Your (Half Yearly Compliance Report) has been Submitted with following details	
Proposal No	SEAC/3639/2016
Compliance ID	547590578
Compliance Number(For Tracking)	EC/M/COMPLIANCE/547590578/2025
Reporting Year	2025
Reporting Period	01 Dec(01 Apr - 30 Sep)
Submission Date	25-11-2025
RO/SRO Name	Shri Satya Prakash Negi
RO/SRO Email	jhk119@ifs.nic.in
State	UTTAR PRADESH
RO/SRO Office Address	Integrated Regional Offices Lucknow

Note:- SMS and E-Mail has been sent to Shri Satya Prakash Negi, UTTAR PRADESH with Notification to Project Proponent.

MAX Healthcare

Date- 27/10/2025

To
The Chief Conservator of Forest,
Regional Office,
Ministry of Environment & forests & Climate change, (Central Region), Kendriya Bhawan, 5th Floor, Sector- H Aliganj, Lucknow-226024, Uttar Pradesh

Sub: - Submission of point wise Half Yearly Compliance report against the stipulated conditions of Environment Clearance ref. no. No-260/ Parya /SEAC/3639/2016 16/09/2016

Dear Sir/Madam,

Refer to above mentioned subject, we are submitting herewith the point wise compliance report for the period of Apr'25 - Sept'25 against the stipulated conditions of Environmental Clearance, granted us for the expansion of our existing M/s. Max Super Specialty Hospital, (A Unit of Crossley Remedies Ltd.) W-3, Sector-1, Vaishali, Ghaziabad-201019, Uttar Pradesh.

Kindly acknowledge the same.

Thanking you

Yours faithfully
For Max Super Specialty Hospital

Max Super Speciality Hospital, Vaishali
(A unit of Crosslay Remedies Ltd.)
W-3, Sector-1, Vaishali, Ghaziabad-201012, UP

Dr. Gaurav Aggarwal
Executive Vice President-Operations

Encl.: Half yearly compliance report for the period of Apr'25 - Sept'25.
CC- Regional Office, Uttar Pradesh Pollution Control Board, Ghaziabad

Max Super Speciality Hospital, Vaishali
(A unit of Crosslay Remedies Ltd.)
W-3, Sector-1, Vaishali, Ghaziabad - 201 012, U.P.
E: info.vsh@maxhealthcare.com
For medical service queries or appointments, call: +91-120 4188 000, 4173 000
www.maxhealthcare.in

Crosslay Remedies Limited
Regd Office: N-110, Panchsheel Park, New Delhi - 110 017
T: +91-70424 01894
E: secretarialcrl@maxhealthcare.com

(CIN: U24239DL2002PLC113719)

Date: 27th Oct' 2025

POINT-WISE STATUS OF CONDITIONS OF THE ENVIRONMENTAL CLEARANCE

Clearance Letter No.: No-260/Parya/SEAC/3639/2016 dated 16th Sep 2016

Name of the Projects- Max Super Specialty Hospital, (A Unit of Crosslay Remedies Ltd.) W-3, Sector-1, Vaishali, Ghaziabad

Period of Compliance Report: Apr'25 - Sep'25

Part A – General Condition

S. N.	Conditions	Status
1.	It shall be ensured that all standards related to ambient environment quality and the emission/effluent standards as prescribed by the MOEF are strictly complied with.	Regular testing of these parameters is being carried out. Test report of DG emissions, treated effluent and ambient air are attached as **Annexure-1.**
2.	It shall be ensured that obtain the no objection certificate from the U.P Pollution control Board before start of the construction	Construction phase is over. CTO has been obtained from UPPCB. CTO vide letter no **194375/UPPCB/Ghaziabad(UPPCBRO)/CTO/both/GHAZIABAD/2023 Dated 27/12/2023** and valid upto **31/12/2026** is attached as **Annexure-2.**
3.	It shall be ensured that no construction work or preparation of land by the project management except for securing the land is started on the project or the activity without the prior environmental clearance.	Obtained the Environmental clearance from SEIAA vide no. **260/Parya/SEAC/3639/2016 dated 16/09/2016** prior to construction work. Copy is attached as **Annexure 3.**
4.	The proposed land use shall be in accordance to the prescribed land use. A land use certificate issued by the competent authority shall be obtained in this regard.	Complied.
5.	All trees felling in the project area shall be permitted by the forest department under the prescribed rules. Suitable clearance in this regard shall be obtained from the competent authority.	Construction phase is over.
6.	Impact of drainage pattern on environment should be provided.	Treated waste water is being used for flushing, cooling and gardening purpose and rest treated water is being discharge in public sewer.
7.	Surface hydrology and water regime of the project area within 10 KM should be provided.	Already submitted in your office.
8	A suitable plan for providing shelter, light and fuel, water and waste water disposal for construction labour during the construction phase shall be provided along with the number of proposed workers.	Construction phase is over.
9	Measures shall be undertaken to recycle and reuse treated effluents for horticulture and	MBR based STP has been installed at site.

	plantation. A suitable plan for waste water recycling shall be submitted.	Treated water is being used in horticulture, cooling tower and flushing. Detailed plan is attached as **Annexure-4.**
10	Obtain prior permission from competent authorities regarding enhanced traffic during and due to construction and operation of the project.	Complied. Attached is the NOC issued by traffic department in this regard as **Annexure-5.**
11	Obtain necessary clearances from the competent authority on the abstraction and use of ground water during construction and operation of the project.	Construction phase is over. We applied in respective authority for approval of ground water abstraction for domestic use. Application copy is attached as **Annexure-6**
12	Hazardous/inflammable/explosives materials likely to be stored during the construction and operation phase shall be as per prescribed under law, necessary clearances in this regard shall be obtained.	We are storing HSD with approval in underground tank. HSD license number no **P/CC/UP/15/2089(P218034) Dated 03/11/2020** and valid upto **31/12/2025** is attached as **Annexure-7.**
13	Solid wastes shall be suitably, segregated and disposed. A separate and isolated municipal waste collection center should be provided. Necessary plans should be submitted in this regard.	Color-coded bins have been provided for solid-waste segregation in accordance with applicable regulations. Biodegradable waste is processed through an Organic Waste Converter, while recyclable waste is sent to authorized recyclers. The detailed plan is attached as Annexure-8.
14	Suitable rain water harvesting systems as per designs of ground water department shall be installed. Complete proposals in this regards should be submitted.	Two recharge pits have been already installed in the site. Design of RWH is attached for your reference as attached **Annexure-9.**
15	The emissions and effluents etc. from machines, Instruments & transport during construction and operation phases should be according to the prescribed standards. Necessary plans in this regard shall be submitted.	Construction phase is over.
16	Water sprinklers and other dust control measures should be undertaken to take care of dust generated during construction and operation phase. Necessary plans in this regard shall be submitted.	Construction phase is over.
17	Suitable noise abatement measures shall be adopted during the construction and operation phase in order to ensure that the noise emissions do not violate the prescribed ambient noise standards, necessary plans in this regard shall be submitted.	Construction phase is over. Acoustic enclosures for DG sets have been provided to maintain the noise limit as per prescribed standard. DG noise report is attached as annexure-8.
18	Separate stock piles shall be maintained for excavated top soil and the top soil should be utilized for preparation of green belt.	Construction phase is over.
19	Sewage effluents shall be kept separate from rain water collection and storage system and separately disposed. Other effluents should not be allowed to mix with domestic effluents.	A separate drainage systems have been provided for sewage effluents & rain water. Others effluent like as trade effluent is being treated in ETP before mixing with domestic effluents.
20	Hazardous/solid wastes generated during construction and operation phases should be	Construction phase is over.

	disposed off as prescribed law. Necessary clearances in this regard shall be obtained.	Hazardous waste/Solid waste i being disposed as per prescribed rules. Hazardous waste authorization from PCB has been obtained.
21	Alternate technologies for solid waste disposals (like vermiculture etc.) should be used in consultation with expert organizations.	Organic waste converter has been installed for processing the organic waste into manure. Photos of OWC is attached as annexure-10.
22	No wetland should be infringed during construction and operation phases. Any wetland coming in the project area should be suitably rejuvenated and conserved.	There is no wet land in and near the premises.
23	Pavements shall be constructed as to allow infiltration of surface run-off of rain water. Fully impermeable pavements shall not be constructed. Construction of pavements around trees shall be as per scientifically accepted principles in order to provide suitable watering, aeration and nutrition to the tree.	Construction phase is over.
24	The green building concept suggested by Indian green building council, which is a part of CII-Godrej GBC, shall be studied and followed as for as possible.	Green building norms has been incorporated in the building. Detail is attached as **Annexure-11.**
25	Compliance with the safety procedures, norms and guidelines as outlined in National Building code 2005 shall be compulsorily ensured.	Complied.
26	Ensure usage of dual flush systems for flush cisterns and explore options to use sensor based fixtures, waterless urinals and other water saving techniques.	This is being ensured.
27	Explore options for use of dual pipe plumbing for use of water with different qualities such as municipal supply, recycled water, ground water etc.	Complied. Dual plumbing system provided.
28	Ensure use of measures for reducing water demand for landscaping and using zeriscaping, efficient, irrigation equipments & controlled watering system.	Noted
29	Make suitable provisions for using solar energy as alternative source of energy. Solar energy application should be incorporated for illumination of common areas. Lighting for gardens and street lighting in addition to provision for solar water heating. Present a detailed report showing how much percentage of backup power for institution can be provided through solar energy so that use and polluting effects of DG sets can be minimized.	Solar based hot water generator has been installed at site. Capacity- 3500 LPD Solar based street lights have been installed. We also installed the roof top solar panels at roof with a capacity of 395 kWP. Annual yield is 5.5 lakhs of kWH. We are able to reduce the carbon emission 402 tCO2e.
30	Make separate provision for segregation, collection, transport and disposal of e-waste.	Complied
31	Educate citizens and other stake holder by putting up hoardings at different places to create environmental awareness.	It is being ensured.

32	Traffic congestion near the entry and exit points from the roads adjoining the proposed project site must be avoided. Parking should be fully internalized and no public space should be utilized.	Parking facilities in developed inside the premises. Photos of internal parking is attached as annexure-12
33	Prepare and Present disaster management plan.	Noted
34	The project proponents shall ensure that no construction activity is undertaken without obtaining pre-environmental clearance.	Environment Clearance has been obtained prior to construction activity.
35	A report on the energy conservation measures confirming to energy conservation norms finalize by Bureau of energy efficiency should be prepared incorporating details about building materials and technology, R & U Factors.	A detailed plan on the energy conservation measures is attached as **Annexure-13**
36	Fly ash should be used as building material in the construction as per the provisions of flies ash notification of September, 1999 and amended as on August, 2003 (the above condition is applicable only if the project lies within 100 KM of thermal Power stations.	Construction phase is over.
37	The DG sets to be used during construction phase should be use low sulphur diesel type and should conform to E.P rules prescribed for air and noise emission standards.	Construction phase is over.
38	Alternate technologies for chlorination (for disinfection of waste water) including methods like ultra violet radiation, ozonation etc. shall be examined and a report submitted with justification for selected technology.	For disinfection of treated waste water, Ultra-violet system has been installed in STP. It is a best technology as compared to other disinfectant method. Detail is attached as STP/ETP report attached **Annexure-14**
39	The green belt design along the periphery of the plot shall achieve attenuation factor conforming to the day and night noise standards prescribed for residential lanes use. The open spaces inside the plot should be suitably landscaped and covered with vegetation of indigenous variety.	Noted, we planted the 110 nos of trees inside the premises and also we adopted the external areas of the hospital for maintaining the green belt.
40	The construction of the building and the consequent increased traffic load should be such that the micro climate of the area is not adversely affected.	Construction phase is over.
41	The building should be designed so as to take sufficient safeguards regarding seismic zone sensitivity.	This is being ensured. Attached is the structural safety certificate as annexure-15
42	High rise building should obtain clearance from aviation department or concerned authority.	Obtained and submitted in your office.
43	Suitable measures shall be taken to restrain the development of small commercial activities or	Noted

	slums in the vicinity of the complex. All commercial activities should be restricted to special areas earmarked for the purpose.	
44	It is suggested that literacy program for weaker sections of society/woman/adults (including domestic help) and under privileged children could be provided in formal way.	All CSR activities is being taken care by Max Healthcare foundation. A details are appended below; • Education • Skill Training • Water recharge & rejuvenation • Health awareness https://www.maxhealthcare.in/maxhealthcare-foundation
45	The use of compact fluorescent lamps should be encouraged. A management plan for the safe disposal of used/damaged CFLs should be submitted.	All used/damaged CFLs are being disposed through authorized channel.
46	It shall be ensured that street and park lighting is solar powered. 50 % of the same may be provided with dual (solar/electrical) alternatives.	Solar based street lights have been installed in and nearby the premise.
47	Solar water heater shall be installed to the maximum possible capacity. Plans may be drawn up accordingly ad submitted with justification.	Solar based hot water generator with the capacity of 3500 LPD has been installed and photos are attached as **Annexure-16**
48	Treated effluents shall be maximally reused to aim for zero discharge. Where ever not possible, a detailed management plan for disposal should be provided with quantities and quality of waste water.	Treated effluent is being used for toilet flushing, gardening and cooling purpose. Rest treated waste water is being discharged in public sewer with conforming norms. Detailed management plan is attached as **Annexure-4**.
49	The treated effluents should normally not be discharged into public sewers with terminal treatment facilities as they adversely affect the hydraulic capacity of STP. If unable, necessary permission from authorities should be taken.	The treated effluent is being used in toilet flushing, gardening & cooling tower. Rest treated waste water is being discharged in public sewer after taking necessary approval.
50	Construction activities including movements of vehicles should be so managed so that no disturbance is caused to nearby residents.	Construction phase is over.
51	All necessary statutory clearances should be obtained and submitted before start of any construction activity and if this condition is violated the clearance, if and when given, shall be automatically deemed to have been cancelled.	Construction phase is over.
52	Parking areas should be in accordance with the norms of MOEF, Government of India. Plans may be drawn up accordingly and submitted.	Noted
53	The location of the STP should be such it is away from human habilitation and does not	The proposed **STP 450 KLD** has been installed in convenient location & It is being ensured that there is no odor problem.

	cause problem of odor. Odorless technology options should be examined and a report submitted.	Biological based MBR STP is installed.
54	The environment management plan should also include the breakup costs on various activities and the management issues also so that the residents also participate in the implementation of the environment management plan.	The environment management plan with breakup cost is attached as **annexure-17.**
55	Detailed plans for safe disposal of STP sludge shall be provided along with ultimate disposal location, quantitative estimates and measures proposed.	Sludge is being disposed through authorized channel.
56	Status of the project as on date shall be submitted along with photographs from north, south, west and east side facing camera and adjoining area should be provided.	Construction phase is over.
57	Specific location along with dimensions with reference to STP, parking, open areas and green belt etc. should be provided on the layout plan.	Already submitted in your office.
58	The DG sets shall be so installed so as to conform to prescribed stack heights and regulations and also to the noise standards as prescribed. Details should be submitted.	Adequate height for DG stack has been provided as per applicable laws. Noise report is attached as **annexure-8.**
59	E-waste Management should be done as per MOEF guidelines.	E-waste is being disposed through as per said standards.
60	Electrical waste should be segregated & disposed suitably as not to impose environment risk.	E-waste is being disposed through as per said standards.
61	The use of suitably processed plastic waste in the construction of road should be considered.	All roads are already constructed in premises.
62	Displaced persons shall be suitably rehabilitated as per prescribed norms.	Construction phase is over.
63	Dispensary for first aid shall be provided.	Construction phase is over.
64	Safe Disposal arrangement of used toiletries items in hotels should be ensured. Toiletries item could be given complimentary to guests, adopting suitable measures.	Construction phase is over.
65	Diesel generating set stack should be monitored for CO & HC.	Agreed.
66	Ground water downstream of rain water harvesting pit nearest to STP should be monitored for bacterial contamination. Necessary hand pumps should be provided for sampling. The monitoring is to be done both in pre and post monsoon seasons.	Feasibility study is in process and will update.
67	The green belt shall consist of 50 % trees, 25 % shrub & 25 % grass as per MOEF norms.	Suitable variety of trees has been planted at site.

68	A separate electric meter shall be provided to monitor consumption of energy for the operation of sewage/effluent treatment tanks.	Already installed.
69	An energy audit should be annually carried out during the operational phase and submitted to authority.	Energy audit is conducted by external agency. Report is attached as **annexure-18.**
70	Project proponent shall endeavor to obtain ISO-14001 certification. All general & specific conditions mentioned under this environmental clearance should be included in the environmental manual to be prepared for the certification purpose and compliance.	Noted.
71	Environmental Corporate responsibility (ECR) plan along with budgetary provision amounting 2% of total project cost shall be submitted (within the month) on need based assessment study in study area. Income generating measures which can help in up-liftment of weaker section of society consistent with the traditional skills of the people identified. The program me can include activities such as old age homes, rain water harvesting provisions in nearly by areas, development of fodder farms, fruit bearing orchards, Vocational training etc. in addition vocational training for individuals shall be imparted so that poor section of society can take up self-employment and jobs. Separate budget for community development activities and income generating program shall be specified. Revised ECR plan is to be submitted within three month, failing which the environmental clearance shall be deemed to be cancelled.	We would allocate the budget for environment corporate responsibility. we adopted the central verge of adjoining roads and are maintaining the green belt of that area. The total strength of this area is approx. 800 mtrs and maintaining the two govt. parks (children and senior-citizen parks) adjacent to the hospital. (Photos are attached). The detail of some ongoing ECR activities is attached as **annexure-19.**
72	Appropriate safety measures should be made for accidental fire.	Necessary action has been taken in this regard.
73	Smoke meters should be installed as warning measures for accidental fires.	These have been installed at site.
74	Plan for safe disposal of RO reject is to be submitted.	TDS of RO Reject is within limit.

Specific Condition

S.N.	Conditions	Status of Compliance
1.	The environmental clearance is issued subject to land use verification, local authority/planning authority should	Agreed

	ensure this with respect to rules, regulations, notifications, government resolutions, circular etc. issued if any.	
2.	The height, construction built up area of proposed construction shall be in accordance with the existing FAR norms of the urban local body & it should ensure the same along with survey number before approving layout plan & before according commencement certificate to proposed work. Plan approving authority should also ensure the zoning permissibility for the proposed project as per the approved development plan of area.	Agreed
3.	All required sanitary and hygienic measures should be in place before starting construction activities and to be maintained throughout the construction phase.	All measures have been taken in this regard.
4.	Project proponent shall ensure completion of STP, MSW disposal facility, green belt development prior to occupation of the building.	Complied
5	Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical healthcare, crèche and first aid rooms etc.	Construction phase is over.
6	Adequate drinking water and sanitary facilities should be provided for construction workers at the site. Provision should be made for mobile toilets. The safe disposal of wastewater and solid waste generated during the construction phase should be ensured.	Construction phase is over.
7	The solid waste generated should be properly collected and segregated. Dry/inert solid waste should be disposed off to the approved sites for land filling after recovering recyclable material.	It is being ensured.
8	Bio medical waste management shall be followed as per the biomedical waste (Management & handling) rules 2016. Special attention to be given for mercury waste management and disposal.	Bio medical waste is being disposed through authorized channel.

<table>
<tr><td>9</td><td>Necessary permissions should be sought for use and safe disposal of radioactive materials. Procedural protocols prescribed by competent authority should be followed for the same.</td><td>Agreed</td></tr>
<tr><td>10</td><td>Sewage/other effluents from infectious diseases ward and pathology/laboratory should be treated/disinfected separately prior to ETP.</td><td>Necessary treatment is being done.</td></tr>
<tr><td>11</td><td>The total cost of the project is Rs. 70 Cr. A CSR plan with minimum Rs. 1.40 Crores should be prepared and submitted. Details of CSR activities and list of beneficiaries with their mobile nos. should be submitted.</td><td>Refer to CSR activities as appended below:
<table>
<tr><th>Transaction Reference</th><th>Description</th><th>Base Amount</th></tr>
<tr><td>CSR Contribution 2024-25</td><td>DEVKI DEVI FOUNDATION</td><td>2,00,00,000.00</td></tr>
<tr><td>CSR Contribution 2024-25</td><td>DEVKI DEVI FOUNDATION</td><td>1,50,00,000.00</td></tr>
<tr><td>CSR Contribution 2024-25</td><td>DEVKI DEVI FOUNDATION</td><td>30,00,000.00</td></tr>
<tr><td>CSR Contribution 2024-25</td><td>AGRAWAL FOUNDATION</td><td>15,00,000.00</td></tr>
<tr><td>CSR Contribution 2024-25</td><td>Sashkat and Vidharthee</td><td>2,44,61,123.00</td></tr>
<tr><td colspan="2">Total Contribution</td><td>6,39,61,123.00</td></tr>
</table></td></tr>
<tr><td>12</td><td>No parking shall be allowed outside the project boundary.</td><td>Noted</td></tr>
<tr><td>13</td><td>Parking space for ambulance shall be exclusively earmarked.</td><td>Complied</td></tr>
<tr><td>14</td><td>Police Post shall be provided near emergency.</td><td>Already provided.</td></tr>
<tr><td>15</td><td>Dedicated power supply to be installed in operation theaters and other critical areas.</td><td>Complied</td></tr>
<tr><td>16</td><td>Accommodation for attendants to be provided near indoor wards. Battery operated vehicles to be used for internal transfer.</td><td>Accommodation facility is provided for attendant near the IP wards.</td></tr>
<tr><td>17</td><td>Passenger and stretcher lift to be provided for each floor.</td><td>Complied</td></tr>
<tr><td>18</td><td>Digging of basement shall be undertaken in view of structural safety of adjacent building under information/consultation with district administration/mining department. All the top soil excavated during construction activities should be stored for use in horticulture/landscape development within the project site. Additional soil for leveling of the</td><td>Construction phase is over.</td></tr>
</table>

	proposed site shall be generated within the sites. (To the extent possible) so that natural drainage system of the area is protected and improved.	
19	The approval of competent authority shall be obtained for structural safety of the building due to any possible earthquake.	Complied
20	Disposal of muck during construction phase should not create any adverse effect on the neighboring communities and be disposed taking the necessary precautions for general safety and health aspects of people, only in approved sites with the approval of competent authority.	Construction phase is over.
21	Any hazardous waste generated during construction phase should be disposed off as per applicable rules and norms with necessary approvals of the UP pollution control board.	Construction phase is over.
22	The diesel generator sets to be used during construction phase should be low sulphur diesel type and should conform the Environment (Protection) rules prescribed for air & noise emission standard.	Construction phase is over.
23	Ambient noise levels should conform to residential standards both during day and night. Incremental pollution loads on the ambient air and noise quality should be closely monitored during construction phase. Adequate measures should be made to reduce ambient air & noise level during construction phase, so as to conform to the stipulated standards by CPCB/SPCB.	All parameters are within norms. Detail is attached as **Annexure-1**
24	The green belt design along the periphery of the plot shall achieve attenuation factor conforming to the day and night noise standards prescribed for residential lanes use. The open spaces inside the plot should be suitably landscaped and covered with grass and shrub. Green belt development shall be carried out considering CPCB guidelines including selection of plant species and in consultation with the local DFO/agriculture dep't.	Complied

25	Pavements shall be constructed as to allow infiltration of surface run-off of rain water. Construction of pavements around trees should be able to faceplate suitable watering, aeration and nutrition to the tree.	Complied
26	Ready mix concrete and sprinkler to be used for curing and quenching during construction phase.	Complied
27	The building should have adequate distance between them to allow movement of fresh air and passage of natural light, air and ventilation, landscape plan to be revised accordingly.	The building has adequate distance 22 meter from adjoining building for movement of fresh air and passage of natural light, air & ventilation.
28	Convenient shops, bank, canteen, post office and medicine shops etc. to be provided with in complex.	Complied
29	RWH to be done only from roof top. Arrangement shall be made that waste water and storm water do not get mixed.	Complied
30	Organic waste converter is to be installed at the site.	Complied
31	The name and address of vendor is to be submitted for biodegradable waste.	Bio degradable waste is being treated through installed Organic Waste Converter.
32	Bio medical waste management shall be followed as per the latest notification and take NOC from UPPCB.	The Segregation, Collection and treatment of Bio medical waste is being done as per applicable norms.

FARELABS
Science | Technology | Innovation

FARE LABS Private Limited (Testing Division)
Location 1 (Permanent Facility)
L-17/3, DLF Phase-II, IFFCO Chowk,
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Tel. : +91-124-4057437 | Cell : +91-9289351688
Email : farelabs@farelabs.com | Website : www.farelabs.com

TEST REPORT

Issued to :
Max Hospital Vaishali
W-3, Sector-1, Vaishali, Ghaziabad 201012
Uttar Pradesh, India

J.O. No.	: ENV20250917-024-060
ULR Code	: TC5503 25 3 00015805 F
Report Date	: 22-09-2025
Sample Receipt Date	: 17-09-2025
Account Manager	: BD Team 3
Credit Manager	: Septesh Kumar

TC - 5503

Customer Provided Information:#

Nature of the Sample	: **Stack Emissions**
Make & Model No.	: Cummins & KTA-50-G8
Engine No.	: 25429408
Rated Capacity	: 1500 KVA
Type of Stack /Duct	: Metal
Stack Height from Ground Level (m)	: 30
Diameter of the Stack (m)	: 0.5
Operation Load During Monitoring	: 1120 KVA

Laboratory Provided Information:

Date of Sampling	: 17-09-2025
Time of sampling	: 12:15 PM
Test Started On	: 17-09-2025
Test Completed On	: 22-09-2025
Purpose of Monitoring	: To Check Pollution Load
Name of the Emission Source Monitoring	: DG Set- 1
Sampling Method	: IS-11255 (P-7, P-3)& FL/SOP/ENV/D-02
Stack Identification	: Stack attached to DG Set- 1
Normal Operating Schedule	: As per requirement
Sampling Duration (min)	: 31
Flue Gas Temperature °C	: 138.6
Ambient Air Temperature °C	: 35
Flue Gas Velocity (m/s)	: 10.48
Volumetric Flow Rate (Nm^3/h)	: 5358.44
Pollution Control Device if any	: Retrofit Emission Control Device

Analysis Report

S. No.	Parameters	Unit	Test Results	Specification as Per CAQM Direction No. 76 Act 2021* (Maximum Allowable Limit)	Test Method
Chemical Analysis					
1	Carbon Dioxide	% by Vol.	6.67	NA	IS:11255 (P-1)
2	Carbon Monoxide at 15% O_2	mg/Nm^3	92.37	100	FL/SOP/ENV-26
3	Hydrocarbons, at 15% O_2	mg/Nm^3	2.87	NA	FL/SOP/02-24
4	Oxides of Nitrogen (as NO_2) at 15% O_2	mg/Nm^3	246.89	650	IS:11255 (P-7)
5	Oxygen	% by Vol.	16.25	NA	IS:11255 (P-4)
6	Particulate matter at 15% O_2	mg/Nm^3	29.18	50	IS:11255 (P-1)

Authorised Signatory
Mr. Arun Kumar Chaturvedi, Scientist-C

FARELABS
Science | Technology | Innovation

FARE LABS Private Limited (Testing Division)
Location 1 (Permanent Facility)
L-17/3, DLF Phase-II, IFFCO Chowk,
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Email : farelabs@farelabs.com | Website : www.farelabs.com

TEST REPORT

Issued to :
Max Hospital Vaishali
W-3, Sector-1, Vaishali, Ghaziabad 201012
Uttar Pradesh, India

J.O. No.	: ENV20250917-024-060
ULR Code	: TC5503 25 3 00015805 F
Report Date	: 22-09-2025
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TC - 5503

Customer Provided Information:#

Nature of the Sample	: **Stack Emissions**
Make & Model No.	: Cummins & KTA-50-G8
Engine No.	: 25429408
Rated Capacity	: 1500 KVA
Type of Stack /Duct	: Metal
Stack Height from Ground Level (m)	: 30
Diameter of the Stack (m)	: 0.5
Operation Load During Monitoring	: 1120 KVA

Laboratory Provided Information:

Date of Sampling	: 17-09-2025
Time of sampling	: 12:15 PM
Test Started On	: 17-09-2025
Test Completed On	: 22-09-2025
Purpose of Monitoring	: To Check Pollution Load
Name of the Emission Source Monitoring	: DG Set- 1
Sampling Method	: IS-11255 (P-7, P-3)& FL/SOP/ENV/D-02
Stack Identification	: Stack attached to DG Set- 1
Normal Operating Schedule	: As per requirement
Sampling Duration (min)	: 31
Flue Gas Temperature °C	: 138.6
Ambient Air Temperature °C	: 35
Flue Gas Velocity (m/s)	: 10.48
Volumetric Flow Rate (Nm^3/h)	: 5358.44
Pollution Control Device if any	: Retrofit Emission Control Device

Analysis Report

S. No.	Parameters	Unit	Test Results	Specification as Per CAQM Direction No. 76 Act 2021* (Maximum Allowable Limit)	Test Method
Chemical Analysis					
7	Sulphur Dioxide	mg/Nm^3	9.87	NA	IS:11255 (P-2)

NA= Not Applicable; ***CAQM**= Commission for Air Quality Management in National Capital Region and Adjoining Areas.

Authorised Signatory
Mr. Arun Kumar Chaturvedi, Scientist-C

******End of Report******

FARELABS
Science | Technology | Innovation

FARE LABS Private Limited (Testing Division)
Location 1 (Permanent Facility)
L-17/3, DLF Phase-II, IFFCO Chowk,
M.G. Road, Gurugram - 122 002, Haryana, INDIA.
Tel. : +91-124-4223207-08, 4034205 | Cell : +91-9289351688
Location 1 (Permanent Site Facility)
D-18, Infocity Ph.-II, Sec-33, Gurugram - 122001, Haryana, INDIA.
Tel. : +91-124-4057437 | Cell : +91-9289351688
Email : farelabs@farelabs.com | Website : www.farelabs.com

TEST REPORT

Issued to :
Max Hospital Vaishali
W-3, Sector-1, Vaishali, Ghaziabad 201012
Uttar Pradesh, India

J.O. No.	: ENV20250917-024-062
ULR Code	: TC5503 25 3 00015807 F
Report Date	: 22-09-2025
Sample Receipt Date	: 17-09-2025
Account Manager	: BD Team 3
Credit Manager	: Septesh Kumar

TC - 5503

Customer Provided Information:#

Nature of the Sample	: **Stack Emissions**
Make & Model No.	: Cummins & KTA-50-G8-1
Engine No.	: 25429412
Rated Capacity	: 1500 KVA
Type of Stack /Duct	: Metal
Stack Height from Ground Level (m)	: 30
Diameter of the Stack (m)	: 0.5
Operation Load During Monitoring	: 1125 KVA

Laboratory Provided Information:

Date of Sampling	: 17-09-2025
Time of sampling	: 01:35 PM
Test Started On	: 17-09-2025
Test Completed On	: 22-09-2025
Purpose of Monitoring	: To Check Pollution Load
Name of the Emission Source Monitoring	: DG Set- 2
Sampling Method	: IS-11255 (P-7, P-3)& FL/SOP/ENV/D-02
Stack Identification	: Stack attached to DG Set- 2
Normal Operating Schedule	: As per requirement
Sampling Duration (min)	: 31
Flue Gas Temperature °C	: 134.9
Ambient Air Temperature °C	: 35
Flue Gas Velocity (m/s)	: 10.38
Volumetric Flow Rate (Nm^3/h)	: 5355.57
Pollution Control Device if any	: Retrofit Emission Control Device

Analysis Report

S. No.	Parameters	Unit	Test Results	Specification as Per CAQM Direction No. 76 Act 2021* (Maximum Allowable Limit)	Test Method
Chemical Analysis					
1	Carbon Dioxide	% by Vol.	7.18	NA	IS:11255 (P-1)
2	Carbon Monoxide at 15% O_2	mg/Nm^3	97.48	100	FL/SOP/ENV-26
3	Hydrocarbons, at 15% O_2	mg/Nm^3	2.38	NA	FL/SOP/02-24
4	Oxides of Nitrogen (as NO_2) at 15% O_2	mg/Nm^3	279.56	650	IS:11255 (P-7)
5	Oxygen	% by Vol.	16.67	NA	IS:11255 (P-4)
6	Particulate matter at 15% O_2	mg/Nm^3	32.57	50	IS:11255 (P-1)

Authorised Signatory
Mr. Arun Kumar Chaturvedi, Scientist-C

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TEST REPORT

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Max Hospital Vaishali
W-3, Sector-1, Vaishali, Ghaziabad 201012
Uttar Pradesh, India

J.O. No.	: ENV20250917-024-062
ULR Code	: TC5503 25 3 00015807 F
Report Date	: 22-09-2025
Sample Receipt Date	: 17-09-2025
Account Manager	: BD Team 3
Credit Manager	: Septesh Kumar

TC - 5503

Customer Provided Information:#

Nature of the Sample	: **Stack Emissions**
Make & Model No.	: Cummins & KTA-50-G8-1
Engine No.	: 25429412
Rated Capacity	: 1500 KVA
Type of Stack /Duct	: Metal
Stack Height from Ground Level (m)	: 30
Diameter of the Stack (m)	: 0.5
Operation Load During Monitoring	: 1125 KVA

Laboratory Provided Information:

Date of Sampling	: 17-09-2025
Time of sampling	: 01:35 PM
Test Started On	: 17-09-2025
Test Completed On	: 22-09-2025
Purpose of Monitoring	: To Check Pollution Load
Name of the Emission Source Monitoring	: DG Set- 2
Sampling Method	: IS-11255 (P-7, P-3)& FL/SOP/ENV/D-02
Stack Identification	: Stack attached to DG Set- 2
Normal Operating Schedule	: As per requirement
Sampling Duration (min)	: 31
Flue Gas Temperature °C	: 134.9
Ambient Air Temperature °C	: 35
Flue Gas Velocity (m/s)	: 10.38
Volumetric Flow Rate (Nm^3/h)	: 5355.57
Pollution Control Device if any	: Retrofit Emission Control Device

Analysis Report

S. No.	Parameters	Unit	Test Results	Specification as Per CAQM Direction No. 76 Act 2021* (Maximum Allowable Limit)	Test Method
Chemical Analysis					
7	Sulphur Dioxide	mg/Nm^3	7.21	NA	IS:11255 (P-2)

NA= Not Applicable; ***CAQM**= Commission for Air Quality Management in National Capital Region and Adjoining Areas.

Authorised Signatory
Mr. Arun Kumar Chaturvedi, Scientist-C

******End of Report******

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TEST REPORT

Issued to :
Max Hospital Vaishali
W-3, Sector-1, Vaishali, Ghaziabad 201012
Uttar Pradesh, India

J.O. No. : ENV20250917-031-079
ULR Code : TC5503 25 3 00015824 F
Report Date : 22-09-2025
Sample Receipt Date : 17-09-2025
Account Manager : BD Team 3
Credit Manager : Septesh Kumar

TC - 5503

Customer Provided Information:#

Nature of the Sample : **DG Noise**
Make & Model No. : Cummins & KTA-50-G8
Engine Serial No. : 25429408
Rated Capacity : 1500 KVA

Laboratory Provided Information:

Date of Monitoring : 17-09-2025
Time of Monitoring : 11:35 AM
Test Started On : 17-09-2025
Test Completed On : 22-09-2025
Purpose of Monitoring : To Check Noise Level
Instrument used : Sound Level Meter
Test Protocol Followed : CPCB Guidelines

Analysis Report

S. No.	Parameters	Unit	Test Results	Specification as Per CPCB*	Test Method
Physical Analysis					
1	DG Noise level at 1 metre from the enclosure surface	dB(A)	74.2	NA	FL/SOP/ENV-08
2	DG Noise level, near the Acoustic Enclosure	dB(A)	99.8	NA	FL/SOP/ENV-08
3	Insertion Loss	dB(A)	25.6	25 Min.	FL/SOP/ENV-08

NA= Not Applicable; ***CPCB**= Central Pollution Control Board.

Authorised Signatory
Mr. Arun Kumar Chaturvedi, Scientist-C

******End of Report******

FARELABS
Science | Technology | Innovation

FARE LABS Private Limited (Testing Division)
Location 1 (Permanent Facility)
L-17/3, DLF Phase-II, IFFCO Chowk,
M.G. Road, Gurugram - 122 002, Haryana, INDIA.
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TEST REPORT

Issued to :
Max Hospital Vaishali
W-3, Sector-1, Vaishali, Ghaziabad 201012
Uttar Pradesh, India

J.O. No. : ENV20250917-031-080
ULR Code : TC5503 25 3 00015825 F
Report Date : 22-09-2025
Sample Receipt Date : 17-09-2025
Account Manager : BD Team 3
Credit Manager : Septesh Kumar

TC - 5503

Customer Provided Information:#

Nature of the Sample : **DG Noise**
Make & Model No. : Cummins & KTA-50-G8-1
Engine Serial No. : 25429412
Rated Capacity : 1500 KVA

Laboratory Provided Information:

Date of Monitoring : 17-09-2025
Time of Monitoring : 01:00 PM
Test Started On : 17-09-2025
Test Completed On : 22-09-2025
Purpose of Monitoring : To Check Noise Level
Instrument used : Sound Level Meter
Test Protocol Followed : CPCB Guidelines

Analysis Report

S. No.	Parameters	Unit	Test Results	Specification as Per CPCB*	Test Method
Physical Analysis					
1	DG Noise level at 1 metre from the enclosure surface	dB(A)	73.2	NA	FL/SOP/ENV-08
2	DG Noise level, near the Acoustic Enclosure	dB(A)	99.5	NA	FL/SOP/ENV-08
3	Insertion Loss	dB(A)	26.3	25 Min.	FL/SOP/ENV-08

NA= Not Applicable; ***CPCB**= Central Pollution Control Board.

Authorised Signatory
Mr. Arun Kumar Chaturvedi, Scientist-C

******End of Report******

Uttar Pradesh Pollution Control Board
Building. No TC-12V Vibhuti Khand, Gomti Nagar, Lucknow-226010
Phone:0522-2720828,2720831, Fax:0522-2720764, Email: info@uppcb.in, Website: www.uppcb.com

194375/UPPCB/Ghaziabad(UPPCBRO)/CTO/both/GHAZIABAD/2023 **Date: 27/12/2023**

To,

M/s

MAX SUPER SPECIALITY HOSPITAL A UNIT OF CROSSLAY REMEDIES LIMITED

W-3, Sector-1, Vaishali,GHAZIABAD,

Application Id-23096313

Consolidated Consent to Operate and Authorisation hereinafter referred to as the CCA (Consolidated Consent & authorization) (Fresh) under Section-25 of the Water (Prevention & Control of Pollution) Act, 1974 and under Section-21 of the Air (Prevention & Control of Pollution) Act, 1981 and Authorization under Rule-6(2) of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 notified under Environment (Protection) Act, 1986 as applicable (to be referred hereinafter as Water Act, Air Act and HW Rules respectively).

CCA is hereby granted to **MAX SUPER SPECIALITY HOSPITAL A UNIT OF CROSSLAY REMEDIES LIMITED** located at **W-3, Sector-1, Vaishali,GHAZIABAD,**. subject to the provisions of **the Water Act, Air Act and Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016** and the orders that may be made further and subject to following terms and conditions :-

1. This CCA MAX SUPER SPECIALITY HOSPITAL A UNIT OF CROSSLAY REMEDIES LIMITED **granted for the period from 01/01/2024 to 31/12/2026** and valid for manufacturing of following products.

S No	Product	Quantity	Unit
1	Multi Specialty Hospital (436 Beds)	436	Numbers/Day

2. Conditions under Water(Prevention and Control of Pollution) Act -1974 as amended :-

(i) The daily quantity of effluent discharge (KLD) :-

Kind of Effluent	Quantity(KLD)	Treatment facility	Discharge point
Domestic	**380 KLD**	**STP**	
Industrial	**20 KLD**	**ETP**	

(ii) Trade Effluent Treatment and Disposal :-The applicant shall operate Effluent Treatment Plant consisting of primary/secondary and tertiary treatment as is required with reference to influent quantity and quality.

In case of stoppage of functioning of ETP, production has to be stopped immediately and this Board has to be intimated by fax/phone/email with a report in this regard to be dispatched immediately.

(iii) The treated effluent shall be recycled to the maximum extent and should be reused within the premises for gardening etc. Quality of the treated effluent shall meet to the following general and specific standards as prescribed under Environment (Protection) Rules, 1986 and applicable to the unit from time-to-time :-

PRADEEP SHARMA

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Industrial Effluent Quality Standard

S.No.	Parameter	Standard
1	pH	6.5-8.5
2	BOD	30 mg/lit
3	COD	250 mg/lit
4	TSS	100 mg/lit
5	Oil & Grease	10 mg/lit

(iv) Sewage Treatment and Disposal :- The applicant shall provide comprehensive STP as is required with reference to influent quantity and quality.In case of stoppage of functioning of STP, production has to be stopped immediately and this Board has to be intimated by fax/phone/email with a report in this regard to be dispatched immediately.

(v) The treated sewage shall be reused in gardening as far as possible. The STP shall be maintained continuously so as to achieve the quality of the treated sewage to the following standards.

S No.	Parameters	Standards
1	pH	6.5-9.0
2	BOD (mg/L)	20
3	TSS (mg/L)	100
4	Fecal Coliform (MPN/100ml)	<1000

3. Conditions under Air (Prevention and Control of Pollution) Act -1981 as amended :-

i) The applicant shall use following fuel and install a comprehensive control system consisting of control equipment as required with reference to generation of emissions and operate and maintain the same continuously so as to achieve the level of pollutants to the following standards.

Air Pollution Source Details

S No.	Air Pollution Source	Type of fuel	Stack no	Control Device	Height of Stack
1	2x600 Kg/Hour Gas Fired Boiler	PNG	1	Oxides of Nitrogen	30 meter from ground level
2	2x3 LKC/Hour Hot Water Generator	PNG	1	Oxides of Nitrogen	30 meter from ground level
3	2x1500 KVA DG Set	Dual Fuel	2	Sulphur Dioxide	As per norms

Emmission Quality Standards

S No.	Stack no	Parameters	Standards
1	1	Oxides of Nitrogen	As per notified under EP Act, 1986
2	1	Oxides of Nitrogen	As per notified under EP Act, 1986

3	2	Sulphur Dioxide	As per notified under EP Act, 1986

In case of stoppage of functioning of air pollution control equipment, production has to be stopped immediately and this Board has to be intimated by fax/phone/email with a report in this regard to be dispatched immediately

(ii) The unit will not use any type of restricted fuel.

iii) Noise from the D.G. Set and other source(s) should be controlled by providing an acoustic enclosure as is required for meeting the ambient noise standards for night and day time as prescribed for respective areas/zones (Industrial, Commercial, Residential, Silence) which are as follows :-

Day time : from 6.00 a.m. to 10.00 p.m., Night time: from 10.00 p.m. to 6.00 a.m.

