≥97% from 50% to 100% loading along with PF Correction to Unity at Input & Harmonic Correction (THDI) to < 5% at Input	As per Tender
29	UPS	7.3.6 The UPS shall be designed for forced air cooling. Air inlets shall be provided from the front bottom of the UPS enclosure. Air exhaust shall be from the top portion of the unit.	Please explain, is Air exhaust from back is acceptable	As per OEM Design
30	UPS	7.5 Non IT UPS - Existing UPS of capacity 3 X 40 KVA to be used for NON IT Load. Bidder to consider the disconnection, shifting and relocation of these three UPS from same floor but in another room. Refer drawing. Also Bidder to consider new SMF battery for these three UPS. Bidder can use existing battery stand only. DC cabling should be new. Battery backup required will for 10 minutes for individual UPS, bidder to consider at .9 power factor for battery sizing	Make of existing UPS and Batteries	Existing UPS is Vertiv make
31	UPS		How will be the mounting of both UPS and Batteries, is any base frame is required if yes then what will be the height	As per Bidder Design, site requirement and Tender specifications

Name of the Bidder:- M/s.RAHI

Sr.No	Ref No.	Section / Page/ Clause Reference /Description	Query from bidder	C-DAC Response
1	7.3.6	UPS The UPS shall be designed for forced air cooling. Air inlets shall be provided from the front bottom of the UPS enclosure. Air exhaust shall be from the top portion of the unit.	Please explain, is Air exhaust from back is acceptable	As per OEM standard
2	7.5 Non IT UPS - E	UPS existing UPS of capacity 3 X 40 KVA to be used for NON IT Load. Bidder to consider the disconnection, shifting and relocation of these three UPS from same floor but in another room. Refer drawing. Also Bidder to consider new SMF battery for these three UPS. Bidder can use existing battery stand only. DC cabling should be new. Battery backup required will for 10 minutes for individual UPS, bidder to consider at .9 power factor for battery sizing	Make of existing UPS and Batteries, How will be the mounting of both UPS and Batteries, is any base frame is required if yes then what will be the height	Liebert RG -40 KVA , DC bus Voltage 576 V DC ,
3		Li-on batteries	backup time needs to be calculation till end of Life	Refer Corrigendum
4	ANNEXURE D - LIST OF RECOMMENDED MAKES	APPROVAL for MAKLE DEVIATION	Kindly confirm if we can take MAKE DEVIATION considering following makes against approved makes.	
5	ANNEXURE D - LIST OF RECOMMENDED MAKES	Fire Detection Cables Polycab, Excel, LAPP kabel	Varsha/Deepanjan	Tender technical requirement needs to be complied
6	ANNEXURE D - LIST OF RECOMMENDED MAKES	IP Dome/Box/PTZ Cameras BOSCH, Honeywell, Siemens ,Samsung	Honeywell-IMPACT, Hanwha	Tender technical requirement needs to be complied
7	ANNEXURE D - LIST OF RECOMMENDED MAKES	Video Management, Recording Software Pelco, BOSCH, Axis, Indigo Vision, Polixel, Milestone	Honeywell-IMPACT, Hanwha	Tender technical requirement needs to be complied
8	ANNEXURE D - LIST OF RECOMMENDED MAKES	Network Switch Comnet, RuggedCom, Moxa	D-Link	Tender technical requirement needs to be complied
9	ANNEXURE D - LIST OF RECOMMENDED MAKES	CAT 6 Cable AMP, Molex, ,Schneider	D-Link	Tender technical requirement needs to be complied
10	ANNEXURE D - LIST OF RECOMMENDED MAKES	Power Cables Polycab, Excel, LAPP kabel	Varsha/Deepanjan	Tender technical requirement needs to be complied
11	ANNEXURE D - LIST OF RECOMMENDED MAKES	Intelligent Access Controller Siemens, Honeywell, Daccess	Smart I Access Solution	Tender technical requirement needs to be complied
12	ANNEXURE D - LIST OF RECOMMENDED MAKES	Time and Access Management Software Nexwatch, Software House, Siemens, Honeywell, Daccess	Smart I Access Solution	Tender technical requirement needs to be complied
13	ANNEXURE D - LIST OF RECOMMENDED MAKES	Biometric Readers /Proximity Readers Nexwatch, HID, DDS, Siemens, Honeywell, Daccess	Smart I Access Readers	Tender technical requirement needs to be complied
14	ANNEXURE D - LIST OF RECOMMENDED MAKES	Cards Siemens, Honeywell, Daccess	Smart I Access cards	Tender technical requirement needs to be complied
15	ANNEXURE D - LIST OF RECOMMENDED MAKES	BMS System: Main Control System/DDC Controllers Honeywell, Schneider, Siemens, Rockwell	Johnson Controls BMS solution	Tender technical requirement needs to be complied
16	ANNEXURE D - LIST OF RECOMMENDED MAKES	Temperature, Air humidity Sensors, DP Switch, Water Flow meter, Level Switch	Johnson Controls, Dwyer, Omicron, shenitech	Tender technical requirement needs to be complied
17	ANNEXURE D - LIST OF RECOMMENDED MAKES	Water Leak Detection System Tracetek, Liebert, Sontay	C-Systems	Tender technical requirement needs to be complied
18		CHEMICAL DOSING SYSTEM, EXPANSION TANK WITH PRESSURIZATION UNIT	Requesting for Power supply for these pumps not considered in SLD	Bidder to add in the SLD
19	7.6 Diesel Generator Set	DG Set	Please confirm on the DG Set approved make	Tender technical requirement needs to be complied
20		General	Please share CAD file	Pl. ask on mmg@cdac.in or download from <a href="https://bighome.iitb.ac.in/index.php/s/ZW3nagbQkyFA95b">https://bighome.iitb.ac.in/index.php/s/ZW3nagbQkyFA95b</a>
21		General	Requesting to allow us for site visit to take measurements for cable routing and Pipe distance	Allowed and communicated also
22		Earth Pit	Location of earth pit	Near thermal storage tank area.

Name of the Bidder:- M/s.Netwebtechnologies

Sr.No	Ref No.	Section / Page/ Clause Reference /Description	Query from bidder	C-DAC Response
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1	(ATC Document Page No: 6,	Point No: 3.3) it is mentioned that, The bidder must have successfully executed at end client sites at least 1 numbers of data centres in India in last five years. Each of the data centres should be with minimum of UPS feeding power of 500 KVA(excluding redundancy) and minimum feeding cooling load of 150 Tons(excluding redundancy) (UPS and cooling to be considered only for server area) along with Fire- fighting and suppression systems with high end integration of building management system and all the allied works required for successful installation & completion of the Data Centre. This order should be on the name of bidder issued by the end client.	Changes need: Kindly humbly requested to consider for relaxation of removal of the UPS Point- "minimum of UPS feeding power of 500 KVA(excluding redundancy)" to get Max. No. of Bids or else make it OEM / Bidder with minimum of UPS feeding power of 500 KVA(excluding redundancy) and minimum feeding cooling load of 150 Tons(excluding redundancy) (UPS and cooling to be considered only for server area) along with Fire- fighting and suppression systems with high end integration of building management system and all the allied works required for successful installation & completion of the Data Centre.	As per tender
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**Name of the bidder: Riello UPS**

Sr.No	Ref No.	Section / Page/ Clause Reference	Query from bidder	C-DAC Response
1		Air inlets shall be provided from the front bottom of the UPS enclosure. Air exhaust shall be from the top portion of the unit.	Most of the modular UPS have air inlet from Front & AIR exhaust from the back. So please consider this.	As per OEM
2		7.3.2- Each UPS Frame shall be sized for kW =kVA load i.e. Uni	Request you to please approve the Module rating of 67KW to achieve 500kva/kw.	Refer Corrigendum
3		Battery Back up	Please confirm the lithium-ion batteries back up calculation on BOL or EOL.	Refer Corrigendum
4		as per clause 7.3.2. ,linear load harmonics should be 3% & non-linear load harmonics distortion should be less than 5% while it is 2% on linear load as per clause Max. 2% @ 100% linear load .	We need to consider 2% or 3% THDv at UPS output with linear load	3%
5		As per clause 7.3.4, what will be the distance between UPS &	Please provide the distance details	As per site visit and Drawing

**Name of the bidder: M/s. Nirvaa Solutions Private Limited**

Sr.No	Ref No.	Section / Page/ Clause Reference /Description	Query from bidder	C-DAC Response
1	Make list - ANNEXURE D -	LIST OF RECOMMENDED MAKES Page No 81	Being the UPS OEM, Kindly allow "Delta" make in Lithium Ion batteries	Offered proven product should match product safety requirement, tender specifications, terms and conditions.
2	SECTION IV – SCHEDULE OF REQUIREMENT Clause 7.3	Page No 26 Modular UPS for IT load only	Do we need to consider Modular Hot Swappable UPS or Modular construction UPS?	As per tender
3	SECTION IV – SCHEDULE OF REQUIREMENT Clause 7.3.2	Page No 26 Each UPS shall be of modular architecture with Power Unit & removable sub power modules rating from 25 kW to 60 kW achieve highest system protection	In Modular Architecture/Construction UPS, Module rating will not having any significance, as in case of faulty module UPS will work on reduced capacity. Kindly remove sub module 25-60KW rating clause.	As per tender
4	SECTION IV – SCHEDULE OF REQUIREMENT	Clause 7.3.6 Page No 27	Please accept Rear side Hot air discharge	As per OEM
5	SECTION IV – SCHEDULE OF REQUIREMENT Clause 7.3.10 Page No 27	UPS Noise level <70dBA	Kindly allow Noise level <80dBA	As per tender
6	SECTION IV – SCHEDULE OF REQUIREMENT Clause 7.5	Page No 34	Please confirm the make and model of existing 40kVA UPS.	Liebert RG,40 KVA , DC bus voltage 576 V.
7		General	Please share the input/ouput cable details	As per SLD
8		General	Please share the SLD and layout	Pl. ask on mmg@cdac.in or download from <a href="https://bighome.iitb.ac.in/index.php/s/ZW3nagbQkyFA95b">https://bighome.iitb.ac.in/index.php/s/ZW3nagbQkyFA95b</a>
9		General	Please confirm the cable length between UPS & Battery	As per Site visit and provided drawings
10		General	Do we need to consider Load Bank for SAT? Please confirm the cable legth between UPS and Load Bank	Load bank is not required

**Name of the bidder: M/s. Network Techlab India Pvt Limited**

Sr.	Point /Section / Page/ Clause Reference	Description in tender	Query from bidder	CDAC Response
1	Supply air RH8.9 / Pg 36 / Technical data sheet	Supply air RH 55 +/- 5 %	As the chilled water inlet temperature is 10DegC, the supply air RH will be about 65-75%	As per Tender
2	TDS- Evaporator fan8.9 / Pg 36 / Technical data sheet	Evaporator fan with infloor EC fan	The fans will be front discharge type	It is front Discharge
3	TDS- Evaporator fan8.9 / Pg 37 / Technical data sheet	Blower ESP -100Pa	As the inrow units are placed close to racks the air delivery will be free flow, so 100Pa ESP will not be reqd. Request you to pl advice	As per Bidders Design
4	TDS- Evaporator coil8.9 / Pg 35 / Technical data sheet	Dual coil units	The machine will be with single evaporator coil, request you to pl advice	Yes It is single evaporator coil
5	TDS- MICROPROCESSOR CONTROLLER8.9 / Pg 39 / Technical data sheet	Interlock with Damper	For inrow units the interlock damper is not possible, request you to pl advice on the same	Interlock with damper is not required
6	8.8.5 The unit to be equipped with DC fan for all the units.8.8.5 / Pg 32 / Chilled water based In Row Cooling Unit	The unit to be equipped with DC fan for all the units	Request you to pl approve EC fan with the unit.	EC fans will be accepted
7	General		Request for submission extension	Refer Corrigendum

## Tender No - : Tender No: GEM/2023/B/3807669, IIT Bombay

Sr. No	Reference	Tender Description	Corrigendum
<b>A</b>		<b>Tender Schedule</b>	
<b>1</b>	Last date of submission of bids	11-09-2023 15:00:00	21-09-2023 15:00:00
<b>2</b>	Date of opening of Technical bids	11-09-2023 15:30:00	21-09-2023 15:30:00
<b>B</b>		<b>Section IV – Schedule of Requirement</b>	
<b>1</b>	Point No 3 General Requirements:	3.6 Electrical power and water during construction will be provided at one location. Client shall not provide any accommodation for the contractor and his staff including labor.	3.6 Electrical power and water during construction will be provided at one location. <b>Construction power will be on a chargeable basis Bidder needs to consider in the scope Complete enclosed DB panel - 2 nos, with calibrated energy meter with MCB feeders for input as well as for output along with Plug and socket. The location of these DBs will be on the Basement floor and on the Terrace floor. From these DBs power required for construction equipment needs to be tapped through plug and socket arrangement Construction equipment's cable should be always single throughout, with no jointing, and no tapping. Based on the reading of the energy meter and unit rate of electricity - the cost of electrical consumption for construction power will be calculated.</b> Client shall not provide any accommodation for the contractor and his staff including laborers.

2	Drawing	<b>Drawing Name -DC layout section Drawing</b>	<p>At the existing Ceiling level, an astatic-pocket type structure is available in the Server Room. Bidder to consider the room height dimensions as below -</p> <p>Raised floor height -450 mm  Raised floor to False Ceiling - 2600 mm  False ceiling to Bottom of Pocket at ceiling level - 550 mm  Room Clear height will be 3600 mm. Bidder to consider the substructure at height from the floor of 3600 mm by Gypsum board, which means we need to close all pockets in the entire server area considering passage also.  Above false ceiling height available will be 550 mm - 13 mm - In this height bus bar and tap-off boxes are to be planned and installed.  Room vide 2600 mm height is available. The rack height is 2150 mm + SS tray height of 60 mm. So clear height above the rack will be around 380 mm.  Bidder to draw the section and submit with tender.</p>
3	<b>Point no 10 page no 64 of 99</b>	Indicative Design Schematic - Point no 6 - 1 X 16 KL Thermal Storage Tank along with pumping system	Indicative Design Schematic - Point no 6 - <b>1 X 15 KL</b> Thermal Storage Tank along with pumping system
4	<b>Point no 9.5 page no -62 of 99</b>	Supply and Implement Video Surveillance systems -	Supply and Implement Video Surveillance systems - <b>Add DG area also in Video Surveillance System</b> in addition to the maintained area in the tender.
5	<b>Clause no 7.3.11</b>	Bidder to submit GTP for UPS in below format  4.8 Transient output voltage variation for 100% block loading - +/-2%  4.9 Recovery time for 100% block load- < 5 mill second (ms)  4.12 Total Voltage Distortion out put side Non-Linear load < 3 %  4.14 Phase Displacement a) Balanced load- 120 +/- 0.65° b) 100 % Unbalanced load-120 +/- 2°  10.11 Event Log-2500 events mandatory	Bidder to submit GTP for UPS in below format  4.8 Transient output voltage variation for 100% block loading - +/-5 %  4.9 Recovery time for 100% block load- < 50 mill second (ms)  4.12 Total Voltage Distortion out put side Non-Linear load < 5 %  4.14 Phase Displacement a) Balanced load- 120 +/- 1° b) 100 % Unbalanced load-120 +/- 3°  10.11 Event Log- <b>1500</b> events mandatory

6	<b>Clause no 7.4 page no 34 of 99</b>	7.4 Choices of lithium chemistries and cell designs	7.4 Choices of lithium chemistries and cell designs  Additional clause -  <b>7.4.9-Warranty – Manufacturer’s warranty of 5 years (End of Life (EOL) requirement) from date of commissioning. At End of life battery should give a minimum of 9 minutes back up time. Bidders are to submit supporting documentation and calculations along with documentation proof for any one site in India for the same rating per unit of UPS as per tender or more rating per unit.</b>
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<p>7</p>	<p><b>Clause no 7.3.2 page no 27</b></p>	<p>Each UPS Frame shall be sized for kW =kVA load i.e. Unity Output power Factor with no derating at 40 Deg C. Design of UPS should be Insulated-gate bipolar transistor (IGBT) rectifier and 3 level IGBT inverter switching with double conversion as per IEC 62040-3 operating modes. Inverter Switching Frequency shall be ≥18 kHz to keep the noise minimum. Inverter shall be PWM controlled using DSP logic. Analog control shall not be acceptable. Each UPS shall be of modular architecture with Power Unit &amp; removable sub power modules rating from 25 kW to 60 kW achieve highest system protection. Failure of any sub power module in individual UPS Frame shall not lead to entire Frame Capacity down but only the failed sub power module capacity shall go down. i.e. In case of Failure of any one Sub Power module, rest of the available power module in the frame shall continue to operate in normal double conversion mode of operation with reduced capacity. This shall also be applicable to all UPS's operating in parallel configuration.. The UPS shall be housed in a freestanding cabinet with casters and shall contain Input, Output, Static Bypass isolator. Steady state voltage regulations will be within 1% of nominal output voltage, linear load harmonics distortion should be less than 3% and non-liner load harmonics distortion should be less than 5%. UPS should be capable of 100% unbalanced load. Efficiency of UPS should be minimum 95% from 25% to 75% in double conversion mode. Noise generated by UPS under normal steady state condition should not be more than 70 DB as per ISO 7779. UPS should be ROHS complied product. All serviceable components to be from front. UPS display should show the battery status monitoring, UPS mode, Alarm (Audio and visible), Events etc. The UPS communication capability should be able to integrate into any industry standard Building Management System (BMS). Adequate protections for UPS, for rectifier, bypass, battery, battery against overload, short circuit, battery over charging, battery over discharging, transients, surges (as per IEEE 587) etc. needs to be considered as per IEC 62040-1. Built in SNMP card, MODBUS TCP IP, Dry contacts card to be standard feature in UPS. Should comply with UL 1973/ CE/IEC 62619 /UN 38.3 for LITHIUM ION BATTERIES. The UPS shall be have self-regulating and self-protection against Over voltage,</p>	<p>Each UPS Frame shall be sized for kW =kVA load i.e. Unity Output power Factor with no derating at 40 Deg C. Design of UPS should be Insulated-gate bipolar transistor (IGBT) rectifier and 3 level IGBT inverter switching with double conversion as per IEC 62040-3 operating modes. Inverter Switching Frequency shall be ≥18 kHz to keep the noise minimum. Inverter shall be PWM controlled using DSP logic. Analog control shall not be acceptable. Each UPS shall be of modular architecture with Power Unit &amp; removable sub power modules rating from <b>25 kW to 67 kW</b> achieve highest system protection. Failure of any sub power module in individual UPS Frame shall not lead to entire Frame Capacity down but only the failed sub power module capacity shall go down. i.e. In case of Failure of any one Sub Power module, rest of the available power module in the frame shall continue to operate in normal double conversion mode of operation with reduced capacity. This shall also be applicable to all UPS's operating in parallel configuration.. The UPS shall be housed in a freestanding cabinet with casters and shall contain Input, Output, Static Bypass isolator. Steady state voltage regulations will be within 1% of nominal output voltage, linear load harmonics distortion should be less than 3% and non-liner load harmonics distortion should be less than 5%. UPS should be capable of 100% unbalanced load. Efficiency of UPS should be minimum 95% from 25% to 75% in double conversion mode. Noise generated by UPS under normal steady state condition should not be more than 70 DB as per ISO 7779. UPS should be ROHS complied product. All serviceable components to be from front. UPS display should show the battery status monitoring, UPS mode, Alarm (Audio and visible), Events etc. The UPS communication capability should be able to integrate into any industry standard Building Management System (BMS). Adequate protections for UPS, for rectifier, bypass, battery, battery against overload, short circuit, battery over charging, battery over discharging, transients, surges (as per IEEE 587) etc. needs to be considered as per IEC 62040-1. Built in SNMP card, MODBUS TCP IP, Dry contacts card to be standard feature in UPS. Should comply with UL 1973/ CE/IEC 62619 /UN 38.3 for LITHIUM ION BATTERIES. The UPS shall be have self-regulating and self-protection against Over voltage, Powerline surges, Undervoltage and overcurrent induced by the mains, Sudden changes in the output load and short circuits at the output, Transient ,surges, voltage spikes shall be suppressed .Critical Cards within UPS which are directly exposed to air should be conformally</p>
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	<p>Powerline surges, Undervoltage and overcurrent induced by the mains, Sudden changes in the output load and short circuits at the output, Transient ,surges, voltage spikes shall be suppressed .Critical Cards within UPS which are directly exposed to air should be conformally coated to protect the UPS from Moisture and Conductive dust. IP rating of Min IP 20.</p>	<p>coated to protect the UPS from Moisture and Conductive dust. IP rating of Min IP 20.</p>
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<p>8</p>	<p><b>Clause no 8.14 Page no 65</b></p>	<p>Supply, installation, testing &amp; commissioning of Centrifugal Pumps of Mono block type. The pumps shall be vertical in-line design which enables installation in a horizontal one pipe system where the suction and discharge ports are in the same horizontal level and have the same pipe dimensions. The pump, electric motor, coupling and coupling guard shall be factory assembled at the pump manufacturer's facility. Pump shall be fitted with a 3-phase, fan-cooled induction motor. Motor shall include a frequency converter VFD ( PI or PID controller )i either in the motor terminal box or in separate Pump panel. The combined motor and frequency converter efficiency shall be to higher than the IE5 level defined for fixed-speed motors in IEC 60034-30-2. Pump and motor shall be of integrated and user-friendly compact design. Sound pressure level of pumps shall be according to EN ISO 3743. The design total head capacity curve shall preferably be continuously rising towards the shut off. In case of unstable (drooping) characteristic the duty point shall be well away from the unstable region. The shut off head shall be at least 110% of the total head. Pumps shall run smooth without undue noise and vibration. The noise level shall be limited to 70 dBA at a distance of 1M. Vibration shall limited to class II C of BS 4675 Part –I. Pumps of a particular category shall be identical and shall be suitable for parallel operation with equal load division. Components of identical pumps shall be interchangeable. . Flexible bellows at pump inlet and pump outlet as per suction and delivery sizes to be considered. Pump Base shall be a robust construction with integrally-cast support in order to transmit pipe load to the foundation. Liquid passages in the casing shall be smooth finish to ensure high Efficiency. Pump base shall have tapped hole provision for draining. The impeller shall be bronge enclosed type with smooth surface finishes for minimum frictional loss. This ensures high Efficiency. Impeller shall be fixed to the shaft by means of a split cone and a split cone nut/union nut. Shaft shall be with splined design, and shall be adequately sized to with stand all stresses, hydraulic loads, vibrations and torques coming in during operation. Shaft shall be provided with Mechanical seal as default fitment to provide leak free operation. The liquid cavity shall be sealed off at the pump shaft by an internally flushed mechanical seal with Silicon carbide seat and Silicon carbide seal</p>	<p>Supply, installation, testing &amp; commissioning of Centrifugal Pumps of Mono block type. The pumps shall be vertical in-line design which enables installation in a horizontal one pipe system where the suction and discharge ports are in the same horizontal level and have the same pipe dimensions. The pump, electric motor, coupling and coupling guard shall be factory assembled at the pump manufacturer's facility. Pump shall be fitted with a 3-phase, fan-cooled induction motor. Motor shall include a frequency converter VFD ( PI or PID controller )i either in the motor terminal box or in separate Pump panel. The combined motor and frequency converter efficiency shall be to higher than the <b>IE3 level</b> defined for fixed-speed motors in IEC 60034-30-2. Pump and motor shall be of integrated and user-friendly compact design. Sound pressure level of pumps shall be according to EN ISO 3743. The design total head capacity curve shall preferably be continuously rising towards the shut off. In case of unstable (drooping) characteristic the duty point shall be well away from the unstable region. The shut off head shall be at least 110% of the total head. Pumps shall run smooth without undue noise and vibration. The noise level shall be limited to 70 dBA at a distance of 1M. Vibration shall limited to class II C of BS 4675 Part –I. Pumps of a particular category shall be identical and shall be suitable for parallel operation with equal load division. Components of identical pumps shall be interchangeable. . Flexible bellows at pump inlet and pump outlet as per suction and delivery sizes to be considered. Pump Base shall be a robust construction with integrally-cast support in order to transmit pipe load to the foundation. Liquid passages in the casing shall be smooth finish to ensure high Efficiency. Pump base shall have tapped hole provision for draining. The impeller shall be bronge enclosed type with smooth surface finishes for minimum frictional loss. This ensures high Efficiency. Impeller shall be fixed to the shaft by means of a split cone and a split cone nut/union nut. Shaft shall be with splined design, and shall be adequately sized to with stand all stresses, hydraulic loads, vibrations and torques coming in during operation. Shaft shall be provided with Mechanical seal as default fitment to provide leak free operation. The liquid cavity shall be sealed off at the pump shaft by an internally flushed mechanical seal with Silicon carbide seat and Silicon carbide seal</p>
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ring, suitable for continuous operation at 50 Deg C. The mechanical shaft seal shall be cartridge type for maintenance free operation and balanced. Pump base shall be EN-GJL-200 or EN-GJS-500-7 grade Cast Iron according to ASTM 25B or ASTM A536-84 70-50-05 or equivalent standard. Motor shall be suitable for operation on a 3 X 380-500V ( $\pm 10\%$  variation), 50-60Hz  $\pm 5\%$ , 3phase AC supply. Motor with thermal protection against steady overload and stalled condition (IEC 34-11). Bidder may consider an integrated frequency convertor and a PI controller incorporated within the motor terminal box and also inbuild DP sensor and flow mater. Bidder to consider shed above the pump with good astestic look or pump with canopy.

05 or equivalent standard. Motor shall be suitable for operation on a 3 X 380-500V ( $\pm 10\%$  variation), 50-60Hz  $\pm 5\%$ , 3phase AC supply. Motor with thermal protection against steady overload and stalled condition (IEC 34-11). Bidder may consider an integrated frequency convertor and a PI controller incorporated within the motor terminal box and also inbuild DP sensor and flow mater. Bidder to consider shed above the pump with good astestic look or pump with canopy.



**NATIONAL SUPERCOMPUTING MISSION**  
INFRASTRUCTURE | APPLICATIONS | R&D | HRD

## *Centre for Development of Advanced Computing*

A Scientific Society of Ministry of Electronics & Information Technology,

Government of India

Innovation Park, Panchavati, Pashan Road, Pune - 411008

Tel: +91-20-25868086 / 25503673-675

[www.cdac.in](http://www.cdac.in)

**Additional Terms Conditions & detailed scope etc. to be read with GeM bidding Document  
& will be binding on the prospective bidders.**

**GeM Bid No & CDACP/NSM-DC-IIT-MUM/23-24/382**

**CDAC, Pune invites 'ONLINE' bids for Design, Site Preparation, Supply, Installation, Testing, Commissioning, and AMC services of Basic Infrastructure for the establishment of a Data Center at Indian Institute of Technology (IIT) Bombay, Powai, Mumbai**



<b>Name of the Institute:</b>	Centre for Development of Advanced Computing, Pune 411007.
<b>Place of Supply, Installation &amp; Commissioning, Support etc.</b>	Indian Institute of Technology, Main Gate Road, IIT Area, Powai, Mumbai 400076. Contact: Mr. Trirag Chowdhury, <a href="mailto:trirag.chowdhury@iitb.ac.in">trirag.chowdhury@iitb.ac.in</a> , (9220427743).
<b>Site Visit</b>	18 <sup>th</sup> August, 2023 – 1100 hrs to 1300 hrs.
<b>Date &amp; Time of Pre-bid meeting (at site – IIT, Mumbai)</b>	18 <sup>th</sup> August, 2023 – 1400hrs. <b>(At Site, IIT, Mumbai).</b>

**Instruction for Online Bid Submission:**

The bidders are required to submit soft copies of their bids electronically on the GeM Portal. More information useful for submitting online bids on the GeM Portal may be obtained at: [https://Government e Marketplace \(GeM\) | National Public Procurement Portal, Government of India \(gem.gov.in\)](https://Government e Marketplace (GeM) | National Public Procurement Portal, Government of India (gem.gov.in)). For any queries at: [helpdesk-gem\[at\]gov\[dot\]in](mailto:helpdesk-gem[at]gov[dot]in) Toll Free Numbers (Inbound): Call 1800-419-3436 / 1800-102-3436( 9:00 am - 10:00 pm Mon to Sat) Helpdesk Outbound No's :0755-6681401, 0755-6685120, 011-69095625, 011-69095640 Railway Helpline: 011-44022666 Defence Helpline: 0755-6681450 Helpdesk Walk-In Address: 2nd Floor, Jeevan Tara Building, 5-Sansad Marg, Near Patel Chowk, New Delhi-110001. (9:00am-06:00pm Mon to Fri) For Seller related tutorials visit <https://gem.gov.in/training/videos/sellers>.



## SECTION I – INVITATION OF BIDS

### 1 Introduction

This RFP is being floated to select the most appropriate vendor to build & operate the Data Center for a period of two years. The model of the proposed Data Center (DC) should be capable of enhancing capacities by incrementally augmenting the infrastructure. The monitoring of the proposed DC is planned through an Integrated Building Management System (IBMS) and therefore, the equipment's to be installed in the proposed Data Centre should be BMS compliant. As a part of this project, C-DAC invites on-line bids from eligible bidders for supply, installation, commissioning and AMC Services of Data Centre Solutions, as per the requirements stipulated in this document, at the Locations given below:

**Indian Institute of Technology Bombay**  
Powai Mumbai, India

### 2 Contact information

Materials Management Group (MMG)  
Centre for Development of Advanced Computing (C-DAC)  
Innovation Park, Panchavati Pashan Road,  
Pune - 411008, Maharashtra India  
E-mail: [mmg@cdac.in](mailto:mmg@cdac.in)

### 3 Two Bid (e-Packet) System:

The bids must be uploaded on-line through [GeM portal](#), as per GeM portal / policy

#### 3.1 e-Packet No. 1: TECHNICAL BID

##### 3.1.1 Section-I

- a. **Annexure G:** The contents must be organized & submitted as per the Annexure G with proper page nos containing the required information/data etc.
- b. Covering Letter, as per **Annexure – A.**
- c. Authorization letter (on bidder's letterhead) issued by the competent authority of bidder, authorizing the signatory to sign on behalf of the bidder, as per **Annexure – B.**
- d. The Undertaking on bidder's letterhead, towards EMD as per format given in **ANNEXURE-F**

##### 3.1.2 Section-II:

- a. A copy of Certificate of Incorporation, Partnership Deed / Memorandum and Articles of Association / any other equivalent document showing date and place of incorporation, in India as applicable.
- b. A copy of GST registration certificate.



