CtrlS™ Asia's Largest Rated 4 Datacenter

Confederation of Indian Industry

Excellence in Energy Management 2022

CTRLS Datacenters Limited, Gachibowli, Hyderabad.

Presented by -

Srinivasa Rao Chanamallu – Sr. Manager DC Operations

Hari Prasad. Neeli– DC Sr, Shift Manager

U.S. GREEN BUILDING COUNCIL LEED PLATINUM USGBC

ANSI/TIA-942:2014 RATED 4 TIA-942

USA | Singapore | India | Middle East | APAC

www.ctrls.in

Our Corporate Factsheet

CtrlS
Asia's Largest
Rated 4 Datacenter

Asia's Largest Rated-4 Datacenter and Managed Services Provider

Healthy Financials

EBITDA 2X
The Industry Standard

50% **YoY Growth**

D/E Ratio 1.19

1.35 **Debt/EBITDA Ratio**

1 Million Square Feet of DC Footprint in India

Serving **60 of the Fortune 500 Globally** and **108** of **ET 500 Indian** companies

Powering **3,500+** Enterprises

Most Awarded Datacenter in India

200 Innovations in technologies since 2008

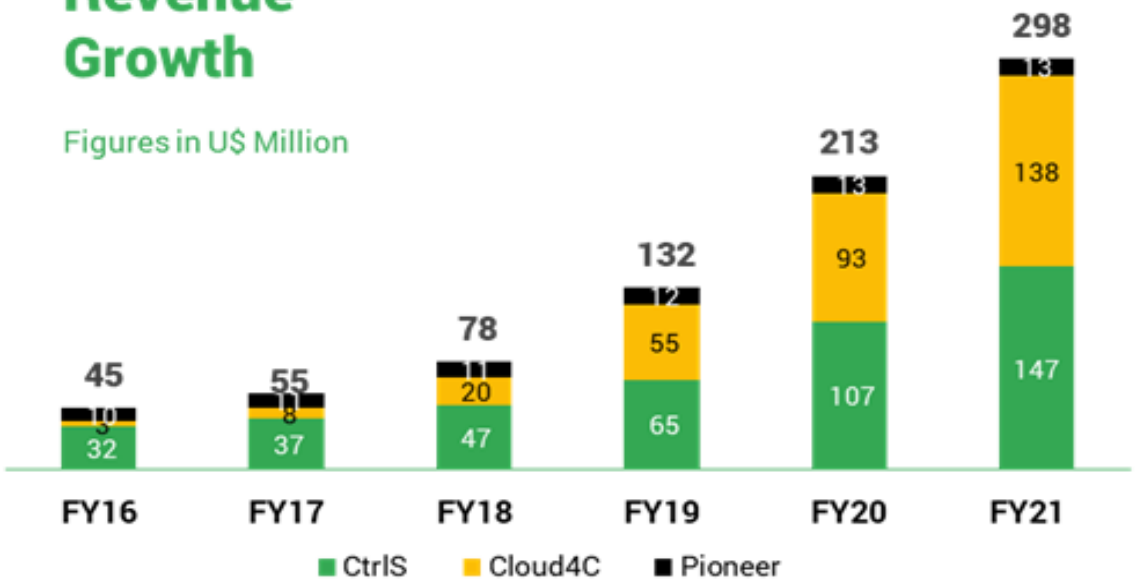
Global Footprint (Cloud4C)

25 Countries, 50 Locations

2,000
People Strong Group

Revenue Growth

Figures in U$ Million



Company	FY16	FY17	FY18	FY19	FY20	FY21
CtrlS	32	37	47	65	107	147
Cloud4C	3	8	20	55	93	138
Pioneer	10	11	11	12	13	13
Total	**45**	**55**	**78**	**132**	**213**	**298**

Company	2018	2019	2020	2021
CtrlS	47	65	107	147
Cloud4C	20	55	93	138

Our Corporate Factsheet

CtrlS
Asia's Largest
Rated 4 Datacenter

Established in 2008 Promoted by Pioneer Group

Most Awarded Datacenter in India
200 Innovations in technologies since 2008

Healthy Financials

2X	0.5	50%
EBITDA	D/E Ratio	YoY Growth

Industry Standard

Cumulative Business Revenues of
$200 Million

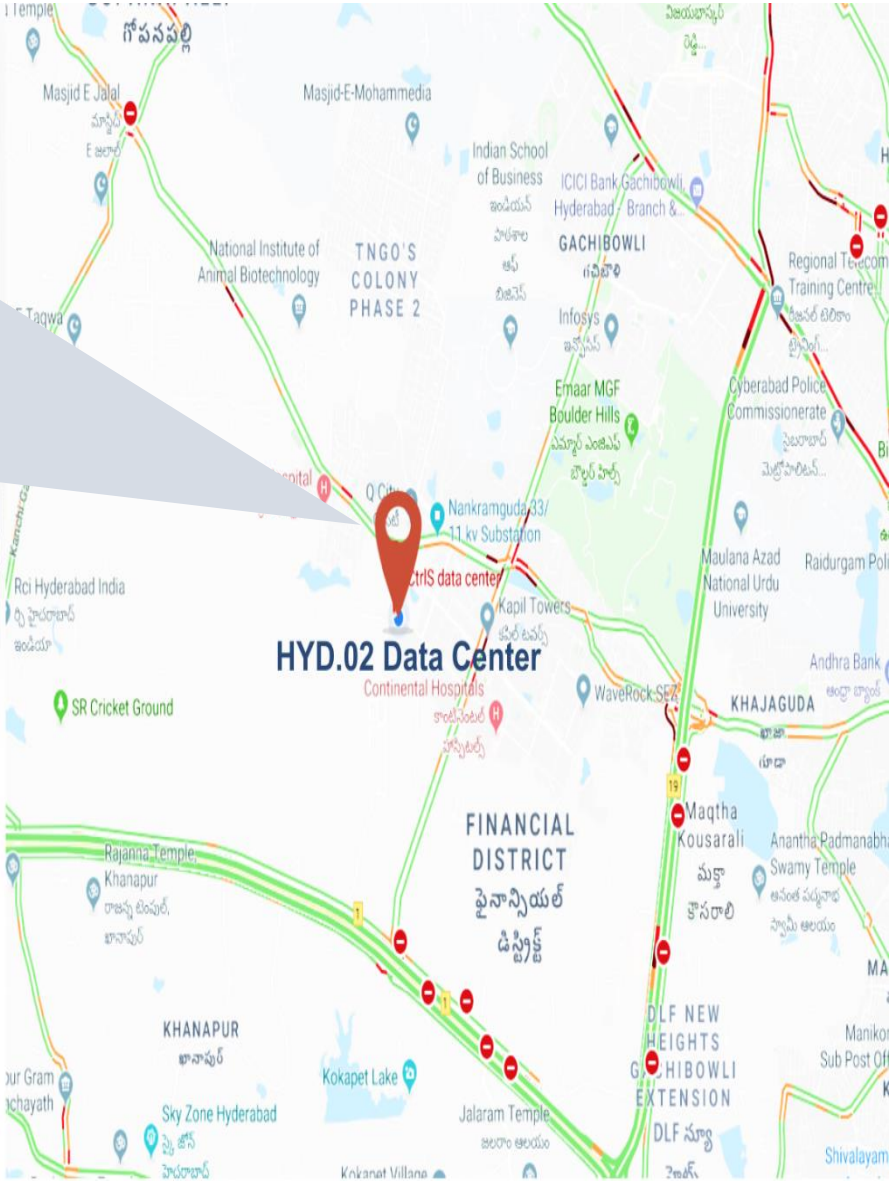
Serving **15** of the Fortune **100** Globally and **25** of ET **100** Indian Companies