Standards for Noise level in db(A) Leq	**Industrial Area**		**Commercial Area**		**Residential Area**		**Silence Zone**	
	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time	Day Time	Night Time
	75	70	65	55	55	45	50	40

4. Conditions under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 :-

The Factory Manager of M/s MAX SUPER SPECIALITY HOSPITAL A UNIT OF CROSSLAY REMEDIES LIMITED. is hereby granted an authorization to operate a facility for collection and storage of Hazardous wastes. The authorization is granted to operate a facility for generation, collection and storage of hazardous wastes within factory premises for following category of wastes:-

S.No.	**Category of Hazardous Waste as per the Schedules I, II and III of these rules**	**Authorised mode of disposal or recycling or utilisation or co-processing, etc.**	**Quantity(ton/annum)**
1	**Schedule I, Cat 5.1 Used or spent oil**	**Through Authorised Recycler/TSDF**	**1.97 KL/Annum**
2	**Schedule I, Cat 5.2 Wastes or residues containing oil**	**Through TSDF**	**0.0365 Ton/Annum**
3	**Schedule I, Cat 33.1 Empty barrels/containers/liners contaminated with hazardous chemicals /wastes**	**Through TSDF**	**3.65 Ton/Annum**
4	**Schedule I, Cat 35.3 Chemical sludge from waste water treatment**	**Through TSDF**	**7.3 Ton/Annum**

The authorization shall be in force and shall be valid upto 31/12/2026. The authorization is subject to the conditions stated below and such conditions as may be specified in the rules for the time being in force under Environment (Protection) Act, 1986.

Terms and conditions of Hazardous Waste authorization :-

(i) The authorization shall comply with the provisions of the Environment (Protection) Act, 1986, and the rules made there under.

(ii) The authorization and its renewal shall be produced for inspection at the request of an officer authorized by the SPCB.

(iii) The person authorized shall not rent, lend, sell, transfer or otherwise transport the hazardous wastes without obtaining prior permission of the SPCB.

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(iv) Any unauthorized changes in personnel, equipment as working conditions as mentioned in the application by the person authorized shall constitute a breach of his authorization.
(v) It is the duty of the authorized person to take prior permission of the SPCB to close down the facility.
(vi) An application for the renewal of an authorization shall be made as laid down under these rules.
(vii) The unit shall comply with any other conditions specified in the guidelines issued by the MoEF or CPCB/SPCB from time to time.
(viii) The authorization is valid for temporary storage of Hazardous Waste within premises only.
(ix) The authorized agency shall ensure that on-line data with regard to quantity and nature of hazardous chemicals being used in the plant as well as air emission and waste generated within premises is displayed on Display Board of size 6x4 feet outside the main factory gate within premises
(x) It is duty of the authorized person to take prior permission of this Board to close and cleanup the facility for treatment, storage and disposal of hazardous waste.
(xi) The applicant shall maintain record of hazardous waste in Form-3 and shall submit annual return in Form-4 on or before the 30th day of June following to the financial year to which that return relates.
(xii) In no case any hazardous waste shall be disposed off on land, in any drain, or into any water stream. All spillage must also be safely collected and stored.
(xiii) Before the hazardous waste is stored or dumped in the facility, applicant must conduct a detailed physical and chemical analysis of hazardous waste sample and report to the Board.
(xiv) Dried hazardous sludge from the process in the plant shall be stored in double lined HDPE pit constructed with R.C.C. or such material which does not react with the waste contained in it.
(xv) The storage area should be fenced properly and Sign/Notice Board indicating 'Danger' and 'Hazardous' shall be displayed at appropriate position both in Hindi and English.
(xvi) The industry shall store non-ferrous metal waste, used oil/spent oil waste in sealed drums placed on impervious floor under covered shed. Hazardous waste if required shall be sold only to Registered Recyclers/Re-processors.
(xvii) In case of any transportation of hazardous waste, the details in Form-10 of the Hazardous and Other Wastes Rules, 2016 shall be submitted to the Board.

5. Essential documents to be submitted by the Industry/Unit as Applicable:-

(i) Annual return in Form-4 and Waste Disposal Manifest in Form-10 under Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and Third Party Audit Report.
(ii) Environment Statement in Form-V of Environment (Protection) Rules, 1986.
(iii) Quarterly compliance report of the CCA, photograph of ETP/APCs/Waste Storage Area.

6. Competent Authority reserves the right to change/modify/add any time any condition of this CCA.
7. Unit has to comply with the following specific & general conditions. Non compliance of any provision of this CCA and provisions of the Water Act, Air Act and Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 will results in legal action under the aforesaid Acts and Rules.
8. In compliance to the G.O 1011/81-7-2021-09 (Writ)/2016 dated.13.10.2021 issued by Department of Environment, Forest and Climate Change, Uttar Pradesh. You are directed to develop Miyawaki Forest as per the SOP available at URL:-http://www.upecp.in/TrainingSession.aspx for ensuring timely compliance of this direction, you are hereby directed to submit a bank guarantee with minimum validity of one year of the amount equivalent to the sum of initial consent fees (Air and Water) or Rs. 50,000/- (Rs. Fifty Thousand Only) whichever is more, within 30 days from the date of issuance of this certificate. In case of non-compliance of this direction, your consent will be revoked by the Board.
9. If the unit uses the ground water and requires the permission from SGWA/CGWA for water abstraction then the industry will have to obtain No objection certificate for abstraction of ground water. It will be the responsibility of the industry to comply with the various conditions of the NOC obtained from the competent authority and submit to the Board, within 3 months time failing which CTO will be revoked.

General Conditions:-

1. The applicant shall get analysed the samples of effluent/emission/hazardous wastes at least once in a three month from the laboratory recognized by the MoEF and shall report to the UPPCB.
2. The applicant shall however, not without the prior consent of the Board bring into use any new or altered outlet for the discharge of effluent or gases emission or sewage waste from the unit.
3. Treated Industial waste water and domestic waste water shall be disposed jointly at one disposal point. The applicant shall provide discharge measurement equipment at final disposal point.
4. The applicant shall strictly comply with conditions of this CCA and submit compliance report of stipulated conditions within 30 days of receipt of this CCA. If at any point of time, it is found that the industry is not complying with stipulated conditions or any further direction/instruction issued by the Board, legal action shall be initiated against the applicant.
5. The applicant shall maintain good house keeping. All valves/pipes/sewer/drains etc. must be leak-proof
6. The industry shall provide uninterrupted entry to the STP/ETP inlet and outlet points, Air Pollution Control equipment and stack for smooth sampling/monitoring of efficiency of pollution control systems.
7. The industry shall provide Inspection Book at the time of inspection to the Board's officials.
8. Whenever due to any accident or other unforeseen act or event, such emission occurs or is apprehended to occur in excess of standards laid down, such information shall be reported to the Board's offices and all other concerned offices. In case of failure of pollution control equipment, the production process connected to it shall be stopped with immediate effect.
9. The industry shall operate in a manner so that all emissions be emitted through designated chimney/stack only.
10. In case of any damage to the agriculture productivity, human habitation etc. by the operation of industry, it shall be imperative to stop production in the industry with immediate effect and such information shall be reported to Board's offices. The industry shall be liable to pay compensation also in such cases as decided by the Competent Authority.
11. The applicant shall apply before the 60 days of expiry of CCA or any change in production types/ production capacity/manufacturing process/capacity enhancement etc. or any change in effluent discharge point or emission point
12. The Board reserves the right to revoke/add/modify any stipulated condition issued along with CCA, as may be necessary.

Specific Conditions:-

1. The unit shall comply with various provisions of Air (Prevention and Control of Pollution) Act 1981 as amended, Water (Prevention and Control of Pollution) Act 1974 as amended and all other applicable rules notified under E.P. Act 1986.
2. The unit shall dispose the hazardous waste through authorized recyclers/TSDF and comply with the provisions of Hazardous and Other Wastes (Management and Trans-boundary Movement) Amendment Rules, 2016 and The Bio-Medical Waste Management (Amendment) Rules, 2018.
3. The unit shall submit the point wise compliance report of the conditions imposed in the previous CTO issued by the Board and the audited balance sheet for the current year and the details of fees deposited within a month failing which consent would be deemed void.
4. This consent is only valid for the emission from the 2x600 Kg/Hour Gas Fired Boiler, 2x03 LKC/Hour Hot Water Generator and 2x1500 KVA DG Set only and the Institute should ensure that there is no adverse impact on public and environment.
5. The unit shall develop proper green belt and rain water harvesting system as per guidelines. For green belt at least 8 feet height plants should be planted which shall be properly protected as proper irrigation and

manoeuvring arrangements shall be made. For the development of the green belt the guidelines issued vide Board office order no. H10405/220/2018/02 Dt. 16-02-2018 shall be complied.
6. This consent is valid only for products and quantity mentioned above. The Institute shall obtain prior approval before making any modification in product/process /fuel/ Plant machinery failing which consent would be deemed void.
7. The unit will ensure the continuous and uninterrupted data supply from the OCEEMS to the CPCB server. The unit shall maintain strict supervision on fluctuations in operating parameters with respect to each treatment unit of the Effluent treatment plant.
8. If the CPCB or UPPCB issues the Closure order against the Institute this consent order stands automatically suspended for that period.
9. The unit shall abide by orders / directions issued by Hon'ble Supreme Court Hon'ble High Court, Hon'ble National Green Tribunal, Central Pollution Control Board and U.P Pollution Control Board for protection and safe guard of environment from time to time.
10. The ETP for the treatment of effluent generated from the OT and Lab shall be installed within 3 month time failing which this conditional CTO will be deemed cancelled automatically.
11. In compliance of the CPCB's Revision 2: Guidelines for Handling, Treatment and Disposal of Waste Generated during Treatment/Diagnosis/Quarantine of COVID-19 Patients the HCFs and the agencies operating Sewage Treatment Plants should continue to ensure disinfection of treated waste water as per prevailing practices to inactivate corona viruses, the Operators of ETPs/STPs attached with discharge from Healthcare Facilities and isolation wards should adopt standard operational practices, practice basic hygiene precautions, and wear personal protective equipment (PPE) prescribed for operation of STPs. PPEs should include Goggles, face mask, liquid repellent coveralls, waterproof gloves and Rubber boots and during the period of COVID-19 pandemic, utilization of treated wastewater in utilities within HCFs may be avoided failing which consent shall stand automatically revoked and legal action may be initiated against the hospital.
12. The unit shall submit monitoring reports of all stacks and ambient air quality from a certified / approved laboratory under E.P. Act 1986.
13. The unit shall comply with various provisions of Air (Prevention and Control of Pollution) Act 1981 as amended, Water (Prevention and Control of Pollution) Act 1974 as amended and all other applicable rules notified under E.P. Act 1986.
14. The unit shall submit the point wise compliance report of the CTO issued by the Board for the year 2023 and audited balance sheet for the current year and the details of fees deposited during last three years within a month otherwise this CTO may be revoked.
15.Unit shall comply with the CAQM (Commission for Air Quality Management in NCR and Adjoining Areas) direction no. 53 and 62-65 and other direction issued time to time regarding use of cleaner fuel.
16.Unit shall comply with the CAQM (Commission for Air Quality Management in NCR and Adjoining Areas) direction no. 55-58 regarding DG sets.
17.Unit shall operate and maintain/upgrade the air pollution control device in such manner that emission should be as per norms prescribed by CAQM.
18. For operation of DG sets during GRAP period institute shall comply with CAQM direction no. 55 and 68.
19. Unit shall comply with the CAQM (Commission for Air Quality Management in NCR and Adjoining Areas) direction no. 76 and 77 regarding regulation of DG sets.
21. This consent is valid only for products and quantity mentioned above. The Unit shall obtain prior approval before making any modification in product/process /fuel/ Plant machinery failing which consent would be deemed void.
20. The Unit shall develop proper green belt and rain water harvesting system as per guidelines. For green belt at least 8 feet height plants should be planted which shall be properly protected as proper irrigation and

maneuvering arrangements shall be made. For the development of the green belt the guidelines issued vide Board office order no. H10405/220/2018/02 Dt. 16-02-2018 shall be complied.

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मिशन LiFE - पर्यावरण के लिए जीवन शैली

(Lifestyle For Environment)

<u>जनसहभागिता का सन्देश</u>

- स्वच्छता – देशसेवा में अपने परिवेश की स्वच्छता हेतु अपना सक्रिय योगदान सुनिश्चित करें
- संकल्प लें -एकल उपयोग प्लास्टिक उत्पाद जैसे कप, तश्तरी, चम्मच, स्ट्रॉ, ईयरबड्स आदि का उपयोग न हो एवं पर्यावरण अनुकूल विकल्पों जैसे कागज/पत्तों से बने दोने या कटलरी को प्राथमिकता दी जाय |
- एकल उपयोग प्लास्टिक उत्पाद के प्रयोग को रोकने एवं प्लास्टिक बैग के बजाय कपड़े के थैले का उपयोग करने मात्र से 375 मिलियन टन ठोस (प्लास्टिक) कचरे का उत्सर्जन बचाया जा सकता है
- चक्रीय अर्थव्यवस्था (सर्कुलर इकोनॉमी) का समुचित कार्यान्वयन वर्ष 2030 तक लगभग 14 लाख करोड़ रुपये की अतिरिक्त बचत उत्पन्न कर सकता है | वेस्ट /अपशिष्ट फेकने के पूर्व सोचें, ये किसी का संसाधन तो नहीं ...?
- अनुपयोगी इलेक्ट्रिक / इलेक्ट्रॉनिक उत्पाद को कचरे में फेकने से रुकें | इसके उपयुक्त निस्तारण हेतु इसे प्राधिकृत ई – वेस्ट रीसाइकलर को दें | प्राधिकृत ई-रीसाइक्लिंग इकाई में अनुपयोगी इलेक्ट्रिक / इलेक्ट्रॉनिक उत्पाद को देने मात्र से 0.75 मिलियन टन तक ई-कचरे का पुनर्चक्रण किया जा सकता है एवं ई-कचरे के विषम पर्यावरणीय दुष्प्रभाव से बचा जा सकता है
- बाहर जाते समय - सोचें कि क्या आपको वास्तव में परिवहन की आवश्यकता है - वह भी क्या व्यक्तिगत रूप से ? छोटी दूरी के लिए पैदल चलना पसंद करें, अथवा सम्भव हो तो कार पूल के रूप में संसाधन को साझा करें अथवा सार्वजनिक परिवहन पर विचार करें
- घरेलू स्तर पर कम से कम ठोस अपशिष्ट का उत्सर्जन करें और इनका प्थाक्कीकरण करें
- उपयोगी शेष खाद्य सामग्री आपके स्वयं प्रयास अथवा निकटस्थ सक्रिय स्वयं सेवी संस्थाओं की सहायता से समाज के वंचित वर्ग तक पहुंचाई जा सकती है | वहीं अनुपयोगी भोजन /खाद्य सामग्री को कंपोस्ट (वर्मी कम्पोस्ट) करने से 15 अरब टन भोजन को नष्ट होने से बचाया जा सकता है
- ध्यान रखें - उपयुक्त नल और शावर के उपयोग से पानी की खपत को 30 - 40% तक कम किया जा सकता है। एवं उपयोग में न होने पर नलों को बंद रखने मात्र से 9 ट्रिलियन लीटर पानी बचाया जा सकता है
- ट्रैफिक लाइट/रेलवे क्रॉसिंग पर कार/स्कूटर के इंजन बंद करने मात्र से 22.5 बिलियन kWh तक ऊर्जा की बचत हो सकती है
- परम्परागत बल्ब के स्थान पर CFL का उपयोग बिजली की खपत में प्रभावी कमी लाते हैं | उपयोग में न होने पर बिजली उपकरणों को बंद करें | स्टार रेटेड विद्युत उपकरणों के उपयोग को प्राथमिकता दें

हमारे द्वारा अपनी जीवन शैली की प्राथमिकताओं का उचित और पर्यावरण अनुकूल पुनर्निर्धारण समाज और पर्यावरण के प्रति हमारा दायित्व है |

Annexure-3 (Annexure-3)

State Level Environment Impact Assessment Authority, Uttar Pradesh

Uploaded on www.seiaaup.in

Directorate of Environment, U.P.
Nivesh Bhawan, 4, Gomti Nagar Extn., Lucknow-226 010
Phone: 91-522-2300 611, Fax: 91-522-2300 548
E-mail: doeuplko@yahoo.com
Website: www.seiaaup.in

To,

Shri Neeraj Mishra,
Sr. Vice President Operation,
M/s Max Super Speciality Hospital,
W-3, Sector-1, Vaishali,
Ghaziabad, U.P

Ref. No. 260/Parya/SEAC/3639/2016 Date: 16 September, 2016

Sub: Environmental Clearance for Expansion of Max Super Speciality Hospital at W-3, Sector-1, Vaishali, Ghaziabad U.P. M/s Max Super Speciality Hospital, Regarding.

Dear Sir,

Please refer to your application/letters 14-03-2016, 21-03-2016, 12-07-2016, 25-07-2016, 12-07-2016 & 21-03-2016 addressed to the Secretary, State Level Expert Appraisal Committee (SEAC) and Director, Directorate of Environment Govt. of UP on the subject as above. A presentation was made by the representative of the project proponent along with their consultant M/s Perfact Enviro Solutions Pvt Ltd, in the SEAC meeting dated 21-07-2016.

The Project proponent, through documents submitted to SEAC and presentation made during meeting, has informed to the SEAC that:-

1. The environmental clearance is sought for Expansion of Max Super Specialty Hospital at W-3, Sector-1, Vaishali, Ghaziabad U.P. M/s Max Super Specialty Hospital.
2. Land use and activities of the project:

Land use	Existing Area (sqm)	Percentage (%)	Additional Area (sqm)	Area after expansion (sqm)	Percentage (%)
Ground coverage	4832.3 sqm	35	-	4832.3 sqm	35
Plantation Area	1387.91 sqm	10	1387.91	2775.81 sqm	20
Road & Open Area	7658.84 sqm	55	-1387.91	6270.94 sqm	45
Total Plot area	13879.05 sq m	100%		13879.05 sqm	100 %

3. Project details:

	Block-A		Block-B		Total
	Existing	Proposed	Existing	Proposed	
Plot Area					13879.05 sq m
Ground Coverage (Permissible)					4857.67 sq m
Ground Coverage (Achieved)	3335.2 sqm	-	1497.09 sqm	-	4832.3 sq m
FAR (Permissible)	-	-			84697.62 sq m
FAR (Achieved)	21602.99 sqm	Nil	1497.09 sqm	5708.21 sqm	28808.29 sqm

Total FAR Free area				(6th to 9th)	
Upper Basement Area	3770.66 sqm		1624.00 sqm		
Lower Basement Area	2648.00 sqm		1624.00 sqm		
Total Basement area	6418.66 sqm		3049.8 sqm		
Service Floor Area	3149.68 sqm				
Total proposed area for MLCP(Ist to 5th floor)	-			7339.05 sqm	
Other Non FAR	-			123.1 sq m	
Total achieved FAR free area	10567.71 sqm		3049.8 sq m	7462.15 sq m	
Total FAR area + FAR free area	91170.70 sqm		4546.89	13170.36 sq m	
Total built up Achieved	91170.70 sqm	-	4546.89 sq m	13170.36 sq m	48887.95 sq m

4. Other details:

Particular	Existing	Proposed	Total
Green Area	1887.91 sq m	1387.81 sq m	2775.81 sq m
No. of Floors	2B+G+S+7	2B+G+9	2B+G+S+7, 2B+G+9
No. of Towers/Block	1	1	2
Level of Basement	2	2	2
Height of Building	37.8 m	37.8 m	37.8 m
No. of Beds	302	134	436
Total Population	1617	494	2111
Total Sanctioned Load	500 KW	1000 KW	1500 KW
No. of DG sets	2x750 KVA	2 X1500 KVA	2 x1500 KVA (Existing 2 no. of DG set of capacity 750 KVA will be removed)
No. of GG Sets	1 x1021 KW 1 x 671 KW	2x400 KW	1 x1021 KW 1 x 671 KW & 2 x 400 KW
No. of Rain Water harvesting pits	2	Nil	2

5. Population:

POPULATION			
Type	Existing	Proposed	Total
In Patient	302	134	436
OPD	525	150	675
Staff	290	110	400
Visitor	500	100	600
Total Population	1617	494	2111

6. Power requirement & backup detail:

Power Source	Purvanchal Vidyut Vitran Nigam Limited
Total Power load	1500 KW
No. of DG sets	2x 1500 KVA After expansion 2 no of DG set of 750 KVA will be discarded
No. of GG sets	Existing 1 x671 KW & 1x 1021 KW

	Proposed 2 no. 2010 kW

7. Parking details:

Parking Required	874 ECS
Parking Provided	878 ECS

8. Waste water, rain water & solid waste management:

Total water requirement	990 KLD
Fresh Water Requirement	802 KLD
Treated water Reuse	97 KLD
Total waste water generation	872 KLD
STP capacity	Existing 210 KLD, Proposed : 250 KLD
ETP capacity	Proposed :25 KLD
No. of Rain water Harvesting pits	2 Nos.
Total Municipal Solid waste generated	567 Kg/ day
Bio-Medical waste	109 Kg/day

9. Project details (floor wise area details):

All Values are in sqm

S.No.	FLOORS	BLOCK A		BLOCK B	
		FAR	Non-FAR	FAR	Non-FAR
1	GROUND FLOOR	3335.18	-	1497.09	
2	FIRST FLOOR	3149.55	-		1467.81
3	SECOND FLOOR	3149.55	-		1467.81
4	THIRD FLOOR	2336.48	-		1467.81
5	FOURTH FLOOR	2232.31	-		1467.81
6	FIFTH FLOOR	2141.06	-		1467.81
7	SIXTH FLOOR	2141.06	-	1461.06	-
8	SEVENTH FLOOR	2141.06	-	1461.06	-
9	EIGHTH FLOOR	-	-	1461.06	-
10	NINTH FLOOR	-	-	1325.03	-
9	UPPER BASEMENT	-	3770.56	-	1524.90
10	LOWER BASEMENT	-	2647.60	-	1524.90
11	SERVICE FLOOR	-	3149.55	-	
12	Other non-FAR	-	-	-	123.1
	TOTAL AREA	21602.99 sqm	9567.71 sqm	7205.30 sqm	10511.95 Sqm

10. Water management (total):

WATER MANAGEMENT						
		TOWER A		TOWER B		TOTAL
S.No.		Population	Requirement in KLD	Population	Requirement in KLD	Requirement in KLD
1.	Domestic					
	In Patient	302	136	134	60	196
	OPD	525	24	150	7	31
	Staff	290	13	110	5	18
	Visitor	500	8	100	2	10
	Total	1617	181KLD	494	74 KLD Domestic: 52 Flushing: 22	255 KLD Domestic: 179 Flushing: 76
2.	Gardening		7		7	14
3.	Cooling		62		68	130
4.	Kitchen (In-		50		50	100

	Patient)						
5.	Laboratory		20		10	80	
6	Laundry				70	70	
	Total		20		270 KLD		599 KLD

11. Water management (tower a):

WATER MANAGEMENT					
S.No.		Population	Factor in LPCD	Requirement in KLD	Waste Water in KLD
1.	Domestic				
	In Patient	802	150	186	
	OPD	525	45	24	
	Staff	220	45	18	
	Visitor	400	15	8	
	Total	1017		181KLD	156 KLD
2.	Gardening			7	Nil
3.	Cooling			62	Nil
4.	Kitchen (In-Patient)			50	46
5.	Laboratory			20	10
	Total	1617		320 KLD	212 KLD

12. Water management (tower b):

WATER MANAGEMENT					
S.No.		Population	Factor in LPCD	Requirement in KLD	Waste Water in KLD
1.	Domestic				
	In-Patient	134	450	60	
	OPD	150	45	7	
	Staff	110	45	5	
	Visitor	100	15	2	
	Total	494		74 KLD Domestic: 52 Flushing: 22	64 KLD Domestic 42 Flushing: 22
2.	Gardening			7	Nil
3.	Cooling			68	Nil
4.	Kitchen (In-Patient)			50	46
5.	Labpratory			10	5
6.	Laundry			70	60
	Total			279 KLD	175 KLD

13. Solid waste management:

Type of Waste	Colours of Bins	Category	Disposal Method	Total Waste (Kg)
Organics	Green	Bio Degradable	Given to authorised vendor	397
Recyclable Items	Blue	Recyclible	Recycler	170
Total				567 Kg/day

14. The project proposals are covered under category B "a" of EIA Notification, 2006, as amended.

Based on the recommendations of the State Level Expert Appraisal Committee Meeting (SEAC) held on on 21-07-2016 the State Level Environment Impact Assessment Authority (SEIAA) in its Meeting held on 26-08-2016 decided to grant the Environmental Clearance to the project subject to the effective implementation of the following general and specific conditions:-

General conditions:

1. It shall be ensured that all standards related to ambient environmental quality and the emission/effluent standards as prescribed by the MoEF are strictly complied with.
2. It shall be ensured that obtain the no objection certificate from the U P pollution control board before start of construction.
3. It shall be ensured that no construction work or preparation of land by the project management except for securing the land is started on the project or the activity without the prior environmental clearance.
4. The proposed land use shall be in accordance to the prescribed land use. A land use certificate issued by the competent Authority shall be obtained in this regards.
5. All trees felling in the project area shall be as permitted by the forest department under the prescribed rules. Suitable clearance in this regard shall be obtained from the competent Authority.
6. Impact of drainage pattern on environment should be provided.
7. Surface hydrology and Water regime of the project area within 10 km should be provided.
8. A suitable plan for providing shelter, light and fuel, water and waste disposal for construction labour during the construction phase shall be provided along with the number of proposed workers.
9. Measures shall be undertaken to recycle and reuse treated effluents for horticulture and plantation. A suitable plan for waste water recycling shall be submitted.
10. Obtain proper permission from competent authorities regarding enhanced traffic during and due to construction and operation of project.
11. Obtain necessary clearances from the competent Authority on the abstraction and use of ground water during the construction and operation phases.
12. Hazardous/inflammable/Explosive materials likely to be stored during the construction and operation phases shall be as per standard procedure as prescribed under law, Necessary clearances in this regards shall be obtained.
13. Solid wastes shall be suitably segregated and disposed. A separate and isolated municipal waste collection center should be provided. Necessary plans should be submitted in this regards.
14. Suitable rainwater harvesting systems as per designs of groundwater department shall be installed. Complete proposals in this regard should be submitted.
15. The emissions and effluents etc. from machines, instruments and transport during construction and operation phases should be according to the prescribed standards. Necessary plans in this regard shall be submitted.
16. Water sprinklers and other dust control measures should be undertaken to take care of dust generated during the construction and operation phases. Necessary plans in this regard shall be submitted.
17. Suitable noise abatement measures shall be adopted during the construction and operation phases in order to ensure that the noise emissions do not violate the prescribed ambient noise standards. Necessary plans in this regard shall be submitted.
18. Separate stock piles shall be maintained for excavated top soil and the top soil should be utilized for preparation of green belt.
19. Sewage effluents shall be kept separate from rain water collection and storage system and separately disposed. Other effluents should not be allowed to mix with domestic effluents.
20. Hazardous/Solid wastes generated during construction and operation phases should be disposed off as prescribed under law. Necessary clearances in this regard shall be obtained.
21. Alternate technologies for solid waste disposals (like vermin-culture etc.) should be used in consultation with expert organizations.
22. No Wetland should be infringed during construction and operation phases. Any wetland coming in the project area should be suitably rejuvenated and conserved.
23. Pavements shall be so constructed as to allow infiltration of surface run-off of rain water. Fully impermeable pavements shall not be constructed. Construction of pavements around trees shall be as per scientifically accepted principles in order to provide suitable watering, aeration and nutrition to the tree.

24. The Green building Concept suggested by Indian Green Building Council, which is a part of CII Godrej GBC, shall be studied and followed as far as possible.
25. Compliance with the safety precautions norms and guidelines as outlined in National Building Code 2005 shall be compulsorily ensured.
26. Ensure usage of dual flush cisterns for flush cisterns and explore options to use sensor based fixtures, waterless urinals and other water saving techniques.
27. Explore options for use of dual plumbing line for use of water with different qualities such as municipal supply, recycled water, ground water etc.
28. Ensure use of measures for reducing water demand for landscaping and use xeriscaping, efficient irrigation equipments & controlled watering systems.
29. Make suitable provisions for using solar energy as alternative source of energy. Solar energy application should be incorporated for illumination of common areas, lighting for gardens and street lighting in addition to provision for solar water heating. Present a detailed report showing how much percentage of backup power for institution can be provided through solar energy so that use and polluting effects of DG sets can be minimized.
30. Make separate provision for segregation, collection, transport and disposal of e-waste.
31. Educate citizens and other stake holders by putting up hoardings at different places to create environmental awareness.
32. Traffic congestion near the entry and exit points from the roads adjoining the proposed project site must be avoided. Parking should be fully internalized and no public space should be utilized.
33. Prepare and present disaster management plan.
34. The project proponents shall ensure that no construction activity is undertaken without obtaining pre-environmental clearance.
35. A report on the energy conservation measures confirming to energy conservation norms finalized by Bureau of Energy efficiency should be prepared incorporating details about building material and technology, R & U Factors etc.
36. Fly ash should be used as building material in the construction as per the provision of fly ash notification of September, 1999 and amended as on August, 2003 (The above condition is applicable only if the project lies within 100 km of Thermal Power Station).
37. The DG sets to be used during construction phase should use low sulphur diesel type and should conform to E.P. rules prescribed for air and noise emission standards.
38. Alternate technologies to Chlorination (for disinfection of waste water) including methods like Ultra Violet radiation, Ozonation etc. shall be examined and a report submitted with justification for selected technology.
39. The green belt design along the periphery of the plot shall achieve attenuation factor conforming to the day and night noise standards prescribed for residential land use. The open spaces inside the plot should be suitably landscaped and covered with vegetation of indigenous variety.
40. The construction of the building and the consequent increased traffic load should be such that the micro climate of the area is not adversely affected.
41. The building should be designed so as to take sufficient safeguards regarding seismic zone sensitivity.
42. High rise buildings should obtain clearance from aviation department or concerned authority.
43. Suitable measures shall be taken to restrain the development of small commercial activities or slums in the vicinity of the complex. All commercial activities should be restricted to special areas earmarked for the purpose.
44. It is suggested that literacy program for weaker sections of society/women/adults (including domestic help) and under privileged children could be provided in a formal way.
45. The use of compact Fluorescent lamps should be encouraged. A management plan for the safe disposal of used/damaged CFLs should be submitted.
46. It shall be ensured that all Street and park lighting is solar powered. 50% of the same may be provided with dual (solar/electrical) alternatives.

Member Secretary
U.P. Environment

47. Solar water heater shall be installed to the maximum possible capacity. Plans may be drawn up accordingly as submitted with justification.
48. Treated effluents shall be maximally reused to aim for zero discharge. Where ever not possible, a detailed management plan for disposal should be prepared with quantities and quality of waste water.
49. The treated effluents should normally not be discharged into public sewers with terminal treatment facilities as they adversely affect the hydraulic capacity of STP. If unable, necessary permission from authorities should be taken.
50. Construction activities including movements of vehicles should be so managed so that no disturbance is caused to nearby residents.
51. All necessary statutory clearances should be obtained and submitted before start of any construction activity and if this condition is violated the clearance, if and when given, shall be automatically deemed to have been cancelled.
52. Parking areas should be in accordance with the norms of MOEF, Government of India. Plans may be drawn up accordingly and submitted.
53. The location of the STP should be such that it is away from human habitation and does not cause problem of odor. Odorless technology options should be examined and a report submitted.
54. The Environment Management plan should also include the break up costs on various activities and the management issues also so that the residents also participate in the implementation of the environment management plan.
55. Detailed plans for safe disposal of STP sludge shall be provided along with ultimate disposal location, quantitative estimates and measures proposed.
56. Status of the project as on date shall be submitted along with photographs from North, South, West and East side facing camera and adjoining areas should be provided.
57. Specific location along with dimensions with reference to STP, Parking, Open areas and Green belt etc. should be provided on the layout plan.
58. The DG sets shall be so installed so as to conform to prescribed stack heights and regulations and also to the noise standards as prescribed. Details should be submitted.
59. E-Waste Management should be done as per MoEF guidelines.
60. Electrical waste should be segregated & disposed suitably as not to impose Environmental Risk.
61. The use of suitably processed plastic waste in the construction of roads should be considered.
62. Displaced persons shall be suitably rehabilitated as per prescribed norms.
63. Dispensary for first aid shall be provided.
64. Safe disposal arrangement of used toiletries items in Hotels should be ensured. Toiletries items could be given complementary to guests, adopting suitable measures.
65. Diesel generating set stacks should be monitored for CO and HC.
66. Ground Water downstream of Rain Water Harvesting pit nearest to STP should be monitored for bacterial contamination. Necessary Hand Pumps should be provided for sampling. The monitoring is to be done both in pre and post monsoon, seasons.
67. The green belt shall consist of 50% trees, 25% shrubs and 25% grass as per MoEF norms.
68. A separate electric meter shall be provided to monitor consumption of energy for the operation of sewage/effluent treatment in tanks.
69. An energy audit should be annually carried out during the operational phase and submitted to the authority.
70. Project proponents shall endeavor to obtain ISO: 14001 certification. All general and specific conditions mentioned under this environmental clearance should be included in the environmental manual to be prepared for the certification purposes and compliance.
71. Environmental Corporate Responsibility (ECR) plan along with budgetary provision amounting to 2% of total project cost shall be submitted (within one month) on need base assessment study in the study area. Income generating measures which can help in up-liftment of weaker section of society consistent with the traditional skills of the people identified. The program me can include activities such as old age homes, rain water harvesting provisions in nearby areas, development of fodder

farm, fruit bearing orchards, vocational training etc. In addition, vocational training for individuals shall be imparted so that poor section of society can take up self employment and jobs. Separate budget for community development activities and income generating programmers shall be specified. Revised ECR plan is to be submitted within 3 month, failing which, the environmental Clearance shall be deemed to be cancelled.

72. Appropriate safety measures should be made for accidental fire.
73. Smoke meters should be installed as warning measures for accidental fires.
74. Plan for safe disposal of R.O rejects to be submitted.

Specific Conditions:

1. This environmental clearance is granted subject to land use verification. Local authority / planning authority should ensure this with respect to Rules, Regulations, Notifications, Government Resolutions, Circulars, etc. issued thereby.
2. The height, Construction built up area of proposed construction shall be in accordance with the existing FAR norms of the urban local body & it should ensure the same along with survey number before approving layout plan & before according commencement certificate to proposed work. Plan approving authority should also ensure the zoning permissibility for the proposed project as per the approved development plan of the area.
3. All required sanitary and hygienic measures should be in place before starting construction activities and to be maintained throughout the construction phase.
4. Project proponent shall ensure completion of STP, MSW disposal facility, green belt development prior to occupation of the buildings.
5. Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, creche and First Aid Room etc.
6. Adequate drinking water and sanitary facilities should be provided for construction workers at the site. Provision should be made for mobile toilets. The safe disposal of wastewater and solid wastes generated during the construction phase should be ensured.
7. The solid waste generated should be properly collected and segregated. Dry/inert solid waste should be disposed off to the approved sites for land filling after recovering recyclable materials.
8. Bio medical waste management shall be followed as per The Bio-Medical Waste (Management and Handling) Rules, 2016. Special attention to be given for Mercury waste management and disposal.
9. Necessary permissions should be sought for use and safe disposal of radioactive materials. Procedural protocol prescribed by competent authority should be followed for the same.
10. Sewage/other effluents from infectious diseases ward and pathology/laboratory should be treated/disinfected separately prior to ETP.
11. The total cost of the project is Rs. 70.0 Cr. A CSR plan with minimum Rs. 1.40 crores should be prepared and submitted. Details of CSR activities and list of beneficiaries with their mobile nos. should be submitted.
12. No parking shall be allowed outside the project boundary.
13. Parking space for ambulances shall be exclusively earmarked.
14. Police post shall be provided near emergency.
15. Dedicated power supply to be installed in Operation Theaters and other critical areas.
16. Accommodation for attendants to be provided near indoor wards. Battery operated vehicles to be used for internal transfer.
17. Passenger and stretcher lift to be provided for each tower.
18. Digging of basement shall be undertaken in view of structural safety of adjacent buildings under information/consultation with District Administration/Mining Department. All the topsoil excavated during construction activities should be stored for use in horticulture /landscape development within the project site. Additional soil for leveling of the proposed site shall be generated within the sites (to the extent possible) so that natural drainage system of the area is protected and improved.

19. The approval of competent authority shall be obtained for structural safety of the buildings due to any possible earthquake, adequacy of fire fighting equipments etc. as per National Building Code including measures from lighting.
20. Disposal of muck during construction phase should not create any adverse effect on the neighboring communities and be disposed taking the necessary precautions for general safety and health aspects of people, only in approved sites with the approval of competent authority.
21. Any hazardous waste generated during construction phase should be disposed off as per applicable rules and norms with necessary approval of the UP Pollution Control Board.
22. The diesel generator sets to be used during construction phase should be low sulphur diesel type and should conform to Environments (Protection) Rules prescribed for air and noise emission standards.
23. Ambient noise levels should conform to residential standards both during day and night. Incremental pollution loads on the ambient air and noise quality should be closely monitored during construction phase. Adequate measures should be made to reduce ambient air and noise level during construction phase, so as to conform to the stipulated standards by CPCB/UPPCB.
24. The green belt design along the periphery of the plot shall achieve attenuation factor conforming to the day and night noise standards prescribed for residential area. The open spaces inside the plot should be landscaped and covered with grass and shrubs. Green Belt Development shall be carried out considering CPCB guidelines including selection of plant species and in consultation with the local DFO/ Agriculture Dept.
25. Pavements shall be so constructed as to allow infiltration of surface run-off of rain water. Construction of pavements around trees should be able to facilitate suitable watering, aeration and nutrition to the tree.
26. Ready Mix Concrete and Sprinkler to be used for curing and quenching during construction phase.
27. The building should have adequate distance between them to allow movement of fresh air and passage of natural light, air and ventilation. Landscape plan to be revised accordingly.
28. Convenient shops, bank, canteen, post office and medicine shops etc to be provided with in complex.
29. RWH to be done only from roof top. Arrangement shall be made that waste water and storm water do not get mixed.
30. Organic waste convertor is to be installed at the site.
31. The name and address of vendor is to be submitted for biodegradable waste.
32. Bio Medical Waste is to be followed as per the latest notification and take NOC from UPPCB.

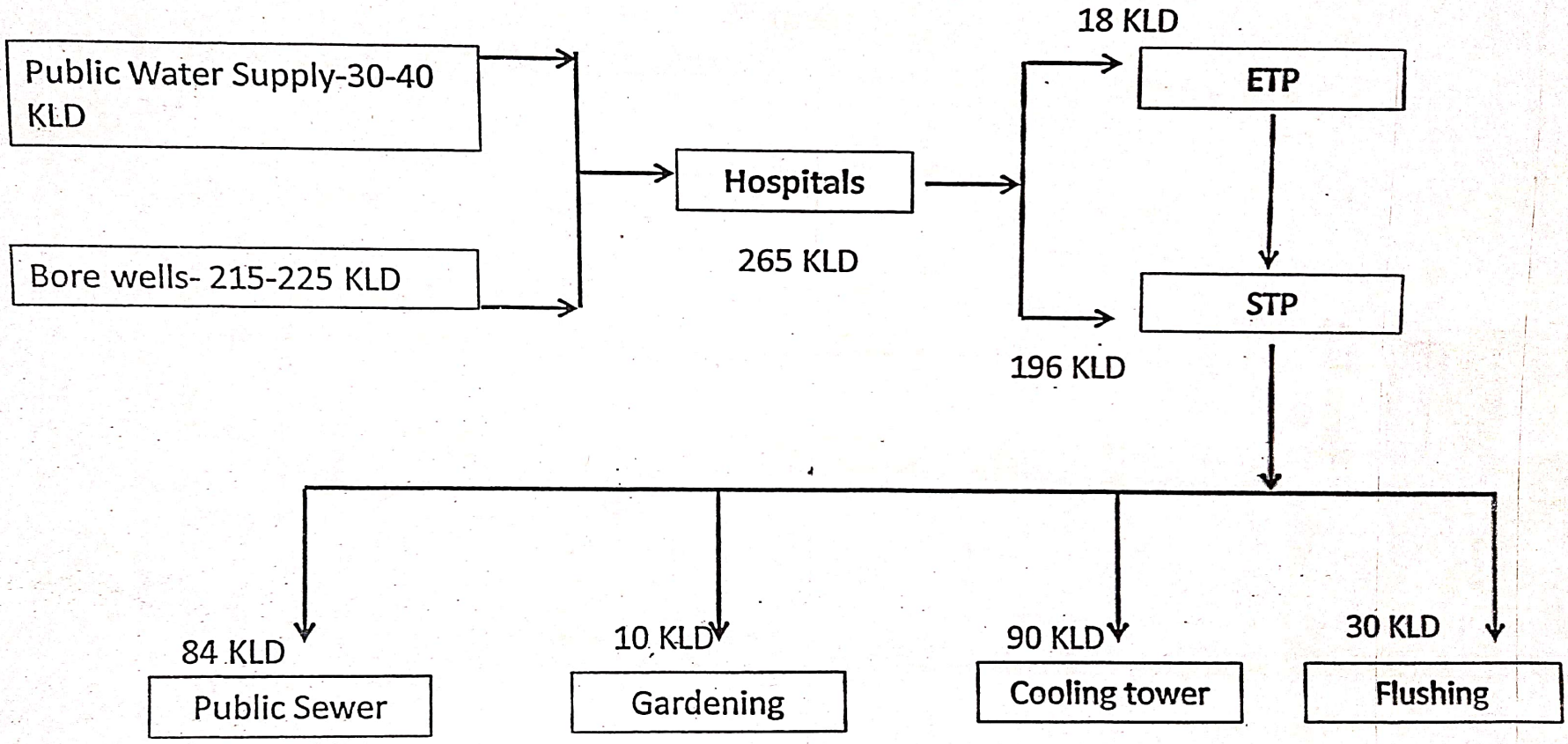
No construction/operation is to be started without obtaining Prior Environmental Clearance. Concealing factual data and information or submission of false/fabricated data and failure to comply with any of the conditions stipulated in the Prior Environmental Clearance attract action under the provision of Environmental (Protection) Act, 1986.

This Environmental Clearance is subject to ownership of the site by the project proponents in confirmation with approved Master Plan for Ghaziabad. In case of violation, it would not be effective and would automatically be stand cancelled.

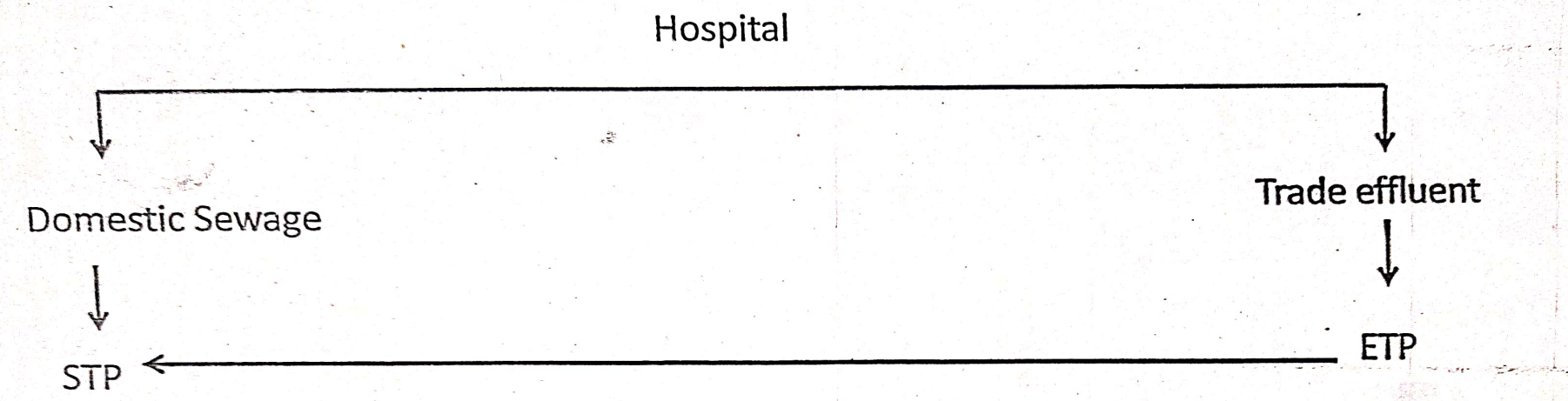
You are also directed to ensure that the proposed site is not a part of any no-development zone as required/prescribed/identified under law. In case of violation, this permission shall automatically deem to be cancelled. Also, in the event of any dispute on ownership or land use of the proposed site, this clearance shall automatically deemed to be cancelled.