- c. Copies of at least one purchase orders or contracts completed and successful installation and completion reports in the name of bidder from the end client / end user, during last Five years for Data Centre work, as per para. 3.3 of Section II. Self-declarations will not be entertained.
- d. Copy of at least one purchase order from the end client/ end user for data center facility management / O & M activities completed / ongoing as per eligibility para. No 3.3.1 of Section II.
- e. The self-certified copies of audited balance sheets or the certificate/s from a Chartered Accountant for last three financial years indicating the annual sales turnover.
- f. A photo copy of the commercial bid actually submitted **without prices** (prices masked) and copy of commercial terms and conditions (in detail) as included in the commercial bid. C-DAC reserves the right to reject the bid in case of any discrepancy observed in the un-priced commercial bid and the actual commercial bid.
- g. Manufacturer authorization certificate as per **Annexure-C** for DG set, UPS and batteries, LT panels and associated component, Adiabatic Dry Cooler, In Row , BMS Software, Pumps, Gas Suppression System, etc., issued by respective OEMs.
- h. The copy of registration certificate or a declaration in compliance with the provisions stipulated in office memorandum F/No/6/18/2019-PPD dated 23 July 2020 issued by public procurement Division, Dept. of Expenditure, Ministry of Finance, GoI or Latest.
- i. Certificates from respective OEMs, as per format given in **Annexure –I**, declaring the country of OEM, country of manufacture and percentage of local contents for DG set, UPS and batteries, LT panels and associated components, Adiabatic Dry Cooler, In Row Units BMS Software, Pumps, VFD Drives, Gas Suppression System etc.
- j. Self- certificate form the bidder towards compliance with the provisions of order No. P-45021/2/2017-PP (BE-II). Dated 4th June, 2020 issued by Public Procurement Division, Department of Investment and Internal Trade, Ministry of Commerce, GoI or latest.
- k. All the necessary documents in support of eligibility criteria

### 3.1.3 Section-III:

- a. The executive summary of the bid submitted.
- b. Duly filled Technical Bid (covering the details of solution, detailed bill of material, bill of quantities, technical specifications, makes and models of items, diagrams, layouts, all drawings etc.)
- c. The details of electrical power consumption, foot-print, ambient temp, temperature range targeted, cable schedule along with voltage drop calculations, battery sizing and back up calculations etc.
- d. Details of diesel consumption & water consumption on various loading conditions.
- e. Design Basic Report along with annual average Power Usage Effectiveness (PUE) calculations for 25%, 50%, 75% and 100 % of IT load.
- f. Design basis and analysis of cooling solution at full and partial load conditions including complete details, assumptions made and the specific references/standards used for the same. Applicable derations while selecting the dry cooler and bidder to submit selection of the product considering site ambient conditions as per ASHRAE.



- g. Technical Compliance matrix against all details requested as per Para. 9 of Section IV.
- h. The printed catalogue / leaflet/brochures published by the principal manufacturer of the items quoted to be submitted along with the Technical Bid.
- i. Legal / statutory permissions required, if any.

### 3.2 e-Packet 2: FINANCIAL BID

The Financial Bid complete in all respects with all details filled in the 'Name of the Bidder' column with name, designation and contact no. as per BOQ.xls format given in GeM Portal.

**Note:**

All the documents listed in e-packet-1 (Section-I, II & III) must be arranged in the flow / in sequence as mentioned as per **Annexure-G** strictly.

C-DAC reserves the right to reject the bid, if any of the above listed documents are not submitted.

## 4 Pre-Bid Meeting – Date/ Time/ Venue / Online:

The pre-bid meeting will be held **at Site** as given in schedule to sort out/resolve queries raised by the prospective bidders regarding the GeM Bid scope, conditions, terms & conditions etc. The prospective bidders requiring any clarification of the bidding document may send their queries in writing through e-mail in the format given below. C-DAC, Pune will respond to these queries during the pre-bid meeting. The queries/doubt/clarifications etc. must be sent at least one days prior to the date of pre-bid meeting.

Name of the bidder:			
Sr.	Section / Page/ Clause Reference	Query from bidder	C-DAC Response
1			
2			

## 5 Last Date of submission of bids:

Last date for submission of e-bids through [GeM portal](#) shall be as per given in GeM Bid Schedule.

## 6 Opening of on-line e-bids

The technical e-bids will be opened through [GeM portal](#).

## 7 Opening of commercial e-bids:

Commercial e-bids of the qualified bidders only will be opened. The decision of C-DAC's bid evaluation committee in this regard will be final and binding on bidders. C-DAC's bid evaluation committee will be authorised to take appropriate decision on minor deviations, if any.

The date, time and venue of opening of commercial bids will be informed later as per GeM portal/policy to the qualified bidder. The financial bids will be opened 'on-line' through [GeM portal/GeM portal/app](#). The bidder's name, bid prices and other appropriate details will be displayed after the opening of the commercial bids.

**(END OF SECTION I)**



## SECTION II – INSTRUCTIONS TO BIDDERS (ITB)

### 1 Locations for Supply, Installation, Commissioning, Warranty Services & AMC Services

The entire data center solutions as described in Schedule of Requirements must be supplied, installed, commissioned & supported at

Indian Institute of Technology Bombay, Powai, Mumbai - details as per the GeM Bid Schedule.

### 2 Order Placements & Payment by

The orders will be placed and payments shall be released by  
**Centre for Development of Advanced Computing (C-DAC),**  
Innovation Park, Panchavati, Pashan  
Pune 411008, Maharashtra, INDIA

### 3 Eligibility Criteria

Only the bidders complying with following eligibility criteria will qualify for opening of commercial bids and for further processing.

- 3.1 The bidder must submit all the documents listed at para 3 Section – I above, along with the technical bid.
- 3.2 The bidder should be an entity registered in India under appropriate Indian Laws. Certificate for the same should be submitted along with the bid.
- 3.3 The bidder must have successfully executed at end client sites at least 1 numbers of data centres in India in last five years. Each of the data centres should be with minimum of UPS feeding power of 500 KVA(excluding redundancy) and minimum feeding cooling load of 150 Tons(excluding redundancy) (UPS and cooling to be considered only for server area) along with Fire- fighting and suppression systems with high end integration of building management system and all the allied works required for successful installation & completion of the Data Centre. This order should be on the name of bidder issued by the end client.
- 3.4 The bidder should have undertaken/ completed the activities of providing on-site support and facility management / O & M services to at least one data centre. The scope of the activity should cover operation and maintenance of Electrical Systems, Cooling systems (Chillers, PAC/PAHU /In ROW/RDHX etc.) UPS and Battery, IBMS etc. Bidder to provide the documentary evidence that minimum three technical manpower had deployed at site and maintaining electrical system and cooling system. Such Data center having minimum cooling capacity of 100 Tons.
- 3.5 A summary of the projects implemented covering all the details must be enclosed with the Technical Bid.
- 3.6 Bidder should have minimum turnover of Rs. 19.0 Crores for each of the last three financial years.
- 3.7 If the bidder is not a principal manufacturer of Data Centre components, the undertaking/s (in original) from the respective OEMs/principal manufacturers (on the letterhead), as per format given in **Annexure-C** must be submitted for the components such as DG set, UPS and battery, LT panels and associated component, Adiabatic Dry Cooler, In Row , , BMS Software and Pumps ,Gas suppression system etc. (in e-packet – 1- Section-II).



- 3.8 The principal manufacturers/ original equipment manufacturer (OEM) of Data Centre components viz. UPS, In ROws, DG Sets, Adiabatic Dry Cooler should have service center in the respective state of site location. Documentary evidence for the same to be provided.
- 3.9 The bidder must submit all the documents as per Document Checklist – **Annexure-G**, with appropriate page nos for the same. The flow of the submitted documents must be in the same order.
- 3.10 The bidder must not be blacklisted by any Central / State Govt. Organizations of India as on date of submission of the bids. A certificate or undertaking to this effect must be submitted (**Annexure – A**).
- 3.11 The bidder must comply with the provisions of Office Memorandum: F/No/6/18/2019-PPD dated 23rd July, 2020, issued by Public Procurement Division, Department of Expenditure, Ministry of Finance, GoI or latest Notifications
- 3.12 The solution offered must comply with the provisions of Order No P-45021/2/2017-PP (BE-II). Dated 4th June, 2020 issued by Public Procurement Division, Department of Investment and Internal Trade, Ministry of Commerce, GoI, read with order number W-43/4/2019-IPHW- MeitY, dated 7th September, 2020 issued by IPWH division of MeitY, GoI or latest Notifications

Note: The bidder should provide sufficient documentary evidence to support of the eligibility criteria and exemptions mentioned. C-DAC reserves the right to reject any bid not fulfilling the eligibility criteria.

#### 4 Exemptions

If in the view of bidder, any exemption / relaxation is applicable to them from any of the eligibility requirements, under any Rules / process/ Guidelines/ Directives of Government of India, bidder may submit their claim for the applicable exemption /relaxation, quoting the valid Rule/ process/ Guidelines/ Directives. In this case the bidder must submit necessary and sufficient documents along with the technical bid, in support of his claim. The decision about granting the exemption/ relaxation will be taken by the bid evaluation committee which is empowered to grant exemption/relaxation.

#### 5 Local Conditions

It will be incumbent upon each bidder to fully acquaint himself with the local conditions and other relevant factors at the proposed Data Centre site which would have any effect on the performance of the contract and / or the cost. The Bidder is expected to make a site visit to the proposed Data Centre facility to apprise them self and obtain all information that may be necessary for preparing the bid and entering into contract.

Failure to obtain the information necessary for preparing the bid and/or failure to perform activities that may be necessary for the providing services before entering into contract, will in no way relieve the successful bidder from the responsibility of performing any work in accordance with the GeM Bid documents. It will be imperative for each bidder to diligently be informed of all legal conditions and factors which may have any effect on the execution of the contract as described in the bidding documents. C-DAC Pune shall not entertain any request for clarifications from the bidder regarding such conditions. It is the responsibility of the bidder that such factors have properly been investigated and considered while submitting the bid proposals and that no claim whatsoever including those for financial adjustment to the contract awarded under the bidding documents will be entertained by C-DAC Pune and that neither any change in the time schedule of the contract nor any financial adjustments arising thereof shall



be permitted by the C-DAC Pune on account of failure of the bidder to appraise himself of local laws and site conditions or otherwise.

## 6 C-DAC Right to amend / cancel

- 6.1 At any time prior to the deadline for submission of bids, C-DAC may, for any reason, whether on its own initiative or in response to the clarification request by a prospective bidder, modify the bid document.
- 6.2 The amendments to the GeM Bid documents, if any, will be notified by release of Corrigendum Notice on [GeM portal \(as ATC\) / www.cdac.in](#) against this GeM Bid. The amendments/ modifications will be binding on the bidders.
- 6.3 C-DAC at its discretion may extend the deadline for the submission of bids if it thinks necessary to do so or if the bid document undergoes changes during the bidding period, in order to give prospective bidders time to take into consideration the amendments while preparing their bids.
- 6.4 C-DAC reserves the right to cancel the entire RFP without assigning any reasons thereof

## 7 Precautions while preparing the Bids

Bidder should avoid, as far as possible, corrections, overwriting, erasures or postscripts in the bid documents. In case however, any corrections, overwriting, erasures or postscripts have to be made in the bids, they should be supported by dated signatures of the same authorized person signing the bid documents. In case of discrepancies and/ or calculation errors, if any, the lower of the unit prices and/ or amounts shall only be considered for comparison of bids. Only Single technical solution to be submitted.

## 8 Earnest Money Deposit (EMD) – Exemption format attached.

The bidder must submit the undertaking towards Earnest Money Deposit (EMD / bid security), as per format given in **Annexure-F subject** to the conditions stipulated therein

## 9 Period of validity of bids

- 9.1 Bids shall be valid for minimum 180 days from the date of submission. A bid valid for a shorter period shall stand rejected.
- 9.2 C-DAC may ask for the bidder's consent to extend the period of validity. Such request and the response shall be made in writing only. The bidder is free not to accept such request. A bidder agreeing to the request for extension will not be permitted to modify their bid.



## 10 Submission of Bids- Online

The Bid documents shall be neatly arranged and all pages should be numbered. They should not contain any terms and conditions, printed or otherwise, which are not applicable to the Bid. **The conditional bid will be summarily rejected.** Insertions, postscripts, additions and alterations shall not be recognized, unless confirmed by bidder's signature.

## 11 Late Bids

C-DAC shall not be responsible and liable for the delay in receiving the bid for whatsoever reason. C-DAC will not be responsible for any issues arising/pertaining with GeM portal for non-submission, failure in submission of bids, responses to queries etc. on-line. Bidders are advised to submit e-bids, responses to queries (if any) etc. well in advance of the last date and time of submission so the bids. C-DAC will not be responsible for failure in submission/upload of bids for non-working of the on line portal at last day/hours of submissions of bids.

## 12 Evaluation of Bids

The bids will be evaluated in two steps.

- 12.1 The bids will be examined based on eligibility criteria stipulated at para 3, Section – II of this document, to check the eligibility of the bidders. The technical bids of only the eligible bidders will be evaluated based on technical requirements stipulated in the RFP.
- 12.2 Only the bidders, whose technical bid is found to meet the requirements as specified above will qualify for opening of the commercial bid and will be informed about the date and time of the opening of the commercial bid.
- 12.3 The decision of the TEC with respect to complete technical evaluation is final and binding on all the bidders.
- 12.4 During evaluation of the bids C-DAC at its discretion may ask the Bidder for clarification of its Bid. The request for clarification and the response shall be in writing, and no change in the prices is permitted. If required C-DAC may invite the Bidders for technical presentation on the solution offered. During the process of evaluation of bids, if any discrepancies are observed in the bid submitted, the bidders may be given an opportunity to clarify on same. If in the view of bidder, any change in quantity, make or model is required or any additional items are required, for clearing the said discrepancy, the bidder has to arrange for said change and/or addition of material without any increase in the prices quoted.
- 12.5 If the information provided by the bidder is found to be incorrect/misleading at any stage/time during the GeM Bidding Process, C-DAC reserves the right to reject all such incomplete bids.
- 12.6 Only technical bids receiving a score greater than or equal to a cut-off score of 80 marks out of maximum 100 marks will be processed further.

Sr.No	Evaluation Factor Points	
1	Technical Ability	
	Evaluate this factor based on review of the technical proposals.	
	Qualifications based on eligibility criteria as Turn Over, experience in similar project as defined in GeM Bid	5



Sr.No	Evaluation Factor Points	
	Understanding of the project based on Technical documents and drawing. Justify the Strengths that make the bidder is Technically Superior. Bidder has understood objective of the project.	10
	Innovativeness -Any value added solution without changes in the specifications	5
	Proposed Project Plan Quality and methodology should be in line with Requirements. Does the bidder address the timeliness which are relevance to the GeM Bid Requirement especially to the Data Center Project. Deployment of quality and experienced technical manpower at site including Project manager and experts in the field of Electrical, Mechanical, I- BMS, Controls and Automation. Bidder to indicate number of such man power getting deployed at site and submit the resume of such expertise.	10
	Risks and Added Value Assessment	5
	Proposed Operation and Maintenance Plan in line with GeM Bid Requirement	5
	<b>Subtotal -</b>	<b>40</b>
2	Past Performance	
	Evaluate this factor based on Past Experience of Work Carried out either with CDAC or other similar work experience with other clients by reference check. Experience in delivering the Data centre and building construction in-line with timelines stipulated for this GeM Bid shall be given weightage.	
	<b>Subtotal – Past Performance</b>	<b>20</b>
3	Financial Ability and Risk Ranking	
	Evaluate this factor based on financial report/ balance sheet, Turn Over.	
	<b>Subtotal-</b>	<b>10</b>
4	Presentation	
	Presentation by the bidder along with the Key management team, Key Technical team Staff, holding owner/employee position in the organization. Presentation should cover bidders in depth understanding of the project for the Electrical , Mechanical, I - BMS, Civil etc. related work, execution Competency and Project execution Plan for this project with timelines(Critical Path timeline), Human Resource Demographics and Deployment for this project (Manpower Deployment Chart), Testimonials & Site ref, Approvals capability, List of Completed and Ongoing Projects, Tools & technology etc. The person responsible for the supervision of the contract performance shall be present during this presentation. The proposed Senior Executive are also expected to be the part of this presentation and must, at a minimum, answer questions directed to him/her during the question-and- answer session. In case of a Consortium, all Senior Executive of members of the Consortium Firm must be also present during the presentation	
	<b>Sub Total -</b>	<b>30</b>
	Total	100

### 13 Comparison of Bids

- 13.1 Only the technically qualified bids as per terms and conditions stipulated in this document shall be considered for opening and evaluation of price bid.
- 13.2 The total price including the GST amounts, (@rates quoted by the bidder or tariff rates, whichever are less) along with the comprehensive warranty support and Operation & maintenance charges for first two years as per price bid format will be considered for the purpose of comparison of bids and for calculating the L1 bidder. (@rates quoted by the bidder or tariff rates, whichever are less). (Please refer para 1, Section- III), as appeared and calculated on GEM portal.



- 13.3 The date and venue for opening of price bids will be communicated to bidders through GeM portal as per GeM policy.

#### **14 Award of Contract**

C-DAC reserves the right to award the contract to the qualified bidder whose technical bid has been accepted and determined as the lowest evaluated price bid (As declared by GeM portal after Reverse Auction, if any).

- 14.1 However, C-DAC reserves the right and has sole discretion to reject the lowest evaluated bid.
- 14.2 If more than one bidder happens to quote the same lowest price, C-DAC reserves the right to place the order with the bidder who has installed a Data Centre with more IT load at single site. The decision of C-DAC shall be final for awarding the contract OR as declared on the GEM.

#### **15 Purchaser's Right to amend / cancel**

- 15.1 C-DAC reserves the right to amend the eligibility criteria, commercial terms & conditions, Scope of Supply, quantities, technical specifications etc. The same shall be published on the Portals.
- 15.2 C-DAC reserves the right to cancel the entire or partially GeM Bid without assigning any reasons thereof.
- 15.3 C-DAC reserves the right to reject the bid submitted by the lowest evaluated bidder.

*(End of Section - II)*



## SECTION III – SPECIAL CONDITIONS OF CONTRACT

### 1 Prices

- a. The prices quoted shall remain firm and no price escalation will be permitted till completion of order.
- b. The prices quoted must be inclusive of comprehensive warranty charges, packing & forwarding, freight, insurance, loading, unloading charges /entry tax/road permit charges and allied charges till destination at site.
- c. The group-wise prices must be quoted for all the items as per format given in **Section – V**.
- d. Over and above the comprehensive warranty for first two years, the successful bidder is required to quote for the following services:
  - i. Operation and Maintenance for first two years.
  - ii. Operation and Maintenance for 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> Years.
  - iii. Comprehensive Annual Maintenance services (CAMC) for 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> Years.
    - The contract only for entire solutions with items 1-d (i) will be entered by C-DAC through GeM portal, as appeared on the GEM Portal.
    - The contracts for item Sr. No 1-d (ii & iii) **may be** entered by I.I.T.-Bombay, Mumbai separately, after expiry of `comprehensive warranty and O & M period of first two years`. The offered prices will be binding on the bidders for such period.
    - Hence, proper care must be taken to submit the financial bids accordingly through GeM portal.
- e. Before the placement of order, the successful bidder must submit the detailed Bill of Material, giving price for each individual line item, keeping the total price quoted un-changed. The order will be placed on the basis of this BoM. The supplier must ensure that their invoice exactly matches this BoM, so as to avoid any payment complications

### 2 Taxes and Duties:

- 2.1 Bidder must indicate applicable GST amounts separately. The bidder should exercise utmost care to quote the correct amounts of GST on each item. Any revision in statutory tax /duty structure as on date of supply/invoice, shall be considered, as applicable.
- 2.2 In case of any error/ oversight in GST amount quoted by the bidder, the bidder will not be permitted to rectify the error/oversight. The orders/ contract will be placed with the GST amounts quoted/calculated by the bidder or actual applicable amount (as on placement of order), whichever is **LOWER**. The difference amount payable, if any, between the quoted GST amount and applicable amount shall be borne by the bidder.
- 2.3 Notwithstanding the para above, if the GST is not quoted separately and the bid is silent whether GST is included or excluded in price, for the purpose of evaluation of bids, the prices shall be taken as quoted with GST. In this case, the order will be placed with the quoted price. The GST applicable, if any will be borne by the bidder/contractor



- 2.4 The prices will be compared on the basis of GST rates quoted/calculated by the bidder. In case of errors, the bidders will not be permitted to change the GST percentage.

### 3 Project Timeline

All the items covered in the Schedule of Requirements (**Section – IV**) must be supplied, installed and commissioned within 4 months (Sixteen weeks) from the date of award of Contract / placement of order.

### 4 Payments (In INR only)

- a. 70% amount of the cost of UPS and batteries, LT Panels, Adiabatic Dry Cooler and Pumps, Inrow, DG set will be released within 30 days of receipt of these components at site along with tax invoice and against physical verification and acknowledgement by C-DAC and/ or end user.
- b. 20% amount of the cost of UPS and batteries, DG sets, LT Panels, Adiabatic Dry Cooler and Pumps, In Rows, DG Set and 90% cost of the remaining supplied items and 90% charges towards installation and commissioning of the system will be released on successful installation, commissioning of the solution. This portion of payment shall be subject to acceptance and submission of Integrated System Acceptance Test (ISAT) report to C-DAC. In case of delay in integration and commissioning of the DC with HPC system for the reasons attributed to C-DAC beyond 60 days, this portion of payment will be released against submission of bank guarantee of equivalent amount. This Bank Guarantee will be released on successful completion of installation, commissioning and ISAT of the solution.
- c. Balance 10% payment will be released on successful installation & commissioning of solution against submission of PBG. The PBG must be submitted within 30 days from the date of successful installation(s) and ISAT. The penalties- if any, for delay in deliveries, will be deducted from this portion of payment.
- d. The proportionate payments towards Operation and Maintenance charges for first two years will be released on quarterly basis within 15 days of the beginning of each quarter.
- e. The penalties - if any, towards non/short performance will be deducted from the quarterly payments payable.
- f. The applicable TDS will be deducted.
- g. The payments shall be remitted through NEFT/RTGS only.
- h. Successful bidder to upload the invoices according to the time lines/supplies as above, on GEM portal/to HPC-Tech Group, C-DAC, Pune.
- i. The post quarterly invoices towards O&M charges to be submitted to C-DAC, Pune for releasing the payments.

**Note:** All the payments are subject to submission of the valid and complete tax invoices.

### 5 Security Deposit (SD)

The successful bidder will be required to furnish the Security Deposit in INR equivalent to 5% of the Contract/Order value (excluding taxes) within 15 days of award of Contract / receipt of Order(s). The Security Deposit should be submitted in the form of Demand Draft drawn in favor of C-DAC payable at Pune or in the form of Bank Guarantee in the name of C-DAC, Pune. The Bank Guarantee submitted towards Security Deposit should be issued by a Scheduled Commercial Bank and must be valid for a



period of 6 months. The Security Deposit will be returned within 30 days upon completion of installation, commissioning and ISAT, and on submission of Performance Security.

## 6 Performance Security

The successful bidder will be required to furnish the Performance Security towards the Data Centre Solutions supplied, in the form of a Bank Guarantee in INR equivalent to 3% of the invoice amount (except for O & M charges and excluding taxes), as per the format attached to this document. This bank guarantee should be submitted along with the invoice after successful installation and commissioning of the Data Centre solution. The Bank Guarantee should be from a Scheduled Commercial bank and shall remain valid for the period of 25 months from the date of installation and ISAT. The PBG must be negotiable at a branch of issuing bank in Pune.

C-DAC reserves the right to invoke the Performance Bank Guarantee(s) submitted by bidder, in case of the following:

- a. The Item/Components fail to achieve the performance as stipulated in this document or
- b. The bidder fails to provide the comprehensive warranty and other services in scheduled time frame, as stipulated in this document or
- c. The bidder delays to provide the warranty services as stipulated in this document.

## 7 Completeness Responsibility

The bidders may please note that this is a contract on 'Turn-key' basis. Notwithstanding the scope of work, engineering, supply and services stated in bid document, any equipment or material, engineering or technical services which are not specifically mentioned under the scope of supply of the bidder and which are not expressly excluded there from but which – in view of the bidder - are necessary for the required performance of the datacenter solution in accordance with the RFP specifications are treated to be included in the bid and has to be implicitly performed by bidder. In no case, the bidder will be permitted to increase the prices quoted.

## 8 Comprehensive Warranty

The Supplier warrants that all the Goods are new, unused, and of the most recent or current models, and that they incorporate all recent improvements in design and materials, unless provided otherwise in the Contract. The supplier further warrants that all Goods supplied under this contract shall have no defect arising from design, materials or workmanship (except when the design and/or material is required by the Purchaser's specifications) or from any act or omission of the supplier. The warranty should be comprehensive on site, repair/replacement basis free of cost. Bidder has to enter into agreement / MoU with C-DAC Pune on award of contract which shall be in-line with this RFP document.

Note: - Supplier has to do the AMC / PM of all the supplied equipment as per the standard schedule with no additional charges to IIT Bombay. Any consumables required shall be paid by IIT Bombay. The supplier has to take prior approval from C-DAC/IIT Bombay before using any consumables.

All the equipment and components supplied must have **two years** onsite comprehensive warranty from date of successful installation, commissioning and signing of ISAT.



SLA and managed service scope as per **Annexure - H**.

## 9 Post warranty AMC

The bidder should quote for post warranty AMC services towards the integrated datacenter solution/sub-systems supplied and installed. The AMC charges should be for 3<sup>rd</sup> year, 4<sup>th</sup> year and 5<sup>th</sup> year from the date of successful installation and ISAT of datacenter solution at respective locations. The AMC charges per year should be quoted as per price format given in Section V of this document and must not be more than **7%** of the cost of capital items supplied.

The post AMC charges will be binding on the bidder. C-DAC/IIT Bombay reserves the right to enter or not into the AMC after the end of warranty period.

## 10 Penalties

CDAC reserves the right to levy penalties for each site, as given below.

Sr. No	Parameters	Penalty
A	Penalty for Delayed Deliveries and installation	0.5% of order value per week for delay in installation and commissioning beyond schedule. If the delay is more than 10 weeks, C-DAC reserves the right to cancel the Contract/ Order. In case of in ordinate delay on the part of bidder in completing the work and cancellation of Purchase order, C-DAC will arrange to complete unfinished work through suitable contactor and expenses incurred by C-DAC in doing of such work shall be recovered from the bidder. Any delay because of CDAC, conditions arising out of Force Majeure will not be considered while calculating the delay period for penalties. i.e. total 5% of maximum penalty shall be levied against Delayed Deliveries and installation
B	Penalty if uptime of Data Centre components. Measured on quarterly basis is ( as per calendar year )	Penalty for downtime shall be levied as given below in B.1, B.2, B.3 which will be over and above the penalty mention above in para A.
1	Less than 98.5% but more than 97.5% in a quarter	Penalty @0.2% of the order value per quarter.
2	Less than 97.5%	Penalty @1% of the order value per quarter.
3	Less than 95%	C-DAC reserves the right to terminate the contract and invoke the performance bank guarantee.
	Capping	The maximum penalty as stipulated in Para A and B above put together will be capped to 10% of the order value.



The detailed mechanism / method for arriving at the measurable parameters mentioned in table above is covered in the **Service Level Agreement (SLA) as per Annexure –H**, to be signed before award of contract/ release of Order.

## 11 Force Majeure

C-DAC may consider relaxing the penalty and delivery requirements, as specified in this document, if and to the extent that, the delay in performance or other failure to perform its obligations under the contract is the result of an Force Majeure. Force Majeure is defined as an event of effect that cannot reasonably be anticipated such as acts of God (like earthquakes, floods, storms etc.), acts of states / state agencies, the direct and indirect consequences of wars (declared or undeclared), Pandemic, hostilities, national emergencies, civil commotion and strikes at successful Bidder's premises or any other act beyond control of the bidder.

## 12 Arbitration

In case any dispute arises between the C-DAC and successful bidder with respect to this RFP, including its interpretation, implementation or alleged material breach of any of its provisions both the Parties hereto shall endeavor to settle such dispute amicably. If the Parties fail to bring about an amicable settlement within a period of 30 (thirty) days, dispute shall be referred to the sole arbitrator mutually appointed by both parties. If the sole arbitrator is not appointed mutually by both the parties then the District Court Pune shall have exclusive jurisdiction for appointment of sole arbitrator through court. Arbitration proceedings shall be conducted in accordance with the provisions of the Arbitration and Conciliation Act, 1996 and Rules made there under, or any legislative amendment or modification made thereto. The venue of the arbitration shall be Pune. The award given by the arbitrator shall be final and binding on the Parties. The language of arbitration shall be English. The common cost of the arbitration proceedings shall initially be borne equally by the Parties and finally by the Party against whom the award is passed. Any other costs or expenses incurred by a Party in relation to the arbitration proceedings shall ultimately be borne by the Party as the arbitrator may decide. Courts in Pune only shall have the exclusive jurisdiction to try, entertain and decide the matters which are not covered under the Arbitration and conciliation Act.

## 13 Risk and Ownership

All risks, responsibilities and liabilities in respect of goods delivered at site shall remain with selected bidder till they are successfully installed and commissioned at site and taken over by end users. Part deliveries shall not be treated as deliveries. Only full deliveries of all items ordered will be considered as delivery. The ownership of the items delivered at site, shall be of C-DAC Pune on successful installation of items.