Global Footprint
Americas | South East Asia | Middle East | Europe | APAC

1,800 People Strong Group

Total Racks: 12500 +
Total Power Capacity: 100 + MW
Total Sft: 1 Million

Hyderabad Hyper Scale DC2 | Gachibowli



Data Center Features

- Rated 4 Hyper Scale Data Centre
- GPS Coordinates latitude - 17°25'23.84"N , Longitude- 78°19'48.98"E
- LEED Gold V4.1 O+M Certified
- EHS Gold Certified from ROSPA#2022
- Certified ISO# 50001 in Energy Management ENMS
- N+N Uninterruptible UPS, Utility Power Substation & Diesel Generator Redundancy For Continuous Support
- N+1 Cooling System Redundancy For Better Temperature Management
- Industry Best Uptime SLA (99.995%)
- IBMS, CCTV, FAS, WLD, Rodent, PA, VESDA Systems For Unmatched Monitoring
- Neutral Networking Allowing Interconnection Between Multiple Telecommunication Carriers
- 6 Pointer Network Path for ISP
- 8 ISP's For Better Transition & Connectivity

Datacenter Facility footprint

CtrlS
Asia's Largest
Rated 4 Datacenter

Sr No.	Details	Quantity	Unit
1	**Area**	85000	Sq Ft
2	**Designed Racks Capacity**	850	Nos
3	**Running racks**	700	Nos
4	**Connected Load**	12	MW
5	**Maximum Demand**	5	MW
6	**Chillers Capacity**	3600	TR
7	**UPS 500 KVA x 30 nos**	15	MVA
8	**Power consumption in a year**	28.9	Million KWH
9	**Power Cost in a year**	207.27	Rs. In Million

- Phase 2 Expansion planned in same Facility with 1500 Racks
- Cooling Capacity- 6000 TR / IT Load of 13.5MW
- HYD DC#3 will be live by Jan-2023