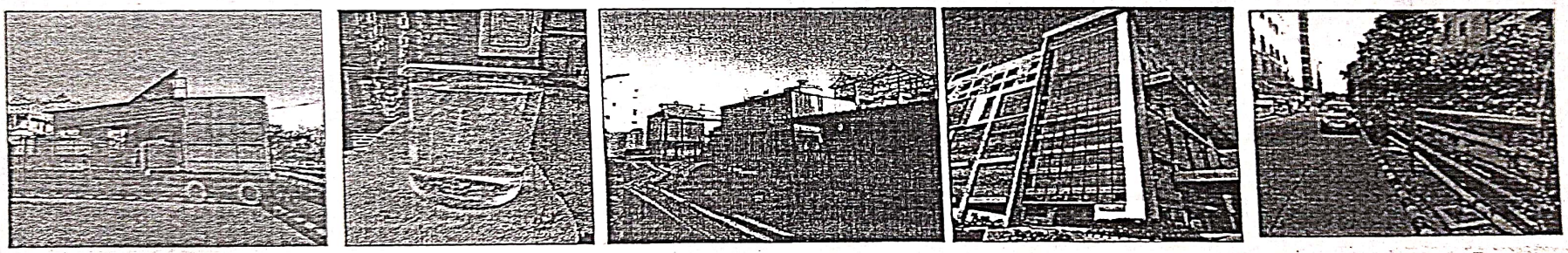
The project proponent will have to submit approved plans and proposals incorporating the conditions specified in the Environmental Clearance within 03 months of issue of the clearance. The SEIAA/MoEF reserves the right to revoke the environmental clearance, if conditions stipulated are not implemented to the satisfaction of SEIAA/MoEF. SEIAA may impose additional environmental conditions or modify the existing ones, if necessary. Necessary statutory clearances should be obtained and submitted, before start of any construction activity.

ANNEXURE-4
Water Management



ANNEXURE-4
Waste Water Recycling plan





- MBR based STP for better quality of product, test report is attached
- Use of STP treated water in cooling, gardening and flushing provision
- Extended the garden water line for gardening Inside and outside both
- Use of STP treated water in sprinkling in duration of high air pollution
- Use of RO reject in secondary purpose

ANNEXTURE - 4

Membrane Bio Reactor,

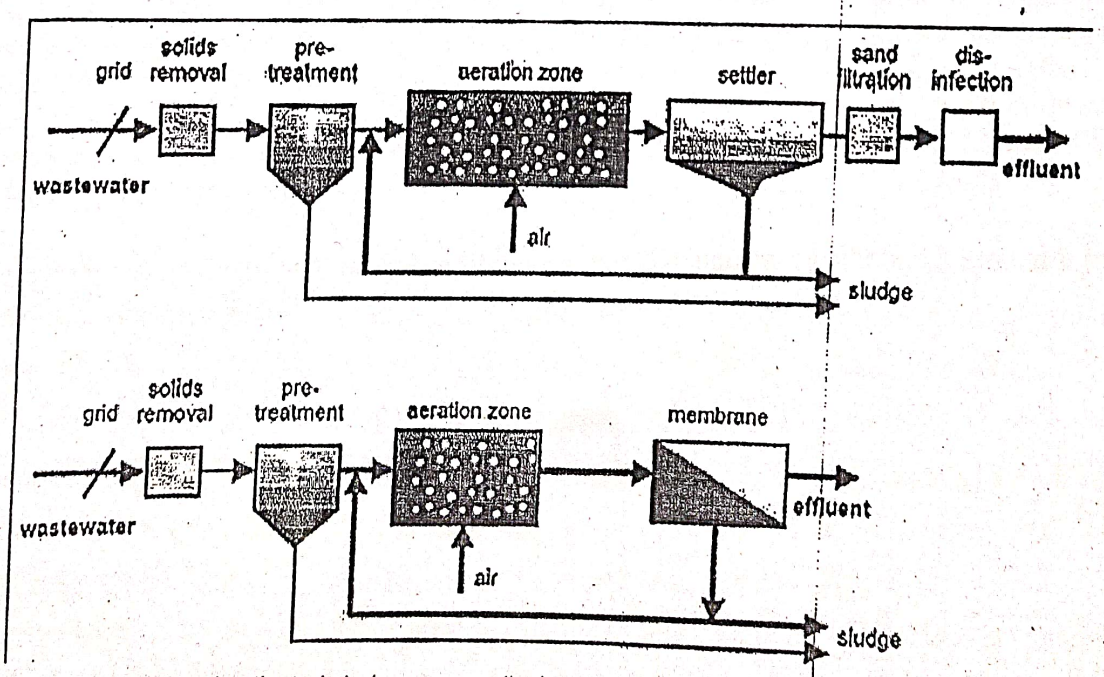
Membrane bioreactor (MBR) is the combination of a membrane process like microfiltration or ultrafiltration with a biologicalwastewater treatment process, the activated sludge process. It is now widely used for municipal and industrial wastewater treatment.

When used with domestic wastewater, MBR processes can produce effluent of high quality enough to be discharged to coastal, surface or brackish waterways or to be reclaimed for urban irrigation. Other advantages of MBRs over conventional processes include small footprint, easy retrofit and upgrade of old wastewater treatment plants.

It is possible to operate MBR processes at higher mixed liquor suspended solids (MLSS) concentrations compared to conventional settlement separation systems, thus reducing the reactor volume to achieve the same loading rate.

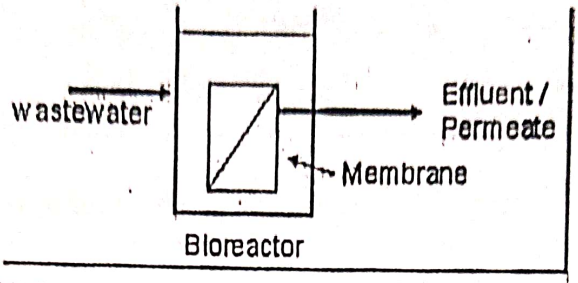
Two MBR configurations exist: internal/submerged, where the membranes are immersed in and integral to the biological reactor; and external/side stream, where membranes are a separate unit process requiring an intermediate pumping step.

In the MBR process, raw sewage from equalization or holding tank first passes through fine screens to remove substances that may clog or scratch the membrane before going into the MBR facilities.



Schematic of conventional activated sludge process (top) and external (sidestream) membrane bioreactor (bottom)

Recent technical innovation and significant membrane cost reduction have enabled MBRs to become an established process option to treat wastewaters.[1] As a result, the MBR process has now become an attractive option for the treatment and reuse of industrial and municipal wastewaters, as evidenced by their constantly rising numbers and capacity.



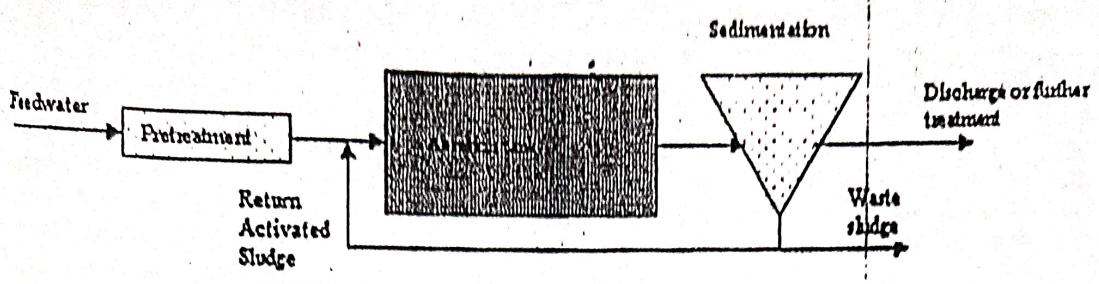
Schematic of a submerged MBR

MBR - Membrane BioReactors for Wastewater Treatment

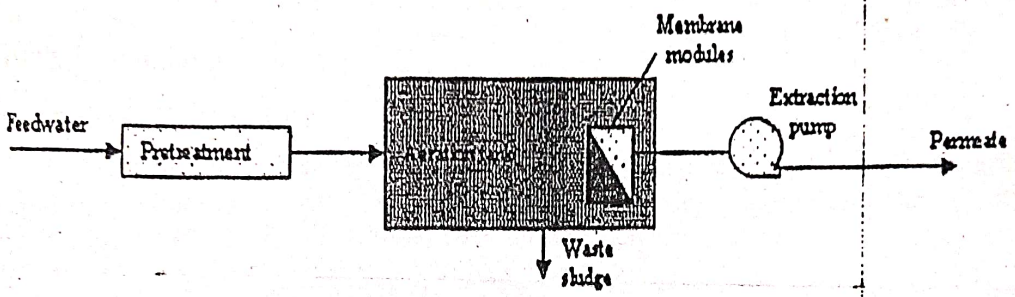
MBR - Membrane Bioreactor Systems are no longer viewed as a novel process as it is used more and more in wastewater treatment applications all over the world.

Wastewater represents a water resource and its reuse can significantly reduce the demand for water supply. Membrane Bioreactor is an effective and economic treatment process for water reuse and reclamation. Advanced membrane technology development includes membrane bioreactors and multi-barrier reclamation processes using dual membrane stages. A common water reclamation process is by integrating MBR and RO (Reverse Osmosis) to produce high quality product water for reuse.

Compared with conventional activated sludge system, the membrane bioreactor system is much simpler, as shown below.



Conventional Biological Treatment Process



Membrane Bioreactor (MBR) Process

3. What are the advantages of MBRs?

It's generally acknowledged that membrane bioreactors have a number of advantages over other wastewater technologies,

- I. Independent control of HRT and SRT
- II. High quality effluent
- III. Small footprint
- IV. Improved bio-treatment.
- V. Independent control of HRT and SRT
- VI. MBR OPEX

I. Independent control of HRT and SRT

As the biological solids (mixed liquor or sludge) are completely contained in the bioreactor, this allows for the solids retention time (SRT) to be controlled independently from the hydraulic retention time (HRT). In the CAS process, the flocculent solids ('flocs') that are essentially the biomass have to be allowed to grow in size to the point where they can be settled out in the secondary clarifier.

So in CAS the HRT and SRT are connected; as the HRT increases, the floos have to grow which then increases their settle-ability.

II. High quality effluent

With the membrane pores of the MBR being of a small size (<0.5), the treated effluent has a very high clarity and significantly reduced pathogen concentration compared with the CAS process. The effluent has enough high quality to be discharged to water bodies or to be used for such applications as urban irrigation, utilities or toilet flushing. It can also be fed directly to a reverse osmosis process in order to get a permeate of even higher water quality.

III. Small footprint

CAS has a high HRT which leads to a larger plant size required. In MBRs, due to higher concentrations obtained, the same total mass of solids is contained in a smaller volume, so the footprint is smaller.

IV. Better bio-treatment

MBRs have higher SRT which tends to provide better overall bio-treatment due to encouraging the development of the slower-growing micro-organisms, specifically nitrifiers. This fact makes MBRs very effective at the biological removal of ammonia ('nitrification').

V. What are the disadvantages of MBRs?

The key disadvantages of an MBR are the operational process complexity and the cost which is translated to CAPEX and OPEX.

Both of the latter are highly sensitive to the cost of the membrane. The OPEX is additionally sensitive to,

- the membrane life
- permeate flux
- the membrane air scour rate (air scour energy)

VI. MBR OPEX

In general, the major elements that affect the MBR OPEX include:

1. membrane cost / m^2 membrane surface area
2. membrane life in years
3. net permeate flux (product flow/unit area), taking account of the downtime and the use of the product water for cleaning the membrane
4. land costs/ m^2 land area
5. energy cost/ kWh
6. value of the improved water quality

An MBR, or Membrane Zone, can best be described as the initial step in a biological process where microbes are used to degrade pollutants that are then filtered by a series of submerged membranes (or membrane elements).

The individual membranes are housed in units known as modules, cassettes or racks and a combined series of these modules are referred to as a working membrane unit.

Air is introduced through integral diffusers to continually scour membrane surfaces during filtration, facilitate mixing and in some cases, to contribute oxygen to the biological process.

The benefits of MBR includes a reduced footprint, usually 30-50% smaller than an equivalent conventional active sludge facility with secondary clarifiers and media tertiary filtration.

The process also produces exceptional effluent quality capable of meeting the most stringent water quality requirements, a modular schematic that allows for ease of expansion and configuration flexibility, a robust and reliable operation and reduced downstream disinfection requirements.

- Simple and high-performance PVDF flat sheet type membrane
- Air is constantly diffused from beneath the bottom of membrane module
- Movable unit easy installation
- Modular design
- Minimize site construction works

VII.Summary

MBRs are drastically changing not only how we view water but also how we treat and manage it. The treatment capability of an MBR will quickly drive it to the forefront of the wastewater treatment industry. No other technology can provide the same level of treatment in the same, small footprint and at the same, small cost. Water sustainability will help drive economies and provide communities with a reliable and dependable water supply. MBRs will undoubtedly play a critical role in advancing such sustainability goals.

ANNEXURE -5

कार्यालय अपर पुलिस अधीक्षक यातायात जनपद गाजियाबाद।

पत्रांकःआर–एसपीटी–२०/2020 [illegible] 2020

सेवा में,

[illegible],
[illegible],
जनपद–गाजियाबाद।

कृपया आपके द्वारा प्रेषित प्रार्थना–पत्र दिनांक 20.0?.2010 के क्रम में निरीक्षक यातायात की यातायात से मौके [illegible] का निरीक्षण कराया गया, निरीक्षक यातायात [illegible] आख्यानुसार भवन पूर्ण [illegible] रहा है। तथा नये भवन में पार्किंग की व्यवस्था है। वर्तमान में यातायात सम्बन्धी कोई समस्या नहीं है।

अस्तु सड़क के किनारे गाड़ियाँ पार्क न होने तथा यातायात बाधित न होने की दशा में यातायात अनापत्ति/अनुमति प्रदान की जाती है।

(एस०एन०सिंह)
अपर पुलिस अधीक्षक यातायात
गाजियाबाद

ANNEXURE- 7

प्रपत्र XV
(नियम अनुसूची का अनुच्छेद 6 देखिए)
FORM XV
(see Article 6 of the First Schedule)

अधिष्ठापनों में पेट्रोलियम के आयात और भंडारकरण के लिए अनुज्ञप्ति
LICENCE TO IMPORT AND STORE PETROLEUM IN AN INSTALLATION

अनुज्ञप्ति सं. (Licence No.) : P/CC/UP/16/2089(P218034) फीस रुपए (Fee Rs.) 5000/- per year

M/S. Crosslay Remedies Limited,, Plot No W-3, Sector - 1,, Valshall,, Ghaziabad, Ghaziabad, Taluka: Ghaziabad, District: GHAZIABAD, State: Uttar Pradesh, PIN: 201012 को केवल इसमें यथा विनिर्दिष्ट वर्ग और मात्राओं में पेट्रोलियम 30.00 KL आयात करने के लिए और उसका, नीचे वर्णित और अनुमोदित नक्शा संख्या P/CC/UP/16/2089(P218034) तारीख 03/11/2020 जो कि इससे उपाबद्ध है, में दिखाए गए स्थान पर भण्डारकरण के लिए पेट्रोलियम अधिनियम, 1934 के उपबंधों या उसके अधीन बनाए गए नियमों तथा इस अनुज्ञप्ति की अतिरिक्त शर्तों के अधीन रहते हुए, यह अनुज्ञप्ति अनुदत्त की जाती है ।

Licence is hereby granted to M/S. Crosslay Remedies Limited,, Plot No W-3, Sector - 1,, Valshall,, Ghaziabad, Ghaziabad, Taluka: Ghaziabad, District: GHAZIABAD, State: Uttar Pradesh, PIN: 201012 valid only for the importation and storage of 30.00 KL Petroleum of the class and quantities as herein specified and storage thereof in the place described below and shown on the approved plan No P/CC/UP/16/2089(P218034) dated 03/11/2020 attached hereto subject to the provisions of the Petroleum Act, 1934 and the rule made thereunder and to the further conditions of this Licence.

यह अनुज्ञप्ति 31st day of December 2025 तक प्रवृत रहेगी ।
The Licence shall remain in force till the 31st day of December 2025

पेट्रोलियम का विवरण /Description of Petroleum	अनुज्ञप्त मात्रा (किलोलीटरों में) /Quantity licenced in KL
वर्ग क प्रपुंज पेट्रोलियम /Petroleum Class A in bulk	NIL
वर्ग क प्रपुंज पेट्रोलियम से भिन्न /Petroleum Class A, otherwise than in bulk	NIL
वर्ग ख प्रपुंज पेट्रोलियम /Petroleum Class B in bulk	30.00 KL
वर्ग ख प्रपुंज पेट्रोलियम से भिन्न /Petroleum Class B, otherwise than in bulk	NIL
वर्ग ग प्रपुंज पेट्रोलियम /Petroleum Class C in bulk	NIL
वर्ग ग प्रपुंज पेट्रोलियम से भिन्न /Petroleum Class C,otherwise than in bulk	NIL
कुल क्षमता /Total Capacity	30.00 KL

July 31, 2009

Jt. Chief Controller of Explosives
CC, Agra

अनुज्ञप्त परिसरों का विवरण और अवस्थान
DESCRIPTION AND LOCATION OF THE LICENSED PREMISES.

अनुज्ञप्त परिसर जिसकी विन्यास सीमाएं अन्य विशिष्टियां संलग्न अनुमोदित नक्शे में दिखाई गई हैं Plot No: Plot No W-3, Sector - 1,, NA, Valshali Ghaziabad, District: GHAZIABAD, State: Uttar Pradesh, PIN: 999999 स्थान पर अवस्थित है तथा उसमें निम्नलिखित One/Ug tank Petroleum Classd B (HSD) together with connected other facilities. सम्मिलित हैं ।

The licensed premises, the layout , boundaries and other particulars of which are shown in the attached approved plan are situated at Plot No: Plot No W-3, Sector - 1,, NA, Valshali Ghaziabad, District: GHAZIABAD, State: Uttar Pradesh, PIN: 999999 and consists of One/Ug tank Petroleum Classd B (HSD) together with connected other

FARELABS
Science | Technology | Innovation

FARE LABS Private Limited (Testing Division)
Location 1 (Permanent Facility)
L-17/3, DLF Phase-II, IFFCO Chowk,
M.G. Road, Gurugram - 122 002, Haryana, INDIA.
Tel. : +91-124-4223207-08, 4034205 | Cell : +91-9289351688
Location 1 (Permanent Site Facility)
D-18, Infocity Ph.-II, Sec-33, Gurugram - 122001, Haryana, INDIA.
Tel. : +91-124-4057437 | Cell : +91-9289351688
Email : farelabs@farelabs.com | Website : www.farelabs.com

TEST REPORT

Issued to :
Max Hospital Vaishali
W-3, Sector-1, Vaishali, Ghaziabad 201012
Uttar Pradesh, India

J.O. No.	: ENV20250917-024-060
ULR Code	: TC5503 25 3 00015805 F
Report Date	: 22-09-2025
Sample Receipt Date	: 17-09-2025
Account Manager	: BD Team 3
Credit Manager	: Septesh Kumar

TC - 5503

Customer Provided Information:#

Nature of the Sample	: **Stack Emissions**
Make & Model No.	: Cummins & KTA-50-G8
Engine No.	: 25429408
Rated Capacity	: 1500 KVA
Type of Stack /Duct	: Metal
Stack Height from Ground Level (m)	: 30
Diameter of the Stack (m)	: 0.5
Operation Load During Monitoring	: 1120 KVA

Laboratory Provided Information:

Date of Sampling	: 17-09-2025
Time of sampling	: 12:15 PM
Test Started On	: 17-09-2025
Test Completed On	: 22-09-2025
Purpose of Monitoring	: To Check Pollution Load
Name of the Emission Source Monitoring	: DG Set- 1
Sampling Method	: IS-11255 (P-7, P-3)& FL/SOP/ENV/D-02
Stack Identification	: Stack attached to DG Set- 1
Normal Operating Schedule	: As per requirement
Sampling Duration (min)	: 31
Flue Gas Temperature °C	: 138.6
Ambient Air Temperature °C	: 35
Flue Gas Velocity (m/s)	: 10.48
Volumetric Flow Rate (Nm^3/h)	: 5358.44
Pollution Control Device if any	: Retrofit Emission Control Device

Analysis Report

S. No.	Parameters	Unit	Test Results	Specification as Per CAQM Direction No. 76 Act 2021* (Maximum Allowable Limit)	Test Method
Chemical Analysis					
1	Carbon Dioxide	% by Vol.	6.67	NA	IS:11255 (P-1)
2	Carbon Monoxide at 15% O_2	mg/Nm^3	92.37	100	FL/SOP/ENV-26
3	Hydrocarbons, at 15% O_2	mg/Nm^3	2.87	NA	FL/SOP/02-24
4	Oxides of Nitrogen (as NO_2) at 15% O_2	mg/Nm^3	246.89	650	IS:11255 (P-7)
5	Oxygen	% by Vol.	16.25	NA	IS:11255 (P-4)
6	Particulate matter at 15% O_2	mg/Nm^3	29.18	50	IS:11255 (P-1)

Authorised Signatory
Mr. Arun Kumar Chaturvedi, Scientist-C

FARELABS
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TEST REPORT

Issued to :
Max Hospital Vaishali
W-3, Sector-1, Vaishali, Ghaziabad 201012
Uttar Pradesh, India

J.O. No.	: ENV20250917-024-060
ULR Code	: TC5503 25 3 00015805 F
Report Date	: 22-09-2025
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Account Manager	: BD Team 3
Credit Manager	: Septesh Kumar

TC - 5503

Customer Provided Information:#

Nature of the Sample	: **Stack Emissions**
Make & Model No.	: Cummins & KTA-50-G8
Engine No.	: 25429408
Rated Capacity	: 1500 KVA
Type of Stack /Duct	: Metal
Stack Height from Ground Level (m)	: 30
Diameter of the Stack (m)	: 0.5
Operation Load During Monitoring	: 1120 KVA

Laboratory Provided Information:

Date of Sampling	: 17-09-2025
Time of sampling	: 12:15 PM
Test Started On	: 17-09-2025
Test Completed On	: 22-09-2025
Purpose of Monitoring	: To Check Pollution Load
Name of the Emission Source Monitoring	: DG Set- 1
Sampling Method	: IS-11255 (P-7, P-3)& FL/SOP/ENV/D-02
Stack Identification	: Stack attached to DG Set- 1
Normal Operating Schedule	: As per requirement
Sampling Duration (min)	: 31
Flue Gas Temperature °C	: 138.6
Ambient Air Temperature °C	: 35
Flue Gas Velocity (m/s)	: 10.48
Volumetric Flow Rate (Nm^3/h)	: 5358.44
Pollution Control Device if any	: Retrofit Emission Control Device

Analysis Report

S. No.	Parameters	Unit	Test Results	Specification as Per CAQM Direction No. 76 Act 2021* (Maximum Allowable Limit)	Test Method
Chemical Analysis					
7	Sulphur Dioxide	mg/Nm^3	9.87	NA	IS:11255 (P-2)

NA= Not Applicable; ***CAQM**= Commission for Air Quality Management in National Capital Region and Adjoining Areas.

Authorised Signatory
Mr. Arun Kumar Chaturvedi, Scientist-C

******End of Report******

FARELABS
Science | Technology | Innovation

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Email : farelabs@farelabs.com | Website : www.farelabs.com

TEST REPORT

Issued to :
Max Hospital Vaishali
W-3, Sector-1, Vaishali, Ghaziabad 201012
Uttar Pradesh, India

J.O. No.	: ENV20250917-024-062
ULR Code	: TC5503 25 3 00015807 F
Report Date	: 22-09-2025
Sample Receipt Date	: 17-09-2025
Account Manager	: BD Team 3
Credit Manager	: Septesh Kumar

TC - 5503

Customer Provided Information:#

Nature of the Sample	: **Stack Emissions**
Make & Model No.	: Cummins & KTA-50-G8-1
Engine No.	: 25429412
Rated Capacity	: 1500 KVA
Type of Stack /Duct	: Metal
Stack Height from Ground Level (m)	: 30
Diameter of the Stack (m)	: 0.5
Operation Load During Monitoring	: 1125 KVA

Laboratory Provided Information:

Date of Sampling	: 17-09-2025
Time of sampling	: 01:35 PM
Test Started On	: 17-09-2025
Test Completed On	: 22-09-2025
Purpose of Monitoring	: To Check Pollution Load
Name of the Emission Source Monitoring	: DG Set- 2
Sampling Method	: IS-11255 (P-7, P-3)& FL/SOP/ENV/D-02
Stack Identification	: Stack attached to DG Set- 2
Normal Operating Schedule	: As per requirement
Sampling Duration (min)	: 31
Flue Gas Temperature °C	: 134.9
Ambient Air Temperature °C	: 35
Flue Gas Velocity (m/s)	: 10.38
Volumetric Flow Rate (Nm^3/h)	: 5355.57
Pollution Control Device if any	: Retrofit Emission Control Device

Analysis Report

S. No.	Parameters	Unit	Test Results	Specification as Per CAQM Direction No. 76 Act 2021* (Maximum Allowable Limit)	Test Method
Chemical Analysis					
1	Carbon Dioxide	% by Vol.	7.18	NA	IS:11255 (P-1)
2	Carbon Monoxide at 15% O_2	mg/Nm^3	97.48	100	FL/SOP/ENV-26
3	Hydrocarbons, at 15% O_2	mg/Nm^3	2.38	NA	FL/SOP/02-24
4	Oxides of Nitrogen (as NO_2) at 15% O_2	mg/Nm^3	279.56	650	IS:11255 (P-7)
5	Oxygen	% by Vol.	16.67	NA	IS:11255 (P-4)
6	Particulate matter at 15% O_2	mg/Nm^3	32.57	50	IS:11255 (P-1)

Authorised Signatory
Mr. Arun Kumar Chaturvedi, Scientist-C

FARELABS
Science | Technology | Innovation

FARE LABS Private Limited (Testing Division)
Location 1 (Permanent Facility)
L-17/3, DLF Phase-II, IFFCO Chowk,
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Tel. : +91-124-4223207-08, 4034205 | Cell : +91-9289351688
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Tel. : +91-124-4057437 | Cell : +91-9289351688
Email : farelabs@farelabs.com | Website : www.farelabs.com

TEST REPORT

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Max Hospital Vaishali
W-3, Sector-1, Vaishali, Ghaziabad 201012
Uttar Pradesh, India

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Account Manager	: BD Team 3
Credit Manager	: Septesh Kumar

TC - 5503

Customer Provided Information:#

Nature of the Sample	: **Stack Emissions**
Make & Model No.	: Cummins & KTA-50-G8-1
Engine No.	: 25429412
Rated Capacity	: 1500 KVA
Type of Stack /Duct	: Metal
Stack Height from Ground Level (m)	: 30
Diameter of the Stack (m)	: 0.5
Operation Load During Monitoring	: 1125 KVA

Laboratory Provided Information:

Date of Sampling	: 17-09-2025
Time of sampling	: 01:35 PM
Test Started On	: 17-09-2025
Test Completed On	: 22-09-2025
Purpose of Monitoring	: To Check Pollution Load
Name of the Emission Source Monitoring	: DG Set- 2
Sampling Method	: IS-11255 (P-7, P-3)& FL/SOP/ENV/D-02
Stack Identification	: Stack attached to DG Set- 2
Normal Operating Schedule	: As per requirement
Sampling Duration (min)	: 31
Flue Gas Temperature °C	: 134.9
Ambient Air Temperature °C	: 35
Flue Gas Velocity (m/s)	: 10.38
Volumetric Flow Rate (Nm^3/h)	: 5355.57
Pollution Control Device if any	: Retrofit Emission Control Device

Analysis Report

S. No.	Parameters	Unit	Test Results	Specification as Per CAQM Direction No. 76 Act 2021* (Maximum Allowable Limit)	Test Method
Chemical Analysis					
7	Sulphur Dioxide	mg/Nm^3	7.21	NA	IS:11255 (P-2)

NA= Not Applicable; ***CAQM**= Commission for Air Quality Management in National Capital Region and Adjoining Areas.

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******End of Report******

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Uttar Pradesh, India

J.O. No. : ENV20250917-031-079
ULR Code : TC5503 25 3 00015824 F
Report Date : 22-09-2025
Sample Receipt Date : 17-09-2025
Account Manager : BD Team 3
Credit Manager : Septesh Kumar

TC - 5503

Customer Provided Information:#

Nature of the Sample : **DG Noise**
Make & Model No. : Cummins & KTA-50-G8
Engine Serial No. : 25429408
Rated Capacity : 1500 KVA

Laboratory Provided Information:

Date of Monitoring : 17-09-2025
Time of Monitoring : 11:35 AM
Test Started On : 17-09-2025
Test Completed On : 22-09-2025
Purpose of Monitoring : To Check Noise Level
Instrument used : Sound Level Meter
Test Protocol Followed : CPCB Guidelines

Analysis Report

S. No.	Parameters	Unit	Test Results	Specification as Per CPCB*	Test Method
Physical Analysis					
1	DG Noise level at 1 metre from the enclosure surface	dB(A)	74.2	NA	FL/SOP/ENV-08
2	DG Noise level, near the Acoustic Enclosure	dB(A)	99.8	NA	FL/SOP/ENV-08
3	Insertion Loss	dB(A)	25.6	25 Min.	FL/SOP/ENV-08

NA= Not Applicable; ***CPCB**= Central Pollution Control Board.

Authorised Signatory
Mr. Arun Kumar Chaturvedi, Scientist-C

******End of Report******

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J.O. No. : ENV20250917-031-080
ULR Code : TC5503 25 3 00015825 F
Report Date : 22-09-2025
Sample Receipt Date : 17-09-2025
Account Manager : BD Team 3
Credit Manager : Septesh Kumar

TC - 5503

Customer Provided Information:#

Nature of the Sample : **DG Noise**
Make & Model No. : Cummins & KTA-50-G8-1
Engine Serial No. : 25429412
Rated Capacity : 1500 KVA

Laboratory Provided Information:

Date of Monitoring : 17-09-2025
Time of Monitoring : 01:00 PM
Test Started On : 17-09-2025
Test Completed On : 22-09-2025
Purpose of Monitoring : To Check Noise Level
Instrument used : Sound Level Meter
Test Protocol Followed : CPCB Guidelines

Analysis Report

S. No.	Parameters	Unit	Test Results	Specification as Per CPCB*	Test Method
Physical Analysis					
1	DG Noise level at 1 metre from the enclosure surface	dB(A)	73.2	NA	FL/SOP/ENV-08
2	DG Noise level, near the Acoustic Enclosure	dB(A)	99.5	NA	FL/SOP/ENV-08
3	Insertion Loss	dB(A)	26.3	25 Min.	FL/SOP/ENV-08

NA= Not Applicable; ***CPCB**= Central Pollution Control Board.

Authorised Signatory
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******End of Report******

ANNEXURE -9

RAIN WATER HARVESTING SCHEME

Soil Quality	: Silt Loam
Annual Rain fall	: 614 mm
Peak Hourly Rain fall	: 60 mm/hr
Ground Water Level	: 10.75-11.10 m
No. of Existing Pits	: 2
Size of Pits	: Diameter-3.0 m; Depth- 4.5 m

RAIN WATER HARVESTING CALCULATION

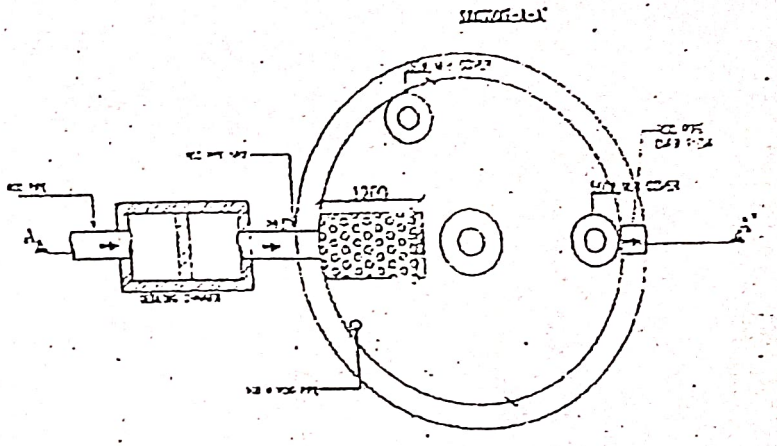
S. No.	Description of Area	Area - Considered (Sq. M)	Harvesting Factor / Collection Efficiency per area	Retention time capacity of recharge tank in 15 min (60 mm)	Total Volume of Water Available for Rain Water Harvesting (cu. m/15 min)
1	Water Available from Terraces of Apartment buildings/Plots and other roof-top surfaces	4832.3 sq m	0.85	15	62
	GRAND TOTAL				62 cu m

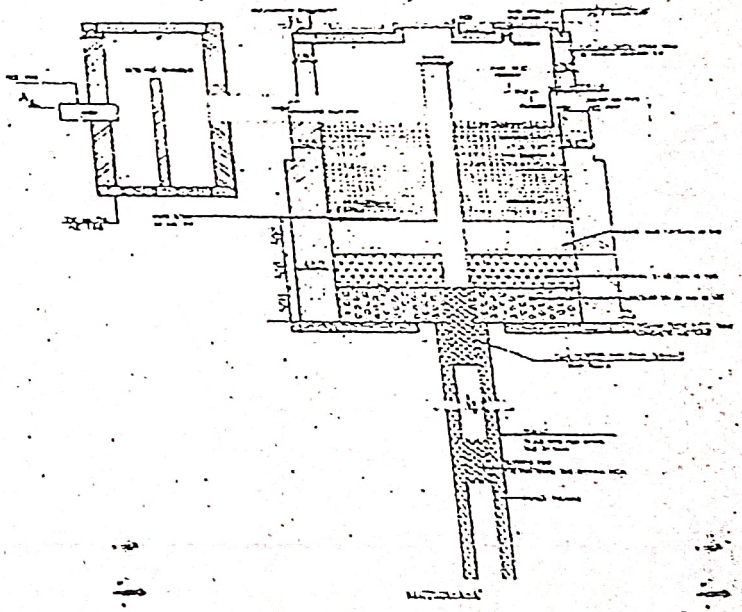
Annexure-9

RAIN WATER HARVESTING SCHEME

RAIN WATER HARVESTING PIT DIAGRA

Dia	Depth
3 Mtr	4.5 m

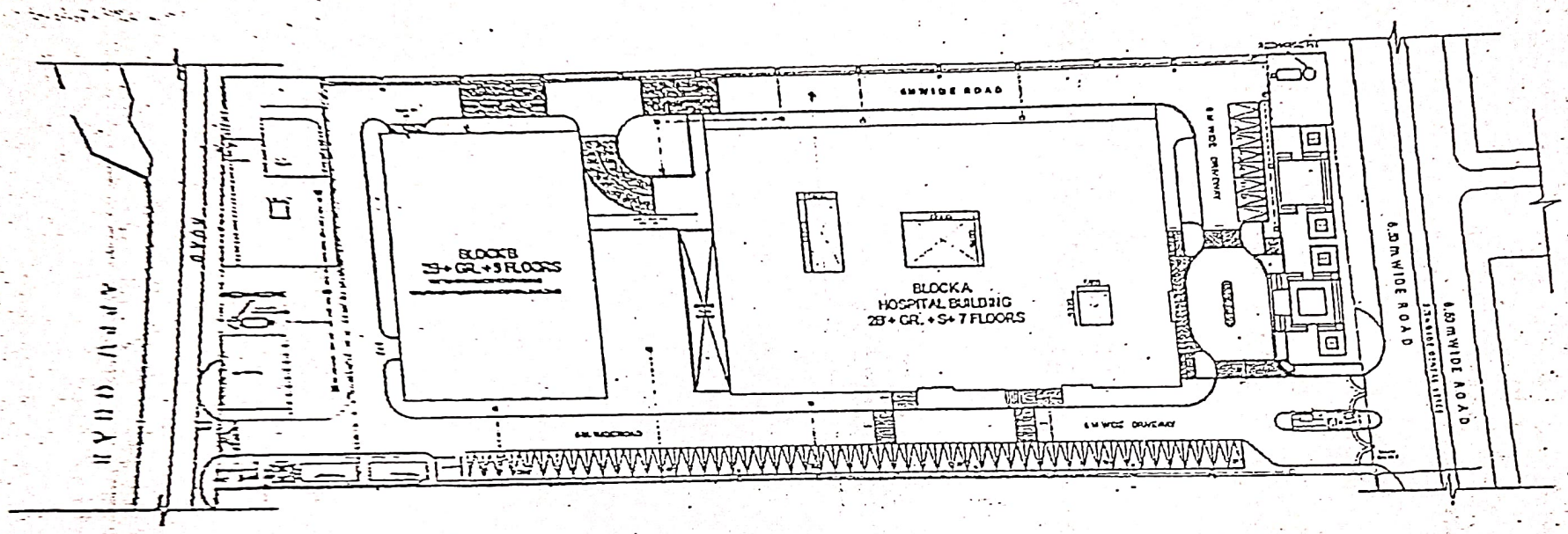




Maintenance of Rain water Harvesting Pits:

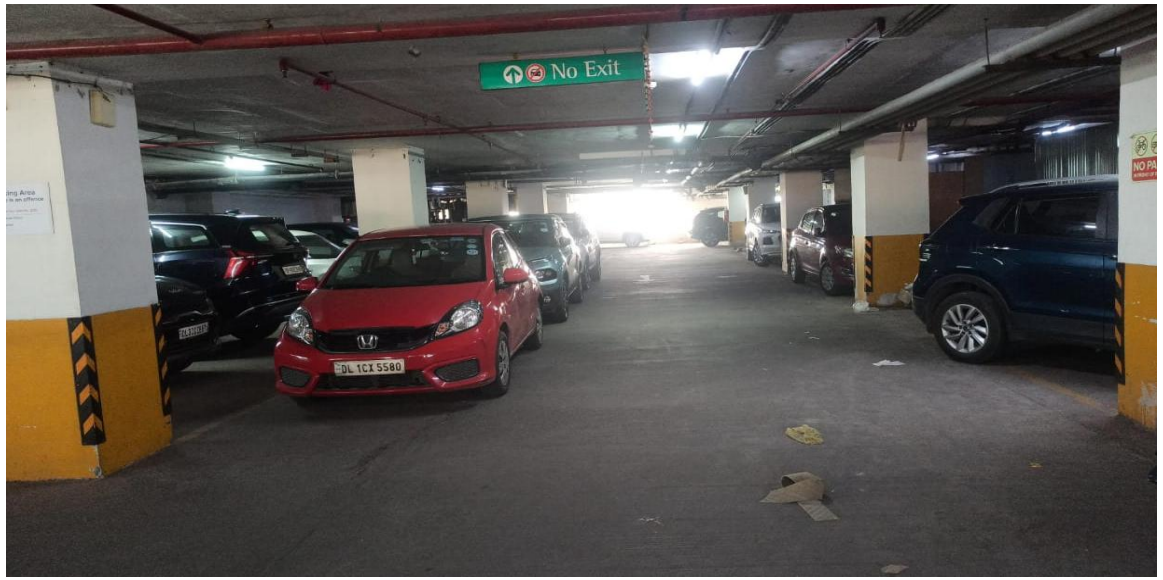
- Regular cleaning of rain water harvesting pits.
- Cleaning of de-silting tank on regular basis. It is well covered.
- Regular cleaning of oil and grease trap is don and maintained.

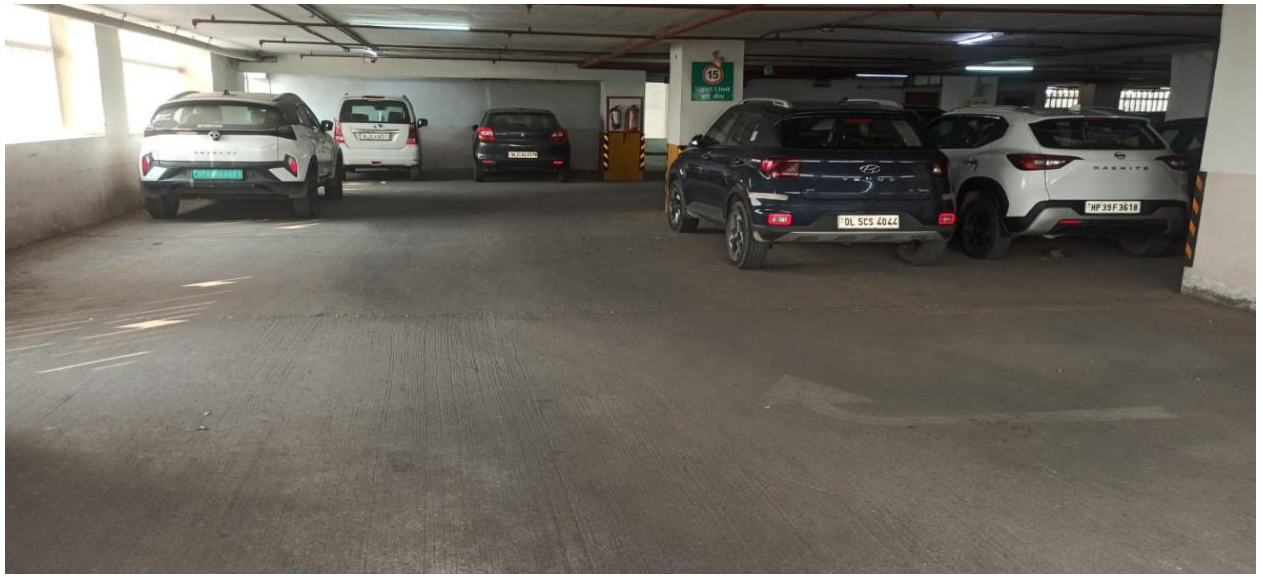
RAIN WATER HARVESTING PLAN

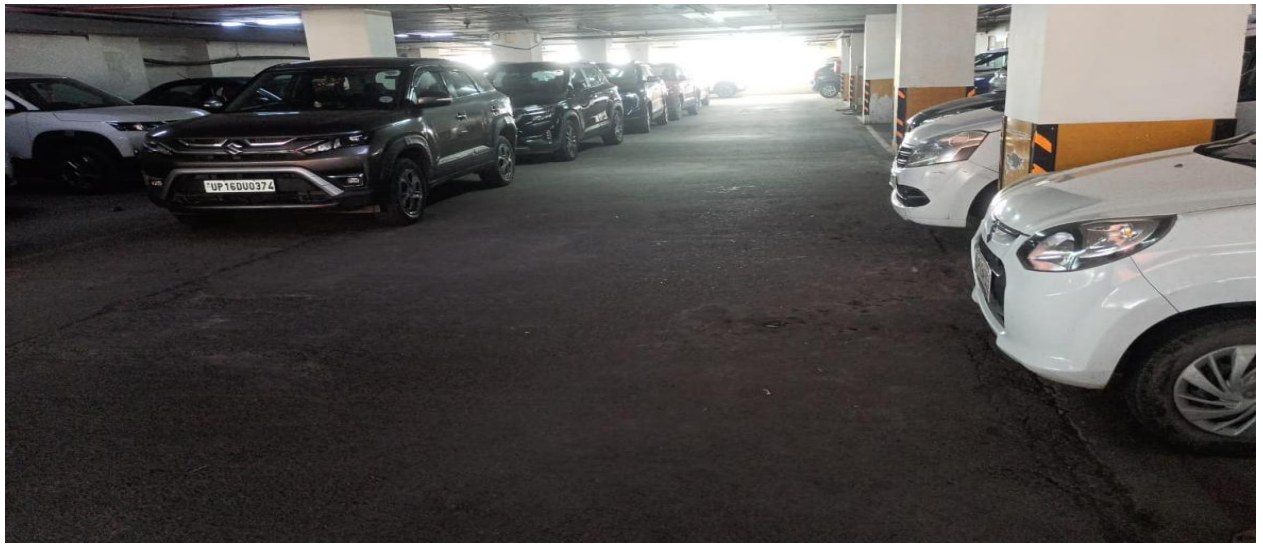


Organic waste converter (Annexure- 10)

Photo of internal Parking (Annexure- 12)







Annexure-. I I &

ANNEXURE- 13 (Annexure - I 3)

Max Vaishali

Green Features in Project

A concise list of Water Conservation Measures, Energy Efficiency Measures, and other Green Features

Annexure-10

Project achieves 10% Energy Savings by virtue of the following energy efficiency measures implemented in the building:

- **AAC Block Work**, for exterior walls on virtue of their low thermal conductivity.
- **High Performance DGU**, to reduce conduction gains and solar gains from Glazing.
- **Recessed Windows**, acting as shading device on glazing, hence reducing solar heat gains.
- **Interior LED Lights**, leading to reduced Lighting Power Density.
- **Reduction in Exterior Lighting Power Density**, leading to over 30% reduced LPDs w.r.t. ASHRAE 90.1-2010.
- **Heat recovery wheels** for pre-cooling outdoor air by using the waste exhaust air from Toilet, OT & Pantry etc.
- **VFD** for fan motor speed control in Cooling Tower.
- *Cooling Tower Approach:* Cooling towers for air conditioning system with for 5^0 F approach to ambient wet bulb temperature.