## 14 Indemnity

The successful bidder shall indemnify, protect and save C-DAC Pune from/against all claims, losses, costs, damages, expenses, action suits and other proceeding, resulting from/arising out of:

1. Infringement of any law pertaining to intellectual property, patent, trademarks, copyrights etc. by the bidder or
2. Such other statutory infringements in respect of all the equipment's supplied by successful bidder, or



3. Violation of any law/rule/ act, omission/performance/under or none or part performance/ failure of the bidder.

## 15 Assignment

Selected bidder/ Party shall not assign, delegate or otherwise deal with any of its rights or obligation to other parties under this Contract, without prior approval of C-DAC.

## 16 Severability

If any provision of this Contract is determined to be invalid or unenforceable, it will be deemed to be modified to the minimum extent necessary to be valid and enforceable. If it cannot be so modified, it will be deleted and the deletion will not affect the validity or enforceability of any other provision.

## 17 Termination

Validity of purchase order/rate contract will remain till fulfillment of all obligations (including but not limited to providing comprehensive warranty / support till completion of three years from acceptance of the entire integrated solution as a whole) by the successful bidder.

In case of the delays in providing the stipulated services, and /or defect/delay/under or non-performance pertaining to the services / products supplied by the bidder, C-DAC Pune will give written notice to the bidder directing to set the things right within 30 days of notice. If bidder fails to comply with the requirements, C-DAC Pune shall have the right to terminate the contract and / or cancel the order/s. The successful bidder agrees and accepts that he shall be liable to pay damages claimed by C-DAC, in the event of termination of contract / cancellation of order, as detailed in this RFP. The successful bidder may terminate the contract by at least 30 days' written notice, only in the event of non-payment of undisputed invoices for 90 days from the due date. Except this situation, the successful bidder shall have no right of termination.

“C-DAC Pune will release the due amount payable to successful bidder towards the material and / or services provided till the date of termination, those are accepted by C-DAC Pune. However, the amount towards penalty, if any will be deducted from the payable amounts.”

C-DAC reserves the right to terminate the contract / cancel order with or without cause/ reason, by giving 90 days' notice to the successful bidder.

## 18 Limitation of Liability

The liability of the Bidder / Contractor arising out of breach of any terms/conditions of the GeM Bid / contract/work order and addendums/amendments thereto, misconduct, willful default will be limited to the total contract value. However, liability of the bidder in case of death/injury/damage caused to the personnel/property due to/arising out of/incidental to any act/omission/default/deficiency of bidder/contractor will be at actual. In no event shall either Party, its officers, directors, or employees be liable for any form of incidental, consequential, indirect, special or punitive damages of any kind

## 19 Disclaimer

The purpose of this RFP is to provide the bidder(s) with information to assist the formulation of their proposals. This RFP does not claim to contain all the information each bidder may require. Each bidder



should conduct his own investigations and analysis and should check the accuracy, reliability and completeness of the information in this RFP and where necessary obtain independent advice. C-DAC Pune makes no representation or warranty and shall incur no liability under any law, statute, rules or regulations as to the accuracy, reliability or completeness of this RFP.

## **20 Jurisdiction**

The disputes, legal matters, court matters, if any shall be subject to Pune jurisdiction only.

## **21 Corrupt or Fraudulent Practices**

It is expected that the bidders who wish to bid for this project have highest standards of ethics.

C-DAC Pune will reject bid if it determines that the bidder recommended for award has engaged in corrupt or fraudulent practices while competing for this contract.

C-DAC Pune may declare a vendor ineligible, either indefinitely or for a stated duration, to be awarded a contract if it at any time determines that the vendor has engaged in corrupt and fraudulent practices during the award / execution of contract.

## **22 Interpretation of the clauses in the GeM Bid Document / Contract Document**

In case of any ambiguity/ dispute in the interpretation of any of the clauses in this GeM Bid Document, the interpretation of the clauses by Director General, C-DAC shall be final and binding on all parties.

*(End of Section- III)*



## SECTION IV – SCHEDULE OF REQUIREMENT

This Section covers the general and technical requirements of Data Centre components.

### 1 Data Centers on Turn-key Basis

The Data Centre is required to be built on 'Turn-key' basis. The successful bidder should build the entire data center infrastructure which includes civil works, interiors, environmental controls like humidity, temperature etc., security (including access/ monitoring equipment), electrical systems, power systems, power supply, Adiabatic Dry Cooler, PAC, Piping, Valves, Fire alarm and suppression, BMS etc. as specified. The responsibility towards required material/items/equipment's, work, man power etc. rests with the successful bidder. The overall requirements and available information/data/documents are included in this Section. The bidders are advised to go through same and visit the sites before working out the details in this perspective and submit the solution document complete in all respects. This data center to be established at IIT Bombay - at Compute Center lab. The existing building is having basement floor, ground floor to six floor. The Data center will be at basement floor, the location of DG sets will be at ground floor, and location of UPS room will be at third floor and adiabatic dry cooler to be installed at terrace floor. Bidder to consider use of existing 3 X 40 KVA UPS. This should include shifting from same floor to another room. Bidder to consider replacement of SMF batteries for this UPS by new one for back up time of 10 minutes.

### 2 Background

Under National Super Computing mission (NSM) Phase-3 at, implementing agency C-DAC is going to build data center of 3 PF capacity which includes server racks as well as storage rack. This data center should be energy efficient in which 58% of heat extraction from server racks is by Direct Contact Liquid Cooling (DCLC)-Cold Plate technology and 42 % by room cooling for compute node racks and storage racks will be on room cooling. Main components in DCLC systems are Cooling Distribution unit (CDU), manifold- inside each rack, cold plate on server board etc. In CDU there are primary and secondary loop. Secondary loop is connected with cold plate and coolant flow is controlled by pumps inside the CDU. In CDU indirect heat exchange from liquid to liquid takes place. Primary loop is connected to Adiabatic Dry cooler water circuit. Adiabatic Dry cooler is closed loop cooling system in which heat exchange takes place from water to air. This way use of energy consuming mechanical cooling systems like chillers are avoided and data center cooling power requirement reduced which ultimately reduces in operating power cost. Dry cooler will be adiabatic dry cooler. Adiabatic cooling systems function similarly to dry cooling systems, but with the incorporation of pre-cooling pads; running water over pre-cooling pads and drawing air through the pads depresses the ambient dry bulb of the incoming air. The depressed dry bulb allows for greater system heat rejection. Supply, installation, testing and commissioning of secondary loop components like CDU, Underfloor SS piping, rack manifolds, cold plates including dripless connectors and tube etc. components are not part of scope of this GeM Bid, whereas Operation and Maintenance of these components are part of the scope including BMS monitoring. All Racks are with DC power Bus bar and are of 45 U size. **All Racks are not part of the scope of this GeM Bid.** Efficient, flexible and scalable 24 KW, +12 VDC @ 2 X 1100 Amperes integrated Power System containing a module mounting assembly/ chassis of size not more than 3U form factor, rectifiers, intelligent control monitoring, 45 U rack of size 800 mm width, 1400 mm depth with both front and back hinged perforated doors, DC bus bars of 2 X 1100 Amps rating etc. The power supply should comply with OCP V1 standard (Updated to V1.2). Two power shelf each of rating maximum 24 KW per rack with 3/3.3 KW each rectifier module rating operating in N+ 1 (6 + 1).



CU Bus Bar @ 1100 Amps rating, two no's in each power zone. Each rack will have dual power zones. Each power zone will provide maximum rated output up to 24 KW with two no's of OCP bus bars

### 3 General Requirements:

The general requirements applicable to the data centres are given below. Other than these requirements, depending on the site conditions, the bidder may propose appropriate changes in other requirements. However, the responsibility towards successful installation and commissioning and smooth running of data centres rests with bidder only.

- 3.1 The solution shall comprise of supply, installation, testing, commissioning training and handing over of all materials, equipment, hardware, software, appliances and necessary labour to commission said system complete with all the required components strictly as per the latest IS, IEC, IEEE, ASHRAE, ASHRAE TC9.9 2017, NBC etc. codes.
- 3.2 Also, the scope includes the supply, installation & commissioning of any material or equipment including civil works that are not specifically mentioned in the specifications and design details but are required for successful commissioning of the project.
- 3.3 The vendor shall provide detailed design, documentation, make, and model, efficiency including user, system and operation manuals along with the necessary diagrams, design drawings and details bifurcation of Bill of Quantity (BOQ) along with details description. Design drawing should include but not limited to Single Line Diagram, Discrimination curves, Lighting drawing, P & ID (Process and Instrumentation Diagram), , equipment sizing and selection along product selection calculations etc. with clear sectional drawings for server and utility room, interior, raised flooring, false ceiling, fire rated glass partitions, complete BMS system required for data centre etc.
- 3.4 The vendor shall take the necessary clearance / approval of the drawings, design, quality of material, make and model of the quoted material etc. prior to the execution of the project
- 3.5 The Data Centre should be complete in all respects.
- 3.6 Electrical power and water during construction will be provided at one location. Client shall not provide any accommodation for the contractor and his staff including labor.
- 3.7 The scope of installation, configuration, integration and commissioning shall mean to install and configure all components and subsystems integrating the Building Management System with the required components, integrating the entire facility and make the system operational as per scope of work.
- 3.8 The acceptance test shall cover the following scope:
  - 3.8.1 Factory Test Reports  
Bidder shall provide factory test report for all products after testing each parameter of products as per their standard test procedure.
    - Electrical panels
    - In Row
    - Pumps
    - Adiabatic Dry Cooler
    - UPS and Li Ion battery



- DG set
- Thermal Storage Tank

#### 4 Design of Data Centre

The proposed designs and indicative drawings enclosed in the RFP document are for reference and for the purpose of bidding. The vendor so finalized would be required to make the necessary shop drawings within the layouts so as to arrive at a final scheme in line with the requirements and in accordance with the requirements of Indian standards, IEC, IS,IEEE,NBC etc. However no change whatsoever in the price schedules would be allowed after the award of the work and the price shall remain firm throughout the project and the entire works are to be executed within the quoted price schedules.

The shop drawings during execution should include the following, but is not limited to,

- a) Floor plan with design layout and detailed drawings, showing necessary sections etc.
- b) Layout of raised floor and false ceiling layout
- c) Electrical diagrams (including UPS, SLD, Lighting, Earthing, Equipment Layout, Power Distribution etc.)
- d) Cooling system layout with (P & ID, Piping layout, Equipment Layout, Schematic etc.)
- e) Fire detection and suppression plan/ layout
- f) Access Control Plan
- g) Surveillance camera placement plan
- h) Environment monitoring system placement plan

#### 5 Design Inputs

Tables given below are the details of exact load parameters. These values are given to the bidders to come out with appropriate configuration and sizing. The major sub systems of the DC infrastructure are:

- a) UPS along with Batteries
- b) Adiabatic Dry Cooler, Piping, Pumps, Electrical Panel, Instrumentation etc.
- c) Raised Flooring and False Ceiling
- d) In Row Units
- e) I-BMS System
- f) DG set and associated work
- g) Electrical Panels and cables
- h) Thermal Storage Tank
- i) Pumps
- j) Illumination system

The specifications and requirement of the entire solution is stipulated in the RFP with respect to the design and solution, certain indicative inputs like layout, SLD, P&ID etc. are provided. Bidder may follow the



indicative inputs provided in this RFP or come out with innovative design which is optimal and cost effective without violating any of the specifications given.

5.1 The envisaged IT load for data center: 424 KW max.

Sr.No	Description Rack	No Of Nodes Per Rack	DCLC Power Per Rack	Room Cooling Power Per Rack ( + losses )	Input Power Per Rack
1	CPU -Rack-1	64	21	14	35
2	CPU -Rack-2	64	21	14	35
3	CPU + GPU - Rack-3	32	11	27	38
4	CPU + GPU - Rack-4	27	9	23	32
5	CPU -Rack-5	28	9	8	17
6	CPU -Rack-6	64	21	14	35
7	CPU -Rack-7	64	21	14	35
8	CPU -Rack-8	64	21	14	35
9	CPU -Rack-9	64	21	14	35
10	CPU -Rack-10	64	21	14	35
11	CPU -Rack-11	64	21	14	35
12	CPU -Service Node Rack-12	20	7	4	11
13	Storage Rack-1		0	12	12
14	Storage Rack-2		0	12	12
15	Storage Rack-3		0	12	12
16	Spare Rack		0	10	10
	<b>DCLC IT Requirement</b>		<b>204</b>		
	<b>Room Cooling IT Requirement</b>			<b>220</b>	
	<b>Total IT Requirement</b>				<b>424</b>

## 6 Requirements towards Civil/Interior work

- 6.1 Civil architecture and preparation of data center: Interiors of the data centre (including, civil works, foundation work, raised floor, false ceiling, fire rated paint, fire rated partitions, fire rated glass partition, fire rated glass doors, fire rated glass sliding door etc.)
- 6.2 METAL GRID CEILING: The drop ceiling shall be provided with Armstrong Lay in (Hot dipped galvanized steel) metal ceiling system 600 x 600 x 5 mm with standard 2.5 mm dia (16% open space) and fleece with NRC (Non Directional Visual) of 70 & CAC 36 (CAC is a measure for rating the performance of a ceiling system as a barrier to airborne sound transmission through a common plenum between adjacent closed spaces) to be laid on Armstrong grid system. The modular ceiling sheets with necessary fittings should be done up aesthetically to integrate with the lighting.



- 6.3 Raised flooring: Suitable raised false flooring as per prevailing standards should be provided as per site requirements. The entire Access floor system shall be made from high density cementitious board and provide Class O as per BS 476 PART 6 for Fire propagation index and Class 1 as per BS 476 Part 7. Fire Ratings tested as per CIRC 91/61 or BS 476 Part 6 & 7 fire resistance up to 60 min as per NFPA. System should have antistatic property and air leakage resistance. The system shall be able to withstand a minimum UDL of 2500 kg per sq meter and a point load of minimum 600 kg. and rolling load of minimum of 300 Kg.
- 6.4 Panel should meet the below requirements:
- 6.4.1 The panel shall be coated with epoxy coating on the exposed surface. Have an infill of light weight cementitious material. Insulated against heat and noise transfer. Panels shall be finished with High Performance Anti-Static Laminate.. Panels will remain flat through and stable unaffected by humidity or fluctuation in temperature throughout its normal working life. Panels will provide for impact resistance top surfaces minimal deflection, corrosion resistance properties and shall not be combustible or aid surface spread of flame. Panels will be insulated against heat and noise transfer. Panels will be 600 x 600mm and fully interchangeable with each other within the range of a specified layout. Panels shall rest on the grid formed by the stringers which are bolted on to the pedestals. Panels shall be finished with anti-static 0.9 mm Laminate and thick plastic edge material that is self-extinguishing and will be PVC free. Panel should withstand a Concentrated Load of minimum 500 Kg applied on area 25mm x 25mm in the centre of the panel which is placed on four steel blocks without deflecting more than 2.5mm and without setting permanently more than 0.20mm
- 6.4.2 Pedestal installed to support the panel will be suitable to achieve a finished floor height of 600mm. Pedestal design will confirm speedy assembly and removal for relocation and maintenance. Pedestal base to be permanently secured to position on the sub-floor. Pedestal assembly will provide for easy adjustment of leveling and accurately align panels to ensure lateral restrain. Pedestals will support an axial load of minimum 1500 Kgs, without permanent deflection and an ultimate load of 2500 Kgs. Pedestal head will be designed to avoid any rattle or squeaks. . Pedestal should have GI Base plate of suitable dimensions, GI Pipe, check nut for level adjustment, threaded stud with GI pedestal head, all screws etc.
- 6.4.3 Understructure (US) system consists of stringers to form a grid of 600 x 600mm. These stringers are locked into the pedestal head and run both ways. The US system will provide adequate solid, rigid and quiet support for access floor panels. The US system will provide a minimum clear, uninterrupted height of 600 mm between the bottom of the floor and bottom of the access floor for electrical conducting and wiring The stringer shall be hot dipped galvanized steel cold roll construction specially designed to stabilize lateral stability and to support the panels on all sides for alignment. The channels shall have counter sunk holes at both ends to accommodate bolting of the same to the pedestal head assembly. Earthing point connections are to be part of standard design. The longitudinal ribs and flaps in the lower part should be designed to increase flexion resistance. The grid formed by the pedestal and stringer assembly will receive the floor panel.
- 6.4.4 Bidder to consider to providing 2 nos. 2-point panel remover, lead, lift, steps for 600mm raised floor etc.
- 6.5 Fire Rated Steel Door-two hours- Two hours fire rated double skin steel door constructed from 1.25mm thick galvanized steel sheet formed to provide a 46mm thick fully flush door shell with lock seam joints at stile edges and the internal construction of the door should be specially designed Honey Comb structure with reinforcements at top, bottom and stile surround. The door frames and door shutters should be primed with Zinc-Phosphate Staving Primer and finished with Polyurethane Aliphatic grade or epoxy paint as per approved manufacturer specifications. Door if used for Emergency purpose is



required to be with Panic bar. The Fire Doors are to be fully insulated and shall be tested as per IS: 3809-1979, ISO: 834-1975, IS: 3614 (PART-II)- 1992 and BS 476 (PART- 20 & 22)- 1987 under live fire conditions, The wired glass is to comply with both BS 476: PART 22 and BS 6206 relating to fire resistant and impact performance.

- 6.6 Fire rated Partition/ Walls: Partition walls within the data centers should have 2-hour fire rated. Suitable smoke seals should be used. Fire line boards should conform to IS:2095 – 1996-Part-I. Providing and fixing minimum 132MM thick FIRE RATED gypsum board partitions with 2 Nos. x 15mm thick fire line board on both sides of 72mm GI floor channel and 70mm Square MS Pipe stud as per specifications, including cost of chasing for electrical conduits,. This item includes all tools, tackles, material, labor, fixture adhesives sealants etc. for the complete work.
- 6.7 Opening for the Cables or other utility services which are coming inside the building needs to be sealed by Fire resistance board system, water soluble fire retardant solutions, fire expanding foam etc. having minimum of 2 hours' fire rating when tested in accordance with BS 476 part 20 and UL 1479 for horizontal and vertical openings in RCC slabs, Beams, walls, Brick masonry or Gypsum partitions for passing service shafts. The service lines could be of various types like electrical cables, cable trays or metal pipes etc. The foam shall have Acoustic property as per DIN 4109 and Smoke and Air Seal. The Foam should have the feature of Re penetrability for future maintenance or repair activities. Fire soluble cable coating Should be suitable for protecting against spread of flame on timber panels and tested as per IEC 332 part 3 standard for reduced spread of flame & tested as per FM Class 3971. It should have no derating effect on cables, free from fiber, asbestos, odourless and solvent free, flexible when dry after application.
- 6.8 Room Signage and fire evacuation map. Providing & fixing Aluminium Modular Signage using Aluminium Alloy 6063 extrusion with Anodising (The thickness of the anodization is typically 30 microns. The integrity of the anodize coating is tested to meet the international specifications ISO 2143-1981.) With lifetime Warranty in normal working condition.
- 6.9 Pumps, thermal storage tanks, etc will be installed on ground at ground level.. Bidder to consider chain link fencing for these equipment along with concrete foundation.
- 6.10 INSULATION ON ROOF ANF FLOOR SLAB: Supply and installation of external thermal insulation class-"O" closed cell elastomeric nitrile rubber insulation with adhesives recommended as per the approved shop drawings/ specifications. Minimum 13 mm thick for floor insulation is required.
- 6.11 Providing and fixing of tested 120 minutes fire rated - integrity and radiation control and partial insulation (EW120) - fully glazed non-load bearing fixed glass partition system with symmetrical (Bi-Directional) fire protection. The glass should be Contraflam Lite or equivalent 14 mm clear 120 min fire rated and partially insulated (EW120), Non Wired Toughened Interlayered glass having a sound reduction of minimum 30 dB and compliant to class 1(B)1 category of Impact Resistance as per EN 12600. The glass shall be able to withstand fire attack from both sides. The glass should be manufactured in UL & TUV audited Facility and including UL Certification. The profiles are manufactured from 1.6 mm galvanized steel sheet pressed and formed to a required profile of the dimension. These specifications are applicable for fire rated glass door, fire rated glass partition . Location of Data center is at basement floor. Rh value is very high, in order to avoid condensation on Glass, Bidder to consider double glass with Vacuum inside with 2 hours fire rating.
- 6.12 Steel structure needs to be consider for the platform of the equipment's as Adiabatic Dry cooler , Panels, pumps, expansion tank etc. MS frame to be considered for piping installation for outside part of building. Adiabatic Dry cooler and associated accessories needs to be installed at terrace floor of the building i.e. above six floor slab not directly on the slab. At terrace floor space available. Bidder need to



consider Tie bracing of existing column by MS structure ,so that entire weight will be transferred to column footing. Necessary calculations and structural stability needs to be certified by certifying agency /structural consultant. Refer attached drawing for reference only. The said drawing of structure needs to be approved/vetted by IIT Bombay. For chiller piping core cutting needs to be carried out at ground floor and entering back in the data center from ground floor to basement. Also DG set cabling from synchronization panel to the DC LT panel to be taken through the existing wall by core cutting. This existing wall is of RCC. Bidder to take at most care while executing the work and after completion of work against water leakage /seepage and astatic look. Core cutting needs to be carried out under guidance and approval from IIT Bombay Team. For this cable core cutting needs to be carried out above ground level at minimum of half meter.

- 6.13 Core cutting for cable and pipe will be required and same is part of scope of GeM Bid . This work needs to be carried out after approval from IIT team . Single hole for each cable / pipe to be used . Before core cutting the RCC wall to be drilled and to be ensured at that location structure steel/ steel rainsformment should not be there.
- 6.14 At some locations for cable and pipe routing existing false ceiling (Gypsum ceiling ) may require to cut . Bidder to ensure after completion of work false ceiling by new in gypsum / earlier material to be done along with same colored painting and finishing .
- 6.15 HOUSE KEEPING: The vendor is responsible for keeping the site clean and deep cleaning by removing all the debris etc. every day, using adequate covering/tarpaulin sheets etc to cover the any areas required (client property etc.). All cleaning equipment's like heavy duty vacuum cleaners etc to be according to the approval.
- 6.16 Power Cable entry in each rack will be from Top, Bidder need to consider boxing arrangement or cable manager or cable trunking system so that entire data center installation should look aesthetically good..
- 6.17 Removal Job -
  - 6.17.1 Bidder to consider removing of existing ceiling suspended AHU unit along with chilled water piping IN and OUT. Plugging the removed piping permantaly.
  - 6.17.2 Bidder to consider removal of existing HVAC ducting system from server room.
  - 6.17.3 Bidder to consider removal of nozzle of sprinkler from existing water based fire fitting system in server area and plug the opening permanently. Bidder to ensure permantaly there should not be any water leakage.
  - 6.17.4 At third floor there are battiers in the battier racks . Those who are not in use Same needs to be disconnected and handover.
  - 6.17.5 Removed components to be placed and handed over to IIT as per defined space in the campus.

## 7 Requirements towards Electrical Work

- 7.1 **Emergency Power off (EPO):** EPO is to be factored in the design for server room.
- 7.2 Transformer rating is 2500 KVA, 22 KV/433 V Dry type. For selecting the source fault level bidder to consider value of transient reactance (Xd') as per IS -1180 for transformer rating.



- 7.3 Modular UPS for IT load only:- Location of these 2 X 500 KVA UPS along with Li Ion battery rack will be at third floor . Refer third floor drawing.
- 7.3.1 The UPS and associated equipment shall operate in conjunction with a primary power supply and an output distribution system to provide quality uninterrupted power for mission critical, electronic equipment load.
- 7.3.2 Each UPS Frame shall be sized for  $kW = kVA$  load i.e. Unity Output power Factor with no derating at 40 Deg C. Design of UPS should be Insulated-gate bipolar transistor (IGBT) rectifier and 3 level IGBT inverter switching with double conversion as per IEC 62040-3 operating modes. Inverter Switching Frequency shall be  $\geq 18$  kHz to keep the noise minimum. Inverter shall be PWM controlled using DSP logic. Analog control shall not be acceptable. Each UPS shall be of modular architecture with Power Unit & removable sub power modules rating from 25 kW to 60 kW achieve highest system protection. Failure of any sub power module in individual UPS Frame shall not lead to entire Frame Capacity down but only the failed sub power module capacity shall go down. i.e. In case of Failure of any one Sub Power module, rest of the available power module in the frame shall continue to operate in normal double conversion mode of operation with reduced capacity. This shall also be applicable to all UPS's operating in parallel configuration.. The UPS shall be housed in a freestanding cabinet with casters and shall contain Input, Output, Static Bypass isolator. Steady state voltage regulations will be within 1% of nominal output voltage, linear load harmonics distortion should be less than 3% and non-linear load harmonics distortion should be less than 5%. UPS should be capable of 100% unbalanced load. Efficiency of UPS should be minimum 95% from 25% to 75% in double conversion mode. Noise generated by UPS under normal steady state condition should not be more than 70 DB as per ISO 7779. UPS should be ROHS complied product. All serviceable components to be from front. UPS display should show the battery status monitoring, UPS mode, Alarm (Audio and visible), Events etc. The UPS communication capability should be able to integrate into any industry standard Building Management System (BMS). Adequate protections for UPS, for rectifier, bypass, battery, battery against overload, short circuit, battery over charging, battery over discharging, transients, surges (as per IEEE 587) etc. needs to be considered as per IEC 62040-1. Built in SNMP card, MODBUS TCP IP, Dry contacts card to be standard feature in UPS. Should comply with UL 1973/ CE/IEC 62619 /UN 38.3 for LITHIUM ION BATTERIES. The UPS shall be have self-regulating and self-protection against Over voltage, Powerline surges, Undervoltage and overcurrent induced by the mains, Sudden changes in the output load and short circuits at the output, Transient ,surges, voltage spikes shall be suppressed .Critical Cards within UPS which are directly exposed to air should be conformally coated to protect the UPS from Moisture and Conductive dust. IP rating of Min IP 20.
- 7.3.3 Parallel operation: it must be possible the connection of minimum 4 units of same size to set up a distributed parallel system, in order to increase system capacity or achieve system redundancy. Parallel control logic must ensure a high load sharing accuracy (less than 5% of nominal power) and no single points of failure. That is a distributed control design must be implemented (no master/slave architecture), so that any failure in one equipment won't impact operation of the whole parallel system. Parallel control connections must provide high noise rejection.
- 7.3.4 UPS to Battery Inter connecting cables,Links- Racks and standard accessories Connections to the Incoming terminals will be provided and take the load from Outgoing terminals of the UPS. All other equipment necessary to operate the UPS is in the scope of the Vendor.
- 7.3.5 The UPS shall be housed in freestanding cabinets. The mechanical structure of the UPS shall be sufficiently strong and rigid to withstand handling and installation operations. The sheet metal elements in the structure shall be protected against corrosion by a suitable treatment, such as zinc electroplating, bi-chromating, epoxy paint, or an equivalent.



7.3.6 The UPS shall be designed for forced air cooling. Air inlets shall be provided from the front bottom of the UPS enclosure. Air exhaust shall be from the top portion of the unit.