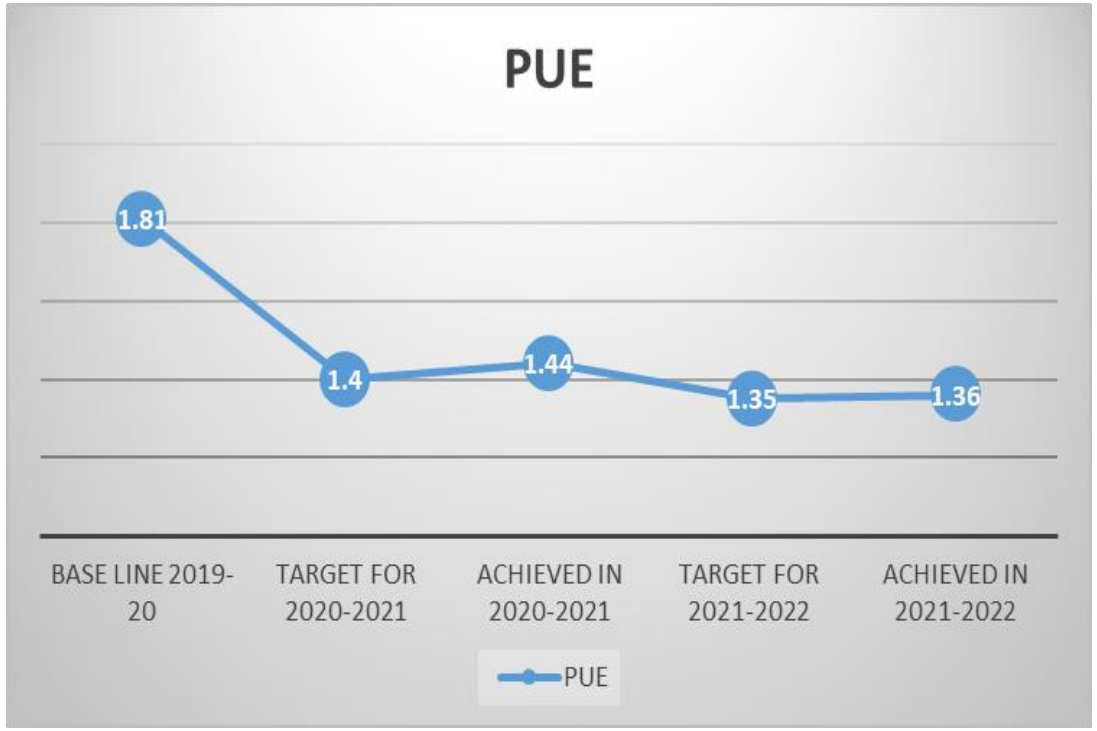
Energy Data

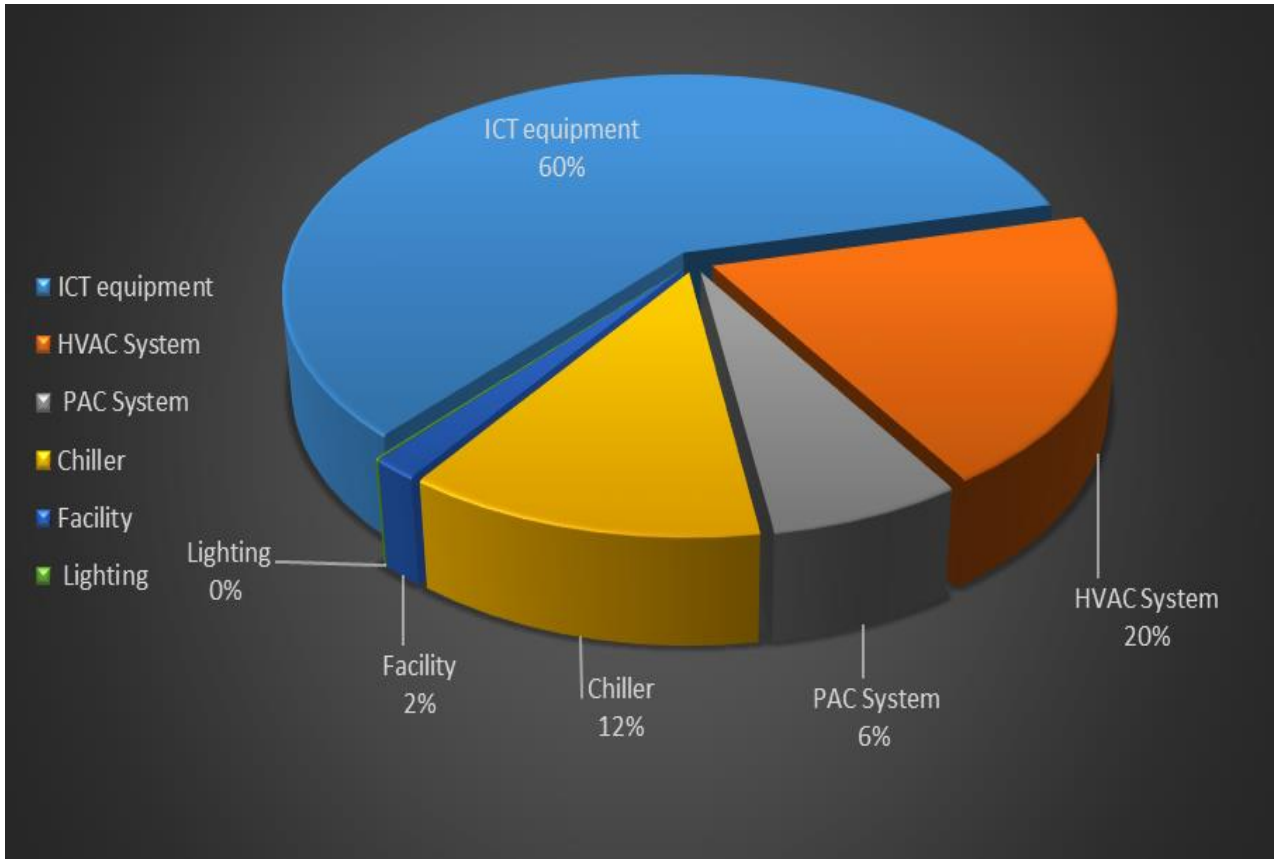
CtrlS
Asia's Largest
Rated 4 Datacenter

Parameters	Units	2019 - 2020	2020- 2021	2021- 2022
Annual Electrical Energy Consumption, purchased from utilities :	kWh	17805000	23095800	28845500
Annual Electricity Generation (in-situ), through Diesel Generating (DG)/Gas Generating (GG) Set(s)	kWh	70000	150330	96199
Total Annual Electricity Consumption, Utilities + DG/GG Sets	kWh	17875000	23246130	28941699
Annual Cost of Electricity Consumed from utilities :	million INR	142.8	180.7	203.44
Annual Cost of Electricity generated through DG/GG Sets	million INR	1.75	3.8	3.8
Total Annual Electricity Cost, Utilities + DG/GG Sets	million INR	142.8	184.5	207.27
Built Up Area	SQMT	5308	5308	5308
No of floors in the building		G+4	G+4	G+4

Facility consumption trend – Continuous PUE improvement

Power usage effectiveness (PUE) is a metric used to determine the energy efficiency of a data center





Information on Competitors, National & Global benchmark

CtrlS
Asia's Largest
Rated 4 Datacenter

As per the standard global bench marking Data centres has to maintain a PUE as per below table

Global Benchmark			
Description	**Standard**	**Good**	**Better**
PUE	2	1.5	1.2
Temperature as per ASHRAE guideline	19- 27 deg C		
Humidity as per ASHRAE Guideline	40%-80%		

Sr No.	National / Global	Name of Competitor	PUE	Remarks
1	National	CtrlS Datacenter Bangalore	1.72	Actual
2		Ctrls Data Center Gachibowli	1.358	Designed PUE 1.35
3	Global	Google Data Center US	1.11	Source: Internet

List of Major Encon projects planned in FY 22-23

CtrlS
Asia's Largest
Rated 4 Datacenter

Sl no	Investment	Invested Value in Million	Annual Electrical saving Million KWH	Annual Electrical cost savings millions
1	PAC to PAC replacement for utility areas	Rs. 9.48	0.199	Rs. 1.592
2	PAC to PAHU conversion for IT rooms	Rs 9.68	1.35	Rs. 10.80
	Total	Rs 19.16	1.549	Rs. 12.392