Other Green Features

- **Site Planning in a sustainable manner:**
  All the exposed soil surfaces of the campus site are covered with trees, shrubs and ground covers to reduce soil erosion & sedimentation and for aesthetic view to the building.
- **Reduced Heat Island Effect:** In order to minimize heat island effect so as to reduce negative impact on micro-climate, more than 75% of campus parking spaces are designed as underground and undercover.
- **Design catering to differently abled:**
  Project is designed in such a manner to effectively cater the requirements of differently abled people. Some of the prominent features are:
  - *Main entrances of the both the blocks are to the road level for the easy access of differently abled.*
  - *Preferred car park spaces which have easy access to the main entrances exclusively for differently abled.*
  - *Rest rooms in the common areas of the project are specifically designed for differently abled as per IGBC requirement.*
  - *Visual warning & Way finding signage's are provided in exterior common areas.*
- **Waste segregation (Provision of separate bins):**
  To encourage recycling of waste generated during post occupancy, below listed separate color coded bins are provided at all the exterior common areas of the campus to collect Dry waste, Wet waste, Hazardous waste and Bio-medical waste. Segregated dry waste, wet waste, hazardous waste and bio-medical waste are collected from all the exterior common areas and diverted to centralized waste collection facility, which is well accessible for hauling.
- **Organic Waste Treatment System:**
  To ensure effective organic waste management, project has installed an on-site organic waste treatment system to treat organic waste (food & garden waste) generated on site.

Water Conservation Measures

- **Rainwater harvesting at site:**

Project has implemented Rainwater Harvesting at site for water conservation. Surface storm water runoff is routed to rainwater harvesting recharge pits which are interconnected as a network.

Total 2 Nos. of recharge pits (8 m x 3.75 m x 4.5 m) are provided at the site to collect roof and site run-off.

- **Waste Water treatment:**

In order to treat waste water generated on-site, project team has designed and installed on-site sewage treatment plant (STP).

Sewage treatment plant (STP) of capacity 435 KLD (150 KLD for the Block A and 265 KLD for Block B). 100% of waste water generated on site is treated through STP, so as to ensure that only treated waste is discharged ensuring a safe disposal.

- **Water Metering:**

Project has incorporated sub-metering to improve water monitoring and thereby control potable water consumption.

Project has planned water meters for municipal water supply, laundry water consumption, treated water consumption for landscape requirements, treated water consumption for centralized HVAC cooling tower makeup, and treated water consumption for flushing.

- **Use of Water efficient plumbing fixtures:**

To minimize potable water consumption, project team has installed water efficient plumbing fixtures (flow and flush) whose flow rates meet or exceed IGBC baseline requirements.

Max Vaishali's Block A is an existing building and Block B is a new construction. The new block, "Block B" being constructed within the project campus is designed as a high performance building to minimize negative environmental impacts resulting from the development. Below is the list of Water Efficient Plumbing Fixtures:

S.No.	Type of Fixture	Proposed Make	Proposed Model No.	Flow rate of the Proposed Model	Baseline Flow rate specified by IGBC
1	Water Closet	Parryware	C0264	4/2 LPF	6/3 LPF
2	Urinal	Parryware	C0588 DC	1.5 LPF	4 LPF
3	Showerhead	Jaguar	OHS-1989	6 LPM	10 LPM
4	Health Faucet	Jaguar	ALD-573	6 LPM	6 LPM
5	Faucet	Jaguar	ATR-3001B	4 LPM	6 LPM

ANNEXURE- 13
COST OF ENVIRONMENT MANAGEMENT PLAN

RECURRING EXPENDITURE

S. N.	Description	Cost (Rs. in Lacs/ ~~Year~~)
1	Gardening	7.75
2	Waste Water Treatment	32
3	Waste disposal	0.68
i)	Hazardous waste disposal	3.35
ii)	Bio medical waste disposal	7.8
4	Environmental Monitoring	3.15
	Total	101.3

Annexure - 13

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Report Date	: 22-09-2025
Sample Receipt Date	: 17-09-2025
Account Manager	: BD Team 3
Credit Manager	: Septesh Kumar

TC - 5503

Customer Provided Information:#

Nature of the Sample	: **Stack Emissions**
Make & Model No.	: Cummins & KTA-50-G8
Engine No.	: 25429408
Rated Capacity	: 1500 KVA
Type of Stack /Duct	: Metal
Stack Height from Ground Level (m)	: 30
Diameter of the Stack (m)	: 0.5
Operation Load During Monitoring	: 1120 KVA

Laboratory Provided Information:

Date of Sampling	: 17-09-2025
Time of sampling	: 12:15 PM
Test Started On	: 17-09-2025
Test Completed On	: 22-09-2025
Purpose of Monitoring	: To Check Pollution Load
Name of the Emission Source Monitoring	: DG Set- 1
Sampling Method	: IS-11255 (P-7, P-3)& FL/SOP/ENV/D-02
Stack Identification	: Stack attached to DG Set- 1
Normal Operating Schedule	: As per requirement
Sampling Duration (min)	: 31
Flue Gas Temperature °C	: 138.6
Ambient Air Temperature °C	: 35
Flue Gas Velocity (m/s)	: 10.48
Volumetric Flow Rate (Nm^3/h)	: 5358.44
Pollution Control Device if any	: Retrofit Emission Control Device

Analysis Report

S. No.	Parameters	Unit	Test Results	Specification as Per CAQM Direction No. 76 Act 2021* (Maximum Allowable Limit)	Test Method
Chemical Analysis					
1	Carbon Dioxide	% by Vol.	6.67	NA	IS:11255 (P-1)
2	Carbon Monoxide at 15% O_2	mg/Nm^3	92.37	100	FL/SOP/ENV-26
3	Hydrocarbons, at 15% O_2	mg/Nm^3	2.87	NA	FL/SOP/02-24
4	Oxides of Nitrogen (as NO_2) at 15% O_2	mg/Nm^3	246.89	650	IS:11255 (P-7)
5	Oxygen	% by Vol.	16.25	NA	IS:11255 (P-4)
6	Particulate matter at 15% O_2	mg/Nm^3	29.18	50	IS:11255 (P-1)

Authorised Signatory
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Sampling Method	: IS-11255 (P-7, P-3)& FL/SOP/ENV/D-02
Stack Identification	: Stack attached to DG Set- 1
Normal Operating Schedule	: As per requirement
Sampling Duration (min)	: 31
Flue Gas Temperature °C	: 138.6
Ambient Air Temperature °C	: 35
Flue Gas Velocity (m/s)	: 10.48
Volumetric Flow Rate (Nm^3/h)	: 5358.44
Pollution Control Device if any	: Retrofit Emission Control Device

Analysis Report

S. No.	Parameters	Unit	Test Results	Specification as Per CAQM Direction No. 76 Act 2021* (Maximum Allowable Limit)	Test Method
Chemical Analysis					
7	Sulphur Dioxide	mg/Nm^3	9.87	NA	IS:11255 (P-2)

NA= Not Applicable; ***CAQM**= Commission for Air Quality Management in National Capital Region and Adjoining Areas.

Authorised Signatory
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4	Oxides of Nitrogen (as NO_2) at 15% O_2	mg/Nm^3	279.56	650	IS:11255 (P-7)
5	Oxygen	% by Vol.	16.67	NA	IS:11255 (P-4)
6	Particulate matter at 15% O_2	mg/Nm^3	32.57	50	IS:11255 (P-1)

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Tel. : +91-124-4057437 | Cell : +91-9289351688
Email : farelabs@farelabs.com | Website : www.farelabs.com

TEST REPORT

Issued to :
Max Hospital Vaishali
W-3, Sector-1, Vaishali, Ghaziabad 201012
Uttar Pradesh, India

J.O. No.	: ENV20250917-024-062
ULR Code	: TC5503 25 3 00015807 F
Report Date	: 22-09-2025
Sample Receipt Date	: 17-09-2025
Account Manager	: BD Team 3
Credit Manager	: Septesh Kumar

TC - 5503

Customer Provided Information:#

Nature of the Sample	: **Stack Emissions**
Make & Model No.	: Cummins & KTA-50-G8-1
Engine No.	: 25429412
Rated Capacity	: 1500 KVA
Type of Stack /Duct	: Metal
Stack Height from Ground Level (m)	: 30
Diameter of the Stack (m)	: 0.5
Operation Load During Monitoring	: 1125 KVA

Laboratory Provided Information:

Date of Sampling	: 17-09-2025
Time of sampling	: 01:35 PM
Test Started On	: 17-09-2025
Test Completed On	: 22-09-2025
Purpose of Monitoring	: To Check Pollution Load
Name of the Emission Source Monitoring	: DG Set- 2
Sampling Method	: IS-11255 (P-7, P-3)& FL/SOP/ENV/D-02
Stack Identification	: Stack attached to DG Set- 2
Normal Operating Schedule	: As per requirement
Sampling Duration (min)	: 31
Flue Gas Temperature °C	: 134.9
Ambient Air Temperature °C	: 35
Flue Gas Velocity (m/s)	: 10.38
Volumetric Flow Rate (Nm^3/h)	: 5355.57
Pollution Control Device if any	: Retrofit Emission Control Device

Analysis Report

S. No.	Parameters	Unit	Test Results	Specification as Per CAQM Direction No. 76 Act 2021* (Maximum Allowable Limit)	Test Method
Chemical Analysis					
7	Sulphur Dioxide	mg/Nm^3	7.21	NA	IS:11255 (P-2)

NA= Not Applicable; ***CAQM**= Commission for Air Quality Management in National Capital Region and Adjoining Areas.

Authorised Signatory
Mr. Arun Kumar Chaturvedi, Scientist-C

******End of Report******

FARELABS
Science | Technology | Innovation

FARE LABS Private Limited (Testing Division)
Location 1 (Permanent Facility)
L-17/3, DLF Phase-II, IFFCO Chowk,
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Tel. : +91-124-4057437 | Cell : +91-9289351688
Email : farelabs@farelabs.com | Website : www.farelabs.com

TEST REPORT

Issued to :
Max Hospital Vaishali
W-3, Sector-1, Vaishali, Ghaziabad 201012
Uttar Pradesh, India

J.O. No. : ENV20250917-031-079
ULR Code : TC5503 25 3 00015824 F
Report Date : 22-09-2025
Sample Receipt Date : 17-09-2025
Account Manager : BD Team 3
Credit Manager : Septesh Kumar

TC - 5503

Customer Provided Information:#

Nature of the Sample : **DG Noise**
Make & Model No. : Cummins & KTA-50-G8
Engine Serial No. : 25429408
Rated Capacity : 1500 KVA

Laboratory Provided Information:

Date of Monitoring : 17-09-2025
Time of Monitoring : 11:35 AM
Test Started On : 17-09-2025
Test Completed On : 22-09-2025
Purpose of Monitoring : To Check Noise Level
Instrument used : Sound Level Meter
Test Protocol Followed : CPCB Guidelines

Analysis Report

S. No.	Parameters	Unit	Test Results	Specification as Per CPCB*	Test Method
Physical Analysis					
1	DG Noise level at 1 metre from the enclosure surface	dB(A)	74.2	NA	FL/SOP/ENV-08
2	DG Noise level, near the Acoustic Enclosure	dB(A)	99.8	NA	FL/SOP/ENV-08
3	Insertion Loss	dB(A)	25.6	25 Min.	FL/SOP/ENV-08

NA= Not Applicable; ***CPCB**= Central Pollution Control Board.

Authorised Signatory
Mr. Arun Kumar Chaturvedi, Scientist-C

******End of Report******

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Email : farelabs@farelabs.com | Website : www.farelabs.com

TEST REPORT

Issued to :
Max Hospital Vaishali
W-3, Sector-1, Vaishali, Ghaziabad 201012
Uttar Pradesh, India

J.O. No. : ENV20250917-031-080
ULR Code : TC5503 25 3 00015825 F
Report Date : 22-09-2025
Sample Receipt Date : 17-09-2025
Account Manager : BD Team 3
Credit Manager : Septesh Kumar

TC - 5503

Customer Provided Information:#

Nature of the Sample : **DG Noise**
Make & Model No. : Cummins & KTA-50-G8-1
Engine Serial No. : 25429412
Rated Capacity : 1500 KVA

Laboratory Provided Information:

Date of Monitoring : 17-09-2025
Time of Monitoring : 01:00 PM
Test Started On : 17-09-2025
Test Completed On : 22-09-2025
Purpose of Monitoring : To Check Noise Level
Instrument used : Sound Level Meter
Test Protocol Followed : CPCB Guidelines

Analysis Report

S. No.	Parameters	Unit	Test Results	Specification as Per CPCB*	Test Method
Physical Analysis					
1	DG Noise level at 1 metre from the enclosure surface	dB(A)	73.2	NA	FL/SOP/ENV-08
2	DG Noise level, near the Acoustic Enclosure	dB(A)	99.5	NA	FL/SOP/ENV-08
3	Insertion Loss	dB(A)	26.3	25 Min.	FL/SOP/ENV-08

NA= Not Applicable; ***CPCB**= Central Pollution Control Board.

Authorised Signatory
Mr. Arun Kumar Chaturvedi, Scientist-C

******End of Report******

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TEST REPORT

Issued to :
Max Hospital Vaishali
W-3, Sector-1, Vaishali, Ghaziabad-201012
Uttar Pradesh, India

J.O. No. : W20250913-028-147
ULR Code : TC5503 25 2 00039612 F
Report Date : 18-09-2025
Sample Receipt Date : 13-09-2025
Account Manager : BD Team 3
Credit Manager : Septesh Kumar

Customer Provided Information:#
Nature/Name of the Sample : **ETP Inlet Water**
Location : ETP Plant

Laboratory Provided Information:
Sample Quantity & Packaging : 1Litre x 20, Pet Bottle
Test started on : 13-09-2025
Test Completed : 18-09-2025
Method of Sampling : FL/SOP/B/D-1
Date of Sampling : 13-09-2025
Sample Collected by : Mr. Uttkarsh Singh (FARE LABS Representative) at the premises of Max Hospital Vaishali

TC - 5503

Analysis Report

Physical Description : Light pink colour water contains suspended solids

S. No.	Parameters	Unit	Test Results	Method
Physical Analysis				
1	pH value	--	6.62	IS 3025 (P-11)
2	Total Suspended Solids	mg/L	72	IS 3025 (P-17)
Chemical Analysis				
1	Biochemical Oxygen Demand, @ 27°C For 3 Days	mg/L	370	IS 3025 (P-44)
2	Chemical Oxygen Demand	mg/L	1100	IS 3025 (P-58)
3	Oil And Grease	mg/L	13.80	IS 3025 (P-39)

Authorised Signatory
Ms. Nayla Tazeen, Scientist-B

FL/T/GEN/F-05

******End of Report******

Digitally Signed

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FARE LABS Private Limited (Testing Division)
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Email : farelabs@farelabs.com | Website : www.farelabs.com

TEST REPORT

Issued to :
Max Hospital Vaishali
W-3, Sector-1, Vaishali, Ghaziabad-201012
Uttar Pradesh, India

J.O. No. : W20250913-028-148
ULR Code : TC5503 25 2 00039613 F
Report Date : 18-09-2025
Sample Receipt Date : 13-09-2025
Account Manager : BD Team 3
Credit Manager : Septesh Kumar

Customer Provided Information:#
Nature/Name of the Sample : **ETP Outlet Water**
Location : ETP Plant

Laboratory Provided Information:
Sample Quantity & Packaging : 1Litre x 20, Pet Bottle
Test started on : 13-09-2025
Test Completed : 18-09-2025
Method of Sampling : FL/SOP/B/D-1
Date of Sampling : 13-09-2025
Sample Collected by : Mr. Uttkarsh Singh (FARE LABS Representative) at the premises of Max Hospital Vaishali

TC - 5503

Analysis Report

Physical Description : Clear water.

S. No.	Parameters	Unit	Test Results	Specification as per CPCB* Guidelines (Inland for Surface Water)	Method
Physical Analysis					
1	pH value	--	7.97	5.5-9.0	IS 3025 (P-11)
2	Total Suspended Solids	mg/L	7	100 Max	IS 3025 (P-17)
Chemical Analysis					
1	Bio-Assay Test	--	100% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent	IS 6582 (P-2)
2	Biochemical Oxygen Demand, @ 27°C For 3 Days	mg/L	9	30 Max	IS 3025 (P-44)
3	Chemical Oxygen Demand	mg/L	80	250 Max	IS 3025 (P-58)
4	Oil And Grease	mg/L	BLQ, (LOQ-2)	10 Max	IS 3025 (P-39)

***CPCB**= Central Pollution Control Board.
BLQ= Below Limit of Quantification; **LOQ=** Limit of Quantification

Opinion: The tested sample of water **conforms** to CPCB Guidelines for (Inland Surface Water), with respect to above tests only.

Authorised Signatory
Ms. Nayla Tazeen, Scientist-B

******End of Report******

FARELABS
Science | Technology | Innovation

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Location 1 (Permanent Facility)
L-17/3, DLF Phase-II, IFFCO Chowk,
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TEST REPORT

Issued to :
Max Hospital Vaishali
W-3, Sector-1, Vaishali, Ghaziabad-201012
Uttar Pradesh, India

J.O. No. : W20250913-028-145
ULR Code : TC5503 25 2 00039610 F
Report Date : 18-09-2025
Sample Receipt Date : 13-09-2025
Account Manager : BD Team 3
Credit Manager : Septesh Kumar

Customer Provided Information:#
Nature/Name of the Sample : **STP Inlet Water**
Location : STP Plant

Laboratory Provided Information:
Sample Quantity & Packaging : 1Litre x 20, Pet Bottle
Test started on : 13-09-2025
Test Completed : 18-09-2025
Method of Sampling : FL/SOP/B/D-1
Date of Sampling : 13-09-2025
Sample Collected by : Mr. Uttkarsh Singh (FARE LABS Representative) at the premises of Max Hospital Vaishali

TC - 5503

Analysis Report

Physical Description : Greyish colour water contains suspended solids.

S. No.	Parameters	Unit	Test Results	Method
Physical Analysis				
1	pH Value	--	6.94	IS 3025 (P-11)
2	Total Suspended Solids	mg/L	236	IS 3025 (P-17)
Chemical Analysis				
1	Biochemical Oxygen Demand, @ 27°C For 3 Days	mg/L	380	IS 3025 (P-44)
2	Chemical Oxygen Demand	mg/L	1100	IS 3025 (P-58)
3	Oil And Grease	mg/L	28.40	IS 3025 (P-39)

Authorised Signatory
Ms. Nayla Tazeen, Scientist-B

FL / T / GEN / F05

******End of Report******

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Science | Technology | Innovation

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Email : farelabs@farelabs.com | Website : www.farelabs.com

TEST REPORT

Issued to :
Max Hospital Vaishali
W-3, Sector-1, Vaishali, Ghaziabad-201012
Uttar Pradesh, India

J.O. No. : W20250913-028-146
ULR Code : TC5503 25 2 00039611 F
Report Date : 18-09-2025
Sample Receipt Date : 13-09-2025
Account Manager : BD Team 3
Credit Manager : Septesh Kumar

Customer Provided Information:#

Nature/Name of the Sample : **STP Outlet Water**
Location : STP Plant

Laboratory Provided Information:

Sample Quantity & Packaging : 1Litre x 20, Pet Bottle
Test started on : 13-09-2025
Test Completed : 18-09-2025
Method of Sampling : FL/SOP/B/D-1
Date of Sampling : 13-09-2025
Sample Collected by : Mr. Uttkarsh Singh (FARE LABS Representative) at the premises of Max Hospital Vaishali

TC - 5503

Analysis Report

Physical Description : Water contains suspended solids.

S. No.	Parameters	Unit	Test Results	Specification as per CPCB* Guidelines for STPs# (Inland for Surface Water), 2017	Method
Physical Analysis					
1	pH Value	--	8.38	6.5-9.0	IS 3025 (P-11)
2	Total Suspended Solids	mg/L	12	50 Max	IS 3025 (P-17)
Chemical Analysis					
1	Bio-Assay Test	--	100% survival of fish after 96 hours in 100% effluent	90% survival of fish after 96 hours in 100% effluent	IS 6582 (P-2)
2	Biochemical Oxygen Demand, @ 27°C For 3 Days	mg/L	18	20 Max	IS 3025 (P-44)
3	Chemical Oxygen Demand	mg/L	160	250 Max	IS 3025 (P-58)
4	Oil And Grease	mg/L	BLQ, (LOQ-2)	10 Max	IS 3025 (P-39)

#STPs= Sewage Treatment Plants
***CPCB**= Central Pollution Control Board.
BLQ= Below Limit of Quantification; **LOQ**= Limit of Quantification

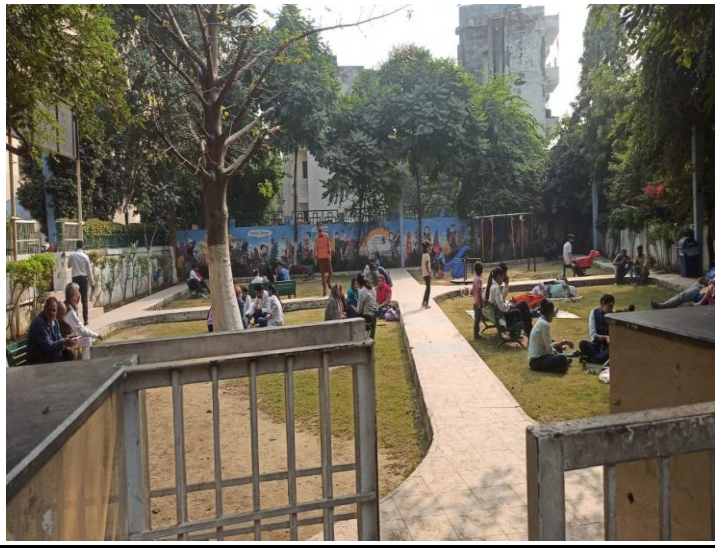
Opinion: The tested sample of water **conforms** to CPCB Guidelines for STPs (Inland Surface Water),2017 with respect to above tests only.

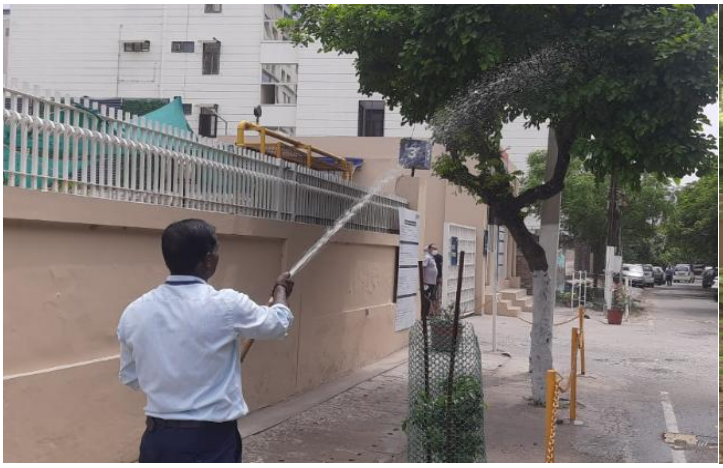
Authorised Signatory
Ms. Nayla Tazeen, Scientist-B

******End of Report******

Annexure-16

Photo of maintaining children & senior citizen parks & adjoining roads maintaining the green belt area of that area approx. 800 mtrs.



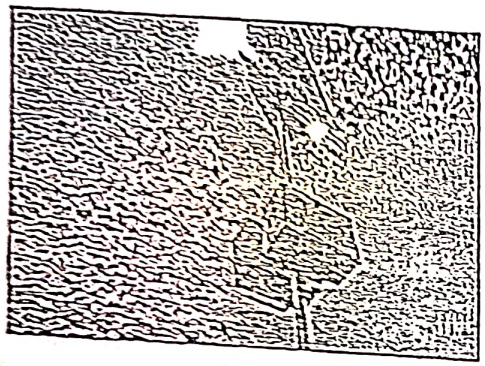


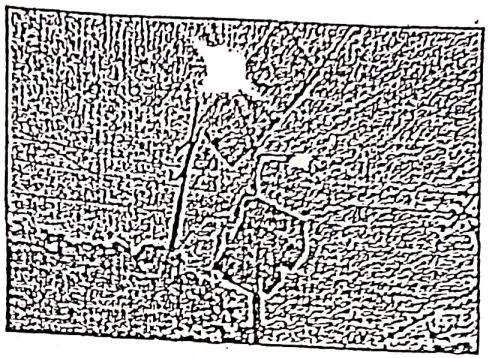
EMAX Healthcare

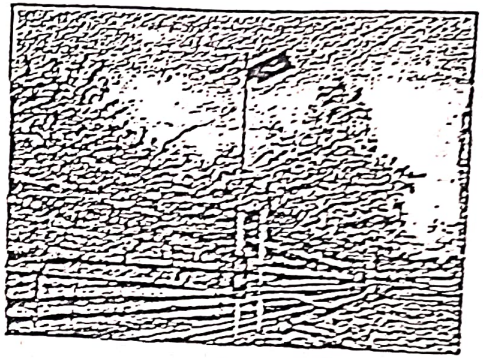
Annexure-16

Renewal Energy- Solar Based Lighting and Hot Water Generator

Solar based street light –In and outside the premises

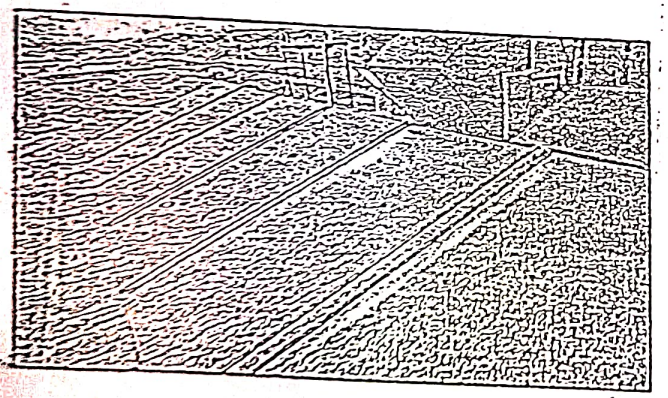


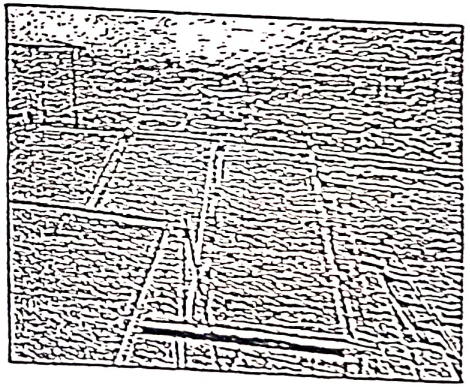




Total 35 Nos of Solar based street lights have been installed in & nearby hospital at VSH and DDN

Solar based Hot Water Generator





Capacity- 3500 LPD

Annexure-II

ANNEXURE- ~~17~~ (Annexure – 17)

COST OF ENVIRONMENT MANAGEMENT PLAN

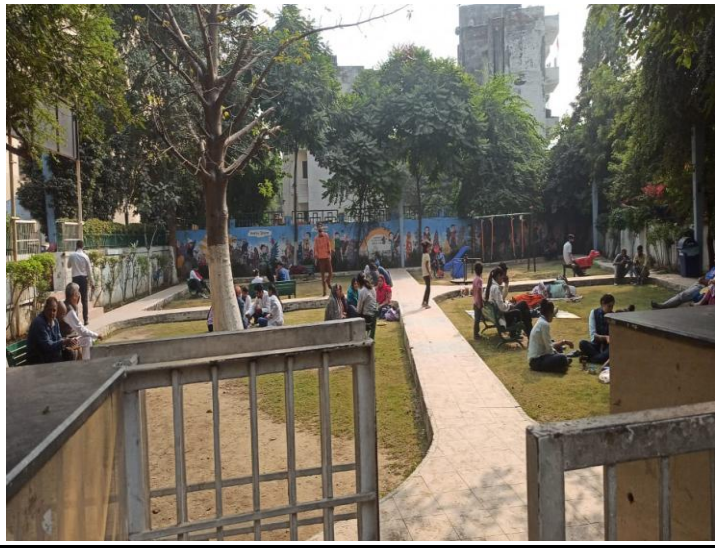
RECURRING EXPENDITURE

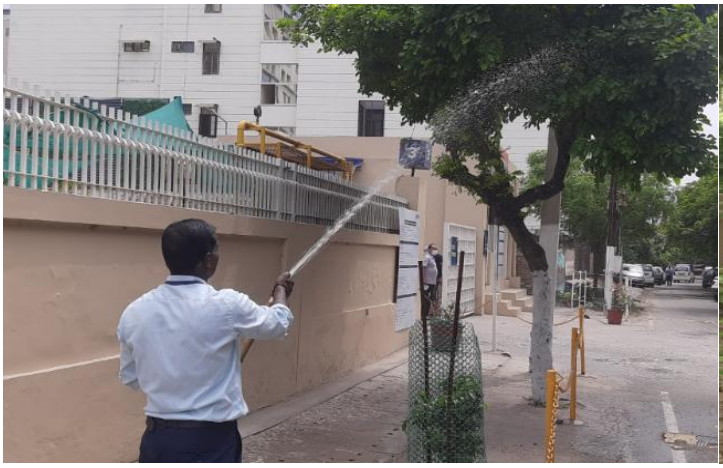
S. N.	Description	Cost (Rs. in Lacs/ ~~Year~~)
1	Gardening	7.75
2	Waste Water Treatment	32
3	Waste disposal	0.68
i)	Hazardous waste disposal	3.35
ii)	Bio medical waste disposal	7.8
4	Environmental Monitoring	3.15
	Total	101.3

Annexure – 23

Annexure-19

Photo of maintaining children & senior citizen parks & adjoining roads maintaining the green belt area of that area approx. 800 mtrs.





ENERGY AUDIT REPORT

2025

AT

Max- Super Specialty Hospital Vaishali

W-3, Sector-1, Ashok Marg

Vaishali, Ghaziabad-201012 (U.P)

Date of Study: 10TH May – 15TH May-2025

Conducted by:

FARE LABS Private Limited

L-17/3, DLF Phase-II, IFFCO Chowk

M.G, Road Gurugram-122002 - (HY.)

Tel:- +91-124-4223207-08

Email: farelabs&farelabs.com

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INDEX

ACKNOWLEDGEMENT

Fare Labs Private Ltd. Gurugram is thankful to the management of **Max- Super Specialty Hospital W-3 Sector-1, Ashok Road, Vaishali, Ghaziabad-201012** to give us an opportunity to study their Facility for the Energy audit. Our sincere thanks to **Mr. Arvind Agarwal (Engineer In charge)** for his keen interest and co-operation extended towards the conduct of the Energy Audit. We are indeed touched by the helpful attitude and co-operation of **Mr. Jaskaran (in charge Air-Conditioning)** and **other Technical Staff** of **Max- Super Specialty Hospital Vaishali** who rendered their valuable assistance and co-operation during the audit.

The study team constituted of the following officials from **FARE LABS.**

Er. A.R. Tripathi - **B.EE. Certified Energy Manager & Team Leader**

Er. Sanjeev Agarwal - **B.E.E Certified Energy Auditor.**

Er. Ajay Rajput - **Electrical Engineer and Co-ordinator.**

Er. Sudhanshu Chandra - **Mechanical Engineer.**

ABOUT ENERGY AUDIT

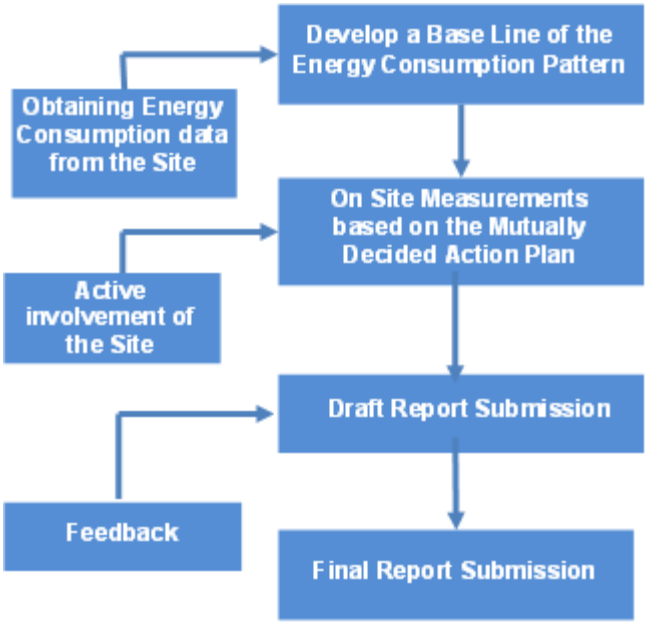
Energy is one of the most important tools in Industrial development and as such, acts as a key factor in determining the economic development of all countries. The Indian energy sector has witnessed a rapid growth. However, resource augmentation and growth in energy supply have failed to meet the ever-increasing demands exerted by industries. Higher energy consumption will also create serious environmental issues, affecting our ozone layer.

The Energy Audit will help to reduce the demand & supply gap in some extent and protect ozone layer as well as our environment. In general, Energy Audit is identifying the areas where waste can occur and where scope for improvement exists. Ultimately it will reduce the energy demand at the same level of outcomes. With this objective, an Energy Audit of **M/S- Max- Super Specialty Hospital, Vaishali Sector-1 Ghaziabad** was carried out. Based on our observations of the various areas, we have identified certain potential areas for energy conservation opportunities, which are summarized in respective chapters.

METHODOLOGY

Methodology adopted for achieving the desired objectives viz. Assessment of the current operational status and Energy savings included the following:

- Discussions with the concerned officials of the unit for identification of major areas of focus and other related systems



- A team of professionals visited the plant and had discussions with the concerned officials/ supervisors to collect data/ information on the Load Distribution and Energy Consumption pattern. The data was analyzed to evaluate the specific power consumption and also to arrive at a base line energy consumption pattern.

- Measurements and monitoring with the help of appropriate instruments including continuous and/ or time-lapse recording, as appropriate and visual observations were made to identify the energy usage pattern and losses in the system.

- Computation and in-depth analysis of the collected data, including analysis and other techniques as appropriate was done and to evolve suitable energy conservation plan/s for improvement/s to reduce the Specific Energy Consumption.

ENERGY MANAGEMENT SYSTEM

1. With the advent of energy crisis and exponential hikes in the costs of different forms of energy, Energy Audit is manifesting its due importance in industrial units. Energy Audit helps to understand more about the ways energy and fuels are used in any industry and helps in identifying areas where waste may occur and scope for improvements.

2. Energy Audit is the key to a systematic approach for decision making in the area of energy management. It attempts to balance the total energy inputs with its use and serves to identify all the energy streams in a facility.

3. An Energy Manager must be identified in the plant and time-bound responsibility must be given to him in getting implemented the findings of the Energy Audit points, which the unit has planned to implement.

4. A record of Energy consumption both Electrical and Thermal of important processes must be kept and monitored on regular basis, to optimize the Energy consumption of the unit. For this, various meters and gauges shall be required to be installed. The data gathered can be centralized manually or through software on a computer for easy analysis.

5. Some facts and figures related with energy and production may be displayed on boards or posters in the premises, to create awareness among the workmen and staff. Training programme may be arranged for officers, workmen to educate them with the latest knowledge available in their fields. As incentives, new ideas and implementation of energy saving point must be recognized and awarded.

6. The findings and implementation status of Energy audits should be reviewed periodically/annually for further action plan.

BENEFIT OF ELECTRICAL AUDIT

- Management gets information about the present status of the unit.
- You get a lifetime second opinion consultant who has full knowledge of your unit.
- Major Electrical Equipment reviewed Transformer, Generator, Electrical panels.
- You shall come to know about the shortcomings of your electrical design and dangers associated with it.
- Increase safety and protection.
- Reduced MDI.
- Reduction in electricity bill up to 5 to 10%.
- Prevention in penalty by SEB (State Electricity Board) due to low power factor.
- Reduced breakdown.
- Reduction in maintenance cost.
- Increased productivity.
- Improvement in product quality.
- The Electrical audits should be reviewed annually for further action plan.

EXECUTIVE SUMMARY

1- Overall housekeeping of the electrical distribution system was found quite o.k.

2- The power quality of the hospital has been analysed and found that voltage %thdv are well within the permissible limit as per IEEE norms but in case of current %thdi was recorded little bit on higher side in between 15%-20% but overall, the power quality was o.k.

3- The auditor has analyzed the electricity bills for the period of one year for the Max hospital and found that overall power factor was running 0.987– 0.995 and avg.0.99 which in quite appreciable range even than there is scope to improve it as suggested.

4- The hospital has installed 3capacitor banks of 400kvar x 2 nos. and 250kvar x 1 nos. at 2500kva transformer in auto mode for both load centers but except one 250kvar APFC panel other remaining two panels were found working in manual mode. During an energy audit to evaluate the performance of the existing capacitors connected with the A.P.F.C panel, the audit team has taken the load in amps. for all the capacitors connected with the panels in auto & manual mode and tabulated in the chapter for the reference and recommended-

1- All capacitors' banks should be in proper functioning.
2- Try to maintain power factor level 0.999 at every load condition for both the transformers as kvah billing is there at present it was running 0.99.

5- Refer the Summary of Saving Opportunities and various energy savings and bill reduction opportunity for saving potential as there is a savings of 466004 units and annual monetary saving is INR 38.676 lakh for which investment is quite nil, and payback period is very attractive.

6- During the audit, the audit team has measured the earth resistance values for all the earth pits of the facility as tabulated in chapter earthing system and found that the earthing values and connection network was maintained as per the IS-5216 –Standard for Electrical safety Part-I & Part-II & IS: 3043 – *1987. Indian Standard.* Code of Practice for Earthing. Proper Inventory was also found maintained.

7- The hospital facility has installed two D.G sets of 1500kva, Cummins make as a captive power to run the facility electrical load smoothly during the power cut/power failure. To evaluate the performance of the D.G sets by calculating the specific fuel consumption, audit team has conducted the load trial for the D.G. Sets for a period of one an hour and recorded the parameters as given here for the reference along with the, total units generated and diesel consumed during the trial period (Refer the table).Team has also

calibrated the Energy meters installed for its unit's generation on the D.G panel and L.T Panel and found that these are working alright. It was also noticed that the fuel tank of D.G set is calibrated already. For details refer to the chapter.

8- Max hospital Vaishali unit is using Electricity as the major source of energy for running the connected as utilities motors such as refrigeration system, Air Handling units, cooling towers, lighting and pumping etc. DG set is using diesel as a fuel for generating electricity at the time of power cut.
Facility also has renewable sources of energy generation which are as follows: -
Solar electricity generation plants of 400kWAC capacity and is generating an average of 1300-1500 kWh per day.
Energy auditor has taken the data for the year 24-25 between the period of April-2024 - March-2025 for all as tabulated below and converted into percentage through pie chart to show the % of all power sources. For detail refer to the chapter hospital energy scenario.

9- During the energy audit, the audit team tried to measure the lighting load in kw and running voltage level but due to the distribution system of lighting circuits, the team could not measure it as it was found distributed in scattered manner while voltage level was measured and found on higher side. The hospital management has taken the good initiative for energy saving on lighting as they have installed LED lights everywhere in the hospital and saved a lot. A few lights are working with UPS power which is already stabilized. The audit team has also measured the lux level of the hospital for different locations, which is quite applicable.

10- The Hospital has installed 7 UPS of different capacity for different loads and locations i.e., 200kva x 2nos. and 100kva x 2nos.inTower no-1 &100kvax3nos. in Tower no-2. For evaluating the performance of the UPS system audit team has analysis load profile of all ups.at their input and output results are tabulated in summary of the chapter attractive amount may save in UPS power by Increasing the load on the ups after optimizing the connected load for saving potential pl refer the chapter performance analysis of ups .

11- The audit team has also evaluated the performance of the HVAC system and calculated a lot of the savings for detail refer chapter performance evaluation of HVAC System and various energy saving & bill reduction opportunities.

12- The audit team has also completed the checking for the hot spots in the electrical distribution system by conducting the thermography. The details are given in respective chapters.

13- The electrical load profile was also taken for the major motors of the hospital which is given in the annexure-1 Motor loading along with the %age of load.

14- For various energy savings and bill reduction opportunities and summary of saving opportunities pl refer incoming chapter.