7.3.7 STANDARDS - Product should confirm to minimum applicable standards as IEC 62040-3 UPS PERFORMANCE, IEC 60950-, CE, VDE,

7.3.8 UPS Input:

AC input nominal voltage	340/380/400/415/440/460 VAC, three phase 50 Hzs, 5 wire (L1+L2+L3+N+G)
AC input voltage window	340V to 460V( @ 400V)
Input frequency range	49-51Hz
Input Power Factor	> 0.99 at 100% load
Input Current Distortion	< 4% at 100% load

7.3.9 UPS Output:

AC Output Nominal Output	(Customer configurable)-380VAC, 400VAC or 415VAC, Three phase five wire, 50 Hz
AC output voltage distortion	Max. 2% @ 100% linear load ,Max. 5% @ 100% non-linear Load
AC output voltage regulation (Static)	+/-1%
Voltage Transient Response	+/- 8% maximum for 100% load step
Voltage Transient Recovery	within < 50ms recovery time
Output Voltage Harmonic Distortion	<3% THD maximum for a 100% linear load <5% THD maximum for a 100% non-linear load
Overload Rating- Online	125% - 1 minute; 150% - 10 Sec
System AC-AC Efficiency	Greater than 95% from 25% load to 75% load in Double Conversion Mode
Output Power Factor Rating	unity power factor KVA=kW @ 40 Deg C without any de rating from 0.8 lagging to 0.9 leading
Output frequency	50 +/- 1Hz tracking
Output connectors	Three phase: Hardwire 5-wire (3 Phase + N + G)

7.3.10 ENVIRONMENTAL

Operating Ambient Temperature	+ 20 to +30°C
Relative Humidity	0 to 95% non-condensing
Operating altitude	
Audible noise	<70 dbA



Conformal coating PCBs	Required
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7.3.11 Bidder  
for UPS in below format

to submit GTP

Sr. No	Description	Requirement	Vendor to Specify for 500 KVA
1	MODEL	please specify	
1.1	TECHNOLOGY	IGBT Rectifier & IGBT Inverter, Microprocessor based, true online double conversion, Online Transformer free Technology ,Modular Technology	
1.2	Inverter	IGBT	
1.3	Rectifier	IGBT	
1.4	Max. Permissible Non-linear loads	100%	
1.5	Max. unbalanced load	100%	
2	PHYSICAL Dimension & Weight		
2.1	Construction	Compact. Modular design	
2.2	UPS Floor Space		
2.2	Ventilation	Specify	
2.3	UPS Dimension & weight		
	Length in MM	Specify	
	Width in MM	Specify	
	Height in MM	Specify	
	Weight in kgs	Specify	
2.4	Li Ion Battery Bank (Dimension and weight)		
	Length in MM	Specify	
	Width in MM	Specify	
	Height in MM	Specify	
	Weight in kgs	Specify	
	Accessibility ( front & back with clear Dimension to be specified )	Specify	
	Cable connection Bottom for Input & Output.	Specify	



	Parallel Configuration upto no of Module .	Specify	
	Minmum Input circuit breaker required to be specified	Specify	
3	INPUT		
3.1	Voltage	380V -400V- 415V -433V	
3.2	Voltage range	340 to 460V	
3.3	Frequency	50 Hz	
3.4	Frequency range	+/- 5 Hz	
3.5	Ripple content	<1% with battery connected	
3.7	Input Power Factor		
	100%	0.99	
	75%	0.99	
	50%	0.99	
	25%	0.98	
3.8	Current Harmonic on source		
	100%	<3%	
	75%	<5%	
	50%	<5%	
	25%	<10%	
3.9	Maximum current with out Battery Charging	Amps	
4	OUTPUT		
4.1	Voltage	380/ 400/ 415 V	
4.2	KW=KVA		
4.3	Voltage regulation		
	Balanced	+/- 1%, 3 Ph. + N	
	Un Balanced	+/- 3%, 3 Ph. + N	
4.4	Power Factor	0.8lag - unity- 0.98 lead (Derating of UPS not acceptable in this range)	
4.5	Frequency	50Hz	
4.6	Frequency range	+/- 0.5 Hz	
4.7	Frequency synch. range	0.25 to 3 Hz	
4.8	Transient output voltage variation for 100% block loading	+/-2%	
4.9	Recovery time for 100% block load	< 5 mill second (ms)	
4.11	Wave form	Sinusoidal	



4.12	Total Voltage Distortion out put side		
	Linear load	< 2 %	
	Non-Linear load	< 3 %	
4.13	Crest Factor	3:1	
4.14	Phase Displacement		
	a) Balanced load	120 +/- 0.65°	
	b) 100 % Unbalanced load	120 +/- 2°	
4.15	Inverter Efficiency		
	c) 100 %	Specify	
4.16	Overall Efficiency for UPS		
	b) 50 %	95%	
	c) 75 %	95%	
	d) 100 %	95%	
4.17	Efficiency of UPS in Battery Operations		
	b) 50 %		
	c) 75 %		
	d) 100 %		
4.18	Overload		
	a) 125 %	10 minutes	
	b) 150 %	10 Sec	
4.19	Short circuit Capability	Vendor to Specify	
5	BUILT IN STATIC BYPASS	Required but not used for IT load in operation	
5.1	Inverter and Static Bypass change over time	Specify	
5.2	Fuse @ static bypass	No as per IEEE standards.	
5.3	Short circuit Capability	Vendor to Specify	
5.4	Overload	Specify	
5.5	Transfer time	Less than 5 milli secs.	
5.6	Manual Bypass inside ups only( input/output)	Required	
6	DC CHARACTERISTIC		



	Battery backup to be calculated at unity pf.		
6.1	VAH	Specify	
6.1	DC bus voltage	Specify	
6.2	DC Current	Specify	
6.3	No. of cells with AH	Specify	
6.4	battery voltage	Specify	
6.5	End. Cell voltage	Specify	
6.6	Float voltage	specify	
6.7	DC current at 100% load	specify	
6.8	Charging current	specify	
6.9	Charging time		
6.1	True autonomy / measurement	Software on SNMP & UPS monitor panel	
6.11	Temp. compensated charger	Required/ Mandatory	
6.12	Automatic battery load test	Required/ Mandatory	
6.13	Batt. Breaker with protection	Required/ Mandatory	
	Required Battery Back Up	10 Minutes	
7	PROTECTION		
7.1	Overload (O/L)	Required	
7.2	Short circuit (SC)	Required	
7.3	Input low voltage	Required	
7.4	Output over voltage	Required	
7.5	Battery over charging	Required	
7.6	Battery over discharging	Required	
7.7	IP Protection		
7.8	DC over current Protection		
8	ENVIRONMENTAL		
8.1	Ambient temperature range	0 to 40° C	
8.1	Relative humidity	95 % RH	
8.2	Max. operating altitude	0 M above MSL	
	without derating		
8.3	Acoustic Noise	65db (Specify)	



9	AUDIO / VISUAL DISPLAY		
9.1	Over load	Required	
9.2	Short circuit	Required	
9.3	Input low voltage	Required	
9.4	Input over voltage	Required	
9.5	Battery over discharging	Required	
9.6	Battery on load	Required	
9.7	Battery low	Required	
9.8	Fuse failure	Required	
9.9	Fan failure	Required	
9.1	Inverter failure	Required	
9.11	DC over voltage	Required	
10	VISUAL DISPLAY		
10.1	Input/Output voltage	Required	
10.2	Output current .	Required	
10.3	Input/ Output frequency	Required	
10.4	Output power in KVA and KW	Required	
10.5	Output load power factor	Required	
10.6	Output load crest factor	Required	
10.7	battery DC voltage	Required	
10.8	Charging current	Required	
10.9	Dis-Charging Current	Required	
10.1	Autonomy Time	Required	
10.11	Event logs	2500 events mandatory	
11	OTHERS		
11.2	Software with LAN connect	Required	
11.3	Auto paging	Required	
11.4	SNMP compatibility	Required	
11.5	Diagnostic system	Required	
11.6	Single line mimic diagram	Required	
11.7	Telemonitoring with software	Required- Mandatory	
11.8	Capablity to parallel 6 similar ups systems	required	



11.9	ventilation	forced air cooling with integral fans	
11.1	Operating temperature	0-40deg.C	
11.11	Battery management	required	
11.12	Power Transfer Mode	auto systems ( during fault condition)	
12	Colour		
13	Online Thermal Dissipation in Btu/Hr		
	at 100 %		
	at 75 %		
	at 50 %		
	at 25 %		

7.4 Choices of lithium chemistries and cell designs : Based on long calendar life, high safety and high power density Bidder to choose either any one maintained below chemistry of Lithium.

NMC (LiNiMnCoO<sub>2</sub> - Lithium Nickel Manganese Cobalt Oxide)

LFP (LiFePO<sub>4</sub> -Lithium Iron Phosphate))

7.4.1 Selection of a particular chemistry should be made with safety in mind as well as the other system requirements, namely float service life, footprint or volume of the solution, power capability, temperature of operation and discharge time etc.. Bidder need to consider above aspects while selection chemistry of Lithium.

7.4.2 A Battery system shall be furnished for the UPS with backup time of 10 Mins at Unity PF, capacity to maintain UPS output at the specified load for the duration. Battery protection shall be provided by thermal-magnetic molded-case circuit breakers in each battery rack. UPS battery should be Lithium Ion based( LFP or LMO or NMC) battery as per recommended makes with back up time of 10 Mins at Unity PF with Built in DC Breaker , Battery Cabinet and Battery Monitoring system. These Batteries are to be in the RACK. The battery system shall be designed with highest level of protection built into the battery system against potential safety risk – over voltage and short circuit. Vendor to submit the compatibility certificate with Offered Model of Battery and UPS. Vendor to submit Battery Sizing calculation for back up.

7.4.3 The Complete battery system should be comprised of multiple such module in series / parallel combination to arrive at the required backup and DC voltage requirement of UPS.

7.4.4 Batteries should be compliant to

Safety Cell	UL1642
Module	UL 1973
Transportation	UN38.3
Seismic	GR63
EMC	IEC61000-6-2, and 61000-6-4
Rack Level	UL 1998,991
Battery Module & Switchgear	UL 1973 with each component level
battery Aging factor	IEEE 495
Battery manufacturer should have Quality Certificate	(i) ISO 14001:2004 (Environment) & OHSAS 18001:2007 (Health & Safety) and (ii) ISO 9001-2008



- 7.4.5 The Battery System should be equipped with Battery Management system to indicate the availability and health of entire battery system and cell balancing activity. Battery cabinet should be free standing housing Battery modules with Battery breaker, Battery management system, and Communication protocol for BMS etc.
- 7.4.6 The lithium ion battery solution shall communicate with the UPS via dry contact.
- 7.4.7 Battery monitoring shall be provided at the module, rack, and system level. A switched-mode power supply shall be included and shall provide power for the battery monitoring system from UPS Input and Output
- 7.4.8 The battery system shall consist of a 3 level of protection namely, cell, module and rack level.
- 1st Level Protection – Battery Management System (BMS) & Switch Gear: Each battery rack shall be installed with main switch gear to isolate the affected battery rack in the event of a fault. BMS shall also be included in each rack to provide continuous monitoring of the voltage and temperature of each cell within the rack. BMS gathers and analyses the rack current. In the event of over voltage or short circuit, the BMS will trip the MCCB at rack level.
- 2nd Level Protection – Fuse: Fuses are built into the main switch gear at rack level. In the event of a fault current (caused by short circuit) which the MCCB cannot be activated in the shortest time, fuses will be activated to clear the fault current without damaging the cells.
- 3rd Level Protection – Cell: Several protection features shall be incorporated into the cell namely, safety function layer (SFL), Multi-layers Separator, Safety Vent, Safety Fuse and Overcharged Safety Device. These safety features are to protect the cell from overcharging and thermal runaway.
- 7.5 Non IT UPS - Existing UPS of capacity 3 X 40 KVA to be used for NON IT Load . Bidder to consider the disconnection, shifting and relocation of these three UPS from same floor but in another room. Refer drawing . Also Bidder to consider new SMF battery for these three UPS. Bidder can use existing battery stand only . DC cabling should be new . Battery back up required will for 10 minutes for individual UPS , bidder to consider at .9 power factor for battery sizing.
- 7.6 Supply, installation and commissioning of Diesel Generator Set with acoustics enclosure and the other necessary systems include power cum synchronization panel, exhaust system, earthing system, battery and battery charger along with Civil foundations for successful erection, completion of the Data centre. DG sets should be of prime rating and should be capable of operating continuously on an unbalanced system within limit described in section 6 of IEC 60034.1. Genset should be with time settable Auto start, synchronization, auto stop controller. DG set should be with Auto Mains Failure (AMF) panel. Synchronization is to be with Auto as well as manual wherever required. DG set should be load dependent start and stop arrangement. Height of the exhaust stack has to be as per Central Pollution Control Board (CPCB) norms. Genset should be supplied with day tank of standard fuel storage capacity.. Fuel tank capacity will be as per Petroleum and Explosives Safety Organization (PESO) fuel storage guideline. Alternator insulation should be of Class H and temperature raise limit to Class H. Entire Genset to be provided with necessary engine protection system, alternator protection system and reverse active power protection system etc. Selection of LT switchgear will be as per IEC 60947 and Genset will be as per ISO 8528 part1 to 10. Alternator should be with Resistance Temperature Detectors (RTD) and Bearing temperature detector (BTD). Electrical performance of the alternator will be as per IS 4722. DG system should come automatically ON LINE in less than 40 sec. First fill of



oil and diesel is part of scope of the bidders scope. Erection of pipe Exhaust structure as per pollution control norms and should have aviation lights if required along with lightening arrestors if required, earthing etc in the exhaust pipes if the height is 30 meters. All necessary statutory approvals including, but not limited to, CEIG approval, Fire authority approval, etc. as applicable to DG System. Bidder to consider synchronization panel near to the DG set as shown in the drawing Ground floor plan . The panel should be IP65 , double door , outdoor installation. Bidder to consider astatically good designed canopy above synchronization panel. Use of canopy will be to work on panel during rainy season under failure situation. Such canopy design needs to be approved by IIT Bombay team prior to execution.

- 7.7 AC wiring circuit: Main circuit Point wiring should be surface or concealed conduit system. Conduit wiring shall be as per IS-732. Conduits and conduit accessories shall be galvanized and shall conform to IS-2667, 1988. Conduit ends shall be free from sharp edges or burrs. The ends of all conduits shall be reamed and neatly bushed with Bakelite bushings. In order to minimize condensation or sweating inside the conduit system, all outlets shall be properly drained and ventilated in such manner so as to prevent entry of insects. Conduit pipes shall be fixed by 22 gauge ribbed G.I. saddles on 25 x 3 mm G.I. (Galvanized Iron) saddle bars in an approved manner at intervals of not more than 50 cms. Saddle shall be fixed on either side of couplers, bends or similar fittings, at a distance of 30 mm from the centre of such fittings. Existing point wiring before using needs to be checked and if technically found ok can be considered for use.
- 7.8 Lighting fixtures: -Lighting wiring between JB(Junction Box ) and lighting fixtures shall be done by PVC insulated 3-core (phase neutral and earth) unarmored cable. All joints of conductors in Switch boards / JB's / Fittings shall be made only by means of approved Mechanical connectors (nylon / PVC connectors). Bare or twist joints are not permitted anywhere in the wiring system. Fixtures shall be firmly supported from the structures, support clamps etc. They may be bolted or welded to the steel work or metal inserts. In case of concrete structures, where metal inserts are not available, fixtures will be fixed to or supported from concrete surfaces with the help of anchor fastener, in such cases special care shall be taken to see that anchoring is firm. All LED fixtures shall be with high power factor, low harmonic (THD< 10%) (THD= Total Harmonics Distortion) and minimum 100 lumens/watt. Lux level requirement will be as per NBC.
- 7.9 Earthing and Earthing Pits: All Electrical Equipment must be efficiently double earthed in accordance with the requirement of IS-3043/IEEE 80 and relevant regulations of Electrical. The earth pits shall be as per IS with proper arrangement for testing. Maintenance free earth pits to be used. All Earthing conductors shall be hot dip galvanized / electrolytic grade base copper conductor. The main earthing rings shall be done as per practice laid in Indian Standard. All electrical equipment shall be connected to the earth bus at two points except the lighting fittings and junction boxes. All hardware for bolted joints shall be galvanized and the size of the bolt shall not be more than quarter of the size of earth conductor. Tinned copper lugs shall be provided where round earthing conductors are used. The 415V neutral shall be solidly earthed by means of two separate and distinct connections to earth. The earth pits shall be interconnected between themselves and the main earthing grid to form an earthing ring. All joints in the main earthing conductors shall be welded. Terminal joints on the equipment shall be bolted. Removable test links shall be provided near the earth pits to facilitate testing of earth pits. Where the earthing terminal diameter provided on equipment is larger than quarter of the size of the earth conductor, connection shall be made using a wider flag welded to the conductor. The equipment to be earthed shall be connected to a common earth grid of power system. The number of earth pits will depend upon soil resistivity and the voltage of the system. The earth pit together with the electrode shall be constructed as per IS-3043-1987. The potential difference between neutral and earth should be less than 3 V. A bolted assembly link shall be provided in the connection between earth electrode and the main earth conductor. Existing Earth pits can not be used all should be new one. Equipotential earthing inside the data center needs to be considered with grid below raised flooring of 2 X 2 meter of 25 X 3 mm Cu strip and all end corners after covering complete room needs to be



grounded. Pedestal /stringers, Rack body to be grounded to this grid sothat flooring and equipment's are at equal potential. Also, all the earth pits dedicated for IT equipment's shall be interconnected in a common grid separate from the other general earthing grid. The earthing pits needs to be covered by earth chamber in brick work / readymade high grade material earthing chamber

- 7.10 LT Panels (Low Tension/voltage Panels): Design, Supply, installation, testing and commissioning of all LT panels. Panels will be as per IEC 61439. Panels feeders should have rated capacity of Load manager with RS 485 communication port. This should compactable for BMS system to know the energy consumption. Bidder to submit License certificate of LT panels as per IEC 61439. Selection of switchgear should be as per IEC 60947 and bidder to submit the Discrimination chart for all the feeders. All the panels should be with Transient Voltage Surge Suppressor (TVSS) having Response time <0.5ns, Let-through Voltage 600V-800V. For selecting the source fault level bidder to consider value of transient reactance ( $X_d'$ ) for transformer of rating 22/.433 KV 2500 KVA and sub transient reactance ( $X_d''$ ) for alternator output at common bus at synchronization panel as per ISO 8528 Part 1 to 10.

Sr. No.	Name of Panel	Purpose	Location
1	DC LT panel	TO feed the power to Data center	Basement - Refer Basement floor layout
2	Synchronization Panel	Feed DG power to Data center	Ground floor Out door type near DG set
3	UPS out put Panel - IT Load	This panel is used to feed the overhead bus bar system vis isolation transformer and ultimately to the server racks.	Third Floor- Refer Third floor layout drawing
4	UPS out put Panel - NON IT Load	. This panel is used to feed the power to NON IT equipments as Adiabatic Dry Cooler, all pumps, Inrow units , BMS etc.	Third Floor Refer Third floor layout drawing
5	ATS panel to Chiller and Pump	Existing chiller, cooling tower and pump are feed thro existing chiller panel. In order to add redundancy from DG power , new ATS panel is required as provisioned in the electrical SLD . .Only one chiller will be in operation during EB failure and DG running condition. This will be manual operation and controlled manually by IIT Bombay operation team.	Basement

- 7.11 - Automatic Transfer Switches (ATS )Supply, Installation , Testing and commissioning of automatic transfer switches (ATS) with number of poles, amperage, voltage, withstand and close-on ratings as shown in the Electrical SLD. Automatic transfer shall consist of an inherently double throw power transfer switch mechanism and a microprocessor controller to provide automatic operation. The transfer switch shall be electrically operated and mechanically held. The electrical operator shall be a momentarily energized, single-solenoid mechanism. Main operators which include over current disconnect devices, linear motors or gears shall not be acceptable. The switch shall be mechanically interlocked to ensure only two possible positions, normal or emergency. All transfer switch sizes shall use only one type of main operator for ease of maintenance and commonality of parts. The switch shall be positively locked and unaffected by momentary outages, so that contact pressure is maintained at a



constant value and contact temperature rise is minimized for maximum reliability and operating life. All main contacts shall be silver composition. Switches rated 600 amperes and above shall have segmented, blow-on construction for high withstand and close-on capability and be protected by separate arcing contacts. Inspection of all contacts shall be possible from the front of the switch without disassembly of operating linkages and without disconnection of power conductors. Switches rated 600 amps and higher shall have front removable and replaceable contacts. All stationary and moveable contacts shall be replaceable without removing power conductors and/or bus bars. Designs utilizing components of molded-case circuit breakers, contactors, or parts thereof, which are not intended for continuous duty, repetitive switching or transfer between two active power sources, are not acceptable. ATS shall be provided with fully rated complete overlapping neutral transfer contacts. The neutrals of the normal and emergency power sources shall be connected together only during the transfer and retransfer operation and remain connected together until power source contacts close on the source to which the transfer is being made. The overlapping neutral contacts shall not overlap for a period greater than 100 milliseconds. Neutral switching contacts which do not overlap are not acceptable. Where neutral conductors are to be solidly connected a neutral conductor plate with fully rated AL-CU pressure connectors shall be provided. The ATS shall be rated to close on and withstand the available RMS symmetrical short circuit current at the ATS terminals with the type of over current protection shown on the plans. The ATS shall be UL listed in accordance with UL 1008 and be labeled in accordance with that standard's 1½ and 3 cycle, long-time ratings. ATSs which are not tested and labeled with 1½ and 3 cycle (any breaker) ratings and have series, or specific breaker ratings only, are not acceptable. The ATS upto 600A should be tested for any breaker rating. The ATS from 800A to 4000A should have short time withstand capacity as - 800A to 1200A...36KA for 18 cycles. The controller's sensing and logic shall be provided by a single built-in microprocessor for maximum reliability, minimum maintenance, and the ability to communicate serially through an optional serial communication module. A single controller shall provide twelve selectable nominal voltages for maximum application flexibility and minimal spare part requirements. Voltage sensing shall be true RMS type and shall be accurate to  $\pm 1\%$  of nominal voltage. Frequency sensing shall be accurate to  $\pm 0.2\%$ . The panel shall be capable of operating over a temperature range of -20 to +60 degrees C and storage from -55 to +85 degrees C. The controller shall be connected to the transfer switch by an interconnecting wiring harness. The harness shall include a keyed disconnect plug to enable the controller to be disconnected from the transfer switch for routine maintenance. Sensing and control logic shall be provided on multi-layer printed circuit boards. Interfacing relays shall be industrial grade plug-in type with dust covers. The panel shall be enclosed with a protective cover and be mounted separately from the transfer switch unit for safety and ease of maintenance. A four line, 20 character LCD display and keypad shall be an integral part of the controller for viewing all available data and setting desired operational parameters. Operational parameters shall also be available for viewing and limited control through the serial communications input port. The parameters shall only be adjustable via DIP switches on the controller as Nominal line voltage and frequency, Single or three phase sensing, Operating parameter protection, Transfer operating mode configuration as Delayed transition, Voltage and frequency on both the normal and emergency sources (as noted below) shall be continuously monitored, with the following pickup, dropout, and trip setting capabilities (values shown as % of nominal unless otherwise specified):

Parameter	Sources	Dropout / Trip	Pickup / Reset
Under voltage	N&E, 3 $\phi$	70 to 98%	85 to 100%
Overtoltage	N&E, 3 $\phi$	102 to 115%	2% below trip
Under frequency	N&E	85 to 98%	90 to 100%
Over frequency	N&E	102 to 110%	2% below trip
Voltage unbalance	N&E	5 to 20%	1% below dropout

Repetitive accuracy of all settings shall be within  $\pm 0.5\%$  over an operating temperature range of -20°C to 60°C. Voltage and frequency settings shall be field adjustable in 1% increments either locally with the display and keypad or remotely via serial communications port access. The



controller shall be capable (when activated by the keypad or through the serial port) of sensing the phase rotation of both the normal and emergency sources. Source status screens shall be provided for both normal & emergency to provide digital readout of voltage on all 3 phases, frequency, and phase rotation. An adjustable time delay of 0 to 60 seconds shall be provided to override momentary normal source outages and delay all transfer and engine starting signals. Capability shall be provided to extend this time delay to 60 minutes by providing an external 24 VDC power supply if required. A time delay shall be provided on transfer to emergency, adjustable from 0 to 60 minutes, for controlled timing of transfer of loads to emergency. Two time delay modes (which are independently adjustable) shall be provided on re-transfer to normal. One time delay shall be for actual normal power failures and the other for the test mode function. The time delays shall be adjustable from 0 to 60 minutes. Time delay shall be automatically bypassed if the emergency source fails and the normal source is acceptable. The controller shall contain a self diagnostic screen for the purpose of detecting system errors. This screen shall provide information on the status input signals to the controller which may be preventing load transfer commands from being completed. The controller shall be capable of interfacing, through a communication module, with a network of transfer switches, locally (up to 4000 ft.) or remotely through modem serial communications.

#### Codes and Standards

UL 1008 - Standard for Transfer Switch Equipment

Low-voltage Switchgear and Control gear; Multifunction equipment; Automatic Transfer Switching Equipment-AC 33A utilization category for Mix Load Application.

NFPA 70 - National Electrical Code

NFPA 99 - Essential Electrical Systems for Health Care Facilities

NFPA 110 - Emergency and Standby Power Systems

IEEE Standard 446 - IEEE Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications

- 7.12 Stainless steel (SS) cable tray to be considered above each row of the Rack.. Cable tray Grid above the rack to be provided and cable tray should be in SS. Rack Interconnecting cables mostly will be fiber, Bidder to take care utmost care as 90 Deg C bend will not be accepted.

All cable Trays up to 300mm shall be perforated type & above 300mm ladder type trays shall be used. The Trays shall be pre-fabricated hot-dipped galvanized. Cold galvanizing at site is acceptable only for touch-ups. The Trays shall have suitable provision for clamping at an interval of 500 mm. The Earthing Strip for the earthing ring shall be run along the side of the Tray. The connection between individual equipment to the ring shall be by bracing or with lugs. The bending of trays shall be smooth and the curvature sufficient for each bending of cables in it. Pre-fabricated accessories such as Tees, bends, risers, couplers, reducers, etc. shall be used at all junction & branches. Cutting & welding of trays at site is not permissible. Similarly, the trays shall not be welded on the supports but bolted only. Electrical Cable Tray routing shall be co-ordinated at site to check fouling with pipes, equipment, light fittings, HVAC, etc. before fixing the trays. Cable trays needs to be used in all utility shafts.

- 7.13 All Low tension cables should be of 1.1 KV grade, All power cables from 25 Sq.mm to 400 Sq.mm should be with stranded, compact aluminium conductor, with XLPE insulated, PVC inner sheathed, galvanized steel strip armored and overall PVC sheathed conforming to IS:7098 /88. As stated in Electrical single line diagram for Cu flexible cables should be of Solid/Stranded Copper conductor, XLPE Insulated, cores laid up, PVC tape/PVC Extruded Inner sheathed for Multicore Cables, Unarmoured, extruded PVC Type ST2 Sheathed as per IS 7098 (Part 1) 1988. Cables shall comply



with the latest editions of following standard, as applicable-BIS : 1554 Part 1 PVC insulated electric cables (Heavy duty), BIS: 7098 Part 2 Cross- Linked Polyethylene Insulated PVC sheathed cables, BIS : 8130 Conductors for insulated electric cables and flexible cables. 1.1 KV grade cables: All LT power cables shall be 660/1100V grade, with aluminium conductor for size 10 Sq.MM and above. Power cables of sizes up to 6 Sq.mm. shall be with copper conductors, All Cables shall be externally marked at either end with the respective identification numbers by means of non-deteriorating material. Cable Markers shall be approved by Client. IS: 1554 - PVC insulated (heavy duty) electric (Part I) Cables - Part I for working voltages up to and including 1100V. IS: 1753 - Aluminium conductors for insulated cables. IS: 3961 - Recommended current ratings for (Part II) cables: Part-II PVC insulated and PVC sheathed heavy-duty cables. IS: 3975 - Mild steel wires, formed wires and tapes for armouring of cables. IS: 5831 - PVC insulation and sheath of electrical cables. IS: 7098 - Cross-linked Polyethylene insulated (Part-II) PVC sheathed cables: Part-II for working voltages from 3.3 KV upto & including 33 KV. IS: 8130 - Conductors for insulated electric cables and flexible cords. IS: 9968 - Elastomer - insulated cables, for (Part I) working voltage upto and including 1100V.

Existing DG set of rating 1 X 320 KVA DG set is with AMF panel . The out going cables 2 X 300 Sq mm A2XFY needs to be removed from AMF panel and to be connected to the feeder as defined in Electrical SLD drawing . Bidder to consider the scope removing of the cable and re termination in the DC LT panel.

The existing main LT panel at Basement have chiller feeder with 4 X 300 Sq mm A2XFY cables with 1200 Amps ACB . This feeder is feeding power to the chiller panel in the basement only . Location of chiller panel is in the chiller area. Bidder to consider removing of these cables and reconnecting in the output of ATS panel as per Electrical SLD . The length of cable may be short , Bidder to consider additional length with proper jointing. Also bidder to consider new 4 X 300 Sq mm A2XFY cables from chiller feeder to input ACB of ATS panel as per Electrical SLD.

Routing of Cable from Basement to Third floor and again back to Server room will be from shaft as shown in the drawing.

- 7.14 Bus Duct Sandwich Type for IT load -- Copper/Aluminium Sandwich Type Construction 3P4W 100% N with body Enclosure as Integral Earth. Operating Voltage 1000V Suitable for 50 / 60 Hz with impulse withstand voltage of minimum 6 kV, Insulation Voltage 690V Rated Short time Current 40 kA for 1 Sec . Cu conductor or Al Conductor with Tin coating on entire surface or silver-plated Bi-metal cladding on Aluminum conductor through high current and high pressure, Neutral conductor shall have same cross section area that of phase conductor. The Earthing shall be Aluminum and it shall be one continuous piece, integral earth rated at min 50% of phase. Earthing shall be factory fitted factory tested and Icw rating for the earthing shall also be declared on Type Test Certificate produced by manufacturer. Bus Bar Should be insulated with red class F thermosetting plastic material and factory fitted in one side of the each trunking components. The enclosure shall provide a protection not less than IP- 55 as per IEC-60529 for indoor application. . The busbar Trunking shall comply with standard IEC 61439-6 and the rated current of the busbar trunking systems shall be referred to the average ambient temperature of 40 °C .The Bus duct enclosure consists of four C-ribbed section bars, bordered and riveted, with excellent mechanical, electric and heat loss efficiency. The sheet metal is made of 1.5 mm thick hot-galvanizes steel treated according to UNI EN 10327 and painted with RAL7035 resins with high resistance to chemical agents. Tap-off Box with Mechanical Interlocking Feature for MCB Power Isolation is required. Entire system should include but not limited to Straight Length, Flange End, Elbow 90 Deg. End cover ,Horizontal hanger, adaptor box , Copper braided flexible, tap off boxes rating as per SLD and Layout Drawing. All these fitting shall be in accordance with IEC 61439-6 and from the same manufacturer. There should not be any risk of exposure to electromagnetic fields. The busbar trunking housing shall be constructed of electro galvanized steel and aluminium to reduce hysteresis and eddy current losses and shall be provided with 7 tank cleaning & powder coating process with a suitable protective finish of ANSI 49 grey epoxy paint. The busbar



trunking housing shall be totally enclosed non-ventilated for protection against mechanical damage and dust accumulation.

Sr.No.	Description	Rating
1	System nominal voltage	433 V
2	System frequency	50 Hz
3	Number of phases	TPN
4	Rated Continuous current	400A for Cu and 630 for Al
5	Fault Level	35KA for 1 sec
6	a) Minimum phase to phase b) Phase to body clearance (clear) c) Phase to neutral (clear)	As per standards Clearance (clear) As per standards As per standards
7	Neutral Grounding	As per standards
8	Insulation level  Impulse withstand voltage	1 min dry power frequency-2.5 kV rms Withstand voltage Short time rating (Sym. KA)-(1 sec) - Refer SLD
9	Dynamic withstand current	100 kA peak
10	Cooling	Self-cooled
11	Design ambient temperature	50°C
12	Location	Indoor/outdoor
13	Degree of protection	IP 52/IP64
14	Maximum temperature rise(over 50 deg. C ambient)  Bus conductor Bus enclosure and support structures	  35°C  20°C
15	Material Busbar Enclosure	AL/ CU MS of minimum thickness 3mm. (CRCA)
16	Bus bar Joints Flexible / expansion	Bolted type To be provided at all joints equipment
17	Insulators	Non-hygroscopic FRP/SMC with high Anti-tracking index. (Hylam Sheet support of any grade is not acceptable.)