Energy Saving projects implemented in FY 2021-22

CtrlS
Asia's Largest
Rated 4 Datacenter

***An overall Investment** of Rs. 3.24 Million has been made towards Energy optimization and the savings achieved in Energy is 0.51 Million KWH.*

Sl no	Investment	Invested Value in Million	Annual Electrical saving Million KWH	Annual Electrical cost savings in Million
1	CPM Automation	Rs. 2.67	0.2278	Rs. 1.822
2	Cooling tower pumps automation	Rs. 0.07	0.0029	Rs. 0.0232
3	3rd floor Cold Aisle Containment in server halls and Blanking panels addition on U space	Rs. 0.5	0.037	Rs. 0.300
4	PAHU logic implementation for 3rd floor	Rs. 0	0.22	Rs. 1.75
5	Implementation of Motion sensor in 3rd floor	Rs. 0	0.03	Rs. 0.25
	Total	Rs. 3.24	0.51	Rs. 4.145

Energy Saving projects implemented in FY 2020-21

CtrlS
Asia's Largest
Rated 4 Datacenter

***An overall Investment** of Rs. 4.23 Crore has been made towards Energy optimization and the savings achieved in Energy is 7.05 Million KWH.*

Sl no	Investment	Invested Value in Million	Annual Electrical saving Million KWH	Annual Electrical cost savings in Million
1	Variable Colling plant	Rs. 39.810	6.04	Rs. 48.32
2	3rd floor Cold Aisle Containment in server halls and Blanking panels addition on U space	Rs. 3.00	0.77	Rs. 6.16
3	Chiller plant manager(CPM)	Rs. 2.495	0.119	Rs. 0.953
4	PAHU logic implementation for 3rd floor	Rs. 0	0.1	Rs. 0.8
5	Implementation of Motion sensor in 3rd floor	Rs. 0.047	0.017	Rs. 0.121
	Total	Rs. 42.352	7.051	Rs. 56.354

Energy Saving projects implemented in FY 2019-20

CtrlS
Asia's Largest
Rated 4 Datacenter

S.No	Investment	Invested Value in Millions	Annual Electrical saving M KWH	Annual Electrical cost savings in Millions
1	High Efficiency UPS	Rs. 32.23	3.152	Rs: 25.21
2	Variable Cooling System	Rs. 39.81	6.044	Rs: 48.35
3	ECO UPS for Mechanical system	Rs. 1.6	0.525	Rs: 4.20
4	On-line Chemical dosing and water treatment	Rs. 2	0.107	Rs: 0.86
5	Motion sensors with LED light	Rs. 0.782	0.088	Rs: 0.706
6	Cold aisle containment system	Rs. 21.35	0.77	Rs: 6.167
7	EB DG Sync & HT Dual source and automation	Rs. 16.0	4.32	Rs: 34.56
8	PAHU operational logic change	Rs. 0.30	0.876	Rs: 7.00
	Total	Rs. 11.1Crores	15.885	Rs: 127.081

Energy Saving projects implemented in FY 2018-19

CtrlS™
Asia's Largest
Rated 4 Datacenter

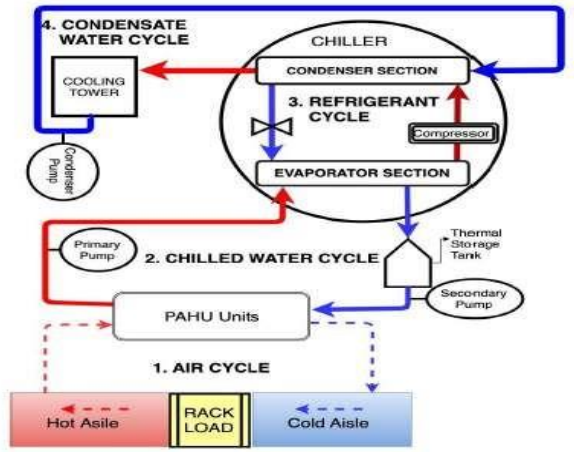
S.No	Investment	Invested Value in Millions	Annual Electrical saving MKWH	Annual Electrical cost savings in Millions
1	Chiller designed with 0.4 iKW/TR	Rs. 14.04	4.43	Rs: 31.9
2	VFD installed for Chiller pumps	Rs. 0.75	1.6	Rs: 11.52
3	Motion lighting sensors to control the lighting consumption	Rs. 0.26	0.05	Rs: 0.34
4	Server hall UPS designed to unity power factor to avoid the losses	Rs. 27.84	1.14	Rs:8.21
	Total	Rs. 42.89	7.22	Rs: 51.97

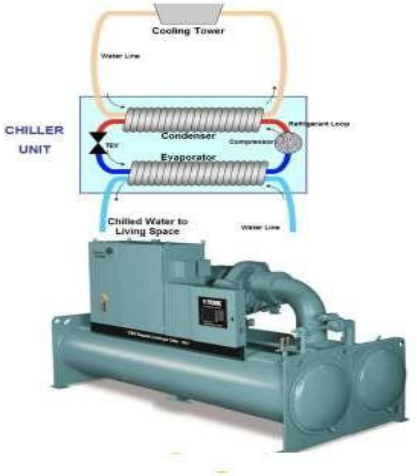
I. Innovative Project – TOTAL VARIABLE COOLING PLANT :

The HVAC plant system includes the below equipment interconnecting each other with its respective water piping. Operated through VSD/VFD to meet the required site demand part load operations.

I. Centrifugal water cooled chillers with Elevated temperature design
II. Condenser pumps
III. Cooling towers
IV. Primary pumps
V. Secondary pumps
VI. PAHUs

All components of Cooling system (Chiller, Condenser, Cooling towers, Pumps, PAAHUs) gives maximum efficiency irrespective of loading percentage.





Design & Selected for elevated temperatures application meeting the Data center cooling requirement to the PAHU with inlet 18◦C and outlet 25◦C respectively.