Summary of Saving Opportunities

S. No.	Description	Annual power savings	Annual Monetary Savings	Tentative Investment	Payback
1-	Saving by maintaining power factor level 0.999 at every load condition	101408 Units	8.43 Lakh	2.5 Lakh	3 Months
2-	Saving in chillers by reducing the kw/TR as suggested.	221165 Units	18.4 Lakh	Very nominal than the saving.	Very attractive
3-	Saving in UPS may be obtained by Increasing the load on the ups and optimizing the connected load.	143431 Units	11.93 Lakh	Nil	Attractive
	Total savings	**466004 Units**	**38.76 Lakh**	**App. 5.0 lakh-**	**Immediately**

Various Energy Saving & Bill Reduction Opportunities

Saving -1

Saving by maintaining power factor level 0.999 at every load condition:

Existing avg. power factor level on the basis of analysis of electricity bills was found -0.99

Proposed power factor level at every load condition. – 0.999

Existing avg yearly kvah units at avg power factor level 0.99 are - 11256348

Kvah units at power factor level 0.999 will be - 11154939

Saving in kvah units at proposed power factor (11256348 – 11154939) - 101409

Annual monetary saving @8.32/- per unit will be – 101409 x 8.32 **= 8,43,722/-**

Saving -2

Saving in HVAC System

During the audit with plant management support chiller water flow rate inlet to evaporator section of chiller has been measured & performance has been evaluated for operating chillers. The evaluated specific power consumption of Chiller-1 is **0.83KW/TR** and Chiller -2 is **0.75 KW/TR,** which is on the higher side**.**

Saving Potential:

A- Chiller No-1

By optimizing the chiller performance

Existing chiller KW/TR	:	0.83 KW/TR
Proposed Chiller KW/TR	:	0.67 KW/TR
Generation TR	:	290 TR
Power saving	:	(0.83 – 0.67) *290TR
	:	46.4 kW
Annual monetary saving	:	46.4 kW*8hours*180 days * Rs. 8.32
	:	**Rs. 5,55,909/-**

B- Chiller No-2

By optimizing the chiller performance

Existing chiller KW/TR	:	0.75 KW/TR
Proposed Chiller KW/TR	:	0.66 KW/TR
Generation TR	:	343 TR
Power saving	:	(0.75 – 0.66) *343TR
	:	30.87 kW
Annual monetary saving	:	30.87 kW*20hours*250 days * Rs. 8.32
	:	**Rs. 12,84,192/-**

Note: For detail refer to the chapter performance evaluation of HVAC System.

Saving -3

Savings in UPS System

Saving in UPS may be obtained by Increasing the load on the ups and optimizing the connected load.

Total power losses at this load profile on annual basis:

Annual energy monetary losses – 18.11 x 22 x 30days x12 months x 8.32

=11,93,347 lakh per year.

Investment – Nil

Note: For detail refer to the chapter Performance Evaluation of UPS System

REVIEW OF ELECTRICITY BILLS

Brief description of existing system and its operation

The electricity billing is in High Tension category (11KV) and has been based on two-part tariff structure (HV1 PV Commercial). One part for capacity or demand drawn in kva,the second part for actual energy drawn during the billing cycle in kvah.

The tariff structure includes the following components:

a) Fixed demand Charges

These charges relate to fixed / maximum demand registered during month/billing period and corresponding rate of utility.

b) Energy Charges.

The energy charges are billed on the Apparent Energy (i.e.) kvah drawn & TOD metering (Time of Day) .

c) Taxes extra.

Tariff Structure :

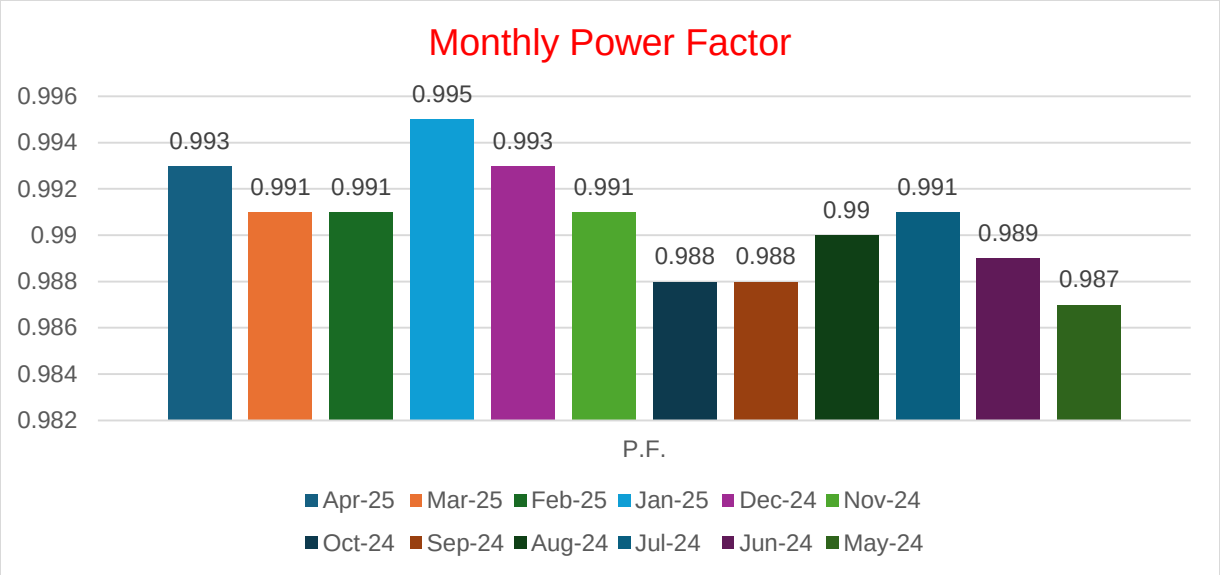
1. Supply Authority : P.V.V.N.L
2. Supply Voltage : 11 KV
3. Contract Demand :2070 KVA
4. Demand Charges : 430/-per kva
5. Unit charges : 8.32/- per unit

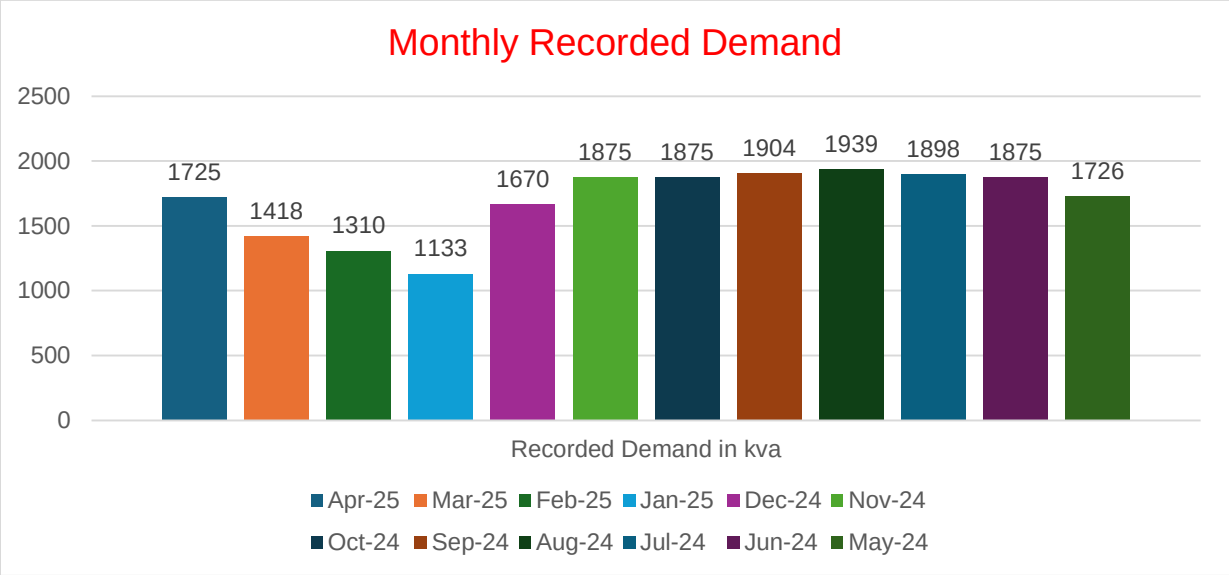
Electricity Bill Analysis

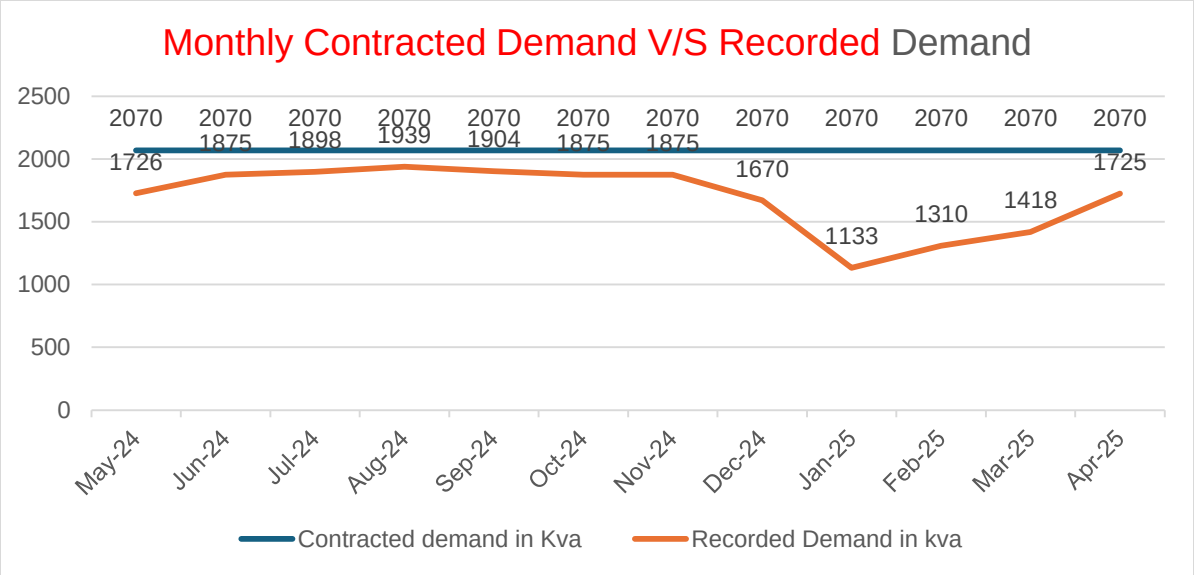
We have analyzed the electricity bills for the period of one year. We have found that overall power factor was running 0.987– 0.995 and avg.0.99 which is quite o.k.

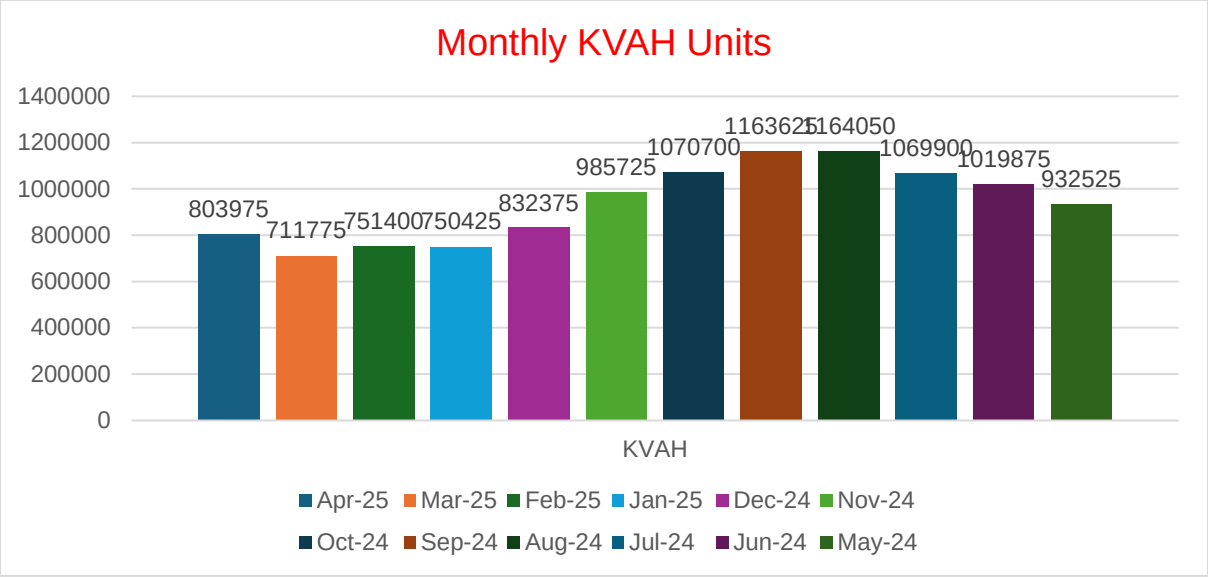
ELECTRICAL BILLS DETAIL

Months	**Contracted demand in Kva**	**75% of Sanction Demand in kva**	**Recorded Demand in kva**	**KWH**	**KVAH**	**P.F.**	**Total Amount Paid**
April-25	2070	1553	1725	799050	803975	0.993	210370.00
March-25	2070	1553	1418.75	705700	711775	0.991	2677248.00
Feb-25	2070	1553	1310	744750	751400	0.991	3005095.00
Jan-25	2070	1553	1133.2	746750	750425	0.995	2882730.00
Dec-24	2070	1553	1670.5	827050	832375	0.993	4040621.00
Nov-24	2070	1553	1875.25	977150	985725	0.991	5993197.00
Oct-24	2070	1553	1875.25	1058525	1070700	0.988	4499497.00
Sept-24	2070	1553	1904.25	1150450	1163625	0.988	4391429.00
Aug-24	2070	1553	1939.50	1153525	1164050	0.990	6777534.00
July-24	2070	1553	1898.25	1061075	1069900	0.991	8976760.00
June-24	2070	1553	1875	1009650	1019875	0.989	9958674.00
May-24	2070	1553	1726.25	920750	932525	0.987	3934978.00
Avg values	-	-	-	-	**938029**	**0.99**	-


Monthly Power Factor
0.996
0.994
0.992
0.99
0.988
0.986
0.984
0.982
0.993
0.991
0.991
0.995
0.993
0.991
0.988
0.988
0.99
0.991
0.989
0.987
P.F.
Apr-25
Mar-25
Feb-25
Jan-25
Dec-24
Nov-24
Oct-24
Sep-24
Aug-24
Jul-24
Jun-24
May-24


Monthly Recorded Demand
2500
2000
1500
1000
500
0
1725
1418
1310
1133
1670
1875
1875
1904
1939
1898
1875
1726
Recorded Demand in kva
Apr-25
Mar-25
Feb-25
Jan-25
Dec-24
Nov-24
Oct-24
Sep-24
Aug-24
Jul-24
Jun-24
May-24


Monthly Contracted Demand V/S Recorded Demand
2500
2000
1500
1000
500
0
2070
1726
1875
1898
1939
1904
1875
1875
1670
1133
1310
1418
1725
May-24
Jun-24
Jul-24
Aug-24
Sep-24
Oct-24
Nov-24
Dec-24
Jan-25
Feb-25
Mar-25
Apr-25
Contracted demand in Kva
Recorded Demand in kva


Monthly KVAH Units
1400000
1200000
1000000
800000
600000
400000
200000
0
803975
711775
751400
750425
832375
985725
1070700
1163625
1164050
1069900
1019875
932525
KVAH
Apr-25
Mar-25
Feb-25
Jan-25
Dec-24
Nov-24
Oct-24
Sep-24
Aug-24
Jul-24
Jun-24
May-24

Hospital Energy Scenario

Energy Scenario and use pattern

Max hospital Vaishali unit is using Electricity as the major source of energy for running the connected as utilities motors such as refrigeration system, Air Handling units, cooling towers, lighting and pumping etc. DG set is using diesel as a fuel for generating electricity at the time of power cut.

Facility also having renewable sources of energy generation which are as follows: -
Solar electricity generation plants of 400kWAC capacity and is generating an average of 1300-1500 kWh per day.
Energy auditor has taken the data for the year 24-25 between the period of April-2024 -March-2025 for all as tabulated below and converted into percentage through pie chart.

Unit generation and purchased detail for the period Pril-2024-March-2025.

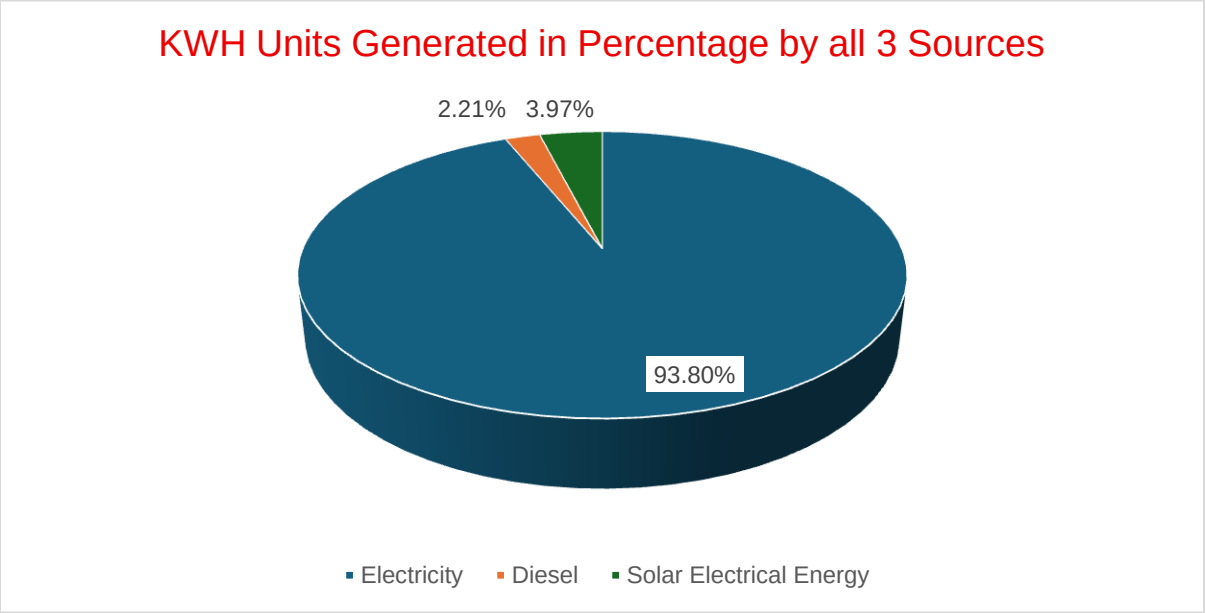
Month	Units Generated by Solar	Units Generated by D.G sets.	Units Purchased from P.V.V.N.L	Total units	Remarks
March -25	43459	22210	803975	869644	
Feb-25	37654	10830	711775	760259	
Jan-25	28668	14961	751400	795029	
Dec-24	24976	13085	750425	788486	
Nov-24	25789	10593	832375	868757	
Oct-24	43814	28774	985725	1058313	
Sept-24	39414	38098	1070700	1148212	
Aug-24	38622	14603	1163625	1216850	
July-24	39499	21130	1164050	1224679	
June-24	51906	17831	1069900	1139637	
May-24	50563	63142	1019875	1133580	
April-24	52354	10046	932525	994925	
Total	**476718**	**265303**	**11256350**	**11998371**	

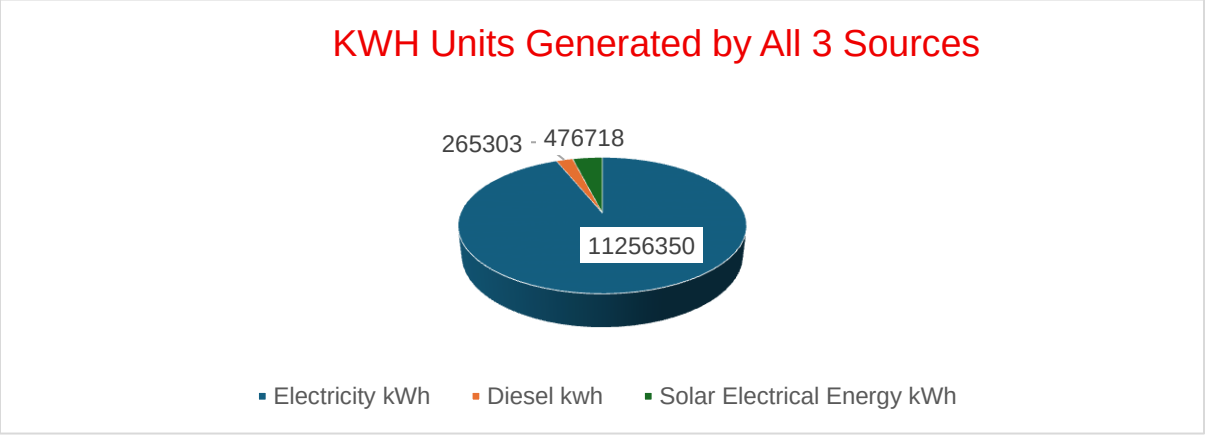
Energy consumption pattern in percentage

S.No	Energy Type	Unit	Quantity	%
1	Electricity	kWh	11256350	93.8%
3	Diesel	kwh	265303	2.21%
6	Solar Electrical Energy	kWh	476718	3.97%
	Total		**11998371**	100%

Table for Energy consumption

Electricity consumption is 93.80%, Diesel Generation is 2.21% and Solar generation is 3.97%.





PERFORMANCE EVALUATION OF A.P.F.C PANEL

The hospital has installed 3capacitor banks of 400kvar x 2 nos. and 250kvar x 1 nos. for 2500kva transformer in auto mode for both load centers but except one 250kvar APFC panel other remaining two were found working in manual mode. During an energy audit to evaluate the performance of the existing capacitors connected with the A.P.F.C panel, the audit team has taken the load in amps. for all the capacitors connected with the panels in auto and tabulated as below. Our observations and recommendations are as follows.

Observations:

1- Out of 1050kvar total connected kvar capacitors only 716kvar were found healthy.
2- Both load centers are working at low power factors one in leading side and one in legging side and maintaining their power factors 0.83 leading and 0.958 legging respectively. Refer chapter transformer loading for both feeders of 2500kva Transformer.

Recommendations:

It is recommended that-

1- All capacitors' banks and panels should be in proper functioning in auto mode only.
2- Try to maintain power factor level 0.999 at every load condition for the transformers as kvah billing is there.

Status of capacitor Banks

Capacitor Loading {400Kvar} for load center of Tower -1								
Sr. No.	**Capacitor Bank**	**kVAr Connected**	**Load in Ampere (A)**			**Rated Amps**	**% Deration**	**Remarks**
			R	**Y**	**B**			
1.	No-1	5	6.58	6.74	6.67	6.7	o.k.	Rated Voltage 440V. Working Voltage 423V,
2.	No-2	5	6.57	6.58	6.51	6.7	o.k.	
3.	No-3	10	13.2	13.3	12.9	13.4	o.k.	
4.	No-4	20	0	0	0	26.8	100%	Because the outgoing connection was disconnected, capacitor bank is removed from input
5.	No-5	30	19.92	36.0	35.5	40.2	50%	One phase derated.
6.	No-6	30	40.0	39.8	39.5	40.2	o.k.	
7.	No-7	30	39.8	39.9	39.0	40.2	o.k.	
8.	No-8	30	39.8	40.1	38.1	40.2	o.k.	
9.	No-9	40	0	45.4	45.8	53.6	100%	
10.	No-10	40	53.4	53.0	52.6	53.6	o.k.	
11.	No-11	40	0	0	0	53.6	100%	Sparking seen on contractor due to loose connection
12.	No-12	40	53.7	52.8	52.1	53.6	o.k.	
13.	No-13	40	54.0	53.4	53.5	53.6	o.k.	
14.	No-14	40	53.2	54.1	52.8	53.6	o.k.	

Capacitor Loading {250Kvar} for load center of Tower-2								
Sr. no.	**Capacitor Bank**	**kVAr Connected**	**Load in Ampere (A)**			**Rated Amps**	**% Deration**	**Remarks**
			R	**Y**	**B**			
1.	No-1	12.5	16.4	16.7	16.5	16.7	o.k.	Rated Voltage Level- 440 V Working Voltage Level- 423 V,
2.	No-2	12.5	15.3	15.6	16.7	16.7	o.k.	
3.	No-3	25	0	0	0	33.5	100%	1.Panel is in on Condition 2.Capacitor Bank is Connected
4.	No-4	25	34.3	34.7	33.8	33.5	o.k.	
5.	No-5	25	33.2	31.4	31.7	33.5	o.k.	
6.	No-6	50	69.0	67.69	68.9	67	o.k.	
7.	No-7	75	104	103	105	100.5	o.k.	Plate Rating of Panel is 100 KVAR but capacitor bank connected (25KVAR*3)

Capacitor Loading {400Kvar} for load center of Tower-2								
Sr. no.	**Capacitor Bank**	**kVAr Connected**	**Load in Ampere (A)**			**Rated Amps**	**% Duration**	**Remarks**
			R	**Y**	**B**			
1.	No-1	25	23.07	28.7	28.2	33.5	26%	Rated Voltage 440 V Working Voltage 423 V,
2.	No-2	25	0	0	0	33.5	100%	Capacitor Bank is Connected But load is Zero
3.	No-3	50	0	0	0	67	100%	Capacitor Bank Wire is Fully Burnt
4.	No-4	100	98.70	121	121	134	16%	-
5.	No-5	25	0	0	0	33.5	100%	Capacitor Bank is Connected
6.	No-6	25	0	0	0	33.5	100%	Capacitor Bank is Connected.
7.	No-7	50	39.29	49.8	55.1	67	41%	-
8.	No-8	100	131.8	133	134	134	o.k.	-

STUDY OF POWER QUALITY

Brief description of existing system and its operation

The electricity billing is in High Tension and has Tariff Category (HV1PV Commercial)and based on two-part tariff structure. One part for capacity (or demand) drawn, the second part for actual energy drawn during the billing cycle in kvah.

Measurement and Observations

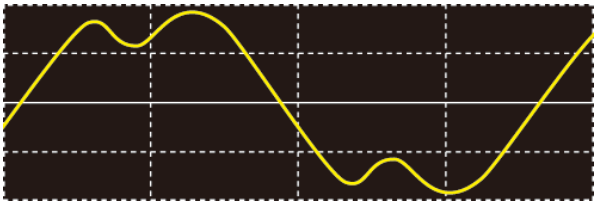
During the energy audit complete load profiling was carried out at 0.433kv main output of the transformers for 24hours and recorded the Voltage, %THD V, Current, %THD I, KW, KVA and Power Factor for both load centers of 2500kvaTransfomer at two different ACB'S. of L.T. Panel. The power quality and harmonics levels were also recorded at the main supply feeder. The actual recorded details are as below:

Study of electrical distribution system

1. During the energy audit the electrical distribution system was studied thoroughly. (For detail refer to graphs)
2. The overall harmonics level at main supply point were found well within the permissible limit of IEEE norms in case of voltage but for current these are recorded on higher side from the level of recommended IEEE Norms in range of 15%-20% Refer the summary of Transformer load profile. The recommended IEEE level is 10% for current and 5% for voltage).

Recently, electricity consumers have shown increasing concern for power quality. Indeed, power quality standards have become higher than before due to sensitivity of electronic gadgets and automation devices. **Power Quality** is the key to successful delivery of quality service of an IT industry. It is now even more critical to the industry because of the increasing application of electronic loads and electronic controllers, which are sensitive to the quality of power supplied.

In this study, the consumers are provided with the basic knowledge of power quality, while on the other hand, the existent regulations are evaluated in terms of consumers' rights so that poor power quality costs and loss are identified and amended. There are so many regulations in relation to the rights of electrical power consumers in legislation that regulates the relations between distribution companies and the consumers, whereas, in this study, only the issue of power quality is dealt with.



Harmonics are generated by semi-conductor control devices in the power supply of equipment because of distorted voltage and current waveforms. When the harmonic component is big, it may cause serious accidents such as overheating or noise in motors or transformers, burn out reactors in phase compensation capacitors, etc, Harmonic Current causes overheating of conductors and their insulation, overheating of transformers with increased losses, overloaded Neutral conductors, Neutral to Earth potential, overheating of capacitors and ultimately premature ageing or failure of equipment .Harmonic Voltage – causes linear loads to draw non-linear current resulting in current distortion effects, torque pulsation in motors, capacitor dielectric failure, insulation breakdown, server and network equipment power supply failure, electronic lighting failure, malfunction of sensitive electronic equipment and, again, excessive distortion in distribution supply networks.

The Institute of Electrical & Electronic Engineers (IEEE), various government agencies and other organizations have been studying these problems and effects for several years. As a result, they have issued design guidelines and recommended practices

The Institute of Electrical and Electronics Engineers (IEEE) & International Electro technical Commission (IEC) has published different slanders time to time in this regards to improve the quality of power. IEEE 1159 describes recommended practices for monitoring of power quality. Comparison of different standards given below in table,

Parameter	**IEEE 519**	**IEC 61000-2-2 (for equipment's)**	**EN 50160 (only up to 35 kV)**
Harmonics	a) THD voltage1.5 -5.0% THD current 5 -20% at PCC	THD<8%	Individual harmonics limit 0.5-6.0%
Voltage Unbalance	NA	2%	2-3%

POWER QUALITY TERM

Voltage Variation Compliance

Voltage is relatively small deviations of voltage characteristics around their nominal or ideal values. The two basic examples are voltage magnitude and frequency.

Voltages must be maintained within +6% of the of the nominal supply voltage according to the Electricity Act 1945 Section 25(1) (d) (Australia). The nominal voltage for the purposes of the Electricity Act and the Code is 240 V single-phase and 415 V three-phase. According to the Technical Rules, the steady state voltage must be within the following limits:

+6% of the nominal voltage during normal conditions.
+8% of the nominal voltage during maintenance conditions; and
+ 10% of the nominal voltage during emergency conditions.

LOAD PROFILE

During the energy audit to assess the power quality of the hospital supply and load profile of the transformer, the auditor connected the power analyzer at 0.433kv of the 2500kva transformer for 24hours at each load center. The outcome is given here in the form of graphs. The summary of the parameters is also given here for reference in a table.

For evaluating the performance of the transformer's auditor has calculated loading percentage on the transformer and found o.k.as given in remarks of summary.

Summary of Load profile:

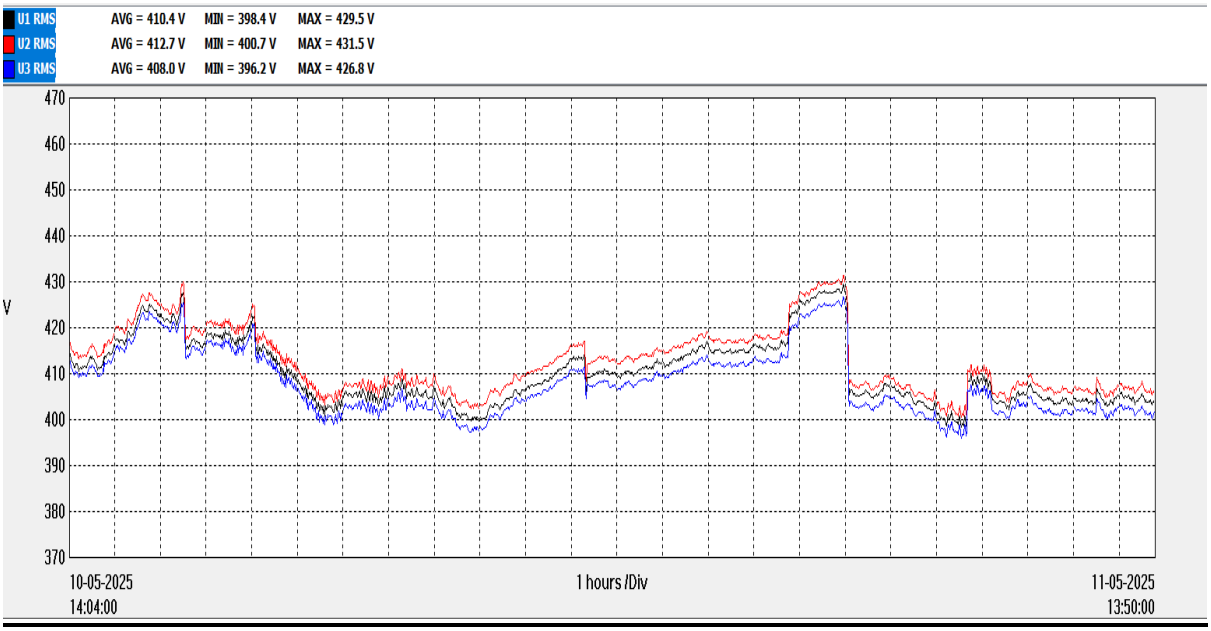
Location	Voltage	% thdv.	Current	% thdi.	kw	kva	Power factor	Remarks
Transformer Load Center-A	410	2.7	702-1996	15	Avg. 775 and Max. 1315	Avg. 809 and Max. 1397	0.958 legging	
Transformer Load Center-B	417	2.5	866-936	20	527	632	0.83 leading	Transformer % Loading 58

Load profile for 2500KVATransformer

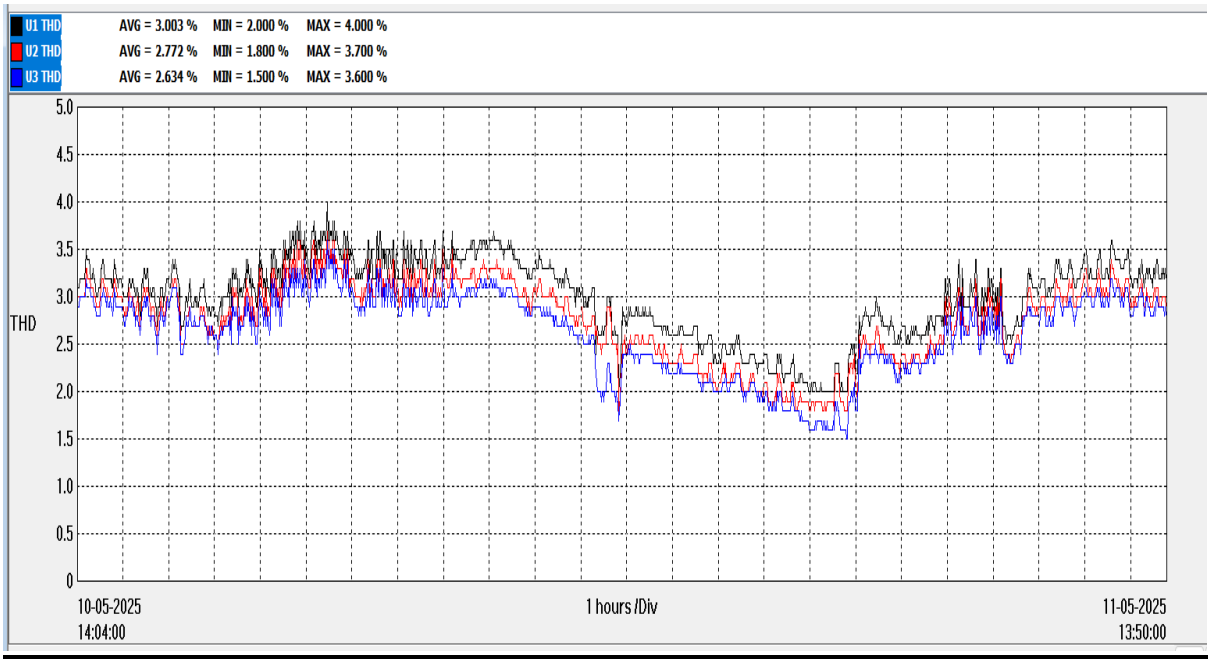
LOAD CENTER

A- 24 hours loading for 10 cables ACB Connected with Transformer

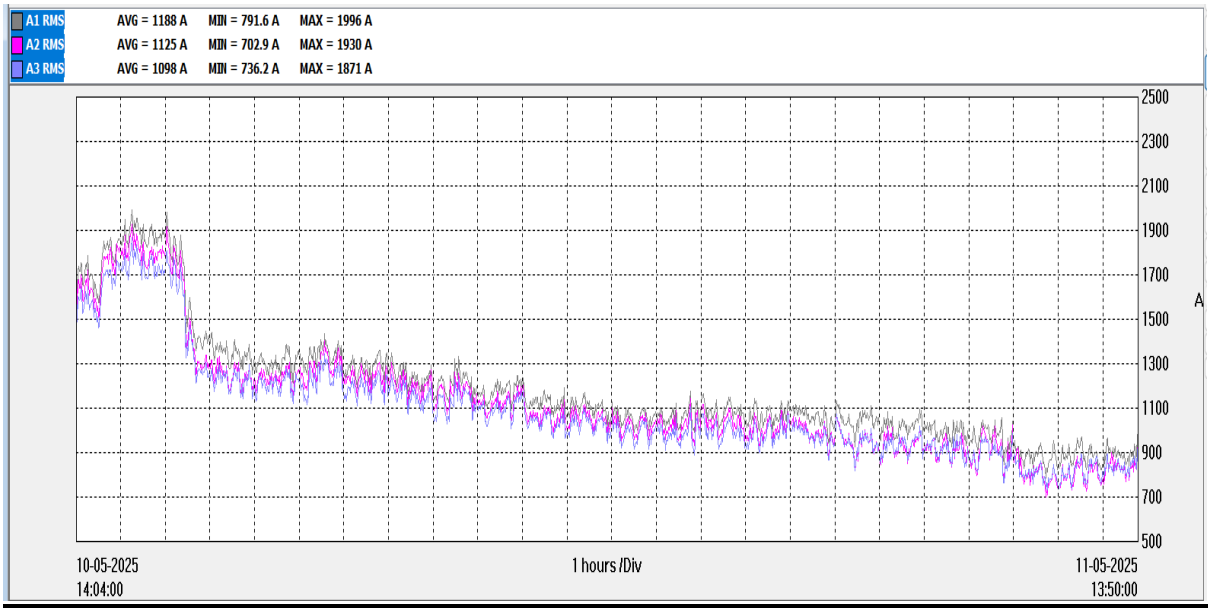
Voltage:



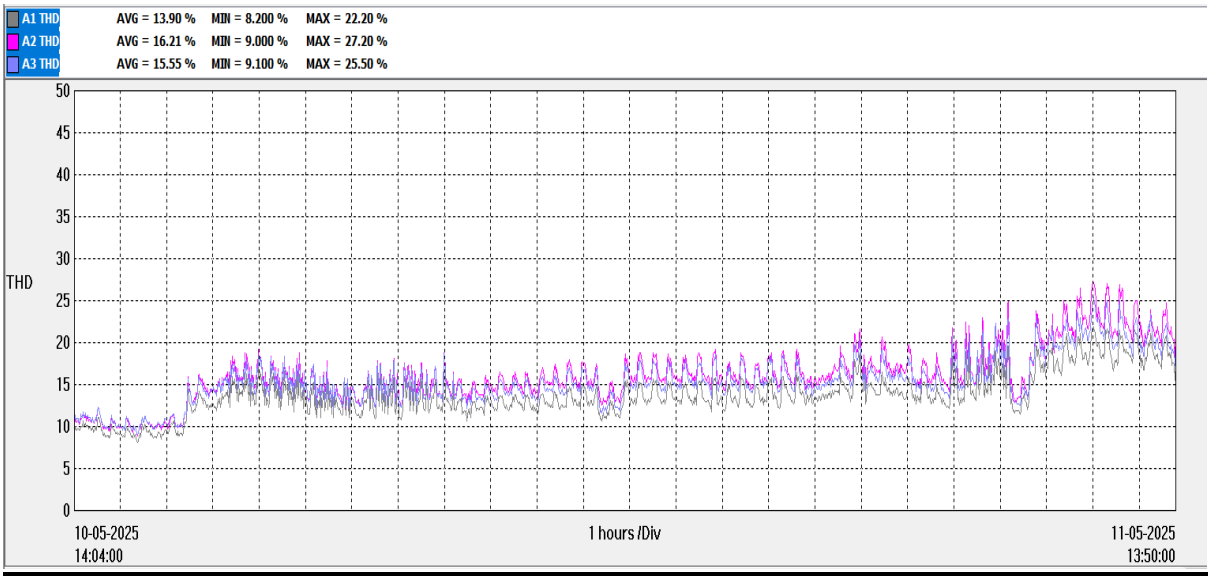
%Thdv:



Load in Amps:



%Thdi:



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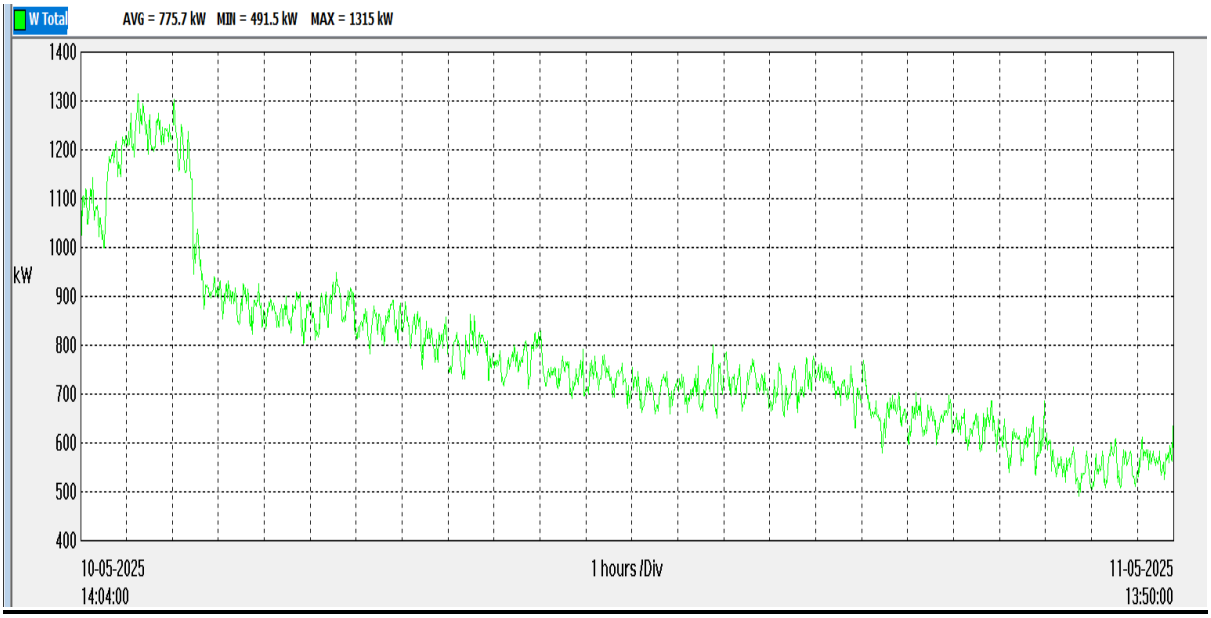