Sr.No.	Description	Rating
18	Heating	Thermostat controlled space heater wired by means of 650V HRPVC 2.5 sq.mm. Copper wire
19	Silica gel breather and drain plugs	Required
20	Applicable standards	IS 8084 IEC 439 IS 8623
21	Acceptance tests	1) As per IS:8084 IS 8623

7.15 K-4 Rated Isolation Transformer with Cu winding , Vector Group of DyN11,insulation class -H with input connection three wire and output connection of four wire to be considered. This should be as per IS2026 . Bidder to submit technical information as per below table.

**BTS- Bidder to Submit**

TECHNICAL INFORMATION			
CAPACITY	500KVA	FREQUENCY	50Hz
K-RATING	K-4	INSULATION CLASS	H
INPUT CONFIGURATION	3 PHASE 3 WIRE	INPUT VOLTAGE (L-L)	<b>BTS</b>
OUTPUT CONFIGURATION	3 PHASE 4 WIRE	OUTPUT VOLTAGE (L-L)	415V
WINDING MATERIAL	COPPER	INPUT CURRENT	<b>BTS</b>
VECTOR GROUP	Dyn-11	OUTPUT CURRENT	695A
		COOLING	AF
TRANSFORMER TURNS RATIO TEST			
PHASE	URNS RATIO	% DEVIATION	Milli Amps
R	<b>BTS</b>	<b>BTS</b>	<b>BTS</b>
Y	<b>BTS</b>	<b>BTS</b>	<b>BTS</b>
B	<b>BTS</b>	<b>BTS</b>	<b>BTS</b>
MEASUREMENT OF IMPEDENCE VOLTAGE / SHORT CIRCUIT IMPEDENCE (PRINCIPAL TAPPING) AND LOAD LOSS.			
PRIM. PH R-Y / U-V	<b>BTS</b>	LOSSES @ 75% LOAD	<b>BTS</b>
PRIM. PH Y-B / V-W	<b>BTS</b>	LOSSES @ 50% LOAD	<b>BTS</b>
PRIM. PH B-R / W-U	<b>BTS</b>	LOSSES @ 25% LOAD	<b>BTS</b>
LOSSES @ 100% LOAD	<b>BTS</b>		
TOTAL LOSSES	<b>BTS</b>		
EFFICIENCY	<b>BTS</b>		



REGULATION %	BTS		
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## 8 Requirements towards Heating, ventilation, and air conditioning work

8.1 Existing cooling equipment's available at site and need to be used to integrated in new requirement.

Sr. No.	Description	Rating	Quantity
1	Water cooled Chiller -1 , 2,3 (Evaporator leaving temperature of 8 Deg C and evaporator entering temperature of 13 Deg C)	250 T.	4
2	Piping		
3	Pump (Primary and Secondary pumping )		

This existing chiller will be used as Evaporator leaving temperature of 8 Deg C and evaporator entering temperature of 13 Deg. C.

8.2 All cooling equipment selection to be done based on American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE n=20 ) standard. The cooling systems should perform efficiently at variable load conditions. The overall cooling solution should be designed to achieve better cooling and low operating cost. The room air temperature should be maintained at 22 +/- 2 Deg. C and humidity as per ASHRAE TC 9.9 2017 guidelines. The cooling system in the server rack area should be designed as per layout design provided in Layout Drawings. Heating and humidifier to maintain correct operating environment throughout the data centre needs to be considered. Relative humidity to be maintained in the data center will be from 45% to 55%.

8.3 Logic of operation of cooling system will be-

8.4 The dedicated temperature sensor will sense the ambient air temperature continuously. As long as the ambient temperature is less than or equal to the "set point temperature", the control system will facilitate the dry cooler to run in "dry mode". ( Set point temperature is water leaving temperature from dry cooler and set point should not be more than 32 Deg. C +1 Deg.C, But equipment should have capacity to set to maximum 33 Deg C and to maintain the same also ). Only at times (if any) the ambient temperature increases beyond the "set point" temperature, the control system enables the unit to transition to "wet mode" operation. During "wet mode", the adiabatic water system will be instigated to facilitate pre-cooling of the incoming hot ambient air before entering the heat exchanger coil section. In addition, the control system must also be able to optimize the fan power consumption continuously depending on the ambient temperature and heat load variations. Make provision on HMI to change set points as required. The process water side RTD (PT100) with temperature output signal will have to be fitted at the main water outlet header of the Adiabatic cooler. This temperature sensor will sense the outlet water temperature and accordingly give a signal to EC fans to increase / reduce the speed. At the set temperature the fans will be running at full speed and as soon as it drops then the fan speed will be reduced resulting in saving of power. If the adiabatic dry cooler leaving temperature increases beyond the "set point" temperature in "Wet Mode", the control system /BMS will facilitate the unit to operate in "Wet mode".

8.5 **.Adiabatic Dry Cooler:** Supply, installation, testing and commissioning of a adiabatic dry cooler with adiabatic cooling pads. The finned coil heat exchangers shall consist of copper phosphorus deoxidised (Cu-DHP) tubes, having copper content 99.9%, made to EN 12735 parts 1 & 2, ASTM



B280/b68/b743 specifications. Aluminium fins shall be with advanced rippled-corrugated fin design to create a state of continuous turbulence, with full drawn collars to maintain fin spacing and provide a continuous surface cover over the entire tube. The tubes shall be mechanically expanded into the fin collars to provide a continuous primary to secondary compression bond over the entire finned length for maximum heat transfer rates. Headers shall be made of copper tubes having steel-flanged connections as standard. The adiabatic cooling system shall consist of instrumentation and controls, Spray pump, adiabatic cooling pads, SS basin, screen, electrical interface, VFD pumps, EC fans. Increased energy savings shall be achieved by using EC (electronically commutated) motors with permanent-magnet rotors. The fans selected shall be labelled as 'soft commutation'. This must involve a combination of commutation strategy and motor design. It should result in low-noise operation, without structure-borne noise. The noise level shall be limited to 75 dBA at a distance of 1.8 m. With the fans selected, there must be no motor noise variation across the entire speed range. When demand for cooling is low, very low operating speeds must be selected; resulting to extremely reduced absorbed power. Fan shall be Axial type aero foil design with Direct Drive. Fan motors should be total enclosed fan controlled (TEFC) with degree of protection IP – 54 or more. The Adiabatic dry cooler shall have a control system that senses the outdoor ambient dry and the leaving water temperature; selects between dry and adiabatic cooling and varies the speed of the fans to meet the heat rejection needs of the system. The controls shall cause the adiabatic water distribution system to operate when the ambient outdoor dry-bulb temperature does not provide sufficient cooling to maintain the desired leaving water temperature. Due to adiabatic pre-cooling, Inlet air temperature (ambient) enables return temperatures below the ambient temperature or a significantly higher device output with the same space requirement. Once the defined set point of the outlet temperature of water or condensing temperature can't be achieved anymore in dry operation, due to an increasing ambient temperature, the pre-cooling system is activated. The upstream Adiabatic Pads are humidified and air cooled by exchanging the latent heat of evaporation. The water is distributed evenly and without pressure via drainage channels, which are quickly and easily accessible for maintenance and cleaning purposes. The water only wets the stable framed, easy-to-replace and chemically resistant Adiabatic Pads and not the heat exchanger, which protects it from corrosion and in most cases eliminates the need for water treatment.. The Adiabatic Pads are impregnated to prevent microbiological growth. The excess water is drained from the stainless steel sump. The adiabatic pre-cooling system should meet the highest hygienic requirements. Stagnation and dead zones in the water-bearing components needs to be avoided, . The cooling pad section on each air-inlet side shall serve as an adiabatic saturator to cool the incoming air. It shall consist of specially integrated cellulose paper sheets with flute angles that have been bonded together. The impregnation procedure shall also ensure a strong self-supporting product, with high absorbance, protected against decomposition and rotting. An inlet-air edge coating shall be provided to prevent the pad surface from extreme environment such as dirt, sand storm, and risk of bacterial and algae growth. The water flow through the pads shall be initially regulated by a special metering device, which throttles the correct flow rate. The unit shall have a water tray to collect the not-evaporated water. The unit shall be equipped with two copper tubes /Al tubes that spray water at a low pressure (2 to 3 bar) over the adiabatic pads to keep them wet. A water distributor shall be placed above wet pads to provide a homogeneous distribution of the water on all the pads length. Two fixed speed pumps shall be onboard the unit and they shall be used to circulate the water from the tank to the distribution pipes over the adiabatic pads. The Water used in the adiabatic mode needs to be reused by use of inbuilt filters. Casing is a self-supporting construction. Maximum casing dimensions are adapted to the local conditions Casing material made of Galvanized steel, powder-coated RAL 7035 Casing surface receives a high quality powder coating (RAL 7035) For easy cleaning, all surfaces are smooth. Controller should regulate the humidification and the amount of wetting water. Control ball valve including motorized valve, continuous control and emergency control function. Capacity of the adiabatic dry cooler shall be computed from the measurements of water flow, incoming/outgoing water temperatures and ambient dry bulb temperature and mean coincidental wet bulb temperature using accurately calibrated mercury-in-glass thermometers. Computed ratings shall conform to the specified capacities. Bidder needs to consider appropriate deration due to ambient temperature ,



altitude etc. factors. Bourdon type pressure gauges with aluminium casing with a minimum 100 mm dial and appropriate range complete with needle valves shall be provided at the inlet and outlets of heat exchangers, and pump sets. Thermometers shall be of dial type weather & water proof type. Thermometer shall be provided at the inlet and outlet of dry cooler

8.6 Bidder to submit technical information as per below table.

**BTS- Bidder to Submit**

<b>Adiabatic Dry Cooler - GTP</b>					
Air inlet temperature	Deg	Bidder to	Capacity	KW	<b>200</b>
Relative humidity	%	As per Site	Airflow	m3/h	<b>BTS</b>
Wet bulb air inlet temperature	Deg C	<b>BTS</b>	Adiabatic System water flow	m3/h	<b>BTS</b>
Guaranteed capacity in dry conditions %	[%]	<b>BTS</b>	Evaporation Efficiency	%	<b>BTS</b>
Switching temperature wet/dry	Deg C	<b>BTS</b>	Fan speed	RPM	<b>BTS</b>
Inlet fluid temperature	Deg C	<b>BTS</b>	Power consumption	W	<b>BTS</b>
Outlet liquid temperature	Deg C	<b>BTS</b>	Motor consumption	W	<b>BTS</b>
Fluid flow	m3/h	<b>BTS</b>	Sound level (at	dB(A)	<b>BTS</b>
Fluid pressure drop	kPa	<b>BTS</b>	Sound Power Level	dB A	<b>BTS</b>
Fluid		Water			
Altitude	m	0			
Fans:	mm	BTS number of fans and dimensions	Surface	m2	<b>BTS</b>
Poles	[n]	EC FANS	Weight	kg	<b>BTS</b>
Volume	[dm3]	<b>BTS</b>	Weight with wet adiabatic panels	kg	<b>BTS</b>
			Inlet Pipe Connection	NB	<b>BTS</b>
Coil operating maximal pressure	[bar]	<b>BTS</b>	Outlet Pipe connections	NB	<b>BTS</b>
Dry Weight	Kg	<b>BTS</b>	Overall dimensions		<b>BTS</b>
Wet Weight	Kg	<b>BTS</b>	Length	m	<b>BTS</b>
			Width	m	<b>BTS</b>



			Height	m	<b>BTS</b>
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### 8.7 PRESSURE GUAGES & THERMOMETERS

Bourdon type pressure gauges with aluminium casing with a minimum 100 mm dial and appropriate range complete with needle valves shall be provided at the inlet and outlets of heat exchangers, and pump sets. Thermometers shall be of dial type weather & water proof type. Thermometer shall be provided at the inlet and outlet of dry cooler.

### 8.8 Chilled water based In Row Cooling Unit

- 8.8.1 These specifications describe requirements for an environmental control system. The system shall be designed to maintain temperature and relative humidity conditions within the row(s) of racks. The environmental control system shall be a In row unit factory assembled unit. It shall be floor mounted, optimized for maximum cooling capacity in a minimum footprint. It shall be specifically designed for service from the front and rear of the unit. The system shall be designed to ensure even air distribution to the entire face area of the coil. The unit shall be able to be mounted between the racks or at the end of the row with the use of optional adjustable air supply diffusers. The unit shall modulate cooling capacity and airflow based on requirements.
- 8.8.2 Each system shall be capable of handling up to 10000 CMH with a horizontal airflow pattern. It shall have a net cooling capacity rated not less than 55 kW, based on the returning air condition of 35°C dry bulb, defined Relative Humidity and 20°C dry bulb supply air temperature. Positive Temperature Coefficient (PTC) ceramic type electric heater shall be used. Input chilled water temperature will be 8 Deg C + 2 Deg C . Bidder to refer P & ID .
- 8.8.3 Electrode humidifier to be factory installed in the cooling unit. The humidifier to include humidifying cylinder kit and humidifying control board. The humidifying control board needs to receives humidifying command from the main control board, controls operation of the humidifying cylinder automatically, and feedbacks alarm information of the humidifier to the main control board. Humidifier to be able to modulate capacity. The humidifier should be self-contained, steam generating type, factory piped and wired, with disposable cylinder and automatic solid-state control circuit. Humidifier canisters shall be replaceable. The humidifier controller needs to communicate directly to the microprocessor controller and provide complete status and control at the operator interface. Humidifier shall control flush cycling and conductivity via automated controls. The unit to be equipped with a factory installed condensate pump. Internal piping is done connecting the pump to the condensate pan. Two types of switch should present where one is to activate the pump and the other for alarm generation in order to protect overflow condensate pan.
- 8.8.4 There shall be one chilled water circuit, incorporating a high efficiency 2-way chilled water valve – Pressure Independent Valve is preferred. The unit needs to run with variable capacity operation based on the chilled water control capabilities. The cooling coil to be designed with water freezing in mind, in the case of super low temperature, by having leaned or gradient design of coil to ensure removal of water during idle of the system. The evaporator coil to be manufactured from copper tubes and hydrophilic coated aluminum fins, with a condensate drain pan. The condensate pan to be made up of galvanized steel pan .The evaporator coil shall have sufficient face area and 2 or 3 rows. The hydrophilic coating provides superior water carryover resistance. Coil headers to be equipped with drip plates in the bottom to route the condensate accumulating on the header tubes to the condensation pan. The 2-way modulating valve to control the mass flow of the chilled water within the chilled water circuits with high speed and high precision. The flow needs to controlled by the



intelligent micro controller which sends signal based on its sensor feedbacks. The coil is configured in a counter flow arrangement to enhance heat transfer efficiency.

- 8.8.5 The unit to be equipped with DC fan for all the units. The fan speed to be variable and automatically regulated by the highly intelligent control through all modes of operation. Each fan to have a dedicated motor which provides a level of redundancy. The fans pull air through the coil and should be located on the front side of the unit. Fan Protection: Each fan assembly shall consist of integral fan finger guards. Each fan assembly features a housing with a foam lining to provide passive noise control.
- 8.8.6 The unit needs to be provided with levelling feet. The perforated inlet and outlet panels need to have 75% open area. All units needs to provide maintenance from the front and rear, allowing units to be placed within a row of racks. The cabinet should be designed to fit the air baffles which helps in modularity design. The design should fit 4 (four) symmetrical air baffles that can be changed to LEFT or RIGHT direction and each baffle is assumed technically to be 25% of capacity cooled. During modular designs, each unit can be configured using the air baffle to divide capacities per 25% range.
- 8.8.7 The unit to be equipped with two air filters rated G4, located within the cabinet, and accessible from the rear of the unit. The filter should comply to average atmospheric dust spot efficiency of 30% per AHRAE Standard 52.1, MERV 8 per ASHRAE 52.2 A filter clog alarm should be available .
- 8.8.8 In row unit models needs be controlled by the intelligent control board. The control board needs to be microprocessor based. The controller should allow setting and monitoring of the room parameters. The unit needs to utilizes multiple temperature sensors placed at the rack inlet, to ensure management and control of temperature by the rack. Each unit can be connected to a maximum numbers of remote Temperature Sensors. The sensors needs to provide real-time, direct feedback to the cooling unit to optimize the amount of cooling and airflow required; increasing energy efficiency and ensuring proper rack inlet air temperatures. The sensor data needs to be reported to remote BMS and monitoring system. Status Report of the latest 500 alarm history of the unit. Input for remote on-off and volt-free contacts for simple remote monitoring of low and high priority alarms: high/low temperature, fan/control failure and others shall be available Automatic restart shall be provided after a power failure. Controller should be with the graphic screen display. It shall provide password protection to prevent unauthorized operation effectively. The operation time of components should be available through the menu. fault diagnosis system can automatically display the current fault information, facilitating maintenance. It provides tracked records of the temperature and humidity. A buzzer provides an audible indication in case of the 'Warning' or 'Alarm' event. Internal supply and return chilled water temperature sensors need to be installed into sealed wells. Wells are filled with thermal conducting heat transfer grease to provide accurate temperature sensors. The data from the water sensors should be processed by the intelligent controller, and to be able to produce the current cooling capacity value in the controller. Internal water flow sensor for chilled water need to be installed into sealed wells to provide accurate flow rate data. The data from the water sensors should be processed by the intelligent controller, and able to produce the current cooling capacity value in the controller
- 8.8.9 Remote shut down contact to incorporate in the Fire input to be provided along with common alarm potential free input.
- 8.8.10 The controller needs to allows setting and/or monitoring of the following minimum space parameters:
- Air inlet Temperature
  - Air supply Temperature (remote sensors at rack inlet)
  - Return Temperature set-point



- Supply Temperature set-point
- Humidity (inlet)
- Humidity set-point
- Fan output
- Heating status
- Humidifier status
- Supply voltage
- Real Time Cooling Capacity (in BTU/h or kW) – water flow sensor required

8.8.11 The list of minimum available warnings/alarms:

- High supply temperature
- Low supply temperature
- High return humidity
- Low return humidity
- Loss of airflow
- Electrical heater high temperature (When applicable)
- Clogged filter
- Supply sensor failure
- Humidifier problem
- Rack sensor failure

8.8.12 In Rows unit should have industry standard communication protocol to communicate to BMS system.

8.8.13 In Row units should have with water leak detection kit.

8.9 Bidder to submit technical information as per below table.

**BTS- Bidder to Submit**

Sr.No.	DESCRIPTION	UNIT	Technical requirements	Supplier Details
1	Net Sensible Cooling Capacity	TR	.....	
2	Airflow	CFM	..... ....	
3	Return air temperature	Deg C	..... ..	
4	Return air RH	%	.....	
5	ESP	Pa	<b>100</b>	
6	Supply air temperature	Deg C	<b>NOT EXCEEDING 22 DEG.C</b>	
7	Supply air RH	%	<b>55 +/- 5 %</b>	
8	Type of In Row	(CHILLED WATER)		



9	Discharge Type	(FRONT /TOP/BOTTOM)	Front with Indoor EC fans	
10	Chilled water Unit Details			
11	a) Chilled Water Inlet Temperature	Deg C		
12	b) Chilled Water Outlet Temperature	Deg C		
<b>UNIT KEY PARAMETER DETAILS</b>				
1	Make of Proposed unit	-		
2	Model of Unit Proposed	-		
3	Total Cooling Capacity	TR (KW)		
4	Net Sensible Cooling Capacity	TR (KW)		
5	SHR			
6	Total fan Power Consumption (Based on motor rated kw)	kW		
7	Total Unit Connected Power (Fan Actual Kw +Controller+Actuator)	KW		
8	Specific Power Consumption	ikw / TR		
9	Unit Size			
	Length (L)	mm		
	Depth (D)	mm		
	Height (H)	mm		
10	FAN	mm		
11	Unit weight	kg		
12	Dual coil units	YES		
13	Valve + Coil Pressure Drop	Kpa		
14	Noise levels at 1.5m distance from unit	dbA		
<b>UNIT CASING DETAILS</b>				
1	Single / Double skin	mm		
2	Outer Casing material	-		
3	Outer Casing thickness	mm		
4	Inner Casing material	-		
5	Inner Casing thickness	mm		
6	Insulation material - thickness / Density	mm		
8	Drain Pan Material & Thickness.			
9	Drain Connection Dia	mm		
10	Service Location	Front / Back /Side		



<b>CHILLED WATER CONTROL VALVE</b>				
1	Make	-		
2	Valve Type	PICV ( Pressure Independent Control Valve)	Required	
3	Cooling coil shall have Pressure Independent Balancing and Control Valves (PIBCV) valve with thermostats / temperature transmitter for their own control	Yes/No	Required	
4	Differential Pressure (DP) valve details	-		
5	Dia of Control Valve	mm		
7	Pressure rating	PN		
<b>COOLING COIL</b>				
1	Type	CHW		
2	Face Area	Sqft		
3	Face Velocity (Required)	FPM		
4	No of evaporator per unit	Nos.		
5	Total No. of Rows Deep	Nos.		
7	Tube Material	-	Cu	
8	Tube OD and Thickness	mm	VTF	
9	Fin Material & Thickness	mm	AL	
10	Fin Spacing	FPI	10 - 12 FPI	
11	Type of treatment for Fins	-	Hydrophilic	
13	Air side pressure drop	Pa		
14	Coil air inlet temperature (DB &RH)	Deg C		
15	Coil air outlet temperature (DB &RH)	Deg C		
16	Coil Water side pressure drop	Kpa		
17	Control valve pressure drop	Kpa		
18	Chilled Water IN Temp	Deg C		
18	Chilled Water OUT Temp	Deg C		
19	PIBCV valve with temperature transmitter - Model selection to be submitted for approval			
20	Chilled water flow rate	USGPM		
21	Total Cooling capacity	kW		
22	Sensible Cooling capacity	kW		



23	Coil Test Pressure	Kpa		
24	Chilled water inlet / outlet nozzle size	mm		
25	<p>Cooling coil selection shall be submitted for the following operating conditions:</p> <p>1) 100% load on cooling coil 2) 50% load on cooling coil</p>	Yes/No		
<b>EVAPORATOR FAN</b>				
1	Type of Fan		EC Fan	
2	Fan make			
3	Discharge type		InFloor EC fan	
4	No. of fans per evaporator	Nos.		
5	Total No of fans per unit	Nos.		
6	Fan Dia	mm		
7	Fan Operating Speed	Rpm		
9	Airflow per unit	CFM		
10	Internal pressure drop	Pa		
11	Blower ESP	Pa	100	
12	Total Static Pressure	Pa		
13	Fan static efficiency	%		
14	Fan Total efficiency	%		
15	Power Consumption each fan	kW		
16	Total Power Consumption(Actual) of all Fans (Unit)- Based on specified cfm and static Pressure	kW		
17	Type of Drive	-		
18	Type and make of Bearing	-		
20	Material of Impeller	-		
22	Fan placement	-		
23	Fan performance curve to be submitted for approval	Yes/No	Required	
<b>FAN MOTOR</b>				
1	Manufacturer / Make	-		
2	Type of Motor	-		
3	Motor Rating	kW		
4	Motor efficiency	%		
5	Operating Speed	Rpm		
6	IP Protection	-		
7	Motor winding Insulation class	-		



8	Full Load current FLA	Amps		
9	Starting current	Amps		
10	Locked rotor current on full load	Amps		
12	Connected load	kW		
13	Electrical Supply	V/ph/Hz		
<b>FILTER SECTION</b>				
1	Manufacturer	-		
2	Filter media	-		
3	Type of filter	-		
4	Airflow per filter	CFM		
4	Air Face Velocity across filter	m/sec.		
5	Size of filter	mm		
6	Quantity of filter	Nos.		
7	Pressure drop-Clean	Pa		
8	Pressure drop-Clogged	Pa		
9	Performance as per ASHRAE Test Std.52, 76	-		
10	a) Efficiency	%		
11	b) Dust holding capacity	-		
12	Material of construction	-		
13	a) Filter frame	-		
<b>HUMIDIFIER</b>				
1	Manufacturer	-		
2	Type of Humidifier	-		
3	Capacity	kg/hr		
4	Input Power	kW		
5	Settings	Amps		
6	Electrical Characteristics			
7	Humidifier Inlet pipe Connection - Dia	mm.		
<b>HEATER</b>				
1	Manufacturer	-		
2	Type of Heater	-		
3	Capacity	kW		
4	Safety Thermostat	Yes/No		
<b>ELECTRICAL</b>				
1	Unit Total connected power (Rated Fan Kw+Controller +Actuator+Heater/humidifier)	KW		



2	Full Load Current	Amps		
3	Dual Power supply (Fan, controller & Actuator on UPS and Heater / humidifier on raw power). Inbuilt ATS-UPS power fails raw power will operate fan, controller & Actuator but if raw power fails, UPS power should not go to heater / humidifier (While switching the power from ups to raw or raw to ups controller should not be rebooting, restarting. It should be quick starting.)	Yes/No	Required	
4	Required MCB / MCCB Rating			
5	Isolation for Incoming	Yes/No		
6	Isolator for Individual motors	Yes/No	Required	
7	Terminal strip for all connection with cable marking	Yes/No		
8	Single phase converter	Yes/No		
9	Low voltage / high voltage cut off	Yes/No		
<b>MICROPROCESSOR CONTROLLER</b>				
1	Microprocessor Based	Yes/No	Required	
2	P/PI/PID Logic	Yes/No	Required	
4	Return air humidity sensor	Yes/No	Required	
5	Auto restart after a power failure(Without rebooting and restarting of controller)	Yes/No	Required	
6	Sequencing of Multiple units	Yes/No	Required	
7	Interlock with Damper	Yes/No	Required	
8	List of Trip signal	Yes/No	Required	
9	List of alarm	Yes/No	Required	
10	Display of Various modes of operation (cooling, heating, humidifying and de-humidifying),	Yes/No	Required	
11	Date, time and unit identification display	Yes/No	Required	
12	Visual system alarm indication (along with mutable audio alarm as well)	Yes/No	Required	



8.10 Thermal Containment should be provided for best in class. Containment of both front and back should be done. Thermal containment should be with manual openable door and spring return automatic close doors.

8.11 Water Piping and accessories: Water pipe should be heavy duty Mild steel (MS) (Black steel) with all necessary fittings like bends, elbows, tees, flanges, reducers, vibration isolators, hanger, supports, PUF Gatti and fitting like flanges, bellows, union, etc. MS 'C' class water piping, cut to required length and installed with welded joints, including all necessary fittings such as elbows, tees etc. The above piping shall be provided with thermal insulation of 'O class' Nitrile insulation with protective coating on water piping with min 26G of Aluminium cladding. Minimum Insulation thickness of 25mm for pipe having diameter 0-80 mm. All pipe joints shall be welded or provided with necessary fittings. Pipe flanges shall conform to IS:1536 whereas the threads shall conform to IS:554. All piping shall be tested to hydrostatic test pressure of at least 1 ½ times the maximum operating pressure but not less than 7 Kg/Sqm for a period of not less than 24 hours. Entire system shall then be retested. After completion of the installation, the pipe lines are to be flushed thoroughly to blow out the entire dirt and muck. The system then shall be balanced to deliver the water quantities. Direction of flow shall be marked on aluminum cladding above pipelines in bold markings. Pipe from Terrace floor to the basement will be from fire pipe shift and needs to be installed at distance minimum 400 mm away from fire pipe.

Bidder to consider tapping from existing chilled water piping as per P & ID.

8.11.1 Piping in the building shaft from Adiabatic Dry cooler to CDU and piping inside server room should be grooved with grooved joints as per below specification.

8.11.1.1 Couplings and Fittings for Joining Pipe

8.11.1.2 Standard Mechanical Couplings, DN50 through DN300: Needs to be manufactured in two segments of cast ductile iron, conforming to ASTM A-536, Grade 65-45-12. Gaskets shall be pressure-responsive synthetic rubber, grade to suit the intended service, conforming to ASTM D-2000. Mechanical Coupling bolts shall be zinc plated (ASTM B-633) heat treated carbon steel track head conforming to ASTM A-449 and ASTM A-183. Coupling housings rigid type with offsetting, angle-pattern bolt pads shall be used to provide system rigidity and support and hanging in accordance with ANSI B31.1, B31.9, and NFPA 13. Installation ready rigid coupling for direct stab installation without field disassembly for DN50 to DN 300. Center-leg gasket with pipe stop to ensure proper groove engagement, alignment, and pipe insertion depth. Gasket shall be EPDM compound designed for operating temperatures from -30 deg F (-34 deg C) to +250 deg F (+120 deg C). For DN250 to DN300: Standard rigid coupling and gasket shall be Grade "E" EPDM compound designed for operating temperatures from -30 deg F (-34 deg C) to +230 deg F (+110 deg C). Flexible type coupling to be used at location where vibration attenuation, misalignment to be covered, stress relief are required. Flexible adaptors to be used with grooved end pipe and fittings, flat faced, for mating to ANSI Class 125 / 150 flanges or PN rated flange outlet connections. Rigid coupling key shall be designed to fill the wedge shaped AGS groove to provide a rigid joint that corresponds with support spacing's as defined by ASME B31.1 and B31.9. Systems incorporating rigid couplings require the calculated thermal growth/contraction of the piping system to be fully compensated for in the design of the piping system through use of adequate flexible components.

8.11.1.3 Grooved End Fittings:

Standard fittings shall be cast of ductile iron conforming to ASTM A-536, forged steel conforming to ASTM A-234, Grade WPB 0.375" wall (9,53 mm wall), or fabricated from Std. Carbon Steel pipe conforming to ASTM A-53, Type E or S, Grade B. Fittings provided with an alkyd enamel finish or hot dip galvanized to ASTM A-153. Zinc electroplated fittings and couplings conform to ASTM B633. AGS Fittings shall be supplied with factory AGS grooved ends, for use with AGS couplings and AGS flange adapter. Fittings shall be manufactured of ductile iron conforming to ASTM A-536,



forged carbon steel conforming to ASTM A-234, or factory fabricated from carbon steel pipe conforming to ASTM A-53. Fittings shall be manufactured to the dimensional standards ASME B16.9. Orange enamel coated or galvanized.