In-built VSD to run on variable loading with harmonics filter towards energy efficient precise part load operation towards energy efficiency, smooth startup and stop, protects mechanical components, enhances the life span of the chiller motor and compressor.

Attaining the precise set temperature on quick ramp up to take the building load to attain the chiller leaving chilled water set temperature by running on additional load and gets stable once on accomplishing set point.

Quantum capacity with salient part load operations with the sophisticated controller operator interface panel along VSD accomplishing merely less than the design ikW/TR even in part load operating conditions as per the below summarized template on chiller plant efficiency equipment wise.

Capable of rugged and heavy duty continuous operation, however changeover has been implemented every 24 hours as per operations phenomena with the available 1 run + 1 standby chiller.

I. Innovative Project – TOTAL VARIABLE COOLING PLANT :

CtrlS
Asia's Largest
Rated 4 Datacenter

Refrigerant R-134a with the chemical name Tetra fluro Ethane is an eco-friendly in terms of the below environmental safety factors, Quick re-start 45 seconds during power interruption to sustain the critical DC cooling is attained in this chillers.

Chiller designed with 0.36 ikw/TR with elevated temperature of 18 and 25°C. 2no's of Chiller installed with each capacity of 1170TR.

Centrifugal Type – Designed for huge capacity at low operating power comparatively. Equipped with inbuilt VSD along harmonics filter.

Major cooling equipment responsible for Chilled water supply to the air handling unit. Removes heat from a liquid via vapor-Compression/absorption refrigeration cycle.

.

Quick start within 45 seconds restart during power interruption along 2 minutes 20 seconds (total 3 minutes 10 seconds full load whereas the standard chiller 10 minutes 12 seconds) to reach full load conditions accomplishing the set temperatures +/-1 °C.

COP (Co-efficient of Performance) – 9.55

HVAC SYSTEM EFFICIENCY AT CTRLS DATA CENTERS LTD, GACHIBOWLI, HYDERABAD								
System	Rated		Design	Operating			Chiller Plant	Overall
	TR	kW	ikW/TR	TR	kW	ikW/TR	ikW/TR	ikW/TR
Chiller	1170	430.8	0.368	439.89	157	0.357	0.56	0.73
Condenser Pump		90			53			
Secondary Pump		75			14.6			
Primary Pump		55			9			
Cooling Tower Fans	1200	18.5			12.39			
PAHUs	1624	439			67.48			
CSUs & TFA	47.9	5.2			6			
					319.47			

I. Innovative Project – TOTAL VARIABLE COOLING PLANT :

CtrlS™
Asia's Largest
Rated 4 Datacenter

Primary & Secondary Pumps:

- VFD mode towards part load operation energy efficient, smooth startup and stop, protects mechanical components, enhances the life of the pump and motor.
- **Rated efficiency of 93.5%**
- Both primary and secondary pumps were connected to the UPS power to ensure utmost reliability to feed chilled water to the PAHU machines at all times to eliminate power interruptions.

Condenser Pumps:

HVAC System high efficiency pumps.

- VFD mode towards part load operation energy efficient, smooth startup and stop, protects mechanical components, enhances the life of the pump and motor.
- **Rated efficiency of 94.2%**

Chiller Plant Pumps			
Description	**Rated kW**	**Part load kW**	**Op. Hz**
Condenser Pump	90	53.0	43
Primary Pump	55	9.0	28
Secondary Pump	75	14.6	28
Net Power	220	76.6	

I. Innovative Project – TOTAL VARIABLE COOLING PLANT :

CtrlS
Asia's Largest
Rated 4 Datacenter

Cross-flow induced draft cooling towers:

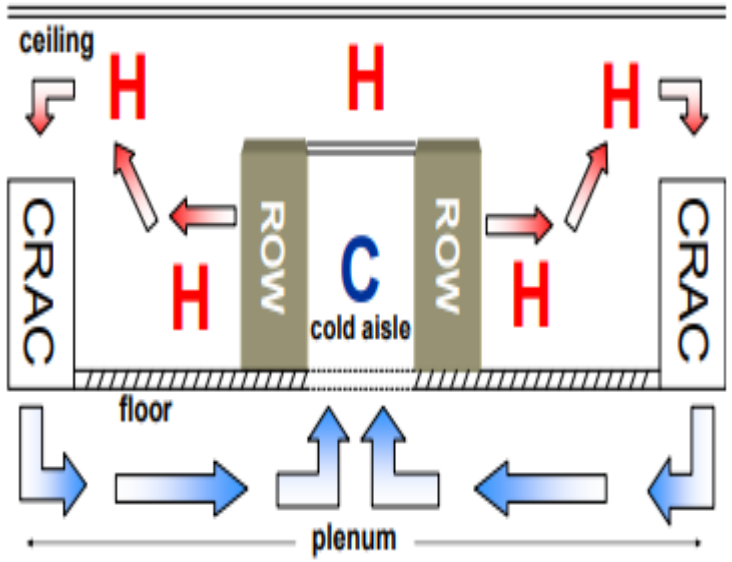
- Low pumping head since no distribution lines to cause back pressure on condenser pump.
- Easy access into the cooling towers.
- Easy maintenance towards fills replacement and cold water basin cleaning.
- As compared to counter flow type operating cost is low.
- Reduced drift losses due to absence of water droplets.
- Direct sunlight on the cold water basin is mostly non-exposed enables neither algae growth.
- Low noise.
- Cooling tower fan operates on VFD reduced power consumption and seasonal control.
- Higher effectiveness with respect to optimistic Range and Approach.
- Need not consider additional pressure drop of water from condenser pump.