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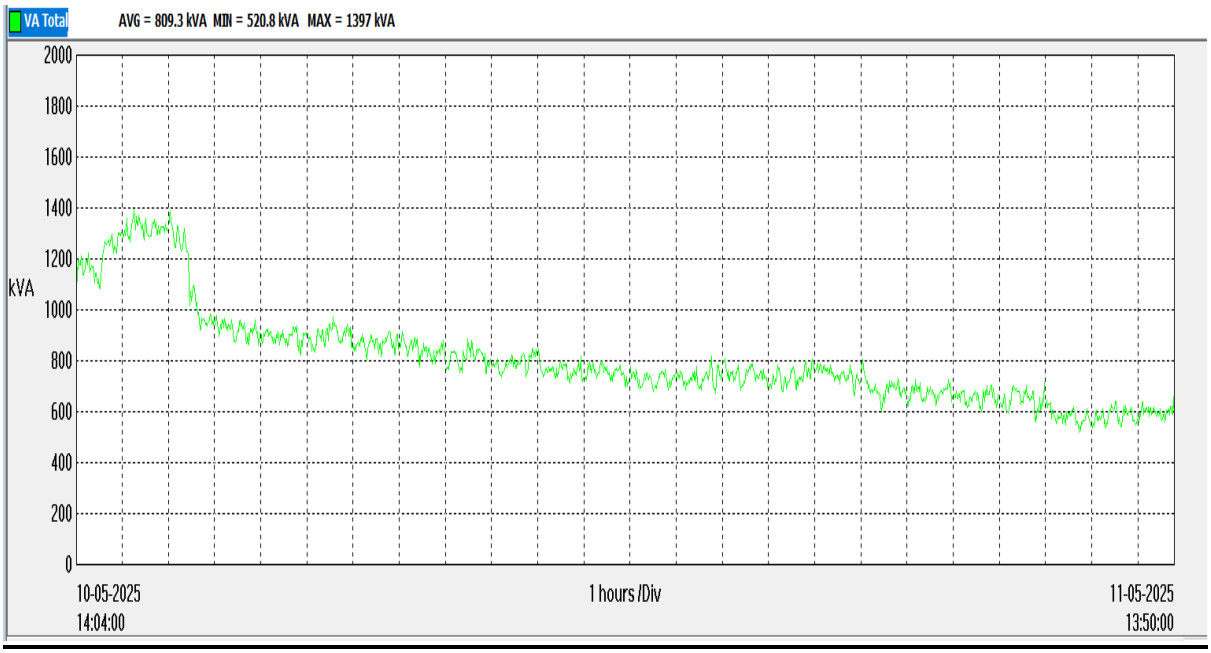

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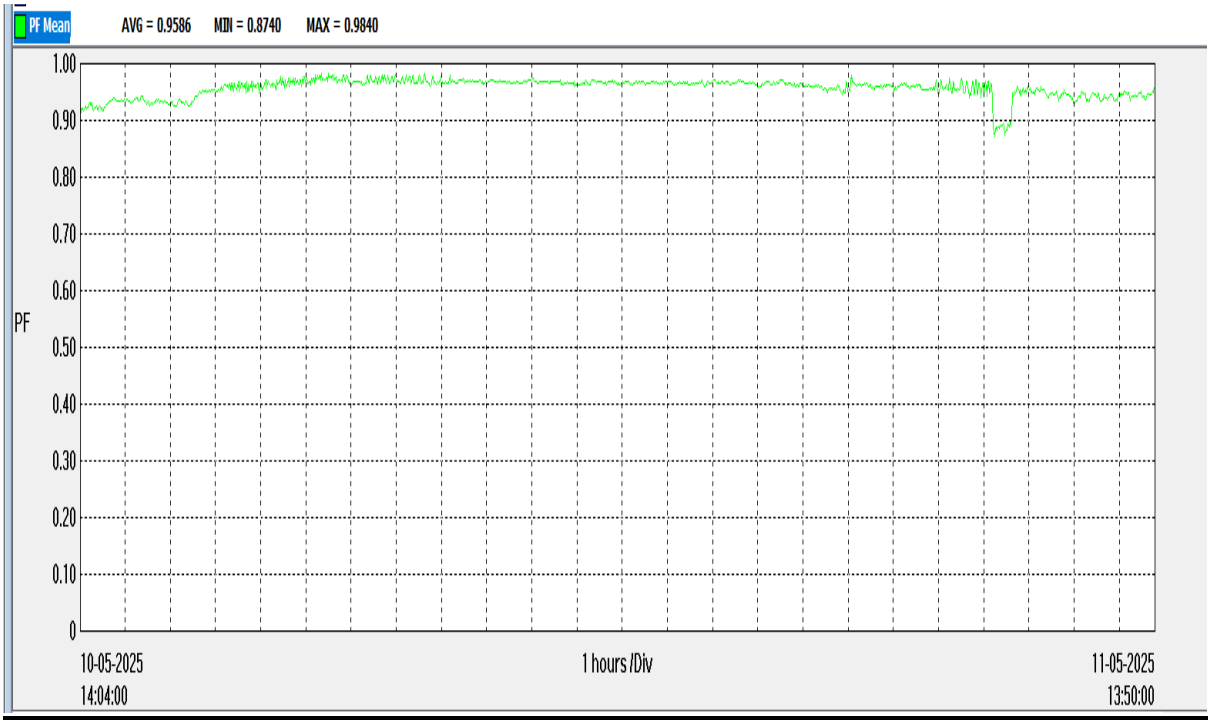
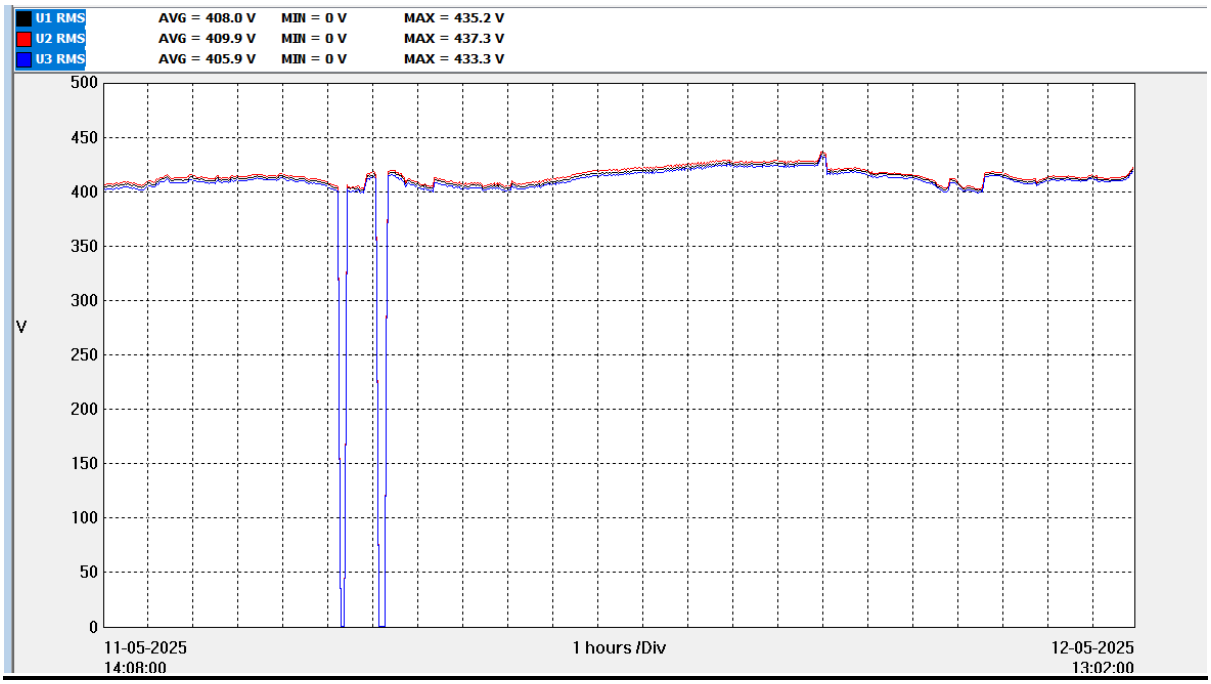


24 hours loading for 5/6 cables ACB Connected with Transformer

Voltage:



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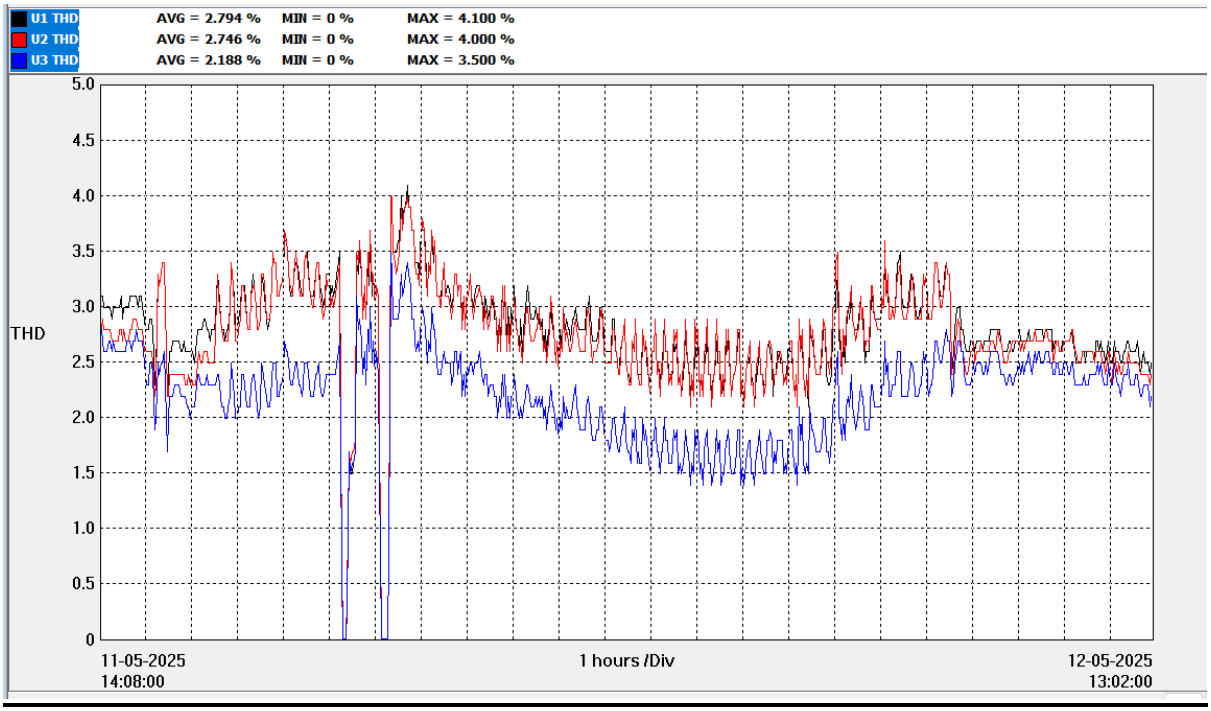
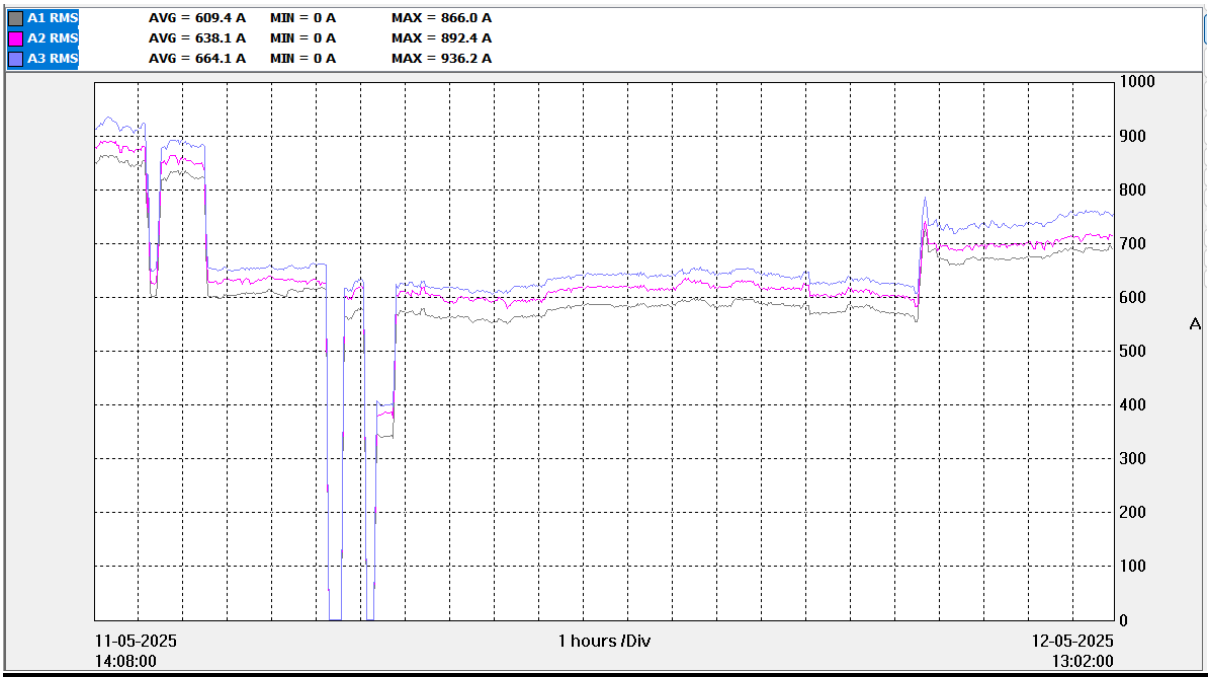


Load in Amps.:



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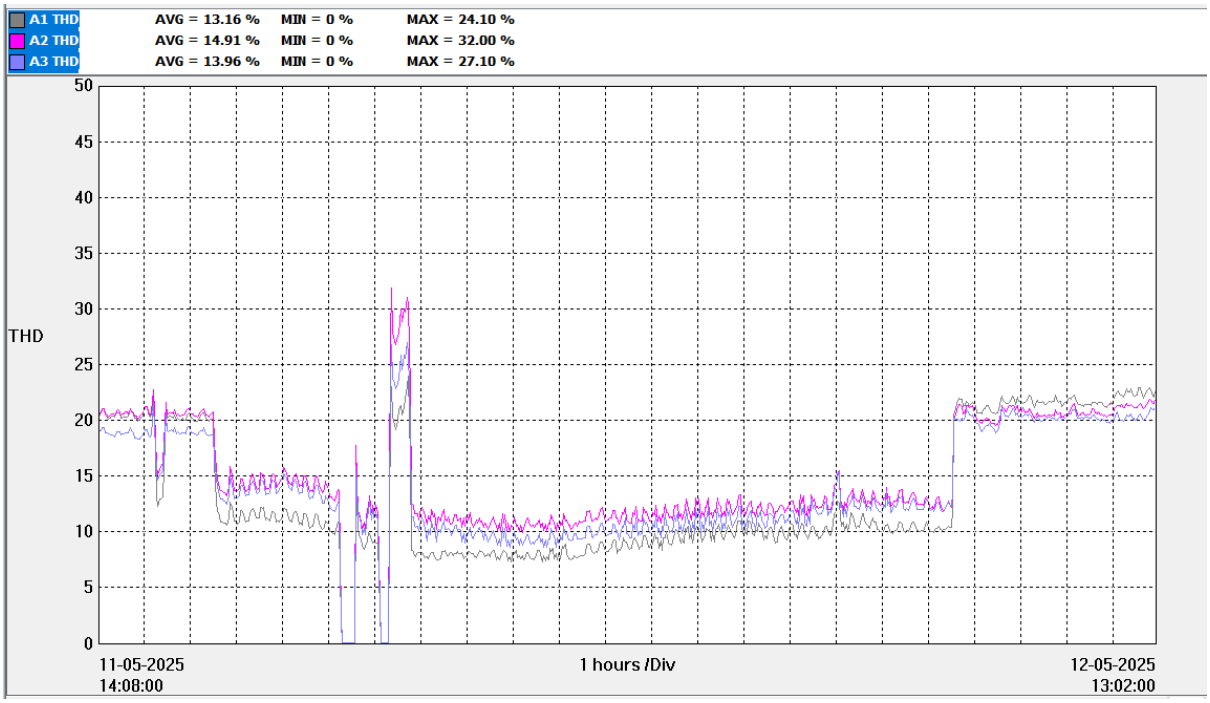

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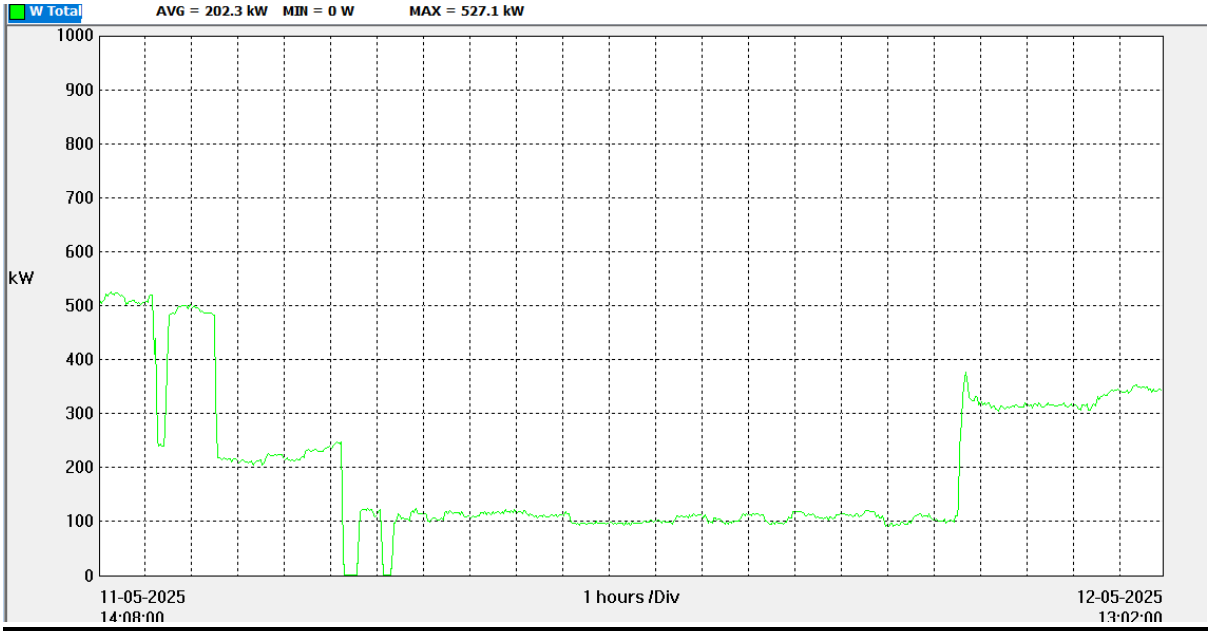
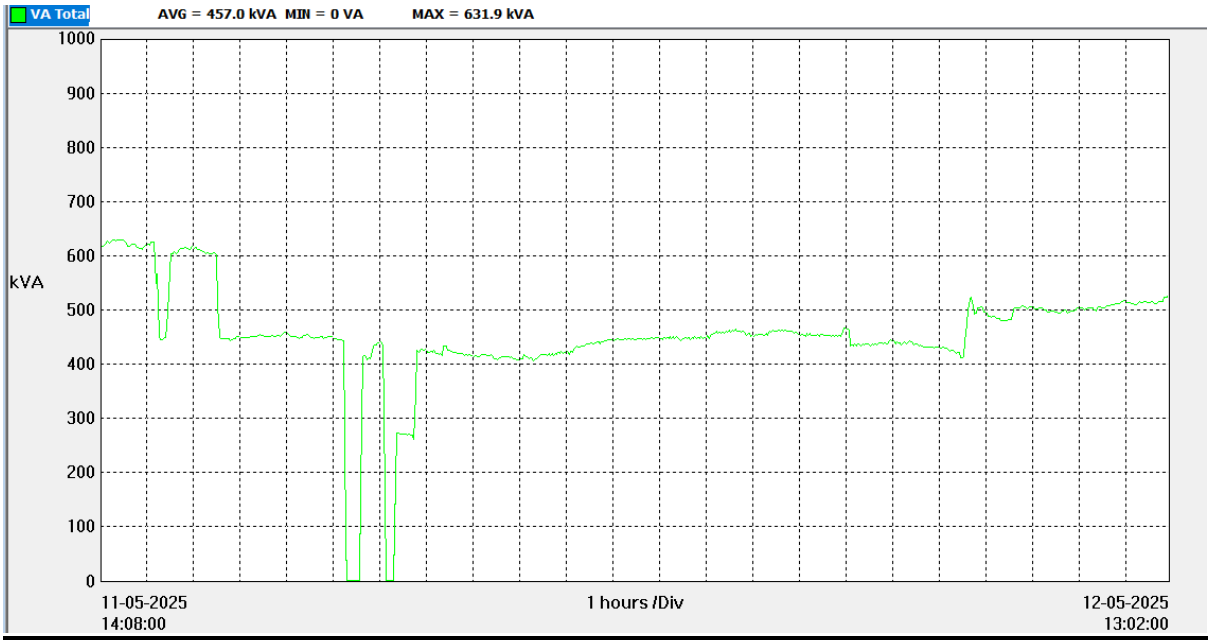
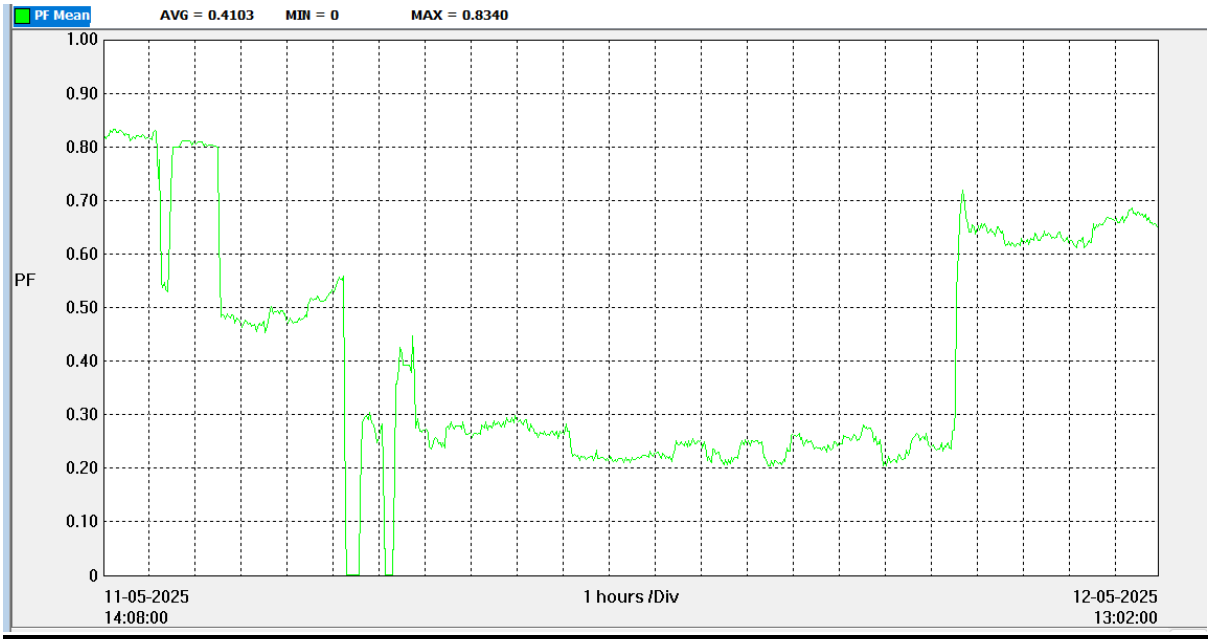


Load in KVA:



Power Factor:



Study of Lighting

During the energy audit, the audit team tried to measure the lighting load in kw and running voltage level but due to the distribution system of lighting circuits, the team could not measure it as it was found distributed in scattered manner while voltage level was measured and found on higher side. The hospital management has taken the good initiative for energy saving in lighting as they have installed LED lights everywhere in the hospital and saved a lot. A few lights are working with UPS power which is already stabilized. The audit team has also measured the lux level of the hospital for different locations as tabulated below, which is quite applicable.

Measured lighting load: -

S. No.	Location	Voltage level	Installed Load in kw
1-	Tower no-1	410	NA
2-	Tower no-2	412	NA

Recommendations:

Hospitals operate 24/7, making energy efficiency in lighting systems crucial for reducing costs and environmental impact. Here are some key strategies for power saving in hospital lighting:

1- **Automated Lighting Systems**
   a- Smart lighting systems adjust brightness based on occupancy and natural daylight.
   b- Motion sensors ensure lights are only on when needed.
   c- Automated schedules can reduce lighting energy use by **30%**.
2- **Lighting Controls**
   a- Dimmers and daylight sensors optimize light levels.
   b- Timers and programmable controls prevent unnecessary energy waste.
   c- Hospitals can integrate **IoT-based building management systems** for real-time monitoring.
3- **UV-C Disinfection Lighting**
   a- Some hospitals use **UV-C lighting** to disinfect air and surfaces.
   b- This technology can improve hygiene while maintaining energy efficiency.

c- V-C disinfection lighting uses ultraviolet light to neutralize bacteria, viruses, and other harmful microorganisms. It works by breaking the DNA or RNA of these pathogens, rendering them harmless.

How It Works

Air Disinfection: UV-C lamps can be installed in HVAC systems or upper-air units to disinfect circulating air.

Surface Disinfection: Used in hospitals, schools, offices, and public spaces to sanitize frequently touched surfaces.

Benefits

Effective: Can inactivate bacteria and viruses within seconds.

Chemical-Free: Provides disinfection without the need for harsh chemicals.

Energy-Efficient: More cost-effective than increasing mechanical ventilation.

Luminous Efficiency and Life of Prevailing Light Sources

Type of Lamp	Lumen/watt		Color Rendering Index (CRI)	Typical Usage	Life (hrs)
	Range	Avg			
Incandescent	8-18	14	Excellent (100)	Homes, restaurants, general lighting, emergency lighting	1000
Fluorescent lamps	46-60	50	Good w.r.t. coating (67-77)	Offices, shops, hospitals, homes	5000
Compact fluorescent lamps (CFL)	40-70	60	Very good (85)	Hotels, shops, homes, offices	8000-10000
High pressure mercury (HPMV)	44-57	50	Fair (45)	General lighting in factories, garages, car parking, flood lighting	5000
Halogen lamps	18-24	20	Excellent (100)	Display, flood lighting, stadium exhibition grounds, construction areas	2000-4000
High pressure sodium (HPSV) SON	67-121	90	Fair (22)	General lighting in factories, ware houses, street lighting	6000-12000
Low pressure sodium (LPSV) SOX	101-175	150	Poor (10)	Roadways, tunnels, canals, street lighting	6000-12000
Metal halide lamps	75-125	100	Good (70)	Industrial bays, spotlighting, flood lighting, retail stores	8000
LED lamps	50-100	80	Very good (80)	Office, industry, outdoor, retail, hospitals, etc	30,000-60,000
Induction Lamps	65-90	75	Very good (80)	General lighting, factories, warehouse, Street lighting, flood lighting, etc	60,000-1,00,000

Performance Assessment of Lightings:

It has been observed that the facility uses LED lights. The lux level was found within a specified range. Illumination will depend upon the visual precision required for which guidance can be derived from the recommended lux level tables.

Details of Lighting, Lux level:

S.No.	Floor	Area/Department	Lux Level					Average
1	Tower 1	MICU 7th Floor	421	425	431	419	415	422
		KTP ICU	751	741	744	769	758	753
		6th Floor Dialysis 1	1109	1123	1118	1102	1108	1112
		Dialysis 2	1052	1063	1054	1044	1049	1052
		6th Floor OPD	526	574	533	512	528	356
		5th Floor Female Ward	384	362	351	327	354	480
		5th Floor IPD	480	487	473	477	482	442
		4th Floor IPD Nursing Station	449	430	438	441	452	468
		4th Floor Daycare-1	470	460	455	475	482	440
		4th Floor Daycare-2	436	455	428	415	466	454
		3rd Floor IPD	551	528	547	561	581	481
		3rd Floor Labor Room	480	475	493	488	471	581
		2nd Floor CCU-1	590	577	564	593	582	377
		2nd Floor CCU-2	380	366	347	391	399	419
		2nd Floor Pre-Operative	410	423	415	418	428	555
		2nd Floor CTVS ICU	553	569	561	548	542	777
		1st Floor Nursing Station	778	770	794	768	774	521
		NSICU 1	510	524	536	514	522	526
		NSICU 2	525	517	529	533	528	196
		1st Floor Nursing Station	190	210	201	196	182	209
		Admin Block	208	216	203	211	208	455
		Service Floor Laboratory	453	442	463	468	447	357

		Service Floor IP Pharmacy	356	361	368	352	347	413
		Ground Floor PHP	410	422	419	403	409	655
		Ground Floor Sample Collection	660	675	631	658	649	758
		Ground Floor Main Lobby	753	748	739	781	768	544
		Ground Floor Main Emergency	530	552	567	528	544	454
		Ground Floor ER Bed No-8	463	428	467	455	459	389
		Ground Floor Billing	392	388	383	394	390	555
		Ground Floor ER RR2	557	566	541	548	562	427
		Ground Floor Reporting Room	411	451	420	436	418	424
S. No.	**Floor**	**Area/Department**	**Lux Level**					**Average**
2	**Tower 2**	9th Floor Pre-Operative	420	416	428	433	421	464
		8th Floor Nursing Station	483	477	475	436	451	744
		8th Floor Nursing Station	740	749	732	758	743	432
		8th Floor Nursing Station	429	423	436	411	461	584
		7th Floor Nursing Station	592	568	598	584	579	475
		7th Floor Nursing Station	477	487	468	470	473	381
		7th Floor General Ward	389	374	368	389	384	472
		6th Floor Endoscopy	473	469	478	473	466	423
		Ground Floor OPD	420	435	428	418	416	514
		Ground Floor Treatment Room	510	518	508	524	511	384
		Ground Floor Pharmacy	380	372	396	394	376	480
		Ground Floor Help Desk	480	468	497	491	466	458
		Ground Floor Nursing Station	425	430	436	415	425	426

Lighting lux level Recommended by NBC-2016 for Hospital Building:

The following Table gives the recommended illuminance range for different tasks and activities. Of the hospital. The values are related to the visual requirements of the task, to user's satisfaction, to practical experience and to the need for cost effective use of energy. (Source IS 3646 (Part I): 1992 and as per National Electrical code 1985 ISI). Illumination will depend upon visual precision required for which guidance can be derived from the recommended lux level table.

Lighting lux level Considered as recommended in the NBC 2016 Volume 2, Part-8, building services Section 1 Lighting and natural ventilation Table 4 recommended values of illuminance as shown below in the lighting lux level table.

S. No	Location	Recommended Lux Level
20.4	Hospitals	
20.4.1	Anesthetic rooms	
20.4.1.1	General	200-300-500
20.4.1.2	Local	750-1000-1500
20.4.2	Consulting areas	
20.4.2.1	General	200-300-500
20.4.2.2	Examination	750-1000-1500
20.4.3	Corridors	
20.4.3.1	General	100-150-200
20.4.4	Ward corridors	
20.4.4.1	Day, screened from bays	150-200-300
20.4.4.2	Day, open to natural light	150-200-300

		(total)
20.4.4.3	Morning/Evening	100-150-200
20.4.4.4	Night	5-10
20.4.5	Cubicles	
20.4.5.1	General	200-300-500
20.4.5.2	Treatment	750-1000-1500
20.4.6	Examination	
20.4.6.1	General	200-300-500
20.4.6.2	Local inspections	750-1000-1500
20.4.7	Intensive therapy	
20.4.7.1	Bad head	30-50
20.4.7.2	Circulation between bed ends	20-100-150
20.4.7.3	Observations	200-300-500
20.4.7.4	Local Observations	750-1000-1500
20.4.7.5	Staff base (day)	200-300-500
20.4.7.6	Staff base (night)	30
20.4.8	Laboratories	
20.4.8.1	General	200-300-500
20.4.5.2	Examination	300-500-750
20.4.9	Nurses' stations	
20.4.9.1	Morning/day/evening	200-300-500
20.4.9.2	Night desks	30
20.4.9.3	Night, medical trolleys	50-100-150
20.4.10	Operating theatres	

20.4.10.1	General	300-500-750
20.4.10.2	Local	10 000 to 50 000
20.4.11	Pathology departments	
20.4.11.1	General	200-300-500
20.4.11.2	Examination	300-500-750
20.4.11.3	Pharmacies	200-300-500
20.4.11.4	Reception/enquiry	200-300-500
20.4.11.5	Recovery rooms	200-300-500
20.4.12	Ward-circulation	
20.4.12.1	Day	50-100-150
20.4.12.2	Morning/evening	50-100-150
20.4.12.3	Night	3-5
20.4.13	Ward-bed head	
20.4.13.1	Morning/evening	30-50
20.4.13.2	Reading	100-150-200
20.4.14	Night	
20.4.14.1	Adult	0.1-1
20.4.14.2	Pediatric	1
20.4.14.3	Psychiatric	1.5
20.4.14.4	Watch	5
20.4.15	X-Ray areas	
20.4.15.1	General	150-200-300
20.4.15.2	Diagnostic	150-200-300
20.4.15.3	Operative	200-300-500

20.4.15.4	Process dark room	50
20.4.16	Surgeries	
20.4.16.1	General	200-300-500
20.4.16.2	Waiting rooms	100-150-200
20.4.17	Dental surgeries	
20.4.17.1	Chair	Special Lighting
20.4.17.2	Laboratories	300-500-750
20.4.18	Consulting rooms	
20.4.18.1	General	200-300-500
20.4.18.2	Desk	300-500-750
20.4.18.3	Examination couch	300-500-750
20.4.18.4	Ophthalmic wall and near-vision charts	300-500-750

EARTHING SYSTEM

During the audit, the audit team measured the earth resistance values for all the earth pits of the Hospital facility and tabulated as under with remarks. The inventory of earth pits was available.

Recommendations:

1- It is recommended that the inventory of earth pits should be maintained properly as discussed.

2- Earth resistance values for all earth pits should be checked once in a year.

Test Results

S.No	Earth Pit No.	Location	Resistance Value in Ohm	Recommended Level in Ohm	Remark
1.	1	Transformer Neutral EP-1	5.27	0.5Ω--5Ω	At the marginal stage needs care.
2.	2	Transformer Neutral EP-2	0.361	0.5Ω--5Ω	ok
3.	3	Transformer Body EP-1	0.099	0.5Ω--5Ω	ok
4.	4	Transformer Body EP-2	1.411	0.5Ω--5Ω	ok
5.	5	DG Set No-1, Neutral EP-1	1.203	0.5Ω--5Ω	ok
6.	6	DG Set No-1, Neutral EP-2	0.901	0.5Ω--5Ω	ok
7.	7	DG Set No-1, Body EP-1	0.81	0.5Ω--5Ω	ok
8.	8	DG Set No-1, Body EP-2	0.82	0.5Ω--5Ω	ok
9.	9	DG Set No-2, Neutral EP-1	0.83	0.5Ω--5Ω	ok

10.	10	DG Set No-2, Neutral EP-2	0.73	0.5Ω--5Ω	ok
11.	11	DG Set No-2, Body EP-1	0.85	0.5Ω--5Ω	ok
12.	12	DG Set No-2, Body EP-2	0.87	0.5Ω--5Ω	ok
13.	13	LT Panel T1	0.35	0.5Ω--5Ω	ok
14.	14	LT Panel T1	0.40	0.5Ω--5Ω	ok
15.	15	UPS Tower 1	0.35	0.5Ω--5Ω	ok
16.	16	UPS Tower 1	0.35	0.5Ω--5Ω	ok
17.	17	UPS Tower 1	0.40	0.5Ω--5Ω	ok
18.	18	UPS Tower 1	0.40	0.5Ω--5Ω	ok
19.	19	Cath Lab 1 equipment	0.55	0.5Ω--5Ω	ok
20.	20	Cath Lab 1 equipment	0.56	0.5Ω--5Ω	ok
21.	21	Cath Lab-1 UPS Neutral	0.82	0.5Ω--5Ω	ok
22.	22	Cath Lab-1 UPS Neutral	0.76	0.5Ω--5Ω	ok
23.	23	Cath Lab-1 Body Earth	0.86	0.5Ω--5Ω	ok
24.	24	Cath Lab-2 equipment	0.85	0.5Ω--5Ω	ok
25.	25	Cath Lab-2 Equipment	0.92	0.5Ω--5Ω	ok
26.	26	Cath Lab-2 UPS Neutral	0.92	0.5Ω--5Ω	ok
27.	27	Cath Lab-2 UPS Neutral	0.85	0.5Ω--5Ω	ok
28.	28	Cath Lab-2 Body Earth	0.85	0.5Ω--5Ω	ok
29.	29	Diesel Yard equipment's	0.82	0.5Ω--5Ω	ok
30.	30	Diesel Yard Diesel Tanker	0.74	0.5Ω--5Ω	ok
31.	31	MRI equipment	0.82	0.5Ω--5Ω	ok
32.	32	MRI equipment	0.74	0.5Ω--5Ω	ok

33.	33	MRI UPS Neutral	0.82	0.5Ω--5Ω	ok
34.	34	MRI Console	0.58	0.5Ω--5Ω	ok
35.	35	MRI Console	0.85	0.5Ω--5Ω	ok
36.	36	Fluoroscopy	0.26	0.5Ω--5Ω	ok
37.	37	Fluoroscopy	0.65	0.5Ω--5Ω	ok
38.	38	CT scan equipment	1.00	0.5Ω--5Ω	ok
39.	39	CT Scan equipment	1.00	0.5Ω--5Ω	ok
40.	40	CT Scan UPS	1.00	0.5Ω--5Ω	ok
41.	41	CT Scan UPS	0.66	0.5Ω--5Ω	ok
42.	42	IT Server	0.88	0.5Ω--5Ω	ok
43.	43	IT Server	0.86	0.5Ω--5Ω	ok
44.	44	IT Server	0.66	0.5Ω--5Ω	ok
45.	45	Tommo Therapy	5.85	0.5Ω--5Ω	At the marginal stage, needs care.
46.	46	Tommo Therapy	4.81	0.5Ω--5Ω	ok
47.	47	Tommo Therapy	2.40	0.5Ω--5Ω	ok
48.	48	Tommo Therapy	5.81	0.5Ω--5Ω	At the marginal stage, needs care.
49.	49	CT Sim	0.96	0.5Ω--5Ω	ok
50.	50	CT Sim	0.96	0.5Ω--5Ω	ok
51.	51	CT Sim	0.96	0.5Ω--5Ω	ok
52.	52	CT Sim	0.96	0.5Ω--5Ω	ok

53.	53	WTP	0.43	0.5Ω--5Ω	ok
54.	54	WTP	0.47	0.5Ω--5Ω	ok
55.	55	STP	0.62	0.5Ω--5Ω	ok
56.	56	STP	0.60	0.5Ω--5Ω	ok
57.	57	Tower-2, LT Panel	0.60	0.5Ω--5Ω	ok
58.	58	Tower-2, LT Panel	0.60	0.5Ω--5Ω	ok
59.	59	Tower-2, LT Panel	0.85	0.5Ω--5Ω	ok
60.	60	Tower-2, LT Panel	0.86	0.5Ω--5Ω	ok
61.	61	Tower-2 UPS	1.16	0.5Ω--5Ω	ok
62.	62	Tower-2 UPS	1.05	0.5Ω--5Ω	ok
63.	63	Tower-2 UPS	1.25	0.5Ω--5Ω	ok
64.	64	Tower-2 UPS	1.22	0.5Ω--5Ω	ok
65.	65	Tower 2 Elevator	1.24	0.5Ω--5Ω	ok
66.	66	Tower 2 Elevator	1.25	0.5Ω--5Ω	ok
67.	67	Tower 2 Elevator	1.27	0.5Ω--5Ω	ok
68.	68	Tower 2 Electrical Floor Panel	1.26	0.5Ω--5Ω	ok
69.	69	Tower 2 Electrical Floor Panel	1.25	0.5Ω--5Ω	ok
70.	70	Tower 2 Electrical Floor Panel	1.27	0.5Ω--5Ω	ok
71	71	Tower 2 Electrical Floor Panel	1.13	0.5Ω--5Ω	ok
72.	72	Tower 2 Chiller Plant	1.10	0.5Ω--5Ω	ok
73.	73	Tower 2 Chiller Plant	1.01	0.5Ω--5Ω	ok
74.	74	Tower 2 Chiller Plant	1.11	0.5Ω--5Ω	ok
75.	75	Tower 2 Chiller Plant	0.98	0.5Ω--5Ω	ok

76.	76	Tower-2 OT-1	0.86	0.5Ω--5Ω	ok
77.	77	Tower-2 OT-2	1.16	0.5Ω--5Ω	ok
78.	78	Tower-2 OT-3	1.05	0.5Ω--5Ω	ok
79.	79	Tower-2 OT-4	1.25	0.5Ω--5Ω	ok
80.	80	Tower-2 OT-5	1.22	0.5Ω--5Ω	ok
81.	81	Tower-2 OT-6	1.24	0.5Ω--5Ω	ok
82.	82	Solar System EP AC-01	1.25	0.5Ω--5Ω	ok
83.	83	Solar System EP AC-02	1.27	0.5Ω--5Ω	ok
84.	84	Solar System EP AC-03	1.26	0.5Ω--5Ω	ok
85.	85	Solar System EP AC-04	1.01	0.5Ω--5Ω	ok
86.	86	Solar System EP DC-01	1.11	0.5Ω--5Ω	ok
87.	87	Solar System EP DC-02	0.98	0.5Ω--5Ω	ok
88.	88	Solar System EP DC-03	0.86	0.5Ω--5Ω	ok
89.	89	Solar System EP LA-01	1.06	0.5Ω--5Ω	ok
90.	90	Solar System EP LA-02	1.24	0.5Ω--5Ω	ok
91.	91	Solar System EP LA-03	1.25	0.5Ω--5Ω	ok
92.	92	Solar System COMM-01	1.27	0.5Ω--5Ω	ok
93.	93	Gama Camera	4.36	0.5Ω--5Ω	ok
94.	94	Linac No-1	10.21	0.5Ω--5Ω	Required new earth pit.
95.	95	Linac no-2	7.85	0.5Ω--5Ω	-do-

Performance Evaluation of D.G Sets

The hospital facility has installed two D.G sets of 1500kva, Cummins make as a captive power to run the facility electrical load smoothly during the power cut/power failure. To evaluate the performance of the D.G sets by calculating the specific fuel consumption, audit team has conducted the load trial for the D.G. Sets for a period of one an hour and recorded the parameters as given here for the reference along with the, total units generated and diesel consumed during the trial period (Refer the table).Team has also calibrated the Energy meters installed for its unit's generation on the D.G panel and L.T Panel. It was also noticed that the fuel tank of D.G set is calibrated already.

S.No	Diesel Generator	Capacity (KVA)	Make
1	DG - 1	1500	Cummins
2	DG - 2	1500	Cummins

Observations:

After load trial auditor has found that-

1- Loading percentage on D.G sets was found on the lower side for no-1 i.e.54% so its specific fuel consumption was low while in the case of no-2 it was found 71% which is quite o.k. reason why its specific fuel consumption is little bit good.
2- Power factor level of both D.G sets was found o.k.
3- Unit cost was coming slightly higher in the case D.G no-1.
4- Auditor has also calibrated the D.G. Energy meters and L. T panel meters of both D. G Sets and found that it was running 2.3% fast which is negligible in case of D. G no-1 D. G panel meter while all others are o.k.in case of both D.G sets.

Recommendations:

Based on above observations, it is recommended that:

1- Improve the loading %age on the D.G sets so that its specific fuel consumption units per Liters may be improved. (As per the Model of the D.G. sets its Specific fuel consumption should app.4.0 units per litters and more). The unit cost will reduce automatically at improved loading %age and improved specific fuel consumption.

D.G. Sets No-1 Load Trial

Make	Cummins
Capacity	1500 kVA
Trial	1.0 hrs.
Generated KWH by auditors calibrated meter fluke Make.	638.6 kwh
KWH recorded by D.G panel Meter	654 kwh
KWH recorded by L.T room Meter	643 kwh
H.S.D. Consumption During trial	240 Liters
Landed cost of diesel	83.17/- Per Liters
Specific fuel consumption i.e., Units/liters A- By Fluke Meter B- By D.G Meter C- By L.T Panel Meter.	 2.66 2.72 2.67
Unit Cost	30.57/- -- 31.26/-
% Age Loading	53% -- 54.5% -
Status of D.G.& L.T Panel KWH meters.	D.G Meter is 2.3%. Fast while L.T Panel Meter is equal to calibrated fluke meter.