- 8.11.1.4 Bolted Branch Outlet: Branch reductions on DN50 through DN200 header piping. Bolted branch outlets shall be manufactured from ductile iron conforming to ASTM A-536, Grade 65-45-12, with synthetic rubber gasket, and heat-treated carbon steel zinc plated bolts and nuts conforming to physical properties of ASTM A-183.
- 8.12 Propylene Glycol- Bidder to consider a mixture of 15% Propylene Glycol and 85% pure water in the water loop circuit. It is used not only for antifreeze but also helps in lubrication of the pump what gives a much better, longer, lifetime. Also it prevent the liquid of having bacterial or micro-organism grow so don't have to exchange the liquid every period of time and gives corrosion protection. This is used only in Adiabatic Dry Cooler Loop.
- 8.13 Differential Pressure Transmitters: Differential pressure transmitters shall be field mounted and shall transmit an isolated 4-20mA DC signal indicative of process variable to the pump logic controller via standard three wire 24 DC system with Emission/Immunity confirming to EN61000-6-2/3. Unit shall have stainless steel wetted parts with two 7/16" process connections. It shall be protected against radio frequency interference and shall have water tight, IP 55 electrical enclosure. Sensor should be capable of withstanding a burst pressure of 25 bar. Accuracy shall be within 2.5% BFSL (Best Fit Straight Line).
- 8.14 Supply, installation, testing & commissioning of Centrifugal Pumps of Mono block type. The pumps shall be vertical in-line design which enables installation in a horizontal one pipe system where the suction and discharge ports are in the same horizontal level and have the same pipe dimensions. The pump, electric motor, coupling and coupling guard shall be factory assembled at the pump manufacturer's facility. Pump shall be fitted with a 3-phase, fan-cooled induction motor. Motor shall Include a frequency converter VFD ( PI or PID controller )i either in the motor terminal box or in separate Pump panel. The combined motor and frequency converter efficiency shall be to higher than the IE5 level defined for fixed-speed motors in IEC 60034-30-2. Pump and motor shall be of integrated and user-friendly compact design. Sound pressure level of pumps shall be according to EN ISO 3743. The design total head capacity curve shall preferably be continuously rising towards the shut off. In case of unstable (drooping) characteristic the duty point shall be well away from the unstable region. The shut off head shall be at least 110% of the total head. Pumps shall run smooth without undue noise and vibration. The noise level shall be limited to 70 dBA at a distance of 1M. Vibration shall limited to class II C of BS 4675 Part -I. Pumps of a particular category shall be identical and shall be suitable for parallel operation with equal load division. Components of identical pumps shall be interchangeable. . Flexible bellows at pump inlet and pump outlet as per suction and delivery sizes to be considered. Pump Base shall be a robust construction with integrally-cast support in order to transmit pipe load to the foundation. Liquid passages in the casing shall be smooth finish to ensure high Efficiency. Pump base shall have tapped hole provision for draining. The impeller shall be bronce enclosed type with smooth surface finishes for minimum frictional loss. This ensures high Efficiency. Impeller shall be fixed to the shaft by means of a split cone and a split cone nut/union nut. Shaft shall be with splined design, and shall be adequately sized to with stand all stresses, hydraulic loads, vibrations and torques coming in during operation. Shaft shall be provided with Mechanical seal as default fitment to provide leak free operation. The liquid cavity shall be sealed off at the pump shaft by an internally flushed mechanical seal with Silicon carbide seat and Silicon carbide seal ring, suitable for continuous operation at 50 Deg C. The mechanical shaft seal shall be cartridge type for maintenance free operation and balanced. Pump base shall be EN-GJL-200 or EN-GJS-500-7 grade Cast Iron according to ASTM 25B or ASTM A536-84 70-50-05 or equivalent standard. Motor shall be suitable for operation on a 3 X 380-500V ( $\pm 10\%$  variation), 50-60Hz  $\pm 5\%$ , 3phase AC supply. Motor with thermal protection against steady overload and stalled condition (IEC 34-11). Bidder may consider an integrated



frequency convertor and a PI controller incorporated within the motor terminal box and also inbuilt DP sensor and flow meter. Bidder to consider shed above the pump with good aesthetic look or pump with canopy.

- 8.15 Gate and globe valves: Gate and globe valves up to 50 mm size shall be gun metal construction. Valves above 50 mm diameter shall have cast iron body and bronze/gun metal spindle valve seat. The valves shall have non rising spindle.
- 8.16 Butterfly valves: The butterfly valve shall be supplied along with flow control lever. The valves shall be compact in size and shall conform to BS 5155, MSS SP 67 and API 609. The valves shall be light in weight and easy to install. The body shall be of close grain cast iron conforming to IS:210 and the seating shall be of Resilient black, Nitrile rubber / EPDM moulded on to the body. The disk shall be of SG iron nylon coated, whereas the shaft shall be of stainless steel A ISI 431 treated permanently for lubrication. The shaft seals shall be of Nitrile 'O' rings and rubber seals. Valves shall be suitable for a working pressure of 16.5 KSC. Care should be taken during installation to see that the disk is not damaged during installation due to the flanges being incorrectly spaced. Provide gear operated valves for sizes having 300 mm and above. For smaller sizes such as 40 mm and below diaphragm type valves are acceptable. The butterfly valve shall be supplied along with flow control lever.
- 8.17 Ball valves: Ball Valves shall have body of carbon steel. The ball and the shaft shall be of stainless steel. The seat shall be of PTFE. The valve shall be complete with socket weld ends.
- 8.18 Check Valves: Check valves for smaller sizes shall be of swing type of gun metal construction. Lift type check valves shall be used for horizontal lines. Wafer type plate check valves shall be used for bigger sizes. The check valves shall be suitable for 10.5 KSC test pressure
- 8.19 Auto Balancing Valve: Balancing valve shall be installed in branch pipe. These valves shall be factory calibrated. Each valve shall limit flow rates within  $\pm 5\%$  accuracy, regardless of system pressure fluctuations. Sufficient number of flanges and unions shall be provided as required to facilitate maintenance work once the piping is installed. Piping shall be properly supported on or suspended from stands, clamps, roller hangers, etc. as required. The contractor shall adequately design all brackets, saddles, clamps and hangers and shall be responsible for their structural integrity. Each support shall be isolated from the support by means of anti-vibration springs or durable liner of neoprene rubber. Pipe supports shall be of steel and shall be painted with rust preventive paint and finish coated with synthetic enamel paint of approved colour. Only factory made supports with Galvanized fully threaded rods with bands are acceptable. The chilled water pipes shall be isolated from the bands by a rubber sheet.
- 8.20 Expansion Tank: Closed Expansion Tank with Expansion Vessel and pressurizing Pumps with one working and one standby. Expansion tank to be of MS with Armaflex / K- Flex Insulation minimum 32 mm thick & minimum 26 Gage Aluminum Cladding with diamond finish with related piping, isolating valves, safety valves, drains, overflow. Tank Shall have Anticorrosive Coating. Close expansion tank should be provided with water capacity to suffice the capacity of volume of water contraction & expansion during operation & rest state of the system while maintaining proper system pressurization under varying operating conditions. Tank should be a closed vessel with rubber bladder/diaphragm to maintain the operating pressure inside the pipelines. System should include PRV and Air Vent also. Standby and working booster pump should be provided with selector switch for pump starting, pressure differential transmitter, pressure gauge & non return valve at discharge outlet of the pump, suction and discharge manifold.



- 8.21 Pressurization unit consisting of inline vertical multistage, centrifugal water pump with SS 304 casing, SS304 impeller and SS316 shaft, CI base TEFC motor, with mechanical seal, control panel and with duty cycling and dry run protection.
- 8.22 Thermal Storage Tank- MS tank with capacity as per P & ID to be used as thermal storage for back up supply. The tank to be of M S Construction and with anti-corrosive coating from inside with Armaflex / K- Flex Insulation 32 mm thick & 26 Gage Aluminum Cladding with diamond finish and with related piping, Isolating valves , Safety valves , Drains, Overflow and Guages. 8 mm Shell thickness and 12 mm Dish thickness. The tank shall have necessary ports with flange. Bidder to consider temperature sensor of as well as level sensor in both the tank and same to be integrated in BMS for control as well as monitoring.
- 8.23 Double Deflection Grilles: Grilles shall be in Aluminum construction. Aluminum double deflection grilles for supply air shall be provided with vertical and horizontal adjustable bars and an approved blade damper adjustable from the front face of the grille. The finish of the grilles will be powder coated in a shade to be approved.
- 8.24 STRAINERS -Strainers shall be preferably of approved 'Y' type or pot type as specified in the GeM Bid schedule with GI or fabricated steel bodies. Strainers up to 50 mm shall be of gun metal type. Strainers shall have a removable bronze screen with 3 mm perforations and permanent magnet. Strainers shall be provided with flanges. They shall be designed so as to enable blowing out accumulated dirt and facilitate removal and replacement of all screen without disconnection from the main pipe. Strainers shall be provided with isolating valves so that they may be cleaned without draining the entire system.
- 8.25 Chemical dosing plant with dosing pumps suitable for the requirement for flushing and treating the water. This should include make up water storage tank, first charge of Dosing chemicals for the commissioning of the system, chemicals for the operation during warranty period. Treated water tank should be of adequate capacity. Entire system should include interconnecting piping, accessories, float and valves complete in all respect. Chemical Dosing System shall be provided for cooling loop. This system is used to remove mill scale, dirt etc. and provide a protective corrosion resistant layer on the inside surface of piping. Chemical dosing system shall be provided to minimize corrosion, biofilm prevention, preventing scale deposition and to control the water quality. Chemical dosing system shall maintain the water PH value 8.0 to 9.5, total dissolved solid less than 1500 ppm and sulphite concentration between 50 to 100 ppm.
- 8.26 Air Separators: Air separator working on basic centrifugal force and low velocity flow, complete with required inlet and outlet connections, high capacity float type air vent, pressure reducing valve, water fill connection, drain valve, flanged connections etc. The air separator shall be suitable for required water flow.
- 8.27 **The bidder is required to do NSM Branding on the front door and side panel of racks as per the specification (Specifications / drawings will be provided by C-DAC). The Banding needs to be considered for total Racks (for front door and side panel).**

## 9 Requirements towards IBMS work

- 9.1 Supply and implement physical security (access controls including biometric), Motion sensors etc.  
The basic function of access door control is as below.
- a) Access control system (ACS) is to be deployed to allow entry for the authorized personnel only and restrict unauthorized people from entering nominated areas of premises. Access privileges to



be configured as per the access data stored in Access Door Controllers (ADC). These privileges define the right of access card holder to enter the predefined area upon presenting the card at readers.

- b) It shall support distributed architecture with central monitoring and control. If communication to the central control fails, the ACS shall continue providing access based on the predefined security configuration. Until communication is restored, all event logs and alarms shall be stored locally for minimum six months (based on ADC capacity). These events shall be sent to the central control when the communication is regained.
- c) It shall have multiple supervised inputs. The dynamic status of each input shall be continuously monitored on BMS system and each change should be reported immediately.
- d) It shall provide programmable inputs, i.e. the ability to apply a variety of conditions to the way in which these inputs are monitored. These conditions shall be expressed in definite terms. It shall be able to produce and communicate various types of outputs (Audible sirens, relay switching etc.) based on the above definition. These outputs shall be standard in terms and shall be interfaced as inputs to other Building Management System. ACS communications should support RS232/RS485/ TCP/IP. All data over the network between the ADC and the Server end shall be encrypted. All ACS software/firmware upgrades shall be downloadable through the network to the ADC.

9.2 Supply and implement environmental Controls and other sensors(Air conditioners, humidity controls, etc.)

- a) Humidity Sensor: The humidity sensor shall be in an independent housing or be combined with the room /duct type temperature sensor in the common housing as per application requirement. The sensor should be electronic type with capacitive sensing element. Relative Humidity (RH) sensors shall be of standard 0-10 VDC or 4-20 mA type, well protected against solid and liquid contaminants with a permeable coating. Range of 0-100% RH. Accuracy: +/- 3% Operating temperature range of 0 to 50 °C. Stainless steel sheath construction complete with integral shroud to enable specified operation in air streams of up to 10 m/sec. Maintenance of Sensor to be by a simple field method such as solvent or mild detergent solution washing, to remove anticipated airborne contaminants. Maximum sensor non-linearity of ±3% RH with defined curve.
- b) Water Flow Meters with BTU Meter- Water flow meter should work on Faraday’s law of induction. As soon as the electrically charged particles of a fluid cross the artificial magnetic field generated by two field coils, an electric voltage is induced. This voltage, tapped by two measuring electrodes, is directly proportional to the velocity of flow and thus to the flow volume. The magnetic field is generated by a pulsed direct current with alternating polarity. This ensures a stable zero point and makes the flow measurement insensitive to multiphase or inhomogeneous liquids, as well as low conductivity. The measuring principle is virtually independent of pressure, density, temperature and viscosity. Flow meter should be communicable type and integrated with preset flow alarm. Accuracy shall be + 2% of actual reading from 0.4 to 20 feet per second flow velocities. BTU meter needs to be connected in the Chilled water tapping - piping line . This should be BMS communication compatible and should give the Tr consumption on the BMS screen. BMS screen should have the flexibility to add value of Ikw / Tr of existing chiller system . Based on Tr consumed and Ikw/Tr the electrical consumption of chilled water needs to be formulated by BMS software.
- c) Sensors for HVAC System control and Monitoring

The following are the main sensor types are proposed for the control and monitoring of HVAC System

Sr.No.	Sensor Type	Purpose
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1	BTU Meters	Calculate chilled water energy usage as well as Dry Cooler Water at main header level . Consumption of chilled water in BTU / Hr to be on BMS system . By multiplying Ikw/Tr of chiller , electrical energy consumption pattern needs to be established in the BMS system.
2	Flow Meter	To Monitor flow of water through chiller as well as Dry Cooler circuit
3	DP Sensors	To modulate Pump speeds or In build
4	Temperature Sensors and Rh Sensor	To monitor temperature and Rh levels in DC areas as well as in USPS and Battery , Also in Hot Aisle
5	Pressure Gauge	To measure pressure on each header (supply/return) Chiller as well as Dry Cooler Loop

d)

- 9.3 BMS System: - The proposed software shall be independent software platform for monitoring the parameters of Mechanical systems, Electrical systems, Dry Cooler , In Row Units, DG Sets, various sensors etc. system as applicable. The BMS shall monitor the parameters of the data centre mechanical equipment to maintain environmental conditions, such as temperature, pressure, and humidity, within acceptable limits and at optimal energy efficiency. The operation of the system is governed by the Sequence of Operation (SOO), which is based on the mechanical system design. A graphical user interface (GUI) or Human Machine Interface (HMI) needs to be provided as a visual representation of local conditions, equipment overrides, set point adjustments, historical trends, and alarms conditions at the equipment level. The BMS also functions to notify the proper recipients, onsite or offsite, in the event of abnormal operation, and archive historical data for use in troubleshooting and analysing system operation. BMS software must have web client and should be able to access from any standard Web browser (Chrome, Firefox, Edge, Internet Explorer etc.) without any plugins and shall be supplied with minimum inbuilt 5 licences. BMS Software patches update and Version updates to be considered as part of scope during Warranty and AMC Period. BMS should have minimum 3-year historical data storage capacity. BMS software should have activity/auditing functionality so that each user action can be tracked based on login. There should be two screens one will be at BMS Room - Ground floor and other will be in the Control room near chiller . Screen on the Ground floor will be used only for monitoring purpose where as system in control room at basement near chiller will be used for controlling purpose.



- 9.3.1 The Integrated Control Platform shall support encrypted password authentication for all web services whether serving or consuming.
- 9.3.2 Supply, Installation, Testing and Commissioning of BMS System which includes Main Building Automation Graphic Software, BMS Machine, DDC Controllers with necessary Panels, Field Sensors, Third Party Integrations as PAC , Load Manager, Integration with fire alarm panel, Monitoring and control of cooling units , monitoring and controlling of pump and valve operations etc,
- 9.3.3 The BMS IO summary bidder to prepare and submit with the BID.. This summary shall define the actual Digital/Analogue Input/output points and soft points to be considered for the functioning of the BMS. The Actual soft points shall be considered during the detail design stage based on the actual parameters selected and the mapping points. Bidder shall work out the Servers configuration and storage calculation based on the requirements as stipulated in this document considering inputs and the exact count of IO, Soft points .
- 9.3.4 Bidder to consider soft IOs for Rack DC rectifier system minimum 50 nos. per rack..
- 9.3.5 BMS should control the operation of oxygen pumping equipment's under fire situation.
- 9.3.6 Architecture of BMS system shall be of:
- Management Level (BMS Servers/Software)
  - Control Level (DDC Controllers)
  - Field Level (Field Sensors)
  - BMS should have capability to show real time PUE, trends and record historical data of PUE.
  - BMS should generate event notifications over emails, data for events based on which uptime and downtime will be calculated.
  - BMS should generate alarm signal and tripping signal at abnormal situations. This should be software generated and any one can be utilized for giving tripping command for shutting down the some servers or all.
- 9.3.7 There should be real-time reporting of
- Component wise and aggregate power consumption
  - Temperature and relative humidity in the data centre and UPS room.
  - Instantaneous PUE, hourly PUE, daily PUE, monthly PUE and annual PUE.
  - Alarm indicators for component failures.
  - GUI with SLD ,P \*ID, Equipment's visuals etc.
- 9.3.8 There should be real-time monitoring and logging of all parameters of the data centre as per ASHRAE/TGG 2009 Real time energy consumption measurements in data centres guidelines (best practical). There should be facilities for periodic reports (including uptime reports) of all aspects of the data Centre. All the required hardware and software eco-system including storage (High end PC, 2 X 32" LCD HD Monitor, Key Board, Mouse etc.) has to be supplied by the bidder.
- 9.3.9 The BMS system should allows for the monitoring, control, interrogation, alarm handling and routing for the following equipment's but not limited to:
- HVAC equipment –Pumps/Adiabatic Dry Coolers / Valves / Actuators / Inrow
  - Generators.
  - UPS and Battery system



- LV metering and equipment.
- Fire Alarm Systems.
- Water Leak detection System.
- Lighting Control
- Rodent Repellent System
- Vesda System
- All Sensors
- Etc.

#### 9.4 Supply and Implement fire alarm system –

The system and its components shall be Underwriters Laboratories, Inc. listed, and FM APPROVED under the appropriate testing standard, for fire alarm systems and the installation shall be in compliance with the UL 10th Edition listing. The fire alarm system shall comply with requirements of NFPA 72 (National Fire Alarm and Signaling Code). The system shall be electrically supervised and monitor the integrity of all conductors.

When a fire alarm condition is detected and reported by one of the system indicating the affected devices, the following functions shall immediately occur:

- The System Alarm LED to be flashed.
- Built in Agent release circuit with release / Abort module of same make.
- System output programs assigned via control-by-event interlock programming to be activated by the particular point in alarm should be executed, and the associated system outputs (notification appliances and/or relays) to be activated.
- The audio portion of the system should sound the proper audio signal (consisting of tone, voice, or tone and voice) to the appropriate zones.
- Zone identification should be available on BMS system.

The publications listed below are part of this specification.

National Fire Protection Association (NFPA) - USA:

No. 70	National Electric Code (NEC)
No. 72-1996	National Fire Alarm Code
No. 90A	Air Conditioning Systems
No. 92A	Smoke Control Systems
No. 92B	Smoke Management Systems in Large Areas
No. 101	Life Safety Code

Bidder to consider fire alarm system in Data center area, UPS area. Supply, Installation, Testing and Commissioning of Intelligent Addressable Fire Alarm System (FM Approved/ UL Listed ) which includes Intelligent Addressable Fire Alarm Panel, FM approved Analogue Addressable Heat Type Smoke Detector, Analogue Addressable Multi Criteria Type Smoke Detector with Inbuilt Isolator Base, Addressable Manual Call Point, Sounder (85 Db), Response Indicator ( For False Floor Areas),



Addressable Control module for activating sounder , Gas release Panel , Access Control De-Activation, Short Circuit Isolator Module, Addressable Monitor Modules, 2 core x 1.5 sq.mm twisted pair shielded multi strand Armored FRLS cable etc.

#### 9.5 Supply and Implement Video Surveillance systems:

The surveillance system shall be designed and developed to the following standards: NFPA-70 (National Electric Code), National Electrical Safety Code (NESC), CE Compliant, UL ISO/IEC 27001 etc.- Supply, Installation, Testing and Commissioning of CCTV system along with indoor, outdoor cameras to cover entire DC area as well as outside equipment's area. The complete security system shall provide "smart monitoring" where the reliance on human monitoring is minimized. All security alarm activations shall be brought to the attention of the BMS room and, where specified, live, and recorded images of the event are to be presented to the BMS control room automatically. The objective will be to provide High degree of Electronic surveillance system to the DC area and outside utility. The purpose is to monitor & serve the entire area for unwanted incidents. The objective is also to restrict unauthorized personnel entry & exit through critical areas and facilitate effective people management. Strategically placed video surveillance cameras help to enhance security by providing motion based/continuous monitoring of all parts of premises. The CCTV system shall comprise of various types of Indoor and Outdoor cameras with 90 days storage capacity with high end recording resolution. In case of network or power failure, camera can automatically switch to auxiliary (local) power source & start recording on the memory card inside the camera & can push the recording back network once the network is up in the same time frame without any loss of recording. Camera should be with true day and night IR lens and suitable IP rated for indoor and outdoor applications.

Below minimum Locations of CCTV camera to be considered -

- Server Room Entry and Exit gate
- UPS and Battery Room- IT as well as NON IT
- Thermal Storage Tank Area
- Dry Cooler Area

Location of monitoring will be in BMS room at Ground floor.

#### 9.6 Supply and implement Very Early Smoke detection system (VESDA ):

Provide an air sampling smoke detection system (Very Early Smoke Detection Apparatus) for each server area. Provide a Laser Focus air sampling smoke detection system for areas as per site condition including but not limited to utility area, server area etc. in accordance with manufacturer's recommendations.

The air sampling smoke detection system shall consist of highly sensitive smoke detectors with aspirating fans, air sampling pipe network, filters, networked controllers and a high-level interface to the building Fire Alarm System, as required.

The air sampling detectors shall provide a nominal obscuration level range from .0015 to 6% /ft., adjustable through the system operator control interface.

Smoke Detector Assembly: The smoke detector, filter, and aspirating fan shall be housed in a Detector Control Assembly Enclosure and arranged in such a way that air is drawn from the protected area through the filter and detector by the aspirating fan.



The Detector Control Assembly shall house the programmable intelligent controller, which will support air flow/detector supervision, automatic and manual sensitivity adjustment, time delay and remote reset functions. Laser COMPACT detector shall communicate with the fire alarm control panel.

The system shall provide 3 field-selectable levels of alarm status: Alert Level 1 (.04% obscuration/ft.), pre-Alarm Level 2 (1.06 % obscuration/ft.) and Alarm Level 3 (2.6% obscuration/ft.). Actual sensitivity levels will be determined in the field and programmed during system commissioning. Alarm Levels 1 and 2 will initiate a Supervisory Condition on the Fire Alarm System, and Alarm Level 3 will initiate the building-wide evacuation sequence.

- Approval – UL & FM
- 18000 Event logs required.
- Output signal – 5 Relay contact for Fault / Alarm & one analogue output for smoke density
- Large flow rate fan (Max. shutoff pressure: at least 350Pa and max. flow rate: at least 170L.min

VESDA to be considered only in the Data Center Area

#### 9.7 Supply and implement Rodent Repellent System:

The objective is to protect the entire premises viz. server area, utility area etc., all the voids against rodents. The purpose is to keep the rodents away from the floor by generating very variable high frequency sound waves which are not audible to human ear but irritate rodents. The objective is to protect all the cables below floor, above ceiling & room void from damage caused by rodents. The system proposed is to protect all the equipment's, areas with relevant type of high frequency sound producing device called satellites or transducers. Once powered up these transducers produce very high frequency variable sound waves continuously which irritate the rodents and are forced to evacuate the place. The devices can be tested periodically by means of a test switch provided on Main console. It is required in Data Center area , UPS area .

#### 9.8 Supply and implementing Water Leak Detection system:

It should include electronic alarm modules, water sensing cable, graphic display map, and auxiliary equipment. The system has to be capable of automatically detecting the presence of water at any point across the length of sensing cable. The system should alarm and locate the point of liquid contact on the digital display. This system should be capable of communicating to BMS.

#### 9.9 Supply and implementing NOVEC 1230:

Supply, install, test and commission NOVEC 1230 (Fluro Ketone FK-5-1-12) based fire suppression system. The fire suppression system shall include and not be limited to gas release control panel, CCOE approved seamless cylinders, discharge valve (with solenoid or pneumatic actuator) as the case may be, discharge pipe, check valve and all other accessories required to make a complete operation system meeting applicable requirements of NFPA 2011 standards and installed in compliance with all applicable requirements of the local codes and standards. Portable fire extinguishers shall be distributed all other areas as Near to DC LT Panel , Dg yard, Dry Cooler area etc. as per NFPA-10 and BIS: 2190. Additional extinguishers shall be provided as per requirements of Local Fire Authorities.

Bidder to consider NOVEC suppression system in Data center area, UPS area- IT + NON IT UPS, existing battery room at third floor. At basement floor near to the data center location of Cylinders



has been shown. Back side of cylinder is glass partition . Cylinder to be mounted inside cage in SS and same needs to be grouted properly.

## 10 Indicative Design Schematic

**Minimum rating** of components at site ambient conditions (considering deration factors, taking in to account utilization of 90% under peak load) along with rating is as shown in below table.

Sr. No.	Name of Components	Rating for each unit	Qty.	Redundancy
1	Adiabatic Dry Cooler system along with Pump, Tank, Piping ,Control Panel, VFD,PID controller, Instrumentation as per P & ID etc.	200 KW	2	
2	Chilled water based In Row units for Data Center Area	55 KW	6	5+1
3	2 X 500 KVA UPS with 10 minutes Li Ion Battery back for IT load	500 KVA	2	
4	2 X 750 KVA DG set	750	2	
5	SMF Batteries for existing 3 X 40 KVA UPS			
6	1 X 16 KL Thermal Storage Tank along with pumping system			
7	I BMS System			
8	.			



## 11 Refer annexure for all drawings

- 11.1 SLD
- 11.2 P & ID
- 11.3 DC Layout Ground Floor
- 11.4 DC layout – Section
- 11.5 DC layout – Section CO ordained
- 11.6 Terrace Floor Layout
- 11.7 Ground Floor Layout
- 11.8 Third floor layout – UPS room – IT + NON IT
- 11.9 DC layout – BBT and Section
- 11.10 DC Layout – Cable tray and section

## 12 Applicable Standards but Not Limited to

Installation and materials shall also confirm to latest amendments of

- a. Indian Electricity Rules
- b. Indian Factories Act
- c. National Electric Code
- d. Petroleum rules
- e. Quality and Safety Standards

Sr. No.	Code Number	Description
1	IS 2309	Protection of buildings and allied structures against lightning.
2	IS 3043 /IEEE 80	Code of practice for earthing.
3	IS 5216	Safety procedure and practices in Electrical work.
4	IS 3106	Code of practice for selection, installation and maintenance of fuses ( Voltage not
5	IS 1646	Code of practice for fire safety of buildings (general) Electrical installation.
6	IS 9921	Alternating Current Dis connectors above 1000 V.
7	IS 2551	Danger notice plates.
8	IS 1248	Electrical indicating instruments.
9	IS 722	AC Electric meters.



Sr. No.	Code Number	Description
10	IS 3156	Voltage transformers.
11	IS 10118	Installation and maintenance of switchgear.
12	IS 398 /IEC 1089-1991	ACSR conductors
13	IS 7098	Cross linked polyethylene insulated PVC sheathed cables up to 33 KV
14	IS 12943	Brass glands for PVC cables
15	IEC 99-4	Gapless Surge Arrestors
16	IS-900	Code of practice for Installation and Maintenance of Induction Motors
17	IS-1255 -1983	Codes of practice for Installation and Maintenance of Power Cables up to and including 33 KV Rating.
18	IS-732 1989	Code of practice for Electrical Wiring Installation. (System Voltage not exceeding 660 Volt).
19	IS-1913	General and Safety Requirements for Luminaries.
20	IS-1646	Code of Practice for Fire Safety of Building (General) Electrical Installation.
21	IS 8130	Conductors for insulated electrical cables and flexible cords.
22	IS 3975	Specification for mild steel wires, strips and tapes for armoring of cables
23	IS-2667	Specification for Fittings for Rigid Steel Conduits for Electrical Wiring.
24	IS 3615	Glossary of terms used in Refrigeration and Air-conditioning.
25	IS 325	Three phase induction motor.
26	IS 1239	Mild steel tubes, tubular and other wrought steel fittings.
27	IS 639	Steel pipe flanges.
28	IS 277	Galvanized sheet steel.
29	IS 5831	Specification for PVC insulation sheath for electric cables.
30	IS 655	Metal air ducts.
31	IS 732	Code of practice for electrical wiring and fittings for buildings.
32	IS 900	Code of practice for installation and maintenance of induction motors.
33	IS 1248	Direct acting electrical indicating instruments.
34	IS 6392	Steel pipe flanges.
35	IS 1367	Technical supply conditions for threaded steel fasteners.