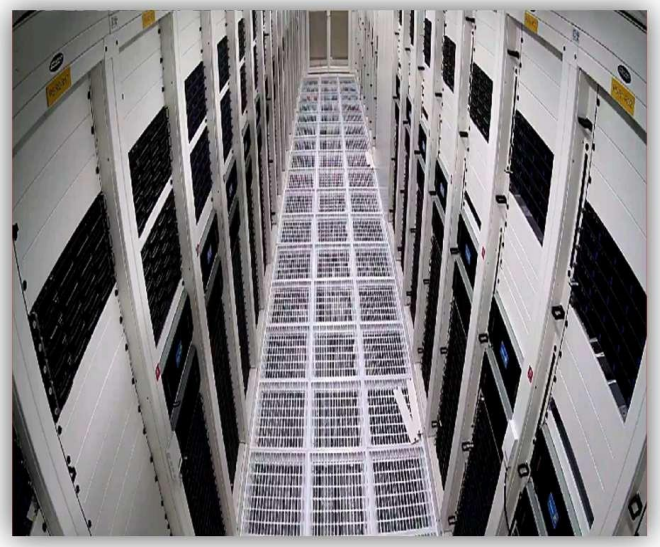
Cooling tower Load						
S#	Cooling Tower	Rated Fans	Rated kW	Op. Qty	VFD Hz	Op. Act. KW
1	CT-1	2	**18.5**	2	47	**12.39**
2	CT-2	2	18.5	STANDBY OFF		

II. Innovative Project – Cold aisle containment:

Cold aisle containment in server halls/ Data centers improves the cooling efficiency by providing greater ability to control supply air to match server airflow.

- Data from top and power from bottom
- Temperature and humidity sensors in cold aisle
- PDUs at the end of each row
- Blanking panels, CAC, cable mangers, rack earthing and seismic protection to racks
- Raised floor height 0.8 m
- 1200 mm clear space in data hall in all corridors
- PAHUs and other services from corridor outside DC
- Raised floor loading 1800 KG/Sqm
- No DC wall exposed to outside (double layered wall).



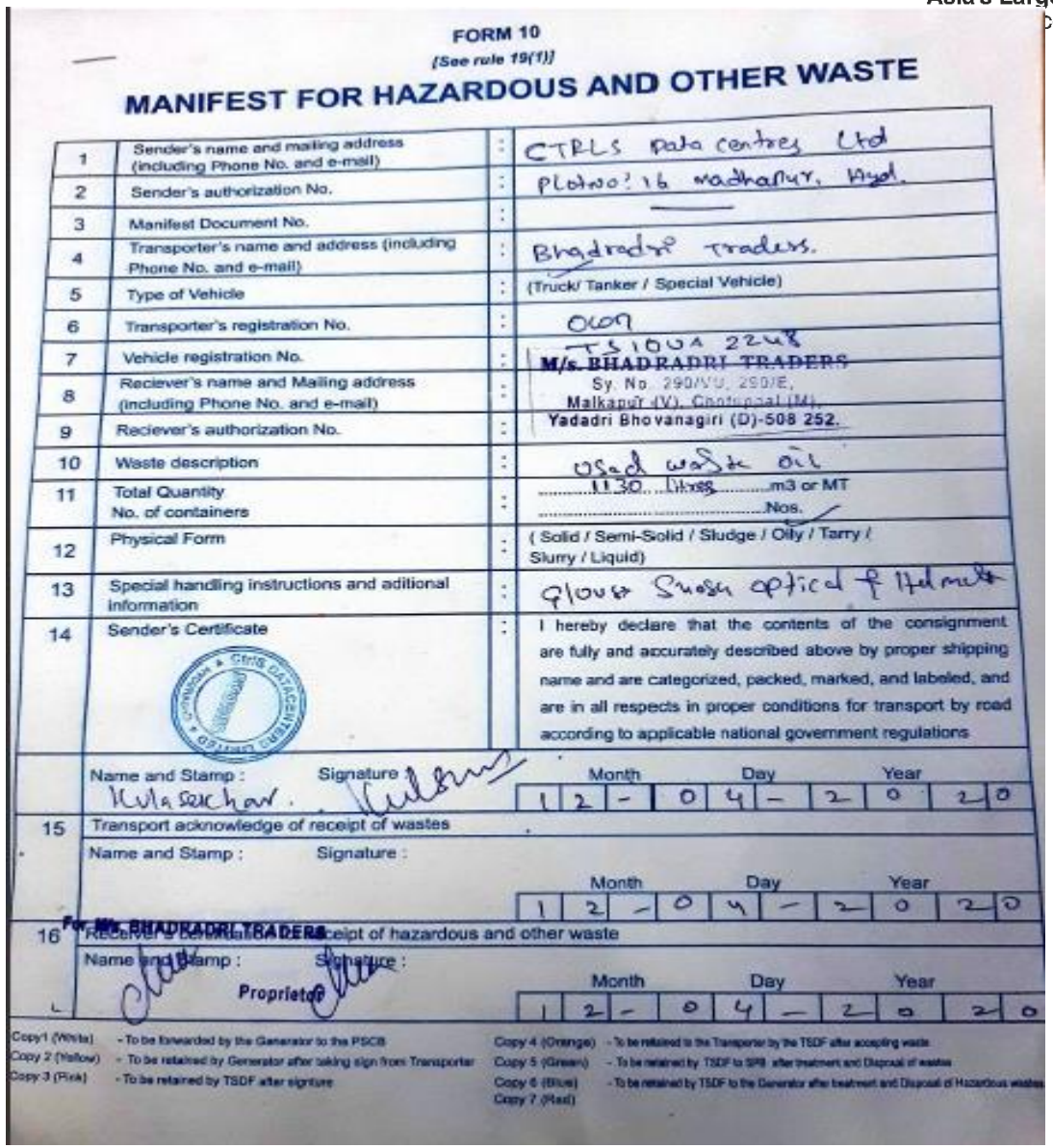


Utilization of waste material

Types of waste material:

- DG engine oil
- Transformer oil

Name of Fuel	Qty of waste fuel used /year
DG Engine Oil	1130
Transformer oil	190



FORM 10
(See rule 19(1))