Table 1 DG No-1-1500-kva Performance

D.G. Sets No-2 Load Trial

Make	Cummins
Capacity	1500 kVA
Trial	1.0 hrs.
Generated KWH by auditors calibrated meter fluke Make.	847 kwh
KWH recorded by D.G panel Meter	853 kwh
KWH recorded by L.T room Meter	837 kwh
H.S.D. Consumption During trial	260 Liters
Landed cost of diesel	83.17/- Per Liters
Specific fuel consumption i.e., Units/liters A- By Fluke Meter B- By D.G Meter C- By L.T Panel Meter.	 3.25 3.28 3.21
Unit Cost	25.35/- -- 25.90/-
% Age Loading	69.7% -- 71%
Status of D.G. &L. T Panel KWH meter.	All D.G Meter found o.k.

Table 1 DG No-2-1500-kva Performance

V, A, Hz, THD overview table for D.G NO-1 (1500KVA)

DG1				
Logging Information				
Study type: Energy study		Topology: 3-ph Wye		
Start date: 14-05-2025 16:32:45		End date: 14-05-2025 17:18:06		
Duration: 45m 21s				
Averaging interval: 1sec		Number of averaging intervals: 2721		
Voltage [V]	AN	BN	CN	N
Max	**242.9 V** 14-05-2025 16:37:06	**244.3 V** 14-05-2025 16:37:06	**245.5 V** 14-05-2025 16:37:06	
linear Avg	**239.0 V**	**240.3 V**	**241.6 V**	
Min	**234.0 V** 14-05-2025 16:37:06	**235.3 V** 14-05-2025 16:37:06	**236.6 V** 14-05-2025 16:37:06	
Current [kA]	A	B	C	N
Max	**1.117 kA** 14-05-2025 17:12:20	**1.086 kA** 14-05-2025 17:12:20	**1.067 kA** 14-05-2025 17:12:20	
linear Avg	**0.976 kA**	**0.946 kA**	**0.926 kA**	
Min	**0.746 kA** 14-05-2025 16:34:20	**0.694 kA** 14-05-2025 16:34:37	**0.685 kA** 14-05-2025 16:34:37	
Frequency [Hz]	AN			
Max	**50.19 Hz** 14-05-2025 17:13:09			
linear Avg	**50.04 Hz**			
Min	**49.75 Hz** 14-05-2025 16:37:01			
V THD [%]	AN	BN	CN	N
Max	**8.8 %** 14-05-2025 16:37:12	**8.5 %** 14-05-2025 16:37:14	**8.2 %** 14-05-2025 16:37:17	
linear Avg	**7.8 %**	**7.7 %**	**7.4 %**	
Min	**6.6 %** 14-05-2025 16:58:53	**6.7 %** 14-05-2025 16:58:53	**6.5 %** 14-05-2025 16:58:53	
A THD [%]	A	B	C	N
Max	**18.5 %** 14-05-2025 16:32:46	**19.7 %** 14-05-2025 16:32:46	**19.6 %** 14-05-2025 16:32:46	
linear Avg	**13.0 %**	**13.1 %**	**13.1 %**	
Min	**9.6 %** 14-05-2025 17:12:21	**9.8 %** 14-05-2025 17:10:20	**9.8 %** 14-05-2025 17:10:20	

RMS Power overview table for D.G NO-1 (1500KVA)

DG1

Logging Information

Study type:	Energy study	Topology:	3-ph Wye
Start date:	14-05-2025 16:32:45	End date:	14-05-2025 17:18:06
Duration:	45m 21s		
Averaging interval:	1sec	Number of averaging intervals:	2721

Active Power [kW]	A	B	C	Total
Max	243.939 kW 14-05-2025 17:12:20	240.293 kW 14-05-2025 17:12:20	234.360 kW 14-05-2025 17:12:20	718.592 kW 14-05-2025 17:12:20
linear Avg	213.225 kW	209.075 kW	203.326 kW	625.626 kW
Min	161.060 kW 14-05-2025 16:34:20	151.933 kW 14-05-2025 16:34:38	148.101 kW 14-05-2025 16:34:37	462.132 kW 14-05-2025 16:34:20
Apparent Power [kVA]	A	B	C	Total
Max	264.333 kVA 14-05-2025 17:12:20	259.159 kVA 14-05-2025 17:12:20	255.593 kVA 14-05-2025 17:12:20	780.289 kVA 14-05-2025 17:12:20
linear Avg	233.140 kVA	227.443 kVA	223.629 kVA	685.526 kVA
Min	180.225 kVA 14-05-2025 16:34:17	169.143 kVA 14-05-2025 16:34:38	167.259 kVA 14-05-2025 16:34:37	519.244 kVA 14-05-2025 16:34:17
Non-Active Power [kvar]	A	B	C	Total
Max	116.046 kvar 14-05-2025 16:37:01	110.370 kvar 14-05-2025 16:37:01	114.626 kvar 14-05-2025 16:37:01	342.862 kvar 14-05-2025 16:37:01
linear Avg	94.217 kvar	89.477 kvar	93.026 kvar	280.041 kvar
Min	78.069 kvar 14-05-2025 16:34:47	72.276 kvar 14-05-2025 16:34:47	76.418 kvar 14-05-2025 16:34:48	229.674 kvar 14-05-2025 16:34:47
Power Factor [1]	A	B	C	Total
Max	0.93 ind 14-05-2025 16:46:17	0.94 ind 14-05-2025 17:12:21	0.93 ind 14-05-2025 17:14:48	0.93 ind 14-05-2025 17:12:21
linear Avg	0.91	0.92	0.91	0.91
Min	0.87 ind 14-05-2025 16:37:01	0.88 ind 14-05-2025 16:37:01	0.86 ind 14-05-2025 16:32:47	0.87 ind 14-05-2025 16:37:01

V, A, Hz, THD overview table for D.G NO-2 (1500KVA)

SS

Logging Information

Study type:	Energy study	Topology:	3-ph Wye
Start date:	14-05-2025 17:22:15	End date:	14-05-2025 17:33:30
Duration:	11m 15s		
Averaging interval:	1sec	Number of averaging intervals:	676

Voltage [V]	AN	BN	CN	N
Max	259.4 V 14-05-2025 17:33:30	259.5 V 14-05-2025 17:33:30	259.6 V 14-05-2025 17:33:30	
linear Avg	234.4 V	236.5 V	236.4 V	
Min	231.7 V 14-05-2025 17:23:22	233.8 V 14-05-2025 17:23:22	233.7 V 14-05-2025 17:23:22	
Current [kA]	A	B	C	N
Max	1.520 kA 14-05-2025 17:32:29	1.501 kA 14-05-2025 17:32:29	1.527 kA 14-05-2025 17:22:33	
linear Avg	1.389 kA	1.365 kA	1.393 kA	
Min	0.079 kA 14-05-2025 17:33:30	0.031 kA 14-05-2025 17:33:30	0.046 kA 14-05-2025 17:33:30	
Frequency [Hz]	AN			
Max	51.52 Hz 14-05-2025 17:33:30			
linear Avg	50.07 Hz			
Min	49.98 Hz 14-05-2025 17:24:44			
V THD [%]	AN	BN	CN	N
Max	4.9 % 14-05-2025 17:22:24	5.2 % 14-05-2025 17:23:39	5.0 % 14-05-2025 17:22:24	
linear Avg	4.7 %	4.9 %	4.7 %	
Min	4.1 % 14-05-2025 17:33:30	3.2 % 14-05-2025 17:33:30	3.6 % 14-05-2025 17:33:30	
A THD [%]	A	B	C	N
Max	5.9 % 14-05-2025 17:27:05	8.5 % 14-05-2025 17:33:30	7.4 % 14-05-2025 17:33:30	
linear Avg	4.8 %	5.6 %	4.9 %	
Min	3.7 % 14-05-2025 17:24:45	4.5 % 14-05-2025 17:33:20	3.9 % 14-05-2025 17:24:45	

RMS Power overview table for D.G NO-2 (1500KVA)

SS				
Logging Information				
Study type: Energy study		Topology: 3-ph Wye		
Start date: 14-05-2025 17:22:15		End date: 14-05-2025 17:33:30		
Duration: 11m 15s				
Averaging interval: 1sec		Number of averaging intervals: 676		
Active Power [MW]	A	B	C	Total
Max	**0.336 MW** 14-05-2025 17:32:29	**0.335 MW** 14-05-2025 17:32:39	**0.335 MW** 14-05-2025 17:24:44	**1.003 MW** 14-05-2025 17:32:29
linear Avg	**0.308 MW**	**0.305 MW**	**0.307 MW**	**0.919 MW**
Min	**0.175 MW** 14-05-2025 17:33:30	**0.176 MW** 14-05-2025 17:33:30	**0.171 MW** 14-05-2025 17:33:30	**0.523 MW** 14-05-2025 17:33:30
Apparent Power [MVA]	A	B	C	Total
Max	**0.353 MVA** 14-05-2025 17:32:29	**0.353 MVA** 14-05-2025 17:32:39	**0.356 MVA** 14-05-2025 17:24:44	**1.061 MVA** 14-05-2025 17:32:39
linear Avg	**0.325 MVA**	**0.323 MVA**	**0.329 MVA**	**0.978 MVA**
Min	**0.260 MVA** 14-05-2025 17:33:30	**0.257 MVA** 14-05-2025 17:33:30	**0.255 MVA** 14-05-2025 17:33:30	**0.773 MVA** 14-05-2025 17:33:30
Non-Active Power [Mvar]	A	B	C	Total
Max	**0.192 Mvar** 14-05-2025 17:33:30	**0.188 Mvar** 14-05-2025 17:33:30	**0.189 Mvar** 14-05-2025 17:33:30	**0.570 Mvar** 14-05-2025 17:33:30
linear Avg	**0.106 Mvar**	**0.106 Mvar**	**0.120 Mvar**	**0.335 Mvar**
Min	**0.100 Mvar** 14-05-2025 17:30:20	**0.099 Mvar** 14-05-2025 17:30:24	**0.114 Mvar** 14-05-2025 17:30:21	**0.315 Mvar** 14-05-2025 17:30:24
Power Factor [1]	A	B	C	Total
Max	**0.95 ind** 14-05-2025 17:24:44	**0.96 ind** 14-05-2025 17:30:24	**0.94 ind** 14-05-2025 17:30:24	**0.95 ind** 14-05-2025 17:30:24
linear Avg	**0.95**	**0.94**	**0.93**	**0.94**
Min	**0.67 ind** 14-05-2025 17:33:30	**0.68 ind** 14-05-2025 17:33:30	**0.67 ind** 14-05-2025 17:33:30	**0.68** 14-05-2025 17:33:30

Performance Evaluation of UPS System

The hospital has installed 7 UPS of different capacity for different loads and locations i.e., 200kva x 2nos. and100kva x 2nos.inTower no-1 &100kvax3nos. in Tower no-2. For evaluating the performance of the UPS system audit team has analysis load profile of all ups.at their input and output results are tabulated in summary.

SUMMARY OF UPS LOAD FOR TOWER No-1&2

		Measured Data								
UPS NO.	**Data**	**Voltage**	**%thdv**	**Current**	**%thdi**	**kva**	**Power factor**	**Losses in kw & kva**	**Net Internal ups losses in kw. Input v/s Output**	**Remarks**
1, 100kva Tower-2	Input Data	405	3.2	23	30.5	15.18	0.82	12.4kw 15.10kva	-	% Loading 15.18
-do-	Output Data	400	1	26	24.4	13.53	0.87	11.81kw 13.53kva	0.59kw	-do-
2, 100kva Tower-2	Input Data	400	3.3	19.08	31	14.62	0.80	11.69kw 14.62kva	-	% Loading 14.6
-do-	Output Data	400	1.0	21.32	26.7	12.27	0.86	10.57kw 12.27kva	1.12kw	-do-
3, 100kva Tower-2	Input Data	414	3.4	20.56	32	14.11	0.78	11.0kw 14.11kva	-	% Loading 14.11
-do-	Output Data	400	1.0	26.98	25.6	12.32	0.87	10.211kw 12.32kva	0.79kw	-do-
1, 100kva Tower-1	Input Data	406	4.1	64.55	73	47.71	0.75	29.57kw 47.71kva	-	% Loading 47.7%

-do-	Output Data	402	1.8	39.5	29	23.55	0.84	19.90kw 23.55kva	9.67kw	-do-
2, 100kva Tower-1	Input Data	406	4.0	47.93	60	32.71	0.68	22.28kw 32.71kva	-	% Loading 32.71
-do-	Output Data	400	2.2	53.65	13.4	30.41	0.72	21.89kw 30.41kva	0.39kw	-do-
1, 200kva Tower-1	Input Data	398	1.2	103.4	25	65.36	0.92	60.60kw 65.36kva	-	% Loading 94
-do-	Output Data	412	4.0	142.1	55.6	93.84	0.72	67.56kw 93.84kva	NIL	-do-
2, 200kva Tower-1	Input Data	415	3.4	132.6	58	89.50	0.71	63.43kw 89.5kva	-	% Loading 89.5
-do-	Output Data	399	1.2	103.4	19.5	63.32	0.91	57.88kw 63.32kva	5.55kw	-do-
	Total losses per hour								**18.11kw**	

Observations:

After analyzing the data, the auditor observed that-

1- Loading percentage in kva was found low in the range of 14%-50% in most of the UPS.
2- The Harmonics percentage in current was recorded on the higher side 13%-73%.
3- Internal ups losses in kw were found app.18.11kw.
4- Power factor level was recorded on lower side.

Recommendations:

On the basis of the above observations, it is recommended that-

1- Increase the load on the ups so that harmonies may be reduced and internal losses may be minimized so load optimization is required.

Total power losses at this load profile on annual basis:

Annual energy monetary losses – 18.11 x 22 x 30days x12 months x 8.32

=11,93,347 lakh per year.

Investment – Nil

Only load is to be increased by optimizing the load and ensuring the proper working of the UPS Power.

Analysis Suggestions

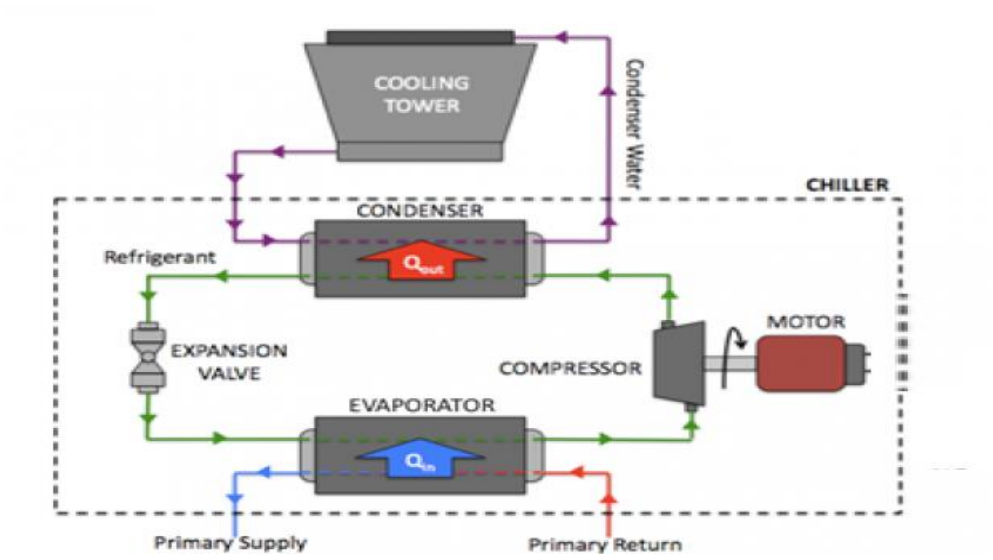
1. **Harmonics & Power Factor Impact:**
   The Total Harmonic Distortion (THD) values indicate potential power quality issues. High THDi values suggest nonlinear loads, which could reduce efficiency. Optimizing power factor correction techniques (like installing capacitor banks) can mitigate this issue.
2. **Load Distribution Optimization:**
   % Loading varies across different UPS units. If some units are underloaded while others are close to maximum capacity, redistributing loads may improve efficiency and extend battery life.

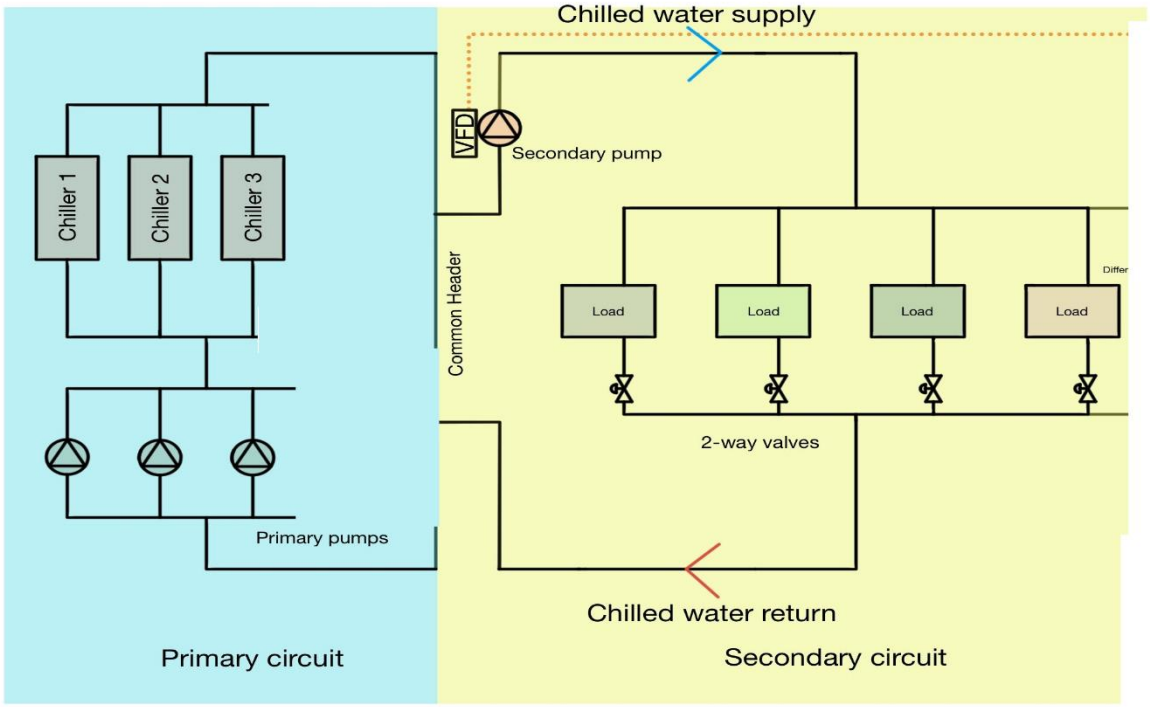
Energy Conservation Measures

1. **Optimize UPS Usage:**
   Consolidate lightly loaded UPS units or adjust their operation schedule based on demand to avoid unnecessary losses.
2. **Upgrade to High-Efficiency Models:**
   If older models show higher internal losses, transitioning to newer UPS models with better efficiency ratings (e.g., those with ECOnversion mode) can save energy.
3. **Cooling System Efficiency:**
   UPS losses contribute to heat load. Ensuring optimal cooling efficiency in the electrical room—such as using smart HVAC controls—reduces excess power consumption.
4. **Power Factor Correction:**
   Installing active harmonic filters or capacitor banks can help maintain power factor close to 0.9+, reducing excess losses.
5. **Regular Maintenance & Monitoring:**
   Ensure periodic battery testing, connections tightening, and calibration to maintain high efficiency and extend equipment life.
   Would you like help estimating potential energy savings based on these recommendations? I can assist with calculations.

Performance Evaluation of HVAC System

Chiller:





Performance Evaluation of Chillers: -

During audit, Chillers performance has been evaluated, chilled water & condenser water flow rate, compressor power has been measured. Logging has been done on compressor panel of chillers. Performance as summarized below.

Sl. No.	Particulars	Chiller # 1	Chiller # 2
1	Chiller Make	TRANE	DAIKIN
2	Chiller Rated TR	400	400
3	Chiller Type	SCREW	CENTRIFUGAL
4	Type of cooling	Water Cooled	Water Cooled
5	Refrigerant	HFC-134a	R-134a
6	Commissioning date	2012	2017
7	Set Point °c	7	7
8	Chiller Rated Input KW	269.4	264.5
9	Designed KW/TR	**0.67**	**0.66**
10	Date of measurement	11/05/2025	11/05/2025
11	Loading - %	92% -95%	95% -100%
12	Voltage, V	400	409
13	Load Current, A	402	401
14	Power Consumption, KW	**242**	**260**
15	P.F.	0.89	0.92
16	Chilled Water Inlet Temp., ^{o}C	12.5	13
17	Chilled Water Outlet Temp., ^{o}C	8.2	9
18	Chilled Water # Δt ^{o}C	4.3	4
19	Cooling Water Inlet Temp., ^{o}C	27	29.7
20	Cooling Water Outlet Temp., ^{o}C	33.5	35.2
21	Cooling Water# Δt ^{o}C	6.5	5.5
22	Chilled Water Flow (m^3/hr)	**204**	**260**
23	Cooling Water Flow (m^3/hr)	**283**	**283**
24	Output TR	**290**	**343**
25	Specific Power Consumption (KW/TR)	**0.83**	**0.75**
26	Remarks	Running without Drive	Running with Drive

During the audit with plant management support chiller water flow rate inlet to evaporator section of chiller has been measured & performance has been evaluated operating chillers. The evaluated specific power consumption of Chiller-1 is **0.83KW/TR** and Chiller -2 is **0.75 KW/TR,** which is on higher side**.**

Saving Potential:

C- Chiller No-1

By optimizing the chiller performance

Existing chiller KW/TR	:	0.83 KW/TR
Proposed Chiller KW/TR	:	0.67 KW/TR
Generation TR	:	290 TR
Power saving	:	(0.83 – 0.67) *290TR
	:	46.4 kW
Annual monetary saving	:	46.4 kW*8hours*180 days * Rs. 8.32
	:	**Rs. 5,55,909/-**

D- Chiller No-2

By optimizing the chiller performance

Existing chiller KW/TR	:	0.75 KW/TR
Proposed Chiller KW/TR	:	0.66 KW/TR
Generation TR	:	343 TR
Power saving	:	(0.75 – 0.66) *343TR
	:	30.87 kW
Annual monetary saving	:	30.87 kW*20hours*250 days * Rs. 8.32
	:	**Rs. 12,84,192/-**

Findings and Observations

1. **Energy Efficiency:**
    - Chiller #2, running with a variable frequency drive (VFD), shows better efficiency with a specific power consumption of **0.75 KW/TR**, compared to **0.83 KW/TR** for Chiller #1.
    - Chiller #1 is operating without a drive, leading to higher energy usage.
2. **Temperature Differentials:**
    - Chiller #1 has a **4.3°C** chilled water temperature differential, whereas Chiller #2 has a **4°C** differential, indicating slightly better performance in heat transfer efficiency.
    - The cooling water temperature differential is **6.5°C** for Chiller #1 and **5.5°C** for Chiller #2, which suggests Chiller #1 has a more efficient condenser heat exchange.
3. **Flow Rates:**

- Chiller #2 has a higher chilled water flow rate (**260 m^3/hr**) compared to Chiller #1 (**204 m^3/hr**), enhancing cooling capacity.
- Cooling water flow rates are identical (**283 m^3/hr**) for both chillers.

Suggestions for Improvement & Energy Savings

1. **Install a Variable Frequency Drive (VFD) on Chiller #1**
    - A VFD can optimize compressor performance, reduce startup and operational power consumption, and improve overall energy efficiency.
2. **Optimize Set Points & Improve Control Strategy**
    - Fine-tuning the chilled water and cooling water set points can improve efficiency and reduce energy wastage.
3. **Improve Condenser Water Treatment & Cleaning**
    - Regular cleaning of condenser coils and ensuring optimal water treatment will improve heat exchange efficiency.
4. **Schedule Preventive Maintenance**
    - Periodic inspections of refrigerant charge, sensor calibration, and control system performance can prevent inefficiencies.
5. **Review Chilled Water Flow Rate**

- If possible, optimizing chilled water flow distribution can enhance cooling efficiency and reduce pump energy usage.

By implementing these recommendations, both chillers can achieve better efficiency, lower energy consumption, and improve overall operational sustainability.

There are several advanced energy-saving technologies that can be applied to chillers to improve efficiency and reduce operational costs:

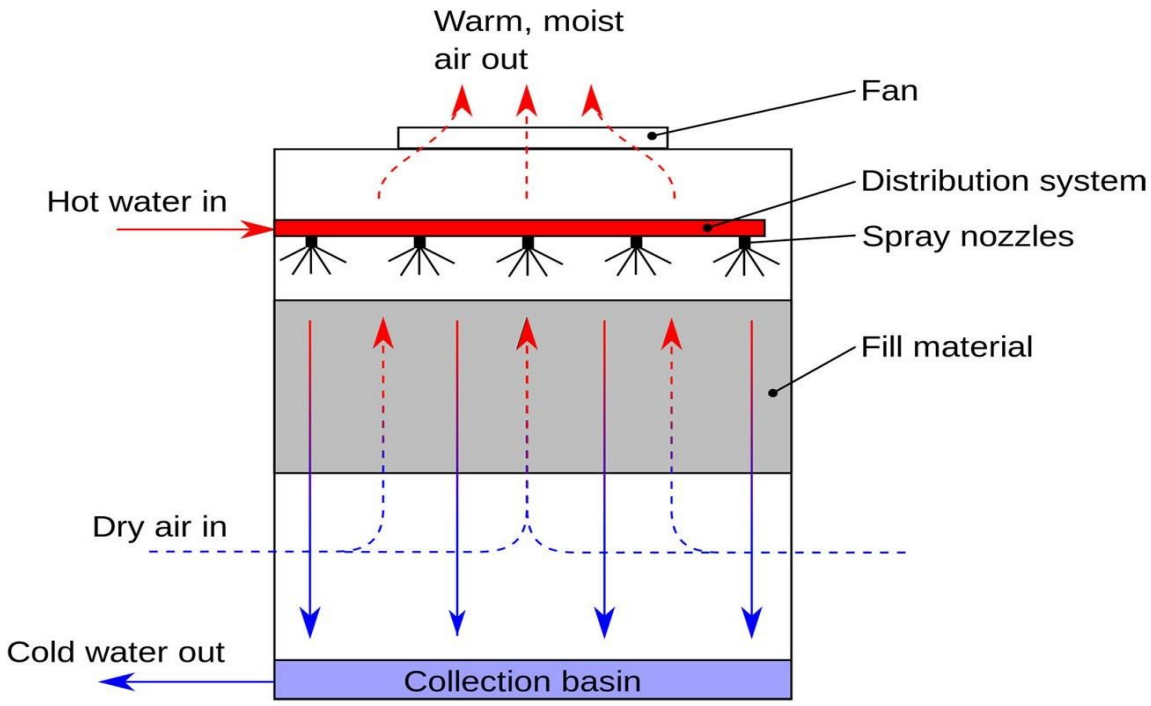
1. **AI-Driven Chiller Optimization**
    - AI systems analyze real-time operational data to optimize load distribution and automate energy-saving adjustments.
    - Machine learning algorithms predict failures and optimize setpoints based on weather and occupancy.
2. **Variable Speed Drives (VSDs) for Compressors**
    - VSDs adjust compressor speed to match cooling demand, reducing energy consumption by 25-35%.
    - Eliminates inefficiencies associated with fixed-speed operation, especially during low-load periods.
3. **Chilled Water Setpoint Optimization**
    - Advanced algorithms manage chiller plants using real-time data and weather forecasts to optimize chilled water temperature setpoints.
    - Reduces energy consumption by up to 25% while maintaining cooling efficiency.
4. **Digital Twin Technology**
    - Virtual replicas of chiller systems simulate performance under different scenarios to identify optimization opportunities without disrupting operations.
    - Helps in predictive maintenance and efficiency improvements.
5. **High-Efficiency Heat Exchangers**
    - Latest technology applied to flooded-type shell and tube evaporators/condenser systems improves efficiency.
    - Enhances heat transfer and reduces energy losses.
6. **Advanced Refrigeration Technologies**

- Trans critical CO2 systems and adiabatic cooling methods reduce electricity use by 7-37% compared to traditional refrigeration.
- Improves sustainability and reduces environmental impact.

Implementing these technologies can significantly enhance chiller performance, reduce energy consumption, and extend equipment lifespan.

Cooling Towers:

A water cooling tower is used to cool water and is a huge heat exchanger, expelling building heat into the atmosphere and returning colder water to the chiller. A water-cooling tower receives warm water from a chiller. This warm water is known as condenser water because it gets heat in the condenser of the chiller. The chiller is typically at a lower level, like in a basement. The cooling tower's role is to cool down the water, so it can return to the chiller to pick up more heat.



The auditor has evaluated the effectiveness of Cooling Tower no1,2,3&4 used for Chiller Plant no-1&2 (400 TR each)

Observation: -

Cooling tower effectiveness has been evaluated and as summarized below.

		CT-1 (400 TR)	CT-2(400TR)	CT-3(400 TR)	CT-4(400dTR)
Cooling Water Inlet Temperature	^{O}C	34.2	37.2	34.2	37.2
Cooling Water Outlet Temperature	^{O}C	30.3	31.7	28.8	31.6
Ambient DBT	^{O}C	36.0	36.0	36.0	36.0
Ambient WBT	^{O}C	21.5	22.5	22.5	22.5
Range		3.9	5.5	5.4	5.6
Approach		6.8	9.2	6.3	9.1
Effectiveness	%	36	37.4	46	38

Results: Performance Cooling tower no 1,2 and 4 is not satisfactory although performance of cooling tower no-3 is little bit o.k.

Physical Condition of cooling towers was not found as healthy as should be




Here's an analysis of the cooling tower performance and some recommendations for improvement:

Performance Analysis:

1. **Cooling Range (ΔT = Inlet Temperature - Outlet Temperature)**
    - **CT-1: 3.9°C**
    - **CT-2: 5.5°C**
    - **CT-3: 5.4°C**
    - **CT-4: 5.6°C**
    - **CT-2, CT-3, and CT-4 show better cooling range than CT-1, indicating more effective heat removal.**
2. **Approach (Approach = Outlet Temperature - Ambient Wet Bulb Temperature)**
    - **CT-1: 6.8°C**
    - **CT-2: 9.2°C**

- **CT-3: 6.3°C**
- **CT-4: 9.1°C**
- **CT-3 has the lowest approach value, meaning it is performing best in achieving lower outlet water temperature relative to the ambient wet bulb temperature.**

3. **Effectiveness (% = (Range / (Range + Approach)) × 100)**

- **CT-1: 36%**
- **CT-2: 37.4%**
- **CT-3: 46%**
- **CT-4: 38%**
- **CT-3 has the highest effectiveness, indicating it is performing optimally compared to the others.**

<u>Recommendations for Improvement:</u>

- **Improve Airflow & Fan Efficiency: Ensuring proper airflow and optimizing fan speeds can help lower the approach temperature, improving cooling efficiency.**
- **Optimize Water Distribution: Uneven water flow can create hotspots, reducing overall performance. Regularly check and adjust nozzles for uniform distribution.**
- **Minimize Scaling & Fouling: Scale buildup and dirt reduce heat transfer efficiency. Regular descaling and cleaning can boost cooling effectiveness.**
- **Check Fill Media Condition: If the fill media is deteriorated, replacing it can improve heat transfer efficiency.**
- **Increase Water Treatment Efficiency: Proper chemical dosing and filtration help maintain optimal thermal performance.**

CT-3 is currently performing the best in terms of effectiveness, while CT-1 could use improvements in cooling range and approach. If further optimization is needed, conducting a detailed on-site assessment of fan operation, drift eliminators, and water distribution can yield more targeted solutions.

Would you like a more detailed breakdown or assistance in drafting a formal report for this analysis?

There are several **targeted energy-saving measures** you can implement for your cooling towers to **reduce power consumption and improve efficiency**. Here's a structured approach:

1. Optimize Fan System with VFDs

- **Install Variable Frequency Drives (VFDs)** to adjust fan speed based on cooling demand instead of running fans at a fixed speed.
- **Lower fan speed during cooler ambient temperatures** to reduce unnecessary energy usage.

2. Improve Water Distribution & Flow Rate

- **Ensure uniform water distribution** over fill media to maximize heat rejection.
- **Clean and unclog spray nozzles** regularly to avoid uneven cooling and improve efficiency.
- **Monitor pump operation** to optimize water circulation and minimize power waste.

3. Enhance Heat Transfer Efficiency

- **Regularly clean fill media** to remove scale, biological growth, and debris that reduce cooling performance.
- **Upgrade fill material** to high-efficiency designs that improve water-air contact and cooling.

4. Reduce Water Approach Temperature

- **Minimize approach temperature** by improving air circulation and water flow rates.
- **Check ambient conditions** and adjust settings to align with wet bulb temperature more effectively.

5. Optimize Airflow & Ventilation

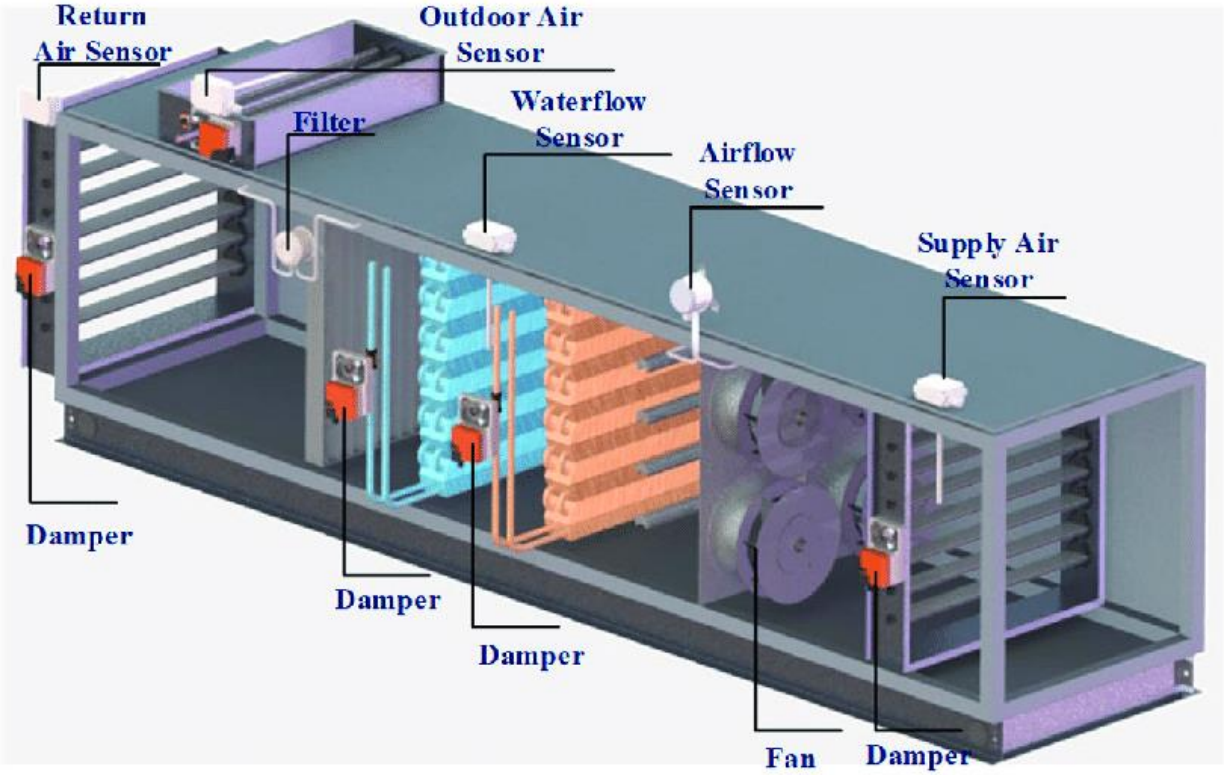
- **Ensure proper fan blade positioning** for maximum airflow efficiency.
- **Eliminate obstructions** in air intake and exhaust areas to maintain steady airflow.
- **Replace inefficient fans** with **energy-efficient models** that consume less power.

6. Water Treatment & Scaling Prevention

- **Implement water treatment solutions** to prevent scaling, corrosion, and biological growth that reduce performance.
- **Regularly monitor water chemistry** to maintain optimal cooling efficiency.

AHU:

Air handling unit is sometimes abbreviated as “AHU.” As the name implies, an air handling unit is a piece of equipment that handles air. Its internal structure is very simple. The air handling unit (AHU) is the heart of central air conditioning. It collects outside air and room air, removes dust and other particles from the collected air, adjusts the temperature and humidity and then supplies comfortable and refreshing air-conditioned air into the rooms through ducts.



At Max Hospital Vaishali Ghaziabad the total number of AHU installed were 126 in which some AHUS are floor mounted while remaining are ceiling mounted.

AHU Performance Evaluation:

During the audit the audit team has measured electrical parameters of few the working AHU and tabulated as below. AHU are maintained by regular cleaning and maintenance even then there is a scope to improve their performance as suggested below.

AHU Fan Motor Loading

Location of AHU	Motor Rating In KW.	CFM	V	%THDV	A	%THDI	KW	PF	Mode of Drive	Frequency
Tower -1 Floor B-2 PET CT	5.5	4500	400	3.1	5.92	4.5	1.86	0.45	Without VFD	Na
Tower -1 Floor B-2 GAMA Camara.	**5.5**	4200	400	3.6	4.64	9.1	1.92	0.62	Without VFD	Na
Tower-1 Floor B-2 CSSD	7.5	7000	385	5.3	5.15	2.9	3.27	0.95	No VFD	Na
Emergency	5.5	4000	402	3.5	4.14	190	1.05	0.39	With VFD	24.8 HZ
Tower-2 O.T Corridor	5.5	4500	405	3.1	5.85	4.6	1.14	0.71	No VFD	50 HZ
Ground Floor Emergency Tower-1	11	10,000	419	2.5	11.60	13.2	5.0	0.59	No VFD	50 HZ
OPD First Floor	5.5	8800	410	3.2	4.18	31.4	2.8	0.95	With VFD	25 HZ
Dental Frist Floor	5.5	5000	405	3.1	6.3	1.8	3.84	0.86	No VFD	50 HZ

Neuro ICU2 1ST Floor	5.5	4000	403	2.8	7.92	4.7	4.3	0.81	No VFD	50 HZ
P ICU 2ND Floor	5.5	5500	405	3.7	6.29	9	3.45	0.79	No VFD	50 HZ
CCO 2ND Floor.	5.5	4000	405	3.9	11.9	9.5	4.7	0.78	No VFD	50 HZ

Actual CFM, TR, Power &Specific Power for the following working AHU: -

During the study the audit team measured the air velocity in m/s at different locations of the AHU filter and measured the area of the filter in m2 and calculated the actual CFM and TR for working AHU as tabulated below along with the power in kw and specific power kw/TR.

AHU NO.	Air Vel.(m/s)	Area Of Filter (m^2)	Rated cfm	Actual working cfm	Rated TR	Actual Working TR	Power in kw	Specific Power KW/TR
Tower -1 Floor B-2 PET CT	1.9	0.64	4500	2575	11.25	6.4	1.86	0.29
Tower -1 Floor B-2 GAMA Camara.	1.2	1.25	4200	3150	10.5	7.85	1.92	0.24
Tower-1 Floor B-2 CSSD	1.2	1.5	7000	3811	17.5	9.5	3.27	0.34
Emergency	1.1	1.12	4000	2608	10	6.52	1.05	0.16
Tower-2 O.T Corridor	1.2	1.25	4500	3175	11.25	7.9	1.14	0.14
Ground Floor Emergency Tower-1	2.5	1.86	10000	7200	25	18	5.0	0.27

OPD First Floor	1.6	1.86	8800	5305	22	13	2.8	0.22
Dental Frist Floor	1.2	1.12	5000	2819	12.5	7	3.84	0.54
Neuro ICU2 1ST Floor	1.3	0.83	4000	2284	10	5.71	4.3	0.75
P ICU 2ND Floor	1.1	1.09	5500	2538	13.75	6.35	3.45	0.54
CCU 2ND Floor.	1.1	1.8	4000	3000	10	7.5	4.7	0.62

Observation and Recommendation:

- Management has taken a very effective step by installing VFD in some AHU's and Temperature sensor to control the flow of chilled water in AHU.
- The performance evaluation of all AHU's is not so satisfactory as should be. Here we recommend cleaning the filters to maintain the specific power consumption KW/TR of AHU's as low as possible.

Other Observations affecting the performance of AHU:

1. Three-way water control flow valves are not functioning properly, so these are to be checked for proper function.
2. AHU water pipeline inlet/outlet piping butterfly's valves should be in proper operation.
3. Variable speed drives are to be checked for proper function on the basis of air requirement the air flow can be adjusted to reduce power consumption by reducing the speed in %age i.e. 10%, 20%, 30% etc.
4. AHU showing less cfm can be improved by proper maintenance.
5. BMS system should be implemented properly.

Energy saving aspects in case of AHU: -

1. **Optimizing Air Velocity and Filter Area**:
    - The air velocity (Air Vel.) and the area of the filter (Area Of Filter) are crucial parameters. Ensuring that these are optimized can reduce the resistance to airflow, thereby reducing the energy required to move the air. For example, the PET CT unit has an air velocity of 1.9 m/s and a filter area of 0.64 m^2, which seems to be well balanced 1.
2. **Balancing Rated and Actual Working CFM**:
    - The difference between the rated cfm and the actual working cfm indicates potential inefficiencies. For instance, the PET CT unit is rated at 4500 cfm but is working at 2575 cfm. Ensuring that the AHUs operate closer to their rated cfm can improve efficiency 1.
3. **Improving Specific Power Consumption**:
    - Specific power consumption (Specific Power KW/TR) is a key metric. Lower values indicate better efficiency. For example, the PET CT unit has a specific power consumption of 0.29 KW/TR, which is relatively efficient 1. Units with higher specific power consumption, such as the Neuro ICU2 unit with 0.75 KW/TR, could benefit from optimization.
4. **Regular Maintenance and Cleaning**:
    - Regular maintenance and cleaning of filters and coils can significantly improve the efficiency of AHUs. Dirty filters and coils increase resistance to airflow, causing the system to work harder and consume more energy.
5. **Variable Frequency Drives (VFDs)**:
    - Installing VFDs on AHU fans can help in adjusting the fan speed based on the actual demand, thereby saving energy. This is particularly useful in systems where the load varies throughout the day.
6. **Energy Recovery Systems**:
    - Implementing energy recovery systems, such as heat recovery wheels or plates, can capture waste energy from exhaust air and use it to pre-condition incoming fresh air, reducing the load on the AHUs.

By focusing on these aspects, you can enhance the energy efficiency of your AHUs and achieve significant energy savings.

MOTOR LOADING

During the audit the team took the load profile for the below- machines and tabulated below. The auditor has also calculated the loading %age on the motors.