Sr. No.	Code Number	Description
36	IS:10462	Thickness of the PVC outer sheath
37	IS 4894	Centrifugal fan.
38		
39		
40	IS 1554	PVC insulated (heavy duty) electrical cables for working voltages up to and including 1100 V.
41	IS 659	Air-conditioning safety code.
42	IS 616	Mechanical refrigeration safety code.
43	IS: 1554 -	PVC insulated (heavy duty) electric (Part I) Cables - Part I for working voltages up to and including 1100V.
44	IS: 1753 -	Aluminum conductors for insulated cables.
45	IS: 3961 -	Recommended current ratings for (Part II) cables: Part-II PVC insulated and PVC sheathed heavy-duty cables.
46	IS: 3975 -	Mild steel wires, formed wires and tapes for armoring of cables
47	IS: 5831 -	PVC insulation and sheath of electrical cables.
48	IEEE 519:1992	Harmonics
49	IS 277	Galvanized Steel Sheet (Plain and corrugated).
50	IS 655	Metal Air Ducts.
51	IS 737	Wrought Aluminum and Aluminum Alloy sheet and strip for general engineering purposes.
52	UL 181	Factory – Made Air ducts and connectors.
53	UL 555	Fire Dampers.
54	ASHRAE 70	Method of testing for rating the performance of Air Outlets and inlets.
55	BS 649	Diesel Engines for general purpose.
56	BS 2613	Rotating Electrical Machinery.
57	IS 4722	Electrical performance of rotating electrical machinery.
58	IS 4728	Terminal markings for rotating electrical machines.
59	IS 4729	Measurement of vibrations of rotating electrical machines.
60	IEC60034	Rotating Electrical Machines
61	IEC60034.1	Rotating Electrical Machines Part1: Rating and Performance



Sr. No.	Code Number	Description
62	IEC60947	Low Voltage Switchgear and Control Gear
63	ISO 8528 Part 1 to 10:	Reciprocating Internal Combustion engine Driven Alternating current Generating Sets
64	IS-375	Marking and arrangement for switchgear bus bars, main connection and auxiliary wiring.
65	IS-722 Part – I	AC Electricity Meters
66		Part - I General requirements and tests
67	IS-1248	Direct acting indicating analogue electrical measuring instruments and their accessories.
68	IS-1822	AC Motor starters, of voltage not exceeding 1000 volts.
69	IS-2147	Degrees of protection provided by enclosures for low voltage switchgear and control gear.
70	IS-2208	HRC cartridge fuse links for voltage above 650V.
71	IS-2419	Dimensions for panel mounting indicating and recording electrical instruments.
72	IS-2516	Circuit Breakers - Requirements and Test voltages not exceeding 1000V AC or 1200V DC.
73	IS-2607	Air break isolators for voltages not exceeding 1000 volts.
74	IS-2959	Contactors for voltages not exceeding 1000V AC or 1200V DC
75	IS-3072	Code of practice for installation and maintenance of switchgear.
76	IS-3106	Code of practice for selection, installation, maintenance of fuses (voltage not exceeding 650V).
77	IS-3156, Part - I	Voltage Transformer - General Requirements.
78	Part – II	Voltage Transformer - Measuring Voltage Transformers.
79	Part – III	Voltage Transformer - Protective Voltage Transformers.
80	IS-3231	Electrical Relays for Power System Protection.
81	IS-3914	Code of practice for selection of AC Induction Motor Starters (Voltage not exceeding 1000V)
82	IS-4047	Heavy-duty air-break switches and composite units of air-break switches and fuses for voltages not exceeding 1000 Volts.
83	IS-4064	Air break switches, air break disconnections, air break switch disconnections and fuse combination units for voltages not exceeding 1000V AC or 1200V DC.



Sr. No.	Code Number	Description
84	Part – I	Part I - General Requirements.
85	IS-4146	Application guide for Voltage Transformers.
86	IS-4201	Application guide for Current Transformers.
87	IS-4237	General Requirements for Switchgear and Control Gear for Voltages not exceeding 1000V AC or 1200V DC.
88	IS-4483	Preferred panel cut-out dimensions for electrical relays - flush mounting IDMTL relays.
89	IS-4794, Part- I	Push Button Switches - General Requirement and Tests.
90	IS-5082	Wrought aluminum & aluminum alloy bars, rods, tubes and sections for electrical purposes.
91	IS-5987	Code of practice for selection of switches (Voltage not exceeding 1000V).
92	IS-6236	Direct recording electrical measuring instruments.
93	IS-6875	Control switches (switching devices for control and auxiliary circuits including contactor relays) for voltages up to and including 1000V AC and 1200V DC.
94	IS-8623	Factory built assemblies of switchgear and control gear for voltages up to and including 1000V AC and 1200V DC.
95	IEC 62040-3	(International Electro technical Commission) – Uninterruptible power systems (UPS) – Part 3: Method of specifying the performance and test requirements.
96	IEEE 587 (ANSI C62.41)	Category A & B (International Electrical and Electronics Engineers) – Recommended practices on surge voltages in low voltage power circuits.
97	ANSI B 31.5	Code for Refrigeration Piping
98	ASHRAE 30	Methods of Testing Liquid Chilling Packages
99	ASHRAE 15	Safety Code for Mechanical Refrigeration
100		

Bidder is required to submit compliance sheet in the tabular format for the selected products against above applicable code provision.

### 13 Recommended Makes:

List of Recommended Makes / Models of the major components/ equipment is given in **Annexure – D**. Bidders should use the makes and models having successful deployments in Data Centre applications in India. It is bidder's responsibility to comply with GeM Bid specifications and conditions, while selecting make and



model of the product. However, bidder may offer equipments of any suitable make and model that complies with the GeM Bid specifications and conditions.

#### 14 DC Acceptance Criteria:

Based on demonstration of following technical parameters, the DC implemented solution will be accepted.

- 14.1 Equipment's supplied and installed as per GeM Bid specifications defined in respective sections.
- 14.2 Validating UPS redundancy operation by switching on and OFF some breakers.
- 14.3 Room Temperature – Measurement at various points inside data center to work out the hot pockets.
- 14.4 Demonstration of UPS system on balanced as well as unbalanced load conditions along with analysis which include harmonics in voltage as well as Current , voltage regulations under No load to full load. Neutral to Earthing Voltage at UPS output should not be more than 3 volts.
- 14.5 FAT report of equipment.
- 14.6 Demonstration of UPS operation under EB failure condition and EB restoration condition.
- 14.7 Demonstration of Battery backup under full load condition. For IT as well as NON IT UPS
- 14.8 Demonstration of operation of Adiabatic Dry cooler.
- 14.9 Demonstration of DG operations for AMF , Auto Synchronization and load demand start and stop and equal load sharing.
- 14.10 As build Drawing
- 14.11 Demonstration of creating false fire signal ( Cross Zoning Input )and checking operation of magnetic coil on NOVEC cylinder manifold.
- 14.12 Demonstration of VESDA, Water Leak Detector system
- 14.13 Safety during Project Execution
- 14.14 Submission of Warranty Certificate from manufacturer of DG set, UPS , Battery , Pumps etc. as per RFP
- 14.15 Effective GUI in BMS screen, Effective implementation and utilization of BMS system. Monitoring of all field devices including Humidity ,temperature sensors etc. on BMS screen , Control thro BMS in Automatic mode as well as Manual mode ( Manual mode should be on BMS screen as well as Hard Wiring) of all actuators equipment's etc as per operating, failure and failsafe logic..
- 14.16 Demonstration of water quality sensors by checking the water quality at external lab and cross checking the parameters.
- 14.17 Data Center aesthetics and interiors



## 15 Safety Regulations

The contractor shall at his own expense, arrange for the safety provisions as per the codes of Indian Standard Institution, Indian Electricity Act / Rule and such other Rules, Regulations and Laws as may be applicable in respect of all labour, directly or indirectly employed in the work for performance of the Contractor's part of this agreement. While the Indian Electricity Rules 1956, as amended up to date, are to be followed in entirety, any installation or portion of the installation that does not comply with these Rules, should be rectified immediately.

The contractor shall be responsible for and indemnify the buyer against all injury to persons – both his own workmen and others and for all damage to structural and / or decorative part of the buyer's property during erection and commissioning of the equipment. The contractor shall repair / reinstate all such damage at his own cost.

It shall be ensured that the control switches and distribution boards are duly marked, the distribution diagrams of substations are prominently displayed, and the substation premises, main switch rooms and D.B. enclosures are kept clean. Particular care should be taken to prevent the substation being used as store for inflammable materials, broken furniture, waste materials etc.

No inflammable materials shall be stored in places other than the rooms specially constructed for this purpose in accordance with the provisions of the Indian Explosives Act. If such storage is unavoidable, it should be allowed only for short period and in addition, special precautions such as cutting off supply such places at normal times, storing materials away from wiring and switch boards, giving electric supply for a temporary period with due permission of engineer- in charge shall be taken.

Protective and safety equipment such as rubber gloves, earthing rods, line men's belt, portable respiration apparatus, necessary number of caution boards such as "Man on Line", "Don't switch on" etc. should be provided in easily identifiable locations. Where electric welding or such other nature of work is undertaken, goggles shall be provided.

Rubber or insulating mats should be available in front of the main switchboards or any other control equipment of medium voltage or above.

Standard first Aid boxes containing materials as prescribed by Indian red cross should be provided in easily identifiable locations and should be easily available.

Periodical examination of the first aid facilities and protective and safety equipment provided should be undertaken and proper records shall be maintained for their adequacy and effectiveness.

Charts (one in English and one in regional language) displaying methods of giving artificial respiration to a recipient of electrical shock shall be prominently displayed at appropriate places.

A chart containing the names, addresses and telephone numbers of nearest authorized medical practitioners, hospitals, fire brigade and also officers in charge shall be displayed prominently along with the first Aid box.

Steps to train supervisory staff and authorized persons of the engineering staff in the first Aid practices, including various methods of artificial respiration with the help of local authorities such as fire brigade, St. John's Ambulance Brigade, Indian Red Cross or other recognized institutions equipped to impart such training shall be taken, as prompt rendering of artificial respiration can save life at the time of electric shock.



Electrical wiring and control switches should be periodically inspected and any defective wiring switches which will expose live parts should be replaced immediately to make installation safe.

No work on live L.T. bus bars or pedestal switch boards should be handled by a person below the rank of a wire man and such a work should preferably be done in the presence of the Engineer in charge of the work.

- When working on or near live installation, suitable insulated tools should be used, and special care should be taken to see that these tools accidentally do not drop on live terminals causing shock or dead short.
- The electrical switchgear and distribution boards should be clearly marked to indicate the area being controlled by them.
- Before starting any work on the existing installation, it should be ensured that the electric supply to that portion in which the work is undertaken is preferably cut off. Precautions like displaying “Men at Work” caution boards on the controlling switches, removing fuse carrier from these switches and these fuse carriers being kept with the person working on the installation, etc., should be taken against accidental energization. “Permit to Work” should be obtained from the Engineer-in-charge. No work on H.T. main should be undertaken unless it is made dead and discharged to earth with an earthing lead of appropriate size. The discharge operation shall be repeated several times and the installation connected to earth positively before any work is taken up.
- Before energizing any installation after the work is completed, it should be ensured that all the tools have been removed and accounted and no person is present inside any enclosure of the switchboard. Any earthing connection made for carrying out the work should be removed. “Permit to work” should be received back duly signed by the person to whom it was issued in token of having completed the work and the installation being ready for energisation and “Men at Work” caution Boards removed.
- In case of electrical accidents and shock, the electrical installation on which the accident occurred should be switched off immediately and the affected person should be immediately removed from live installation by pulling him with the help of coat, shirt, and wooden material or with any other dry cloth. He should be removed from the place of accident to a nearby safe place and artificial respiration continuously given as contained in BIS code and standard prescribed by St John Ambulance Brigade or Fire Brigade.
- While artificial respiration on the affected person is started immediately, help of Fire Brigade and Medical Practitioner should be called for an artificial respiration should be continued uninterrupted until such help arrived.
- These instructions should be explained in Hindi / local language to those staff who does not understand English.

The contractor shall ensure that all portable power tools used by the workman are rated 230 volts, double insulated and have to be taken through 100 mA Earth Leakage Circuit Breaker (ELCB). Also all temporary lighting shall be supplied through 30 mA ELCB. Inserting wire into the sockets without the plug tops is not allowed. The length of the extension cord for portable tools should not be more than 5 feet. Temporary cables and flexible wires of short length should be bunched up and supported at inaccessible height. Temporary lamps should be mounted at inaccessible height. If lamps are incandescent, they should be protected by wire-mesh.

All power supply / Distribution Boards shall have canopy for protection against weather if located outdoors.



While carrying out work in Vessels / AC ducts or any other confined place, hand lamps with metallic guard suitable for 24 Volts AC supply shall be used. All non-current carrying metallic parts of electrical system and equipment shall be earthed with two separate earthing wires of adequate capacity.

a. GENERAL RESPONSIBILITY

The contractor shall obtain a “Work Permit” from the Site Engineer / Client before starting any work at site. The work permits are issued to prevent any one working in unauthorized areas and they are valid for specific period.

The contractor shall produce test certificates from Government approved certifying authorities for all the lifting gear & hoists (slings, chains, hooks, chain pulley blocks, winches, cranes etc.) before starting the work. The contractor’s supervisor for subsequent spot checks shall retain the certificates.

The gas cylinders should be used in safe manner. They should not be dropped from heights. Acetylene cylinder should be kept upright position. Oxygen cylinders should not be kept near inflammable materials like oil etc.

The contractor is to remove all waste materials from and around the work site and leave the work spot spick and span.

**Works like Gas cutting, welding etc.**

Before carrying out any work like gas cutting, welding etc. the contractor shall contact the site-in - charge to ascertain about the safety of the area for welding work.

The contractor shall produce certificates for his welding sets checked by the site in charge before starting the work. The certificates shall have to be renewed every two months. A copy of the current certificate shall be displayed on the welding sets.

Only cables in good condition and insulated holders are to be used. The length of the supply cable shall not exceed 25 feet and the welding set body shall be properly earthed. Under no circumstance building structure pipeline should be used as a return path of the current.

**A charged fire extinguisher of CO2 type is to be carried with each welding set.**

**The welder is to wear good quality insulated welding gloves, shoes & goggles while at work.**

**Tarpaulins are not be used in the vicinity of welding / gas cutting jobs.**

b. EXCAVATION

In the event of an excavation being made, it is the responsibility of the contractor to see that any opening, sump or pit caused by them is securely fenced as required by the Factory Act.

c. WORKING AT HEIGHT

For carrying out work at heights exceeding 6 feet or over and near the opening in floors, roofs, etc the following precaution to be taken.

The written permission of the Departmental Manager is to be taken before carrying out any work. Adequate safety precautions like use of safety belts, crawling ladders etc are to be taken.

All personnel engaged on overhead work shall be men experienced in such work.



Whenever possible timber staging or platform shall be erected with planks of minimum thickness 2 inches and minimum width 12 inches when the nature of work demands staging of a greater width than plank provided then additional planks shall be added and lashed securely.

Staging shall be provided with simple safety rails or ropes throughout its length, at waist height and on each open side.

Staging supports shall be of standard steel scaffolding safely secured and supported on firm level footings or slung from overhead beams. The supports shall be situated at a maximum distance of 8 feet apart and staging shall be secured to each support.

In case the site or nature of work is unsuitable for erection of proper staging all workers shall wear safety belts around their waists and secure their lifelines to strong scaffolding or structural members.

Wherever it is not possible to put up staging and / or use safety belts, safety nets or sheets shall be slung beneath the place of work.

When working in open process vessels or tanks, safety belts or safety nets shall always be used whether or not staging and scaffolding is provided.

Safe access to all points of work should be provided in the form of suitable ladders, stairways etc.

Contractor's employee of at least status of a foreman shall examine all arrangements before starting such work is commenced and shall satisfy himself that all reasonable safety precautions have been taken.

#### d. FIRE INSTRUCTIONS

Before carrying out any gas cutting, welding etc, the contractor shall contact the site-in -charge to ascertain about the safety of the area for welding work.

Smoking is strictly prohibited in premises. Severe action will be taken if any of the contractor's workmen is found smoking at the work site area.

In case fire is discovered, dispatch additional force & site Engineer. Wherever possible switch off any electrical and gas apparatus near the fire.

Check the nature of fire, pick up appropriate fire extinguisher and try to put out fire. For Electrical fire use carbon dioxide fire extinguisher.

#### e. PERSONAL PROTECTIVE EQUIPMENT

The personal protective equipment should be worn wherever necessary.

#### f. REVIEW MEETINGS

Periodic safety review meeting shall be conducted to review safety and for better coordination with other agencies.

Periodically safety review will be held with Site Engineer and issues will be discussed and action points shall be monitored and recorded in a separate safety Register / File.

#### g. WORK AFTER NORMAL WORKING HOURS

Extra care need to be taken for jobs being carried out after normal working hours with due revalidated work permit.

#### h. ACCIDENTS



In case of injury or serious illness, the department should be informed immediately. All injuries are to be reported by filling in the “injury report” form, which will be available with the respective department / site engineer.

These safety conditions should not be regarded as exhaustive. These have been issued for the guidance of the contractor and will not in any way absolve the contractor from any obligations or liabilities that might incur or transfer such obligations on liabilities to the company.

*(End of Section- IV)*



## SECTION V - PRICE SCHEDULE

Summary Format- Supply, Installation, Testing and Commissioning along with Loading, Unloading, Transport, Transit Insurance etc.

Sr. No	Particulars	Quantity	Price Rs.	GST Rs.	Total Price Rs.
	Bidders to calculate the quantity as per Drawing Layout, SLD,P & ID and Site visit				
1	Civil and allied works including scope of removable of some of existing infrastructure				
2	UPS 2 X 500 KVA				
3	LI Ion Batteries for 2 X 500 KVA along with Battery Rack, Isolator, DC cabling etc.				
4	Shifting of 3 X 40 KVA UPS along with battery rack to new locations as per drawing on same floor and New SMF Batteries for Existing 3 X 40 KVA UPS for back up time of 10 minutes				
5	2 X 750 KVA DG sets with Synchronization controller				
6	DG Synchronization panel				
7	Other Accessories as Power and Control Cabling, Terminations, Exhaust Stack, approvals, earthing etc.				
8	LV Electrical Components , LT Panels, DBs, Bus bars, End feed unit, Tap off boxes ,ATS panel , change over panels isolation transformer etc.				
9	All LT Cabling –Power and Control, Earthing, , Cable Trays, Supports, Cable terminations, Glands and other accessories etc.				
10	Internal Illumination System along with DBs				
11	Adiabatic Dry Cooler along with associated accessories , pumping system, storage tank etc.				
12	Thermal storage tank and associated accessories, pumping system, chilled water piping, BTU meter ,valves, bends etc.				
13	Pipes of all sizes ,Bends, valves, actuators, joints, end flanges and other hardware including accessories , grooved piping system and grooved fittings etc.				



14	Instrumentation and Control for entire Cooling System				
15	6 X 55 KW Chilled water based In Row Units along with humidified, dehumidifier etc.				
16	Fire Alarm system including Detectors, panels, cabling and associated accessories etc. ( Server Room + IT UPS room + NON IT UPS Room )				
17	Fire Suppression system for Data Center area + IT UPS Area + NON IT UPS Area including Gas release panel, cylinder, Manifold, piping and associated accessories etc.				
18	NOVEC Gas for Data center area + IT UPS area + Non IT UPS Area				
19	CCTV system including camera, switch, NVR, Cables, monitors etc.				
20	IBMS software including system ( Computer ,Monitor) integration of third party devices, I/O modules, all control and communication cabling etc.				
21	Other IBMS including Water leak detectors, Rodent Repellent, Vesda etc. all instrumentation, I/O panels, metering system etc.				
22	Any other item, material required to complete the solution				
23	Any other charges required to complete the turnkey job in total, (if any).				
24	Installation, commissioning, testing, etc.				
25	Operation & Maintenance-Year-1				
26	Operation & Maintenance-Year-2				
	Grand Total Rs. (F.O.R. Site, inclusive of Applicable GST)				

**Optional Items (These items will not be considered for computing L1)- Bidders to submit the offer carefully.**

Sr. No.	Particulars	Quantity	Quoted Price Rs.	GST Rs.	Total Price Rs.
1	Comprehensive Annual Maintenance Contract - Year-3				
2	Comprehensive Annual Maintenance Contract - Year-4				
3	Comprehensive Annual Maintenance Contract - Year-5				
4	Operation and Maintenance –Year-3				



Sr. No.	Particulars	Quantity	Quoted Price Rs.	GST Rs.	Total Price Rs.
5	Operation and Maintenance –Year-4				
6	Operation and Maintenance –Year-5				

**Note: The AMC charges should not exceed more than 7% of the cost of all the capital equipment, which includes but not limited to DG set, All LT panels, Dry Cooler, PHE, Pumps, Thermal Storage Tank, PAC units, UPS. Batteries are not considered under AMC.**

**Detailed Commercial Bid is to be submitted in the format as appearing on GeM portal/GeM portal/app.**

**Notes:**

- 1. Prices for individual line items of the BoQ should be mandatorily submitted. CDAC Pune reserves the right to reject the bid in case bidder fails to quote all the required items.**
- 2. Bidder must fill the supply and installation prices separately as per the above table.**
- 3. The prices quoted should include the charges towards testing of equipment, installations and approvals from local electricity board/PWD, electrical/ civil engineering authority, pollution control board - as applicable. The official charges required for the required testing, certification, NOC etc. are to be paid by the bidder. The certifications, NOC etc. shall be in the name of C-DAC**
- 4. The invoice can be raised in compliance with GST requirements, giving full bill of material.**



## ANNEXURE A – COVERING LETTER

Date:

To:

Director General,  
Centre for Development of Advanced Computing(C-DAC)  
S.P. Pune University Campus,  
Pune – 411007.

**Subject:** Submission of the Technical bid for Supply of Data Centre Solutions

Dear Sir,

We, the undersigned, offer to supply Data Centre Solutions and allied services in response to your GeM Bid & CDACP/NSM-DC-IIT-MUM/23-24/382. We are hereby submitting our proposal for same, which includes this Technical bid and the Financial Bid through [GeM portal](#).

We hereby declare that all the information and statements made in this Technical bid are true and we accept that any misinterpretation contained in it, may lead to our disqualification.

We undertake, if our proposal is accepted, to submit a Security Deposit of 5 % of the contract / order value, as per terms stipulated in the GeM Bid.

We confirm that the deliveries, installation will be done within 4 months (16 weeks), if the order is placed. The Post Warranty CAMC charges are not beyond 7% of the capital items involved in the project solutions.

We hereby certify that my/ our firm has not been disqualified and / or blacklisted by any Office/ Department/ Undertaking of the State Government / Central Govt. of India, PSU/ Autonomous Body of Government of India, as on the date/time of submission of this bid.

We undertake, if our proposal is accepted, to initiate the Implementation activities towards supply of material and services, as stipulated in the referred Gem Bid/ATC etc.

We hereby accept the applicable protocols while delivery, installation, implementation, commissioning of the entire 'Turn-key' job with regards to 'COVID-19' conditions at the Institution/site. (The same will be informed in the supply/work order(s) placed, if any).

We agree to abide by all the terms and conditions of the GeM bid document, including corrigenda. We would hold the terms of our bid valid for 180 days as stipulated in the Bid document.

We understand you are not bound to accept any Proposal you receive.

The undersigned is authorized to sign this bid document. The authority letter to this effect is enclosed.

Yours sincerely,

Authorized Signatory:

Name and Title of Signatory:

e-mail:

Mobile No:



## ANNEXURE B – AUTHORITY LETTER

Date:

To:

Director General,  
Centre for Development of Advanced Computing(C-DAC)  
S.P. Pune University Campus,  
Pune – 411007.

**Subject: Authority Letter**

Reference: GeM Bid & CDACP/NSM-DC-IIT-MUM/23-24/382

Dear Sir,

We, M/s \_\_\_\_\_ (Name of the bidder) having registered office at \_\_\_\_\_ (address of the bidder) herewith submit our bid against the said bid document.

Mr./Ms. \_\_\_\_\_ (Name and designation of the signatory), whose signature is appended below, is authorized to sign and submit the bid documents on our behalf against said RFP

Specimen Signature:

The undersigned is authorised to issue such authorisation on behalf of us.

For M/s \_\_\_\_\_ (Name of the bidder)

Signature and company seal

Name

Designation

Email

Mobile No.



## ANNEXURE C – UNDERTAKING BY PRINCIPAL MANUFACTURER

(To be submitted in Original on Letterhead- for all major equipment/devises/products – separately.)

Date:

Director General,  
Centre for Development of Advanced Computing(C-DAC)  
Innovation Park, Panchavati, Pashan,  
Pune – 411008.

Subject: **Undertaking by Principal Manufacturer against GeM Bid: CDACP/NSM-DC-IIT-MUM/23-24/382 for Supply, Installation & Commissioning of Data Centre Solutions.**

Dear Sir,

We, M/s \_\_\_\_\_ (Name of the manufacturer) having registered office at \_\_\_\_\_ (address of the manufacturer) by virtue of being manufacturer for \_\_\_\_\_ (Name of the product/s), hereby authorise M/s \_\_\_\_\_ (Name of the bidder) having their office at \_\_\_\_\_ (Address of bidder) to submit quote, supply, install and provide after sales support for our range of products quoted by them to meet the above mentioned GeM Bid requirements, including post warranty support (CAMC) for 3rd, 4th & 5th year.

M/s \_\_\_\_\_ (Name of the manufacturer) within the scope of requirement as per the GeM Bid mentioned above undertake to provide technical & other support towards fulfilling the requirements of installation, commissioning, acceptance criteria and product warranty services for min. 5 years - of the Data Centre Items/Solutions to be supplied and installed at site(s) by our authorised representative M/s (Name of bidder) against said GeM Bid.

The undersigned is authorised to issue such authorisation on behalf of M/s \_\_\_\_\_ (Name of the manufacturer).

For M/s \_\_\_\_\_ (Name of the manufacturer)

Signature & company seal

Name

Designation

Email

Mobile No.