MANIFEST FOR HAZARDOUS AND OTHER WASTE

1	Sender's name and mailing address (including Phone No. and e-mail)	:	CTRLS Data centres Ltd
2	Sender's authorization No.	:	Plot no: 16 Madhapur, Hyd.
3	Manifest Document No.	:	
4	Transporter's name and address (including Phone No. and e-mail)	:	Bhadradri traders.
5	Type of Vehicle	:	(Truck/ Tanker / Special Vehicle)
6	Transporter's registration No.	:	0609
7	Vehicle registration No.	:	TS10UA 2248
8	Reciever's name and Mailing address (including Phone No. and e-mail)	:	M/s. BHADRADRI TRADERS Sy. No. 290/VU, 290/E, Malkapur (V), Choutuppal (M), Yadadri Bhuvanagiri (D)-508 252.
9	Reciever's authorization No.	:	
10	Waste description	:	Used waste oil
11	Total Quantity No. of containers	:	1130 Litres m3 or MT ..... Nos.
12	Physical Form	:	(Solid / Semi-Solid / Sludge / Oily / Tarry / Slurry / Liquid)
13	Special handling instructions and aditional information	:	Gloves Shoes optical & Helmets
14	Sender's Certificate	:	I hereby declare that the contents of the consignment are fully and accurately described above by proper shipping name and are categorized, packed, marked, and labeled, and are in all respects in proper conditions for transport by road according to applicable national government regulations

Name and Stamp : Kula Sekhar. Signature : Month 12 Day 04 Year 2020

15 Transport acknowledge of receipt of wastes

Name and Stamp : Signature : Month 12 Day 04 Year 2020

16 Receiver's confirmation of receipt of hazardous and other waste

For M/s. BHADRADRI TRADERS

Name and Stamp : Signature : Proprietor Month 12 Day 04 Year 2020

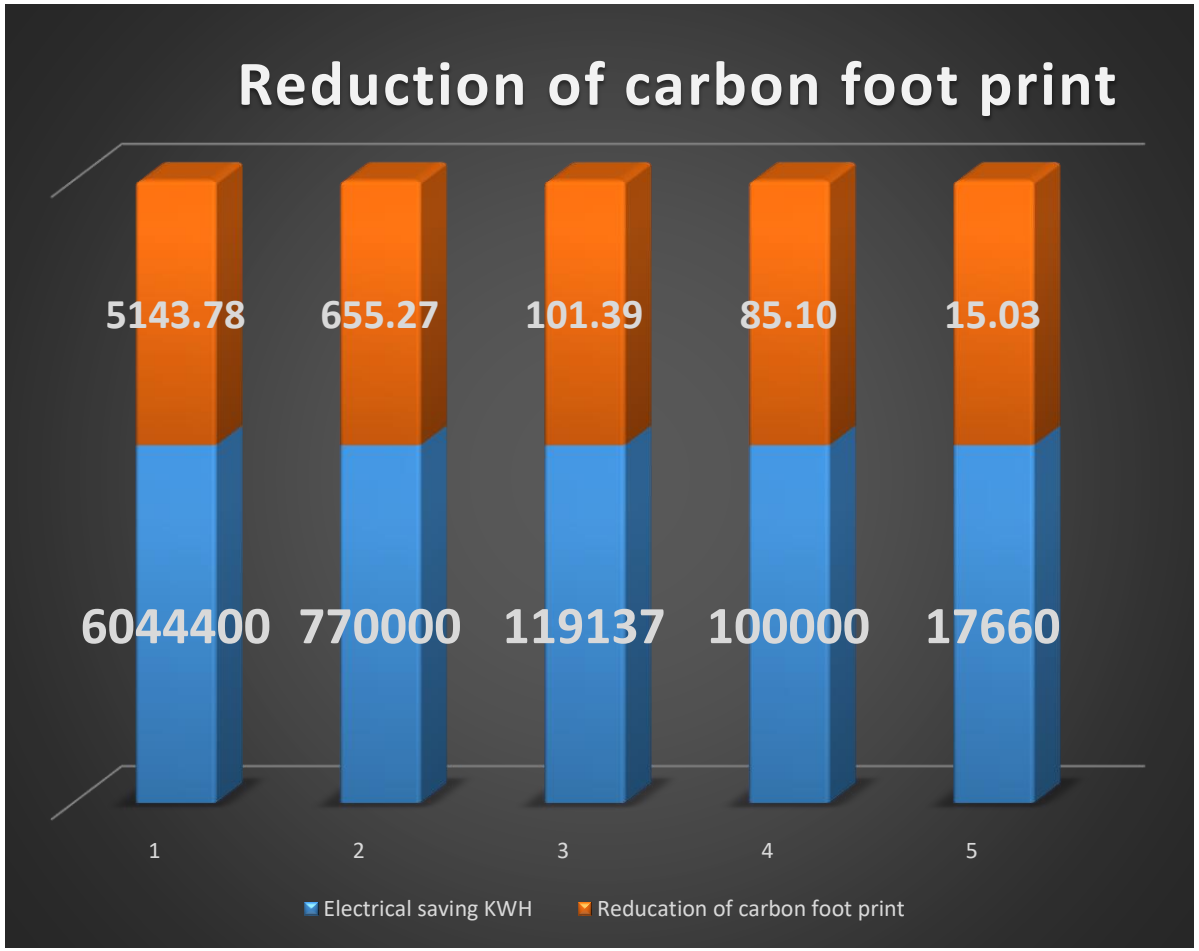
Copy1 (White) - To be forwarded by the Generator to the PSCB
Copy 2 (Yellow) - To be retained by Generator after taking sign from Transporter
Copy 3 (Pink) - To be retained by TSDF after signture
Copy 4 (Orange) - To be retained by the Transporter by the TSDF after accepting waste
Copy 5 (Green) - To be retained by TSDF to SPB after treatment and Disposal of wastes
Copy 6 (Blue) - To be retained by TSDF to the Generator after treatment and Disposal of Hazardous wastes
Copy 7 (Red)

GHG inventorisation

CtrlS
Asia's Largest
Rated 4 Datacenter

Reduction of Carbon foot print :