Annexure-1

Motor Loading

Sr. No.	Location	Motor kW	Electrical Parameters						% Loading	Remarks
			Voltage	% THDV	Current	% THDI	kW	P.F.		
1.	Condenser Pump No-2	30	410	3.0	47	3.2	28.95	0.84	96.5%	Without VFD
2.	Secondary Pump-1	37	412	2.7	48.5	47	31.75	0.90	89 %	With drive At Frequency 47
3.	Secondary Pump-3	30	411	2.5	39	50	24	0.86	80 %	With drive At Frequency 42
4.	Secondary Pump-5	18.5	410	2.5	25	45	16	0.9	86%	With drive At Frequency 45
5.	Primary Pump No-2	11	403	3.2	12	11	8.32	0.99	75.6 %	No drive
6.	Primary Pump	11	410	3.5	20	16.6	11.3	0.80	100 %	No drive

	No-6									
7.	Cooling Tower No -1 Fan No-1 Fan no-2	9.3 each	400 400	3.2 -	10 13	4 -	4.5 6.84	0.66 0.74	48 % 73.5 %	No drive
8.	Cooling Tower No-2 Fan no-1	9.3	410	3.0	12	6	8.38	0.99	90 %	No drive
9.	Cooling Tower N-3 Fan no-1	9.3	400	-	7	-	3.78	0.74	41 %	No drive
10.	Cooling Tower No-4 Fan no-1 Fan no-2	9.3 each	400 410	- -	12 10	4 -	3.5 4.4	0.44 0.49	37 % 47 %	No drive

Chiller Loading

Sr. No.	Name of Feeder	Electrical Parameter						Remarks
		Voltage	% THDV	Current	% THDI	kW	P.F.	
1.	Chiller No-1 TRANE (400TR)	400	3.2	402	3.4	242	0.89	92% Loading
2-	Chiller No-2 DAIKIN (400TR)	409	3.5	401	40	260	0.91	95%

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Electrical Feeder Loading

During the audit the team took the load profile along with the harmonics level for the below Electrical feeders at L. T panel and tabulated here for the reference.As below.

Annexure-2

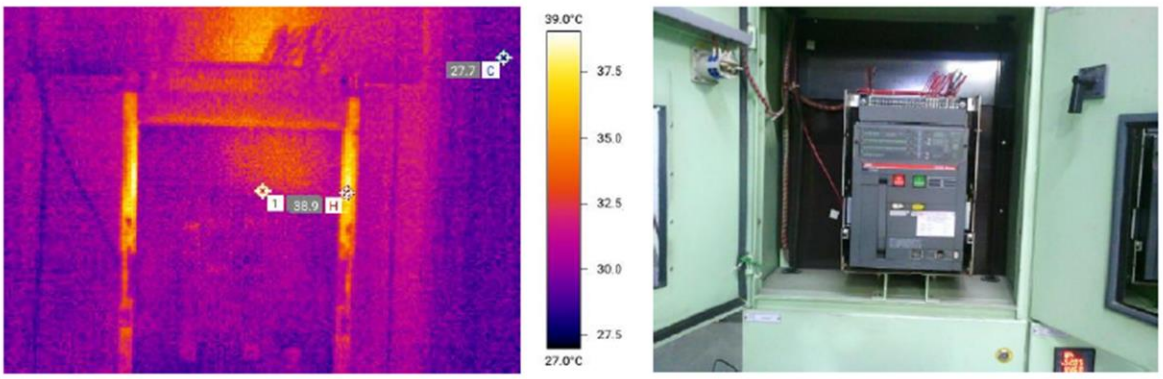
Electrical Feeder Loading (LT Room Panel)									
Sr. no.	**Name of Feeder**	**Electrical Parameter**							**Remarks**
		Voltage	**% THD (V)**	**Current**	**% THD (I)**	**kW**	**KVA**	**P.F.**	
1.	Main LT Panel Block A	404	3.5	649	35.0	415.5	459	0.91	
2.	Main LT Panel Block B (Outgoing to Q5)	405	3.2	195	19.1	133.1	118.4	0.88	
3.	Main LT Panel Block B (Outgoing to Q3)	401	3.3	196	14	130.8	135.6	0.96	
4.	HVAC Outgoing from Q5	404	3.0	68	2.7	41.58	48.08	0.86	
5.	Raising Main-2 (B-side)	408	3.1	115	34.0	68.21	81.53	0.87	
6.	Incomer-3 from Q5	416	2.8	165	18.9	104.9	128.0	0.87	
7.	Incomer-2 (B-side)	414	2.9	190	15.4	132.5	139.3	0.96	

8.	Rising Main-1 (B-side)	414	2.9	12	14.2	10.56	11.67	0.91	
9.	UPS Input Panel (Incomer B-Side)	414	2.8	54	31.1	33.29	44.02	0.79	
10.	HVAC-2 Outgoing from Q3	415	2.9	121	21	73.68	82.89	0.89	
11.	Incomer-1	404	3.0	909	19.5	533.9	645	0.84	
12.	HVAC-3 Outgoing	404	3.2	509	33.6	333.7	360	0.92	
13.	MDB-1 Lightning and Power	405	3.3	15	98.8	10.75	15.30	0.69	
14.	MDB-2 Basement Ventilation	404	3.1	25	5.6	11.76	13.21	0.65	
15.	Laundry	402	3.5	18	3.2	11.72	13.93	0.84	
16.	STP	402	3.3	44	4.8	20.35	31.61	0.64	

1. **Panel Name:** Main LT Panel(Block-A)
   Panel No.: Panel-01
   Panel Location: LT Room, TRF, DG & GAS Genset Changeover Panel

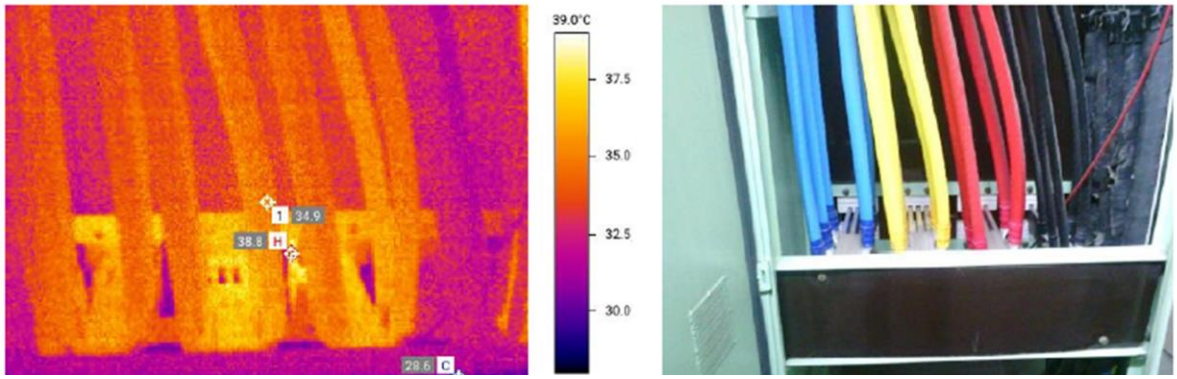
Measurement Results

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	32.2
2.	Cold Point	27.7
3.	Hot Point	38.9

Figure: 2

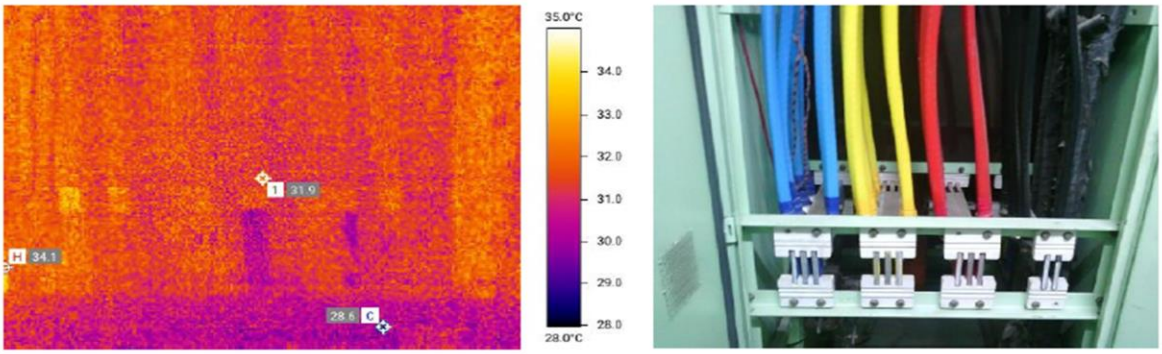


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	34.9
2.	Cold Point	28.6
3.	Hot Point	38.8

2. **Panel Name:** Main LT Panel (Block-B)
Panel No.: Panel-02
Panel Location: LT Room, TRF, DG & GAS Genset Changeover Panel

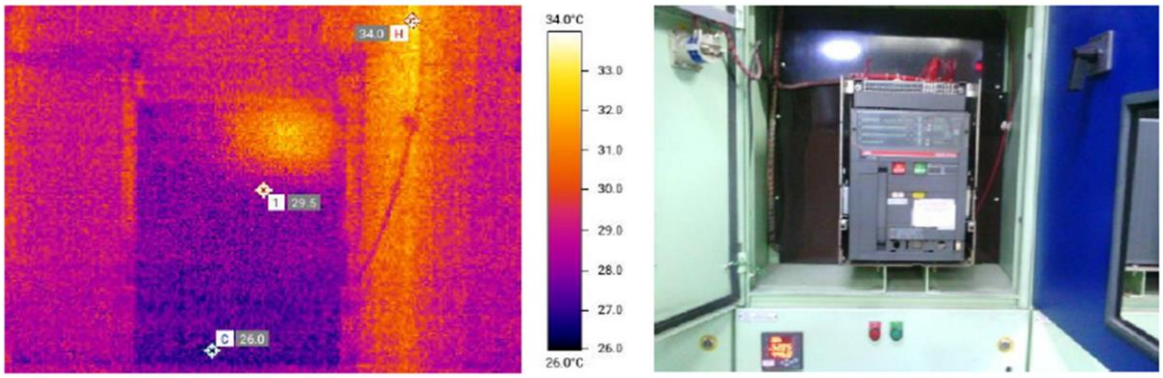
Measurement Results

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	31.9
2.	Cold Point	28.6
3.	Hot Point	34.1

Figure: 2

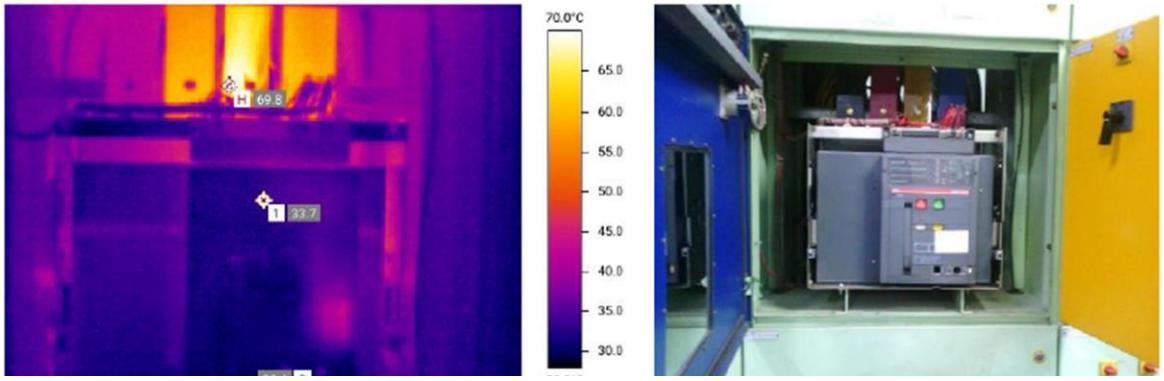


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	29.5
2.	Cold Point	26.0
3.	Hot Point	34.0

3. **Panel Name:** TRF Incomer-1
Panel No.: Panel-03
Panel Location: LT Room, TRF, DG & GAS Genset Changeover Panel

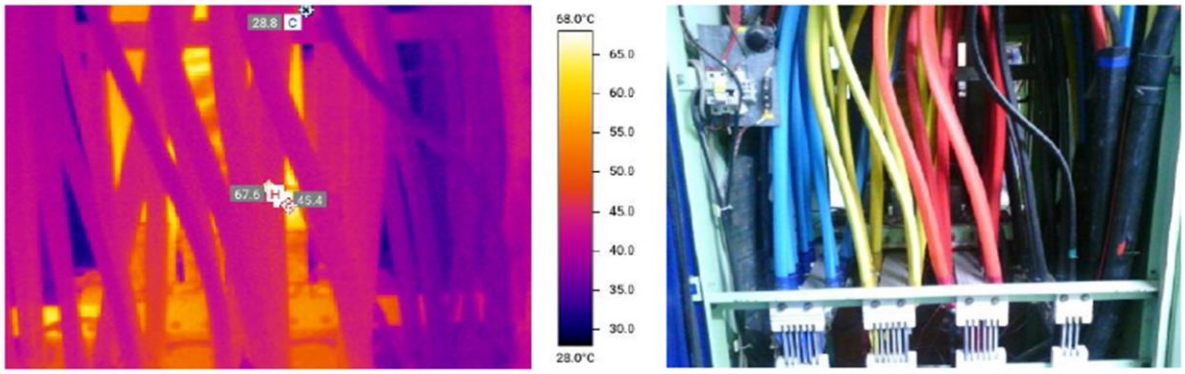
Measurement Results

Figure: 1



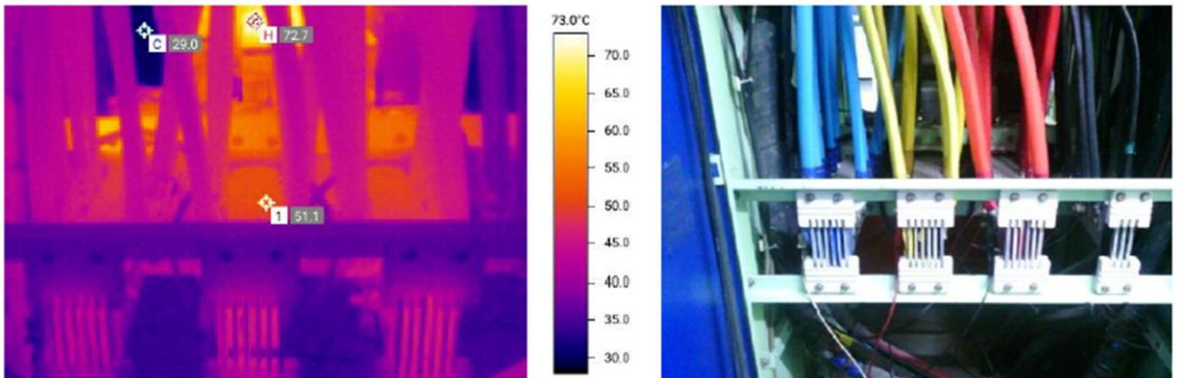
S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	33.7
2.	Cold Point	28.4
3.	Hot Point	69.8

Figure: 2



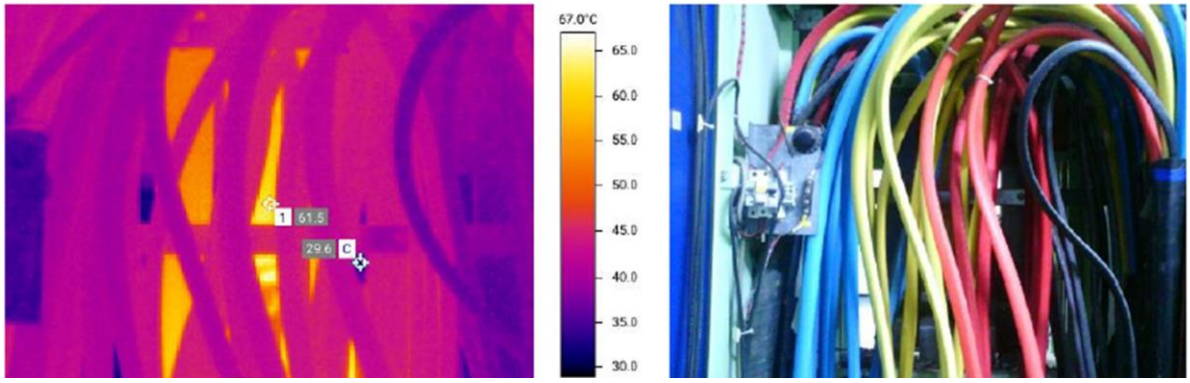
S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	45.4
2.	Cold Point	28.8
3.	Hot Point	67.6

Figure: 3



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	51.1
2.	Cold Point	29.0
3.	Hot Point	72.7

Figure: 4

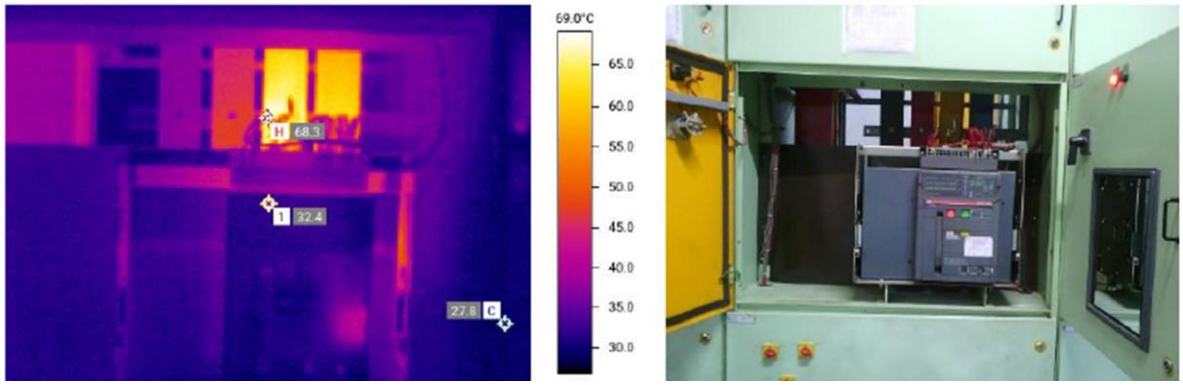


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	61.5
2.	Cold Point	29.6
3.	Hot Point	66.1

4. **Panel Name:** Bus Coupler-1
Panel No.: Panel-04
Panel Location: LT Room, TRF, DG & GAS Genset Changeover Panel

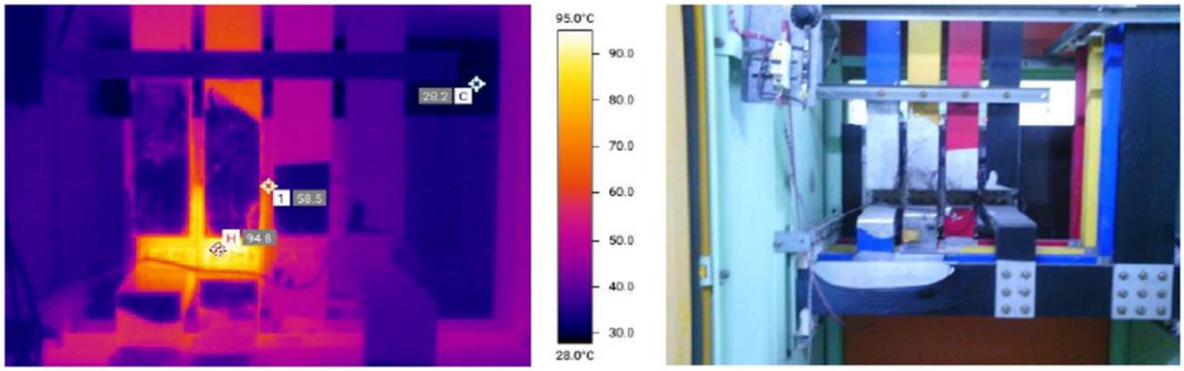
Measurement Results

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	32.4
2.	Cold Point	27.8
3.	Hot Point	68.3

Figure: 2

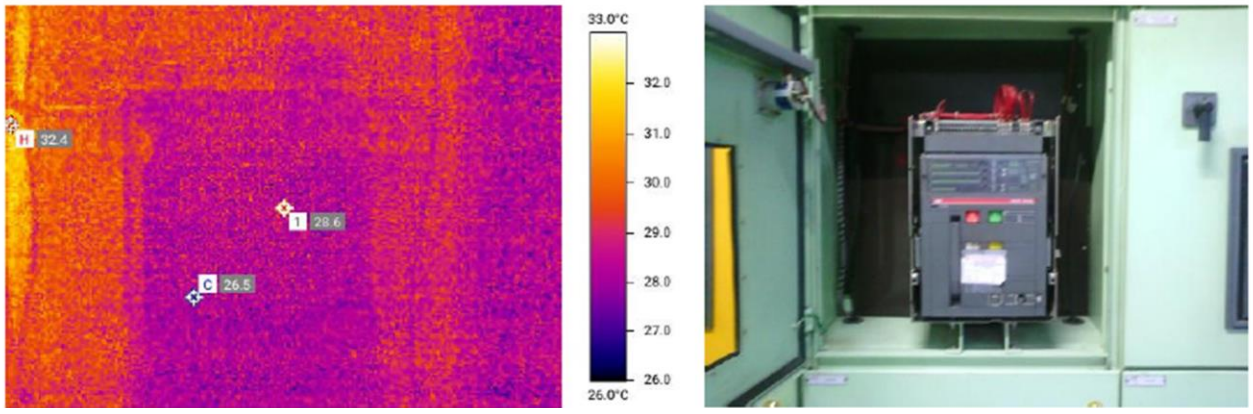


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	58.5
2.	Cold Point	28.2
3.	Hot Point	94.8

5. **Panel Name:** Main LT Panel (Block-A)
Panel No.: Panel-05
Panel Location: LT Room, TRF, DG & GAS Genset Changeover Panel

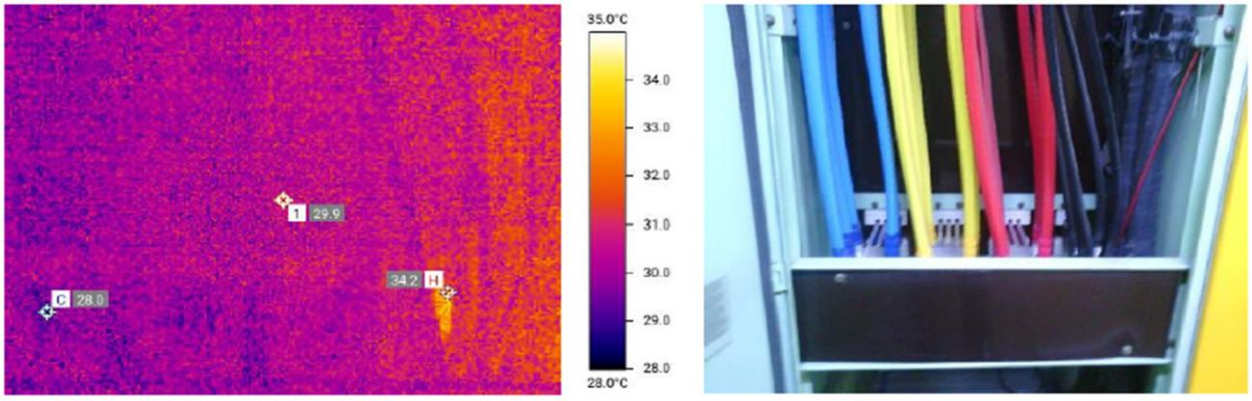
Measurement Results

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	28.6
2.	Cold Point	26.5
3.	Hot Point	32.4

Figure: 2

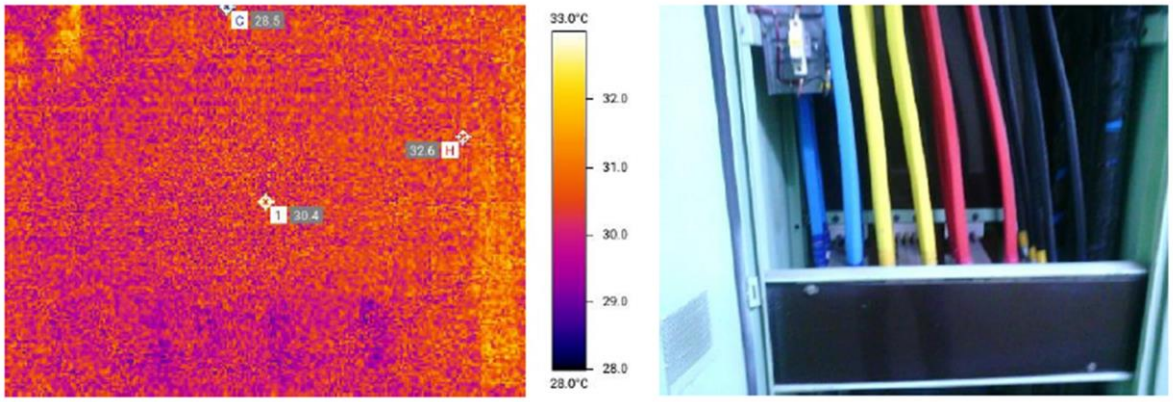


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	29.9
2.	Cold Point	28.0
3.	Hot Point	34.2

6. **Panel Name:** Mail LT Panel (Block-B)
Panel No.: Panel-06
Panel Location: LT Room, TRF, DG & GAS Genset Changeover Panel

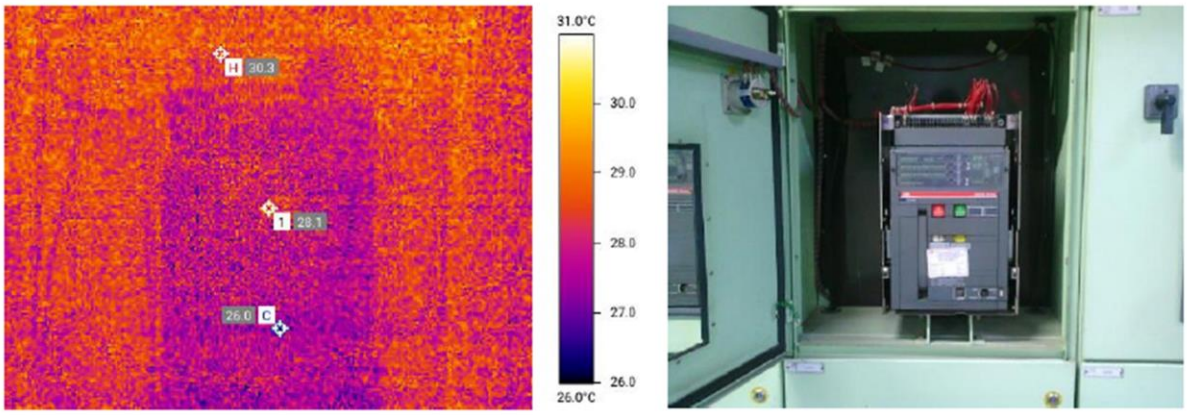
Measurement Results

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	30.4
2.	Cold Point	28.5
3.	Hot Point	32.6

Figure: 2

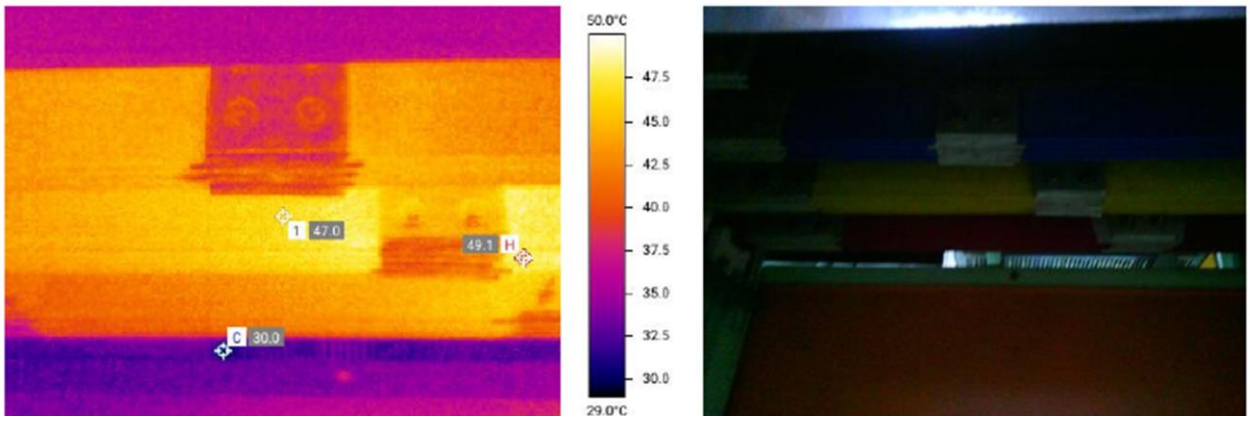


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	28.1
2.	Cold Point	26.0
3.	Hot Point	30.3

7. Panel Name: Bus Coupler-2
Panel No.: Panel-07
Panel Location: LT Room, TRF, DG & GAS Genset Changeover Panel

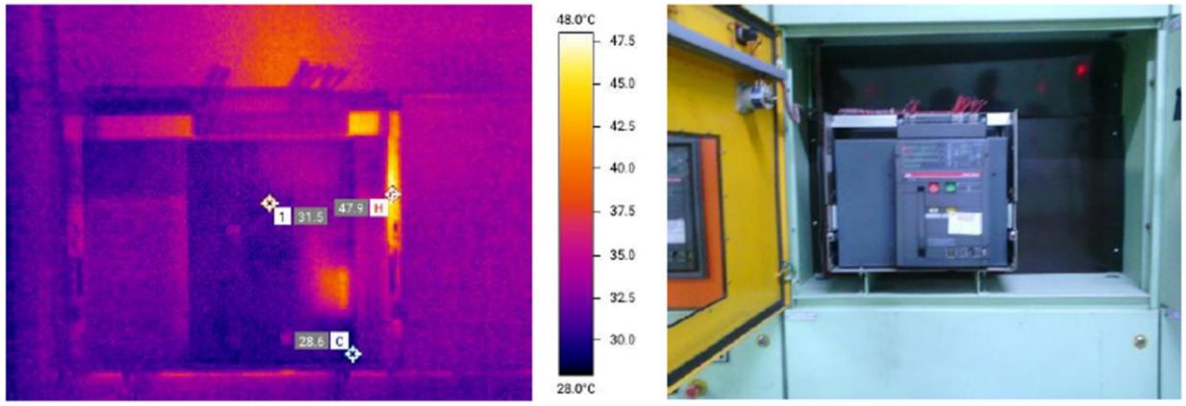
Measurement Results

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	47.0
2.	Cold Point	30.0
3.	Hot Point	49.1

Figure: 2

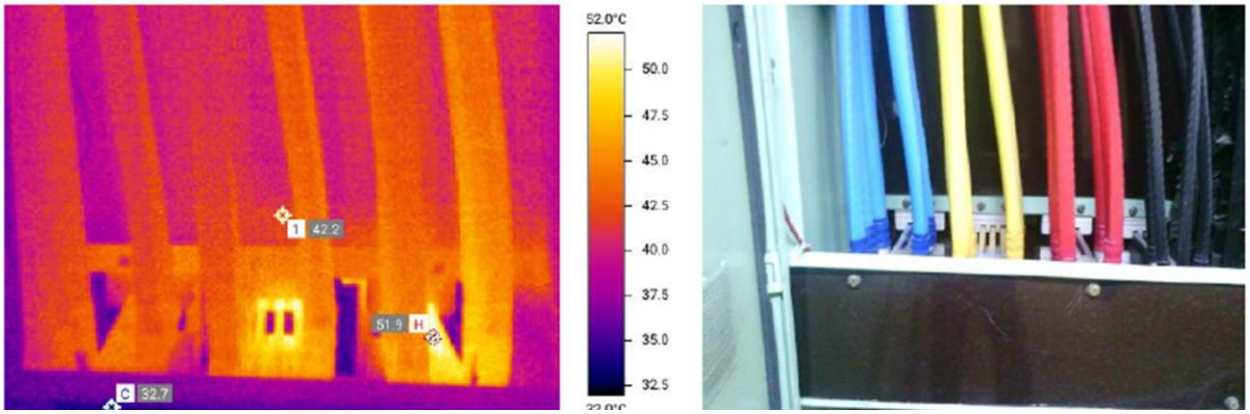


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	31.5
2.	Cold Point	28.6
3.	Hot Point	47.9

8. Panel Name: Mail LT Panel (Block-A)
Panel No.: Panel-08
Panel Location: LT Room, TRF, DG & GAS Genset Changeover Panel

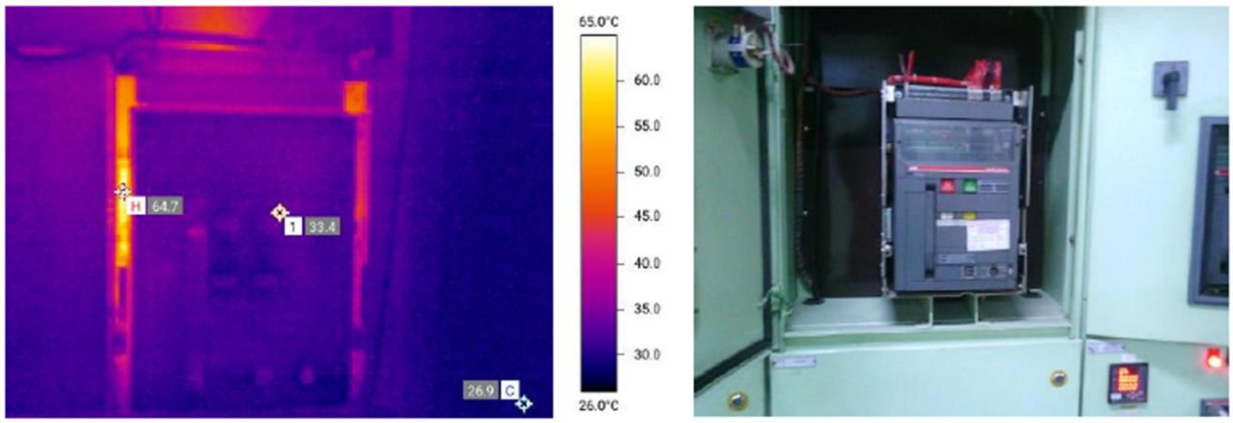
Measurement Results

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	42.2
2.	Cold Point	32.7
3.	Hot Point	51.9

Figure: 2

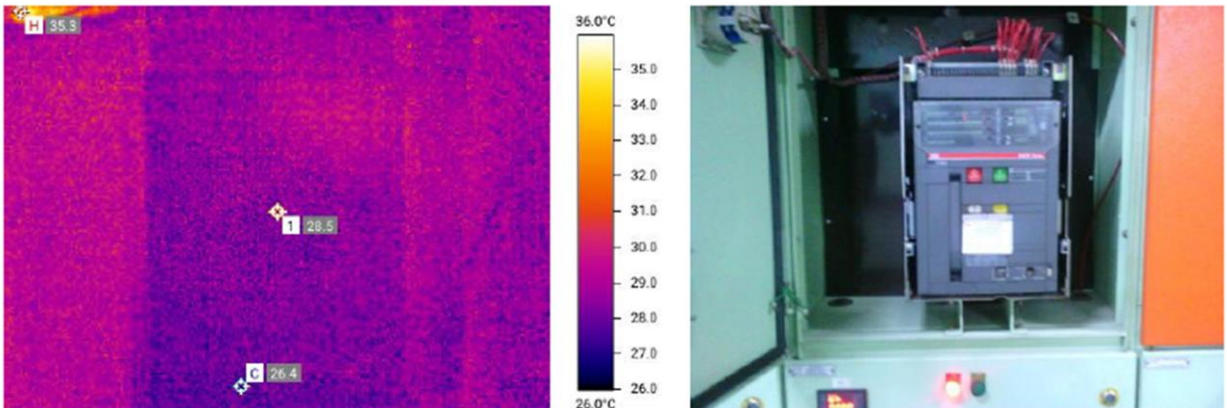


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	33.4
2.	Cold Point	26.9
3.	Hot Point	64.7

9. Panel Name: SPARE
Panel No.: Panel-09
Panel Location: LT Room, TRF, DG & GAS Genset Changeover Panel

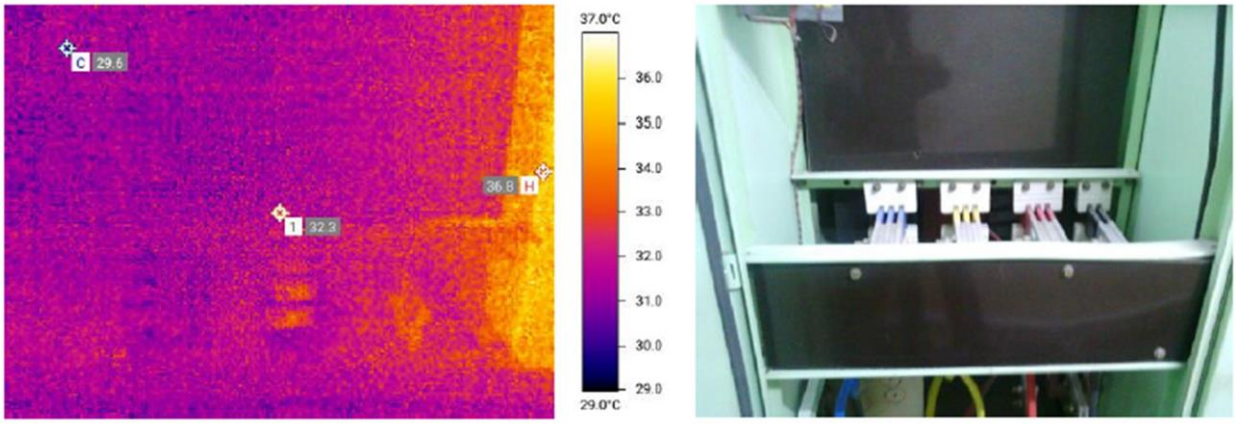
Measurement Results

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	28.5
2.	Cold Point	26.4
3.	Hot Point	35.3

Figure: 2

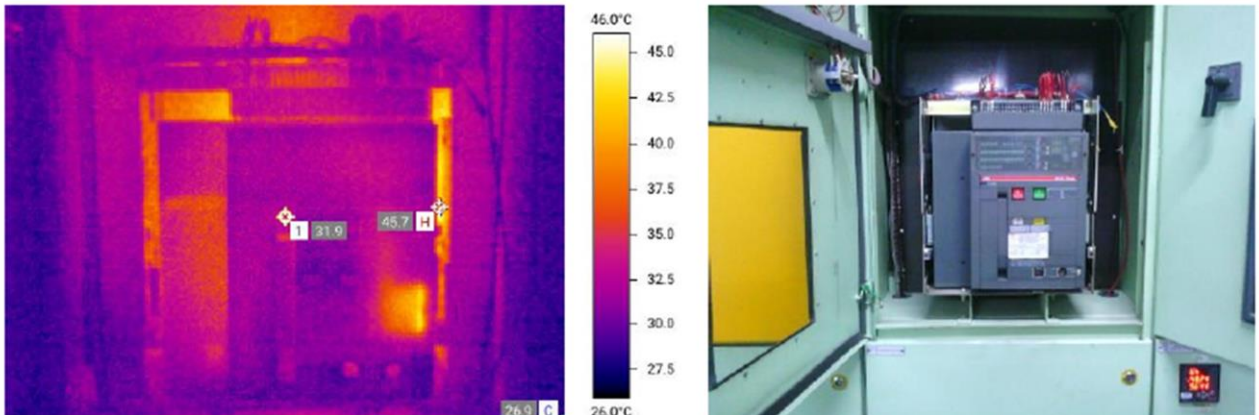


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	32.3
2.	Cold Point	29.6
3.	Hot Point	36.8

10. Panel Name: Metering & Incomer From Main
Panel No.: Panel-10
Panel Location: LT Room, TRF, DG & GAS Genset Changeover Panel

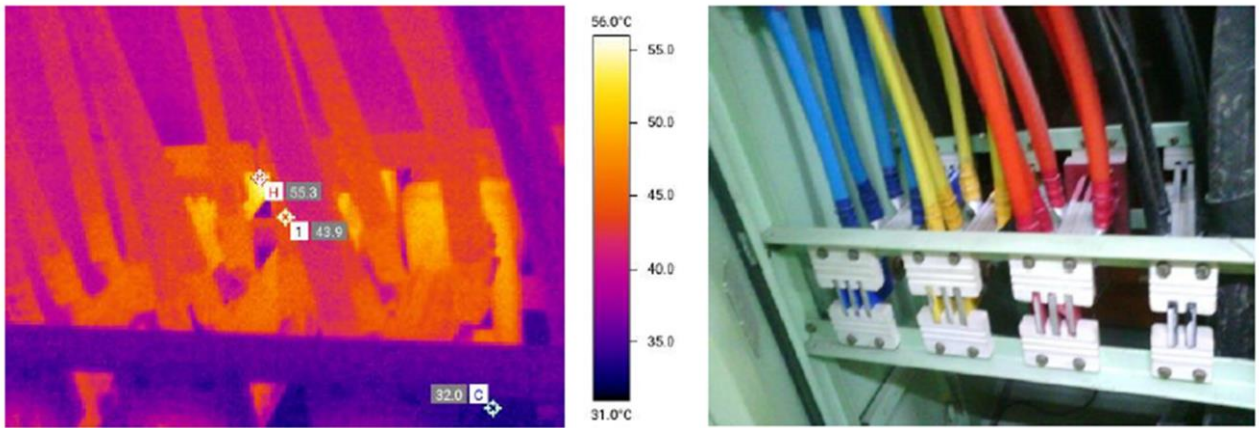
Measurement Results

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	31.9
2.	Cold Point	26.9
3.	Hot Point	45.7

Figure: 2

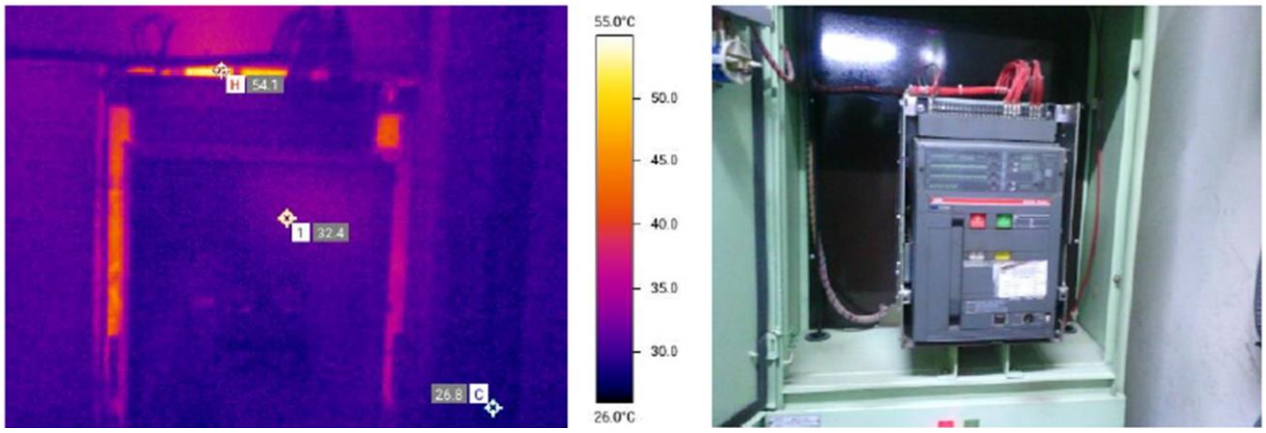


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	43.9
2.	Cold Point	32.0
3.	Hot Point	55.3

11. Panel Name: Main LT Panel (Block-B)
Panel No.: Panel-11
Panel Location: LT Room, TRF, DG & GAS Genset Changeover Panel