## ANNEXURE D - LIST OF RECOMMENDED MAKES

**THE FOLLOWING LIST IS INDICATIVE ONLY. THE ITEMS OFFERED MUST COMPLY WITH THE ORDER NO. P-45021/2/2017-PP (BE-II). DATED 4TH JUNE, 2020 ISSUED BY PUBLIC PROCUREMENT DIVISION, DEPARTMENT OF INVESTMENT AND INTERNAL TRADE, MINISTRY OF COMMERCE, GOI**

Sr. No	Description List of Makes - Electrical	Recommended Makes
1	UPS System	Schneider/Vertiv/Eaton/Numeric/ FUJI /TMEIC/Delta/Socomec/ Riello Power India Pvt. Ltd
2	SMF Batteries for UPS	Rocket / Amar Raja / HBL /Quanta/Exide and for Li Ion - Samsung /LG
3	LT CABLES	RPG /KEI /FINOLEX/POLYCAB/Ravin/Lapp
4	Multifunction Meter (Digital Type)/Load Manager	Schneider/Socomec/Secure Meter/HPL/Siemens/L&T
5	MS/GI CONDUITS	BEC/BHARAT/AKG/UNIVERCELL
6	PVC CONDUITS	AVON PLAST//Precision/Dimond
7	MODULAR SWITCH SOCKET WITH SWITCH BOXES	ANCHOR/Legrand/Schneider
8	BRASS DOUBLE COPRESSION GLANDS	DOWELLS/COMMET/Siemens/Phoenix
9	MCCB/MCB/ACB	Schneider/L&T/ABB/Siemens/Eaton/Legrand
10	ELCB/MCB	Siemens/ Schneider / Legrand/Eaton
11	MCB DBS	Siemens/Schneider/Legrand/L&T /Eaton/ABB
12	METAL CLAD SOCKET OUTLETS	Legrand/SALZER/HAVELLS/L&T HAGER/Schneider
13	CABLE TRAYS	PROFAB/Indiana/OBO Bettermann
14	LUMINAIRES	PHILLIPS/WIPRO/BAJAJ/HAVELLS/Syska
15	PROTECTIVE RELAYS	Siemens/ ABB/L&T/Schneider/Eaton
16	CT's	VOLTAMP/AE/KAPPA
17	SURGE PROTECTION DEVICES	Schneider/Siemens/Legrand/Eaton
18	Auto Transfer Switch (ATS)	Siemens/Socomec/Schneider (ASCO)
19	LT Switchboards	License of IEC 61439 Panel Builder
20	Power Distribution Unit (PDU- Inside the Rack)	Vertiv/APC-Schneider /Raritan/Eaton/Numeric/enlogic/Dhananjay Group



Sr. No	Description List of Makes - Electrical	Recommended Makes
21	FRLS PVC insulated stranded copper conductor wires and cables	Finolex   Lapp Kabel   Skyline   L&T   National   Echo   Havells
22	Terminal blocks & cage clamps	Elmexx   Phoenix   Wago
23	Star Delta starter	L&T   ABB   Siemens   Schneider/Eaton
24	Soft starters/VFD Drives	ABB   Schneider   L&T/Siemens/Eaton/Danfoss/Grandfoss, Danfoss
25	Single phase preventor	L&T   Minilec   Syntron   Beluk
26	Electric Motors	Siemens   Crompton   ABB   Bharat Bijlee   Alstom
<b>Sr. No.</b>	<b>Details of Material- Civil and Interior</b>	
1	Cement	ACC, L&T, Ambuja
2	WALL PUTTY	GOLDSIZE PUTTY BY SHALIMAR PAINTS LTD., J K WALL PUTTY, Birla White
3	STRUCTURAL STEEL	TISCO, SAIL, RINL, JINDAL, ESSAR, Tata Steel
4	ANCHOR FASTNER	HILTI, FISHER
5	ALUMINIUM SECTIONS	INDAL, HINDALCO, JINDAL,
6	DISTEMPER & PAINTS	ICI-Dulux, ASIAN PAINTS, BERGER PAINTS, NEROLAC, British Paint
7	GYPSUM BOARD and Fire Rated partition	INDIA GYPSUM, LAFARGE BORAL, RAMCO LTD
8	Fire Sealants	3M, Hilti, Fischer
9	GLASS	SAINT GOBAIN, Schott, Pilkington
10	FALSE CEILING	INDIA GYPSUM, ARMSTRONG, AMF
11	Raised/False Flooring	Unitile/Uniflair/ USG/Access Floor Systems/AET Flexible
12	Fire Door	Shakti Mat, Radiant, ProMat, Godrej,
13	Insulation	Armaflex/K-FLex
<b>Sr. No.</b>	<b>System / Description-IBMS</b>	
A	Intelligent Fire detection System	
1	Analogue Addressable Fire detection Panel	Tyco, Honeywell, Siemens, Schneider, Johnson Control



Sr. No	Description List of Makes - Electrical	Recommended Makes
2	Analogue Addressable Thermal /smoke Detector	Tyco , Honeywell, Siemens , Schneider
3	Analogue Addressable Manual Call Point	Tyco , Honeywell, Siemens , Schneider
4	Analogue Addressable Abort cum Gas Release Station	Tyco , Honeywell Siemens , Schneider
5	Analogue Addressable Control / Relay / Isolator Modules	Tyco , Honeywell Siemens , Schneider
6	Building Management Interface	Tyco , Honeywell, Siemens , Schneider
7	Fire Extinguisher's	Cease Fire / Minimax
8	Aspiration Smoke Detection System	Xtralis, ICAN, Tyco,Siemens
9	Response Indicators	Daksh, Polixel, Agni
10	Gas Release Modules	Tyco , Honeywell, Siemens , Ravel
11	Fire Detection Cables	Polycab, Excel, LAPP kabel
<b>B</b>	<b>IP CCTV Surveillance System</b>	
1	IP Dome Cameras with Varifocal lense	BOSCH, Honeywell, Siemens ,Samsung
2	IP BOX Camera	BOSCH, Honeywell, Siemens
3	IP PTZ Camera	BOSCH, Honeywell, Siemens
4	Video Management, Recording Software	Pelco, BOSCH, Axis, Indigo Vision, Polixel, Milestone
5	32" Monitors	Samsung, LG, Sony
6	Network Switch	Comnet, RuggedCom, Moxa
7	CAT 6 Cable	AMP, Molex, ,Schneider
8	OFC Cables	Finolex, Sterlite, HFCL
9	Power Cables	Polycab, Excel, LAPP kabel
10	MS Conduit	BEC, AKG, Dimond
11	PVC Conduits	BEC, AKG, Precision
12	Storage Device	DELL, HP, IBM
13	Servers / Workstation	DELL, HP, IBM
<b>C</b>	<b>Access Control System</b>	



Sr. No	Description List of Makes - Electrical	Recommended Makes
1	Intelligent Access Controller	Siemens, Honeywell, Daccess
2	Time and Access Management Software	Nexwatch, Software House, Siemens, Honeywell, Daccess
3	Biometric Readers	Nexwatch, HID, DDS, Siemens, Honeywell, Daccess
4	Cards	Siemens, Honeywell, Daccess
5	Proximity Readers	Nexwatch, DDS, HID, Siemens, Honeywell, Daccess
6	Electromagnetic Locks	Dafikas, BELL, Trimec, Insyn
7	Network Switch	Comnet, RuggedCom, Moxa
8	Emergency Glass Break Station	KAC
9	CAT 6 Cable	AMP, Molex, Schneider
10	OFC Cables	Finolex, Sterlite, HFCL
11	Servers / Workstation	DELL, HP, IBM
<b>D</b>	<b>UL Listed Novec 1230 Clean Agent Fire Suppression System</b>	
1	UL Listed & PESO Approved Seamless Cylinders	Ansul, UTC, Siemens, Tyco
2	Novec 1230	Ansul, UTC, Siemens, Tyco, Siemens
3	Nozzles	Ansul, UTC, Siemens
4	Electronic/ Pneumatic Actuators	Ansul, UTC, Siemens
5	Discharge Valves	Ansul, UTC, Siemens
6	M.S Seamless Pipes	Jindal, Tata
7	Discharge Hose	Ansul, UTC, Siemens
8	Manifold Check Valve	Ansul, UTC, Siemens
9	Warning Sign Boards	Ansul, UTC, Siemens
10	Manual Abort & Release Station.	Daksh, Agni
<b>E</b>	<b>Building Management System</b>	
1	Main Control System/DDC Controllers	Honeywell, Schneider, Siemens, Rockwell
2	Temperature, Air humidity Sensors (Duct, Room)	Azbil (Yamatake), ALC, Sauter, Siemens, Endress-Hauser
3	Building Management Software	Honeywell, Siemens, Schneider,



Sr. No	Description List of Makes - Electrical	Recommended Makes
4	Differential pressure switch Air flow / Water Flow switch/water Level switch	Azbil (Yamatake ), ALC, Sauter, Honeywell,Emerson Process
5	Water Flow meter	Emerson -Process/Endress-Hauser/ Honeywell/ Sontay/Forbes Marshal
6	Water Pressure Transmitter/ Level Transmitter	Invensys/Kele/ Honeywell/ Sontay/Forbes/Marshal
7	Motorized Butterfly valves/ actuators	Rapid Cool/Audco/ Johnson/Siemens/Belimo
8	Current/Voltage/Power Factor/FrequencyKWH Transducers with digital display/Electronic Meter	Situ Electro Instruments Pvt.Ltd./ Secure metres Ltd./ Enercon/L&T
9	Printer	HP/Epson
10	Switching Relays	PLA/OMRON
11	Flame proof level switch	Veksler/Minilec
12	Electromagnetic Lock	Trimec/Dafickas
13	Current Relays	Sitn/Minilec/Sentry
14	Electric Actuators for 2-way ON/OFF valves	Danfoss/ Emtrack/ Johnson/ Honeywell/ Siemens/ Trane/ Cyclon Controls.
15	Transducer/Sensors/Water Quality system-- pH,Conductivity,Dissolved Oxygen etc	Emerson - Process,Endress-Hauser,Siemens,ABB,Thermax
16	CAT 6 Cable	AMP, Molex,Schneider
17	OFC Cables	Finolex, Sterlite, HFCL
18	Servers / Workstation	DELL, HP, IBM
<b>F</b>	<b>Water Leak Detection System</b>	
1	Sensing Cables	Tracetek, Liebert, Sontay
2	WLDS Controller	Tracetek, Liebert, Sontay
3	Jumper Cables	Tracetek, Liebert, Sontay
<b>G</b>	<b>Rodent System</b>	
1	Controller	MASER (Tarrant Range), C Systems, Verma Craft



Sr. No	Description List of Makes - Electrical	Recommended Makes
2	Sattelites	MASER (Tarrant Range), C Systems, Verma Craft
3	GUI Software	MASER (Tarrant Range), C Systems, Verma Craft
<b>Mechanical Components</b>		
1	Variable Speed Pumping system with Pump sets	Grundfos   Armstrong
2	In Row	Schneider, Vertiv, nVent, BlueBox, Clievameneta,
3	Variable Speed Pumping system with Pump sets	Grundfos   Armstrong
4	PAC	Schneider   Blue Box   Vertiev   Climaveneta
4.1	Fan section-Blower	Kruger   Flaktwood   Nutech   TCF Nadi
4.2	Variable frequency drives	Danfoss   ABB/Eaton
4.3	Air Handling Unit (AHU)	Trane/Voltas/BlueStar/Blue Box
4.4	Variable Air Volume (VAV) Boxes	Caryaire-Titus   Trane   Johnson Control   Belimo
5	Racks (42 U IT and BMS )	Schneider, Valrack,,EFS,Rittal,Netrack,Dhananjay Group,Metafin Techanology
6	Adiabatic Dry Cooler	Thermax   Paharpur   Schneider   Lu Ve Exchangers   Thermofin   Kelvion
7	G.I.	Jindal (Hissar)   TATA   GST
8	M.S. upto 300 mm	Jindal (Hissar)   TATA   GST
9	M.S. Above 300 mm	Maharashtra Seamless   TATA   GST
<b>10</b>	<b>Valves</b>	
10.1	Butterfly Valves	Audco   Advance   C&R   Oventrop   TA Hydronics   Flowcon
10.2	Valve	Audco   Advance   Leader
10.3	Non Return Valve	Audco   Advance   C&R   Cim
10.4	Balancing Valves	Advance   Oventrop   Flowcon   T&A Hydronics   Honeywell   Danfoss
10.5	Ball ,Gate,Globe Valve	Audco   Emerald   Oventrop   Rapidcool   Cim   Zoloto
10.6	Ball Valves with Y Strainer	Rapidcool   Cim   Zoloto
<b>11</b>	<b>Accessories</b>	
11.1	Pressure Gauges	H.Guru   Fiebig   WAREE



<b>Sr. No</b>	<b>Description List of Makes - Electrical</b>	<b>Recommended Makes</b>
11.2	Thermometers	Emerald   Fiebig   WAREE
11.3	Flow Switch	Anergy   Honeywell   Siemens   Johnson   Schneider
11.4	Motorized butterfly valve	Siemens   Danfoss   Schneider   Advance   Audco
11.5	Dash Fastners	Hilti   Fischer
11.6	Vibration Isolators (Bellow Type)	Resistoflex   Cori   Easyflex
11.7	Spring Mounts	Emerald   Resistoflex
11.8	Rubber Groumat/ Clamps/ Hangers	Emerald/ Resistoflex/ Kanwal
<b>12</b>	<b>Air Filters</b>	
12.1	Filters	Airtech   Purolator   Puromatic   Thermodyne   Spectrum   Dynafilters
<b>13</b>	<b>Insulation</b>	
13.1	Glass Wool	Owens Corning   U.P. Twiga   Kimmco
13.2	Mineral Wool	Lloyd Insulation
13.3	Closed Cell Elastomeric Insulation	Armaflex   Aeroflex   Vidoflex   Kflex
13.4	Aluminium Sheets	TATA   Nippon   Hindalco   Indalco
14	Balancing Valve	TA Hydronics   Danfoss   Oventrop   Flowcon



**ANNEXURE E – PERFORMANCE BANK GUARANTEE**  
**(on non-judicial paper of appropriate value)**

To,

Director General,  
Centre for Development of Advanced Computing(C-DAC)  
S.P. Pune University Campus,  
Pune – 411007.

BANK GUARANTEE NO:

DATE:

Dear Sir(S)

This has reference to the Purchase Order No. \_\_\_\_\_ Dated \_\_\_\_\_ been placed by C-DAC on M/s \_\_\_\_\_ (Name & Address of vendor) for supply, installation, commissioning, warranty of \_\_\_\_\_ (description of items) at IIT Bombay, Mumbai.

The conditions of this order provide that the vendor shall,

1. Arrange to deliver the items listed in the said order to the consignee, as per details given in said order, and
2. Arrange to install and commission the items listed in said order at client's site, to the entire satisfaction of C-DAC and
3. Arrange for the comprehensive warranty service support towards the items specified in purchase order.

M/s (Name of Vendor) has accepted the said purchase order with the terms and conditions stipulated therein and have agreed to issue the performance bank guarantee on their part, towards promises and assurance of their contractual obligations vide the Supply Order No. \_\_\_\_\_ M/s. \_\_\_\_\_ (name of vendor) holds an account with us and has approached us and at their request and in consideration of the promises, we hereby furnish such guarantees as mentioned hereinafter.

C-DAC shall be at liberty without reference to the Bank and without affecting the full liability of the Bank hereunder to take any other undertaking of security in respect of the suppliers obligations and / or liabilities under or in connection with the said contract or to vary the terms vis-a – vis the supplier or the said contract or to grant time and or indulgence to the supplier or to reduce or to increase or otherwise vary the prices or the total contract value or to forebear from enforcement of all or any of the obligations of the supplier under the said contract and/or the remedies of C-DAC under any security (ies) now, or hereafter held by C-DAC and no such dealing(s) with the supplier or release or forbearance whatsoever shall have the effect of releasing the bank from its full liability of C-DAC hereunder or of prejudicing right of C-DAC against the bank.

This undertaking guarantee shall be a continuing undertaking guarantee and shall remain valid and irrevocable for all claims of C-DAC and liabilities of the supplier arising up to and until \_\_\_\_\_ (date)

This undertaking guarantee shall be in addition to any other undertaking or guarantee or security whatsoever the that C-DAC may now or at any time have in relation to its claims or the supplier's obligations/liabilities under and / or in connection with the said contract and C-DAC shall have the full authority to take recourse to or enforce this undertaking guarantee in preference to the other undertaking or security (ies) at its sole



discretion and no failure on the part of C-DAC in enforcing or requiring enforcement of any other undertaking or security shall have the effect of releasing the bank from its full liability hereunder.

We \_\_\_\_\_ (Name of Bank) hereby agree and irrevocably undertake and promise that if in your (C-DAC's) opinion any default is made by M/s \_\_\_\_\_ (Name of Vendor) in performing any of the terms and /or conditions of the agreement or if in your opinion they commit any breach of the contract or there is any demand by you against M/s \_\_\_\_\_ (Name of Vendor), then on notice to us by you, we shall on demand and without demur and without reference to M/s \_\_\_\_\_ (Name of Vendor), pay you, in any manner in which you may direct, the amount of Rs. \_\_\_\_\_/- (Rupees \_\_\_\_\_ Only) or such portion thereof as may be demanded by you not exceeding the said sum and as you may from time to time require. Our liability to pay is not dependent or conditional on your proceeding against M/s \_\_\_\_\_ (Name of Vendor) and we shall be liable & obligated to pay the aforesaid amount as and when demanded by you merely on an intimation being given by you and even before any legal proceedings, if any, are taken against M/s \_\_\_\_\_ (Name of Vendor)

The Bank hereby waives all rights at any time inconsistent with the terms of this undertaking guarantee and the obligations of the bank in terms hereof shall not be anywise affected or suspended by reason of any dispute or disputes having been raised by the supplier (whether or not pending before any arbitrator, Tribunal or Court) or any denial of liability by the supplier or any order or any order or communication whatsoever by the supplier stopping or preventing or purporting to stop or prevent payment by the Bank to C-DAC hereunder.

The amount stated in any notice of demand addressed by C-DAC to the Bank as claimed by C-DAC from the supplier or as suffered or incurred by C-DAC on the account of any losses or damages or costs, charges and/or expenses shall as between the Bank and C-DAC be conclusive of the amount so claimed or liable to be paid to C-DAC or suffered or incurred by C-DAC, as the case may be and payable by the Bank to C-DAC in terms hereof.

You (C-DAC's) shall full liberty without reference to us and without affecting this guarantee, postpone for any time or from time to time the exercise of any of the powers and rights conferred on you under the contract with the said M/s \_\_\_\_\_ (Name of Vendor) and to enforce or to forbear from endorsing any power or rights or by reason of time being given to the said M/s \_\_\_\_\_ (name of Vendor) which under law relating to the sureties would but for the provisions have the effect of releasing us.

You will have full liberty without reference to us and without affecting this guarantee, postpone for any time or from time to time the exercise of any of the powers and rights conferred on you under the contract with the said M/s \_\_\_\_\_ (Name of Vendor) and to enforce or to forbear from endorsing any power or rights or by reason of time being given to the said M/s \_\_\_\_\_ (Name of Vendor) which under law relating to the sureties would but for the provisions have the effect of releasing us.

Your right to recover the said sum of Rs. \_\_\_\_\_/- (Rupees \_\_\_\_\_ only) from us in manner aforesaid will not be affected/ or suspended by reason of the fact that any dispute or disputes have been raised the said M/s \_\_\_\_\_ (Name of Vendor) and/ or that any dispute or disputes are pending before any officer, tribunal or court or Arbitrator.

The guarantee herein contained shall not be determined or affected by the liquidation or winding up, dissolution or change of constitution or insolvency of the said M/s \_\_\_\_\_ (Name of Vendor) but shall in all respects and for all purposes be binding and operative until payment of all dues to C-DAC in respect of such liability or liabilities.

Our liability under this guarantee is restricted to Rs. \_\_\_\_\_/- (Rupees \_\_\_\_\_ Only). Our guarantee shall remain in force until unless a suit action to enforce a claim under guarantee is filed against us within one month from the date of expiry of guarantee, all your



rights under the said guarantee shall be forfeited and we shall be relieved and discharged from all liabilities there under.

We have power to issue this guarantee in your favour under Memorandum and Articles of Association of our Bank and the undersigned has full power to do under the power of Attorney dated.

Notwithstanding anything contained herein:

- A. Our liability under this guarantee shall not exceed Rs\_\_\_\_\_ (in words)
- B. This bank guarantee shall be valid up to (26 months from date of installation) & unless a suit for action to enforce a claim under guarantee is filed against us within one month from the date of expiry of guarantee, all your rights under the said guarantee shall be forfeited and we shall be relieved and discharged from all liabilities there after i.e. after one month from the date of expiry of this Bank guarantee
- C. We are liable to pay the guaranteed amount or any parts thereof under this bank guarantee only and only if you serve upon us a written claim or demand or before \_\_\_\_\_
- D. The Bank guarantee will expire on \_\_\_\_\_

Granted by the Bank

Yours faithfully,

For (Name of Bank)

SEAL OF THE BANK

Authorised Signatory



## ANNEXURE F – UNDERTAKING

Date:

To:

The Director General,  
Centre for Development of Advanced Computing (C-DAC)  
Innovation Park, Panchavati, Pashan Road,  
Pune - 411008 Maharashtra, INDIA

### Subject: Undertaking as per GFR – 2017, Rule 170(iii)

Dear Sir,

We, the undersigned, offer to carry out the 'Turn-key' project including **Products/items, components etc.** as per GeM Bid at C-DAC, Pune, in response to your GeM Bid & CDACP/NSM-DC-IIT-MUM/23-24/382. We are hereby submitting our proposal for same, which includes Technical bid and the Financial Bid through GeM portal. As a part of eligibility requirement stipulated in said GeM Bid document, we hereby submit a declaration in lieu of Earnest Money Deposit (EMD), as given below:

1. Our bid shall remain valid for 180 days from the date of submission and that we will not withdraw or modify our bid during the validity period,
2. In case, we are declared as successful bidder and an order is placed on us, we will submit the acceptance in writing within 7 days of placement of order on us.
3. In case, we are declared as successful bidder and an order is placed on us, we undertake, to submit a Security Deposit of 5 % of the order value, as per terms stipulated in the GeM Bid.
4. The Post Warranty CAMC charges are not beyond 7% of the capital items involved in the project solutions.
5. In case of failure on our part to comply with any of the above said requirements, we are aware that we shall be declared as un-eligible for said GeM Bid and /or debarred from any **future bidding process of C-DAC or any Government entity & GeM portal for a period of minimum one year.**
6. The undersigned is authorized to sign this undertaking.

Yours sincerely,

Authorized Signatory:

Name and Title of Signatory:

e-mail:

Mobile No:



### ANNEXURE –G: DOCUMENTS CHECK –LIST

Sr. No.	Documents to be Submitted (IN THE FOLLOWING SEQUENCE ONLY).	Submitted (Yes / No) with page nos.
	e-Packet-1 (Section-I)	
1	<b>Annexure-G</b> duly filled and neatly arranged in the following sequence only. The bidder must submit all the documents as per Document Checklist – Annexure G, with appropriate page nos for the same. The flow of the submitted documents must be in the same order/sequence.	
2	Covering Letter as per Annexure - A.	
3	Authority Letter as per Annexure – B	
4	Exemption documents or Annexure F towards EMD	
5	A copy of Certificate of Incorporation, Partnership Deed / Memorandum and Articles of Association / any other equivalent document showing date and place of incorporation, as applicable.	
6	A copy of GST registration certificate.	
7	Copies of at least one purchase orders or contracts and installation reports in the name of bidder from the end client / end user, during last Five years for Data Centre work.	
8	A photo copy of the commercial bid without prices (prices blocked) and copy of commercial terms & conditions (in detail) as included in the commercial bid. C-DAC reserves the right to reject the bid in case of any discrepancy observed in the un-priced commercial bid and the actual commercial bid.	
9	The undertaking(s) from the Principal Manufacturer(s) (OEMs) of products/ items offered as per Annexure – C.	
10	Undertaking to the effect that a Security Deposit of 5% of the order value will be submitted in case C- DAC decides to place the Purchase Order.	
11	Undertaking to the effect that the bidder is not black-listed or barred from participation in bidding process by any Central/ State Government, Government	



Sr. No.	Documents to be Submitted (IN THE FOLLOWING SEQUENCE ONLY).	Submitted (Yes / No) with page nos.
	Department, Government Undertaking, Public Sector Unit (PSU) or autonomous institution, as on date of submission of bids.	
12	All the necessary documents in support of eligibility criteria stipulated in Eligibility Criteria.	
	(Section-III)	
13	The executive summary of the bid submitted (As per Section-V)	
14	Duly filled Technical Bid (covering the details of solution, detailed bill of material, technical specifications, makes and models of items, diagrams, layouts, all drawings etc.)	
15	The details of electrical power consumption, foot-print, ambient temp, temperature range targeted, discrimination curves, short circuit calculations, cable schedule along with voltage drop calculations, battery sizing and back up calculations etc.	
16	Details of diesel consumption & water consumption on various loading conditions.	
17	Design Basic Report along with annual average Power Usage Effectiveness (PUE) calculations for 25%, 50%, 75% and 100 % of IT load.	
18	Design basis and analysis of cooling solution at full and partial load conditions including complete details, assumptions made and the specific references/standards used for the same	
19	Legal / statutory permissions required, if any.	
19	e –packet 2 (FINANCIAL BID)	
	Price Bid as per format given in Section – V (as per GeM policy)	



## ANNEXURE H – SERVICE LEVEL AGREEMENT (SLA)

The successful bidder will be required to sign a SLA, at the time of issuing the works order for supply, installation and commissioning of Data Centres. The basic service requirements / conditions that would be covered in the SLA are as given below.

### 1. Scope of Work for Operation and Maintenance

Scope of this SLA covers the satisfactory Operations of DC, Maintenance, warranty and support, as stipulated in the GeM Bid, Works Order, for a period of two years from the date of successful installation and commissioning of the Data Centre. One minimum 8 years experienced technician with experience in the field of O & M for Electrical and cooling equipment's per shift and one Diploma Engineer with minimum 10 year of technical + administration experience needs to be deployed.

### 2. Definitions

"**Uptime**" shall mean the time period for which the specified services / components with specified technical and service standards are available to the state and user departments. Uptime, in percentage, of any component (Non-IT) can be calculated as:

$$\text{Uptime} = \{1 - [(\text{Downtime}) / (\text{Total Time} - \text{Scheduled Maintenance Time})]\} * 100$$

"**Downtime**" shall mean the time period for which the specified services / components with specified technical and service standards are not available to the state and user departments and excludes the scheduled outages planned in advance, the link failures and reasons beyond Vendor Control.

"**Incident**" refers to any event / abnormalities in the functioning of the Data Centre Equipment / specified services that may lead to disruption in normal operations of the Data Centre services.

"**Resolution Time**" shall mean the time taken (after the incident has been reported at the helpdesk), in resolving (diagnosing, troubleshooting and fixing)

**The following shall be the responsibilities of the successful bidder.**

### 3. Uptime Requirements:

The bidder shall ensure the uptime requirements for various systems, equipment, components as per details given in the following Table.

Sr No	List of Utilities	Criticality	Redundancy	Uptime	Resolution time
1	HVAC and Cooling (Including In ROW, Dry cooler/ Pumps,)	High	N+1	98.5%	6-8 hours for minor complaints and 24-48 hours for major complaints.
2	UPS	High	N+1	98.5%	6-8 hours for minor complaints and 24-48 hours for major complaints.
3	Electrical Infrastructure	High	N+1	98.5%	6-8 hours for minor complaints and 24-48



Sr No	List of Utilities	Criticality	Redundancy	Uptime	Resolution time
					hours for major complaints.
4	DG Sets	High		98.5%	6-8 hours for minor complaints and 24-48 hours for major complaints.
5	Fire detection and alarm systems, VESDA system, Fire suppression system,	High			Within 24 Hours
6	BMS and real-time measurements, CCTV system, Rodent control, Water leak detection system, Access control system	Medium			Within 48 Hours

#### 4. Reporting Methodology

Understand & analyzing the products covered in the Supply, installation and commissioning scope and performance on periodic basis.

Submission of daily, weekly and monthly service performance reports in the agreed format specified as per the requirement of the infrastructure facilities.

Measurement and Monitoring with recording of readings and checking parameters of different facility equipment's.

Analyzing the readings and escalating suitably for abnormalities observed, if any. Supervise installation and maintenance work, whenever new equipment or systems are to be / being installed.

Adequate stock of onsite and offsite spare parts and spare component must be maintained by the successful bidder.

Successful bidder to ensure the commitment towards uptime requirement of the DC.

To provide this service it is important for the M/S ..... selected bidder to have back to back arrangement with the OEMs. The selected bidder would be required to provide a copy of the service level agreement signed with the respective OEMs.

Component that is reported to be down on a given date should be either fully repaired within the stipulated time frame. If breakdown is major, bidder to arrange for standby component/equipment on temporary basis (of equivalent configuration) within the time frame. In case the selected bidder fails to meet the above standards of maintenance, there will be a penalty as per clause 9 of section III.

#### 5. DAILY CHECKS:

**Access Control System:**



- 24x 7 checking of Access System for alert and alarms.
- Monitoring of Status.
- Abnormality of System / errors
- Access Card Activity
- Report of Access to Data Center
- Report of Forceful Access (Invalid Access)
- Generation of Logs / reports and submission to Host Institute for review and necessary action.
- Testing & checking of all Doors, Magnetic locks and Sensors.

#### **CCTV:**

- Daily Checking of DVR System & Cameras
- Suspicious Action Report
- Abnormality of System
- Generation of Logs / reports and submission to Host Institute for review and necessary action/s  
Maintenance of reports

#### **Fire Alarm System, Novec 1230 Gas, VESDA, Water Leak Detection (WLD), Rodent Repelled:**

- Daily Checking of FAS Panel
- Immediate Action to Alarm Generated
- Monitoring of MCP
- Generation of Logs / reports and submission to Client for review and necessary action/s  
Maintenance of reports, Report Generation through IBMS.

#### **Precision AC, PAHU and Comfort AC:**

- Monitoring of PAC's Temperature and Humidity every half an hour physically.
- Monitoring of Alarms & Immediate Action to it Comparison of Software readings with Actual Reading.

#### **6. Fire Drill Test**

Maintenance Activities will be carried for the System/Devices in Coordination with Host Institute Engineer & Technician

#### **7. Daily Reports**

1. Hourly basis monitoring of UPS & PAC & concern System
2. Reports of Energy meter reading of all meters.
3. Readings of main LT panel.
4. Fuel in DG fuel tank.
5. Immediate response to electrical complaints by any Working staff.
6. Following of effective power consumption chart provided by Customer.
7. Maintaining Critical Electrical parts.



8. Generation of Logs / reports and submission to Host Institute for review and necessary action's Maintenance of reports

## **8. Weekly Reports**

1. All Electrical Systems Health Check Report
2. Vendor call tracking until closure
3. UPS & DG: On load Report.
4. Fire Alarm System: Reports of False Alarm.
5. Access System: Data Backup.
6. CCTV: Backup of DVR Status.
7. WLD: Test of Water Leak Detection Sensor Cable.
8. All System Health Report.
9. PAC, Chiller and comfort AC

## **9. Monthly Reports**

1. Follow up of schedule regarding preventive maintenance.
2. Presentation of consumption of meter units by Pie diagram.
3. Vendor Performance Reports.
4. Report of pending calls/problems.
5. MIS Report Presentation for Each Month

## **10. Call Logging Process with OEM/Vendors**

The onsite team will get alerts on any issue in the data center. The onsite team will identify the area of problem and define problem severity into minor or major call. Call severity will be decided on basis of unit under suspect and impact on functions inside data center like - electrical power in DB, racks, cooling efficiency. Based upon this on site team will either manage to close the problem in case of minor alerts/alarms or In case of major alarms the team will raise an alarm over phone and email to OEM/Vendor with information to C-DAC /Host Institute designated team and O&M in-charge. O&M team will follow the Escalation matrix. The site team / OEM will identify problem area and will work towards resolution of problem.

## **11. Scheduled Maintenance**

Bidder to submit the scheduled maintenance time along with frequency for the components.

12. Bidder has to submit and present the detailed plan of execution for Operation and maintenance activities including manpower deployment along with qualification details of manpower deployed at site.



## Annexure – I: Certificate/s from Respective OEMs

Name of Bidder:

Detail Address:

Contact Person:

Mobile No:

**GeM Bid Ref. No: CDACP/NSM-DC-IIT-MUM/23-24/382**

Pertaining to the provisions of order No. Order No P-45021/2/2017-PP (BE-II). Dated 4th June, 2020 issued by Public Procurement Division, Department of Investment and Internal Trade, Ministry of Commerce, GoI, read with order number W-43/4/2019-IPHW- MeitY, dated 7th September, 2020 issued by IPWH division of MeitY, GoI, we hereby certify the percentage of local contents for each item, as given below: (Bidder to add rows, as required & mention the \*% of local contents against each item and consolidated % of local contents).

Sr. No	Item Description, with <b>Make, &amp; Model</b>	Country of origin of OEM	Country of Manufacture of item	Country of Shipment	*Percentage of local contents as defined by order number W-43/4/2019-IPHW- MeitY, dated 7th September, 2020 issued by IPWH division of MeitY, GoI or Latest Notifications.	
					% per item	Consolidated % of Local contents.
1						
2						
3						

(\*While declaring the Local content percentage, the (DPIIT-PP) OM No. P-45021/102/2019-BE-II-Part (1) (E-50310) Dt. 4 March 2021 – must be taken into consideration by the bidders/OEMs)

We also certify that, we are not from a country sharing land border with India as defined in order no. F/No/6/18/2019-PPD dated 23 July 2020 issued by public procurement Division, Dept. of Expenditure, Ministry of Finance, GoI and the goods offered by us comply with the provisions of said order. CDAC reserves the right to accept/Reject/Cancel the bid/inquiry, at its sole discretion, based on the responses received against the MII declaration submitted by the bidders / vendors, and may try to seek approvals from the respective competent authorities, to proceed.

**For (Name of bidder)**

**Authorized Signatory**

**Contact Details:**

*(End of Document)*