Opportunities Implemented	Electrical saving KWH	Reduction of carbon foot print Tons of CO2
Variable Cooling Plant	6044400	5143.78
3rd floor Cold Aisle Containment in server halls and Blanking panels addition on U space	770000	655.27
Chiller plant manager(CPM)	119137	101.39
PAHU logic implementation for 3rd floor	100000	85.10
Implementation of Motion sensor in 3rd floor	17660	15.03
Total Savings	7051197	5,781



Green Supply Chain

CtrlS
Asia's Largest
Rated 4 Datacenter

Purchased most energy efficient products:

- Energy efficient LED lights, motion sensor
- Cold Aisle containment for all new requirements
- Energy efficient transformer, UPS and PAHU
- Common share point is being used at site by team to maintain documents thereby minimizing the usage of hardcopies
- STP treated water using for flushing and garden.
- Trainings on environmental best practices

Team work, Employee Involvement & Monitoring

CtrlS
Asia's Largest
Rated 4 Datacenter

Monitoring and Reporting	
Parameters	Details
Frequency of Review of PUE & Consumption :	Monitor through BMS 24/7 and review Once in a Week
Roles & Responsibilities of Energy Manager :	Minimum 20% power savings to be achieved.
Details of Monitoring & Reporting System / Methodology Employed by the Unit for Review of SEC & Consumption (Max. 100 Words):	Mr. Brahma Reddy - SVP, Mr. MVBV Prasad, Vice President,, Mr. Srinivasa Rao, Sr. Manager, Mr. Hari Prasad
Who Chairs the Review Meeting on SEC & Consumption (Provide Designation) :	Mr. Brahma Reddy - SVP, Mr. MVBV Prasad, Vice President, Mr. Rajesh Singh- AVP, Mr. Srinivasa Rao, Sr. Manager, Mr. Hari Prasad
Budget for Energy Conservation	INR 40 Millions which is 0.12% on total company turn over
Energy efficiency / awareness training program	Training are planned quarterly for all the team members
Projects implemented through Kaizens (Workers and Supervisor level)	Operational savings of all the Electro mechanical equipment, utilization of optimized energy or power.

Implementation of ISO 50001/Green Co/IGBC rating

CtrlS
Asia's Largest
Rated 4 Datacenter

Implementation of ISO 50001/Green Co/IGBC rating	
Parameters	Details
Is your Building ISO 50001 Certified?	Certification process been initiated, Internal Audits completed gap analysis also completed stage 1 is in progress final certification expected to complete by sep-21
Is your Building Certified by IGBC/Any other Building Certification?	USGBC Gold certified under (O&M) version 4.1, World's first certified data center under this version 4.1
Total Turnover of the company/Plant FY 2020-21 (RS. Millions)	460
Amount invested in EnCon Projects FY 2020-21 (Rs. Millions)	42.35
Investment %	9%

Awards

Best Data Center Award 2013

CIO Choice Award for Data Centre Managed Services, Cloud 2013. 2014, 2015

CII Energy Efficiency Award 2012, 2014, 2015, 2020

Nasscom Awards 2010, 2011

Golden peacock Award 2020

Certifications

TIA Rated 4 certification
Industries highest Uptime of 99.995%

ISO 22301
Industries highest Uptime of 99.995%

ISO 20000-1
Efficient and timely service delivery

SOC-1, SOC-2
Organization wide process

ISO 27001
Ensuring data security and safety

cloud security alliance

People

Certified people resources

- **ITIL, COBIT**
- **CISA, CISSP**
- **Six Sigma, PMP**
- **CCNA, MCSE,**
- **SAP Basis, HANA etc**

More than 75% of the people resources are dedicated to customer support (Service Delivery) operations.

Accomplishments

Most Energy Efficient Unit

CII Energy Efficiency Award

Best Data Center Award

2013 - 2019

CIO Choice Award for Data Centre Managed Services

2013 - 2019

People

Certified people resources

- **ITIL, COBIT**
- **CISA, CISSP**
- **Six Sigma, PMP**
- **CCNA, MCSE,**
- **SAP Basis, HANA etc**

More than 75% of the people resources are dedicated to customer support (Service Delivery) operations.

Accomplishments

TSI (Telangana State Industry Award #2021 for Best Sustainability category

CSR OSSOCHAM Award #2021 for Excellence in Energy Management

Golden Peacock Award #2020 in Eco Innovation & Energy Efficient

Certifications and Compliances

ISO 9001:2015
Quality management Systems

ISO/IEC 20000-1:2011
Service management system (SMS)

ISO 22301:2012
Business continuity Management system

ISO/IEC 27001:2013
Information Security Management system

ISO# 50001:2018
In Energy Management ENMS

ISO/IEC 27018:2014
protection of Personally Identifiable Information.

SOC 1 and 2 Audit Reports
Organization wide process

ISO/IEC 27017:2015
Information security control

ISO 45001
Occupational health & safety management system

US GBC LEED Certified

Our Expansion Plans

About CPM

CtrlS
Asia's Largest
Rated 4 Datacenter

Chiller plant manager (CPM) sets automation of chiller plant system which reduces man intervention on operations and periodical changeover automatically. CPM reduces operating cost with energy conservation Enhanced reliability on sustaining desired operations of chiller plant We can generate complete system reports and trends of each equipment Operational run hours will be maintained uniformly across run and standby system. To meet the global standards in terms of data center sustainability to target 100% uptime and Energy efficient chiller plant auto operations.
Remote monitoring will be available with 90 days back up history
Reduced energy and operating costs up to 20%
Easy performance management. Features such as Data Trending can be tracked and repeated to manage multiple facilities.
Improved sustainability. Gained intelligence from the system provides ways to manage environmental footprint.
Demonstrated performance
The Chiller Plant Manager will **maintain water flow by controlling the pumps**. To determine the site needs, the Chiller Plant Manager will compare the control temperature to the temperature target and develop the step capacity needed.

Thank Q

CtrlS™

Asia's Largest
Rated 4 Datacenter

srinivasarao.chanamallu@ctrls.in

Hariprasad.n@ctrls.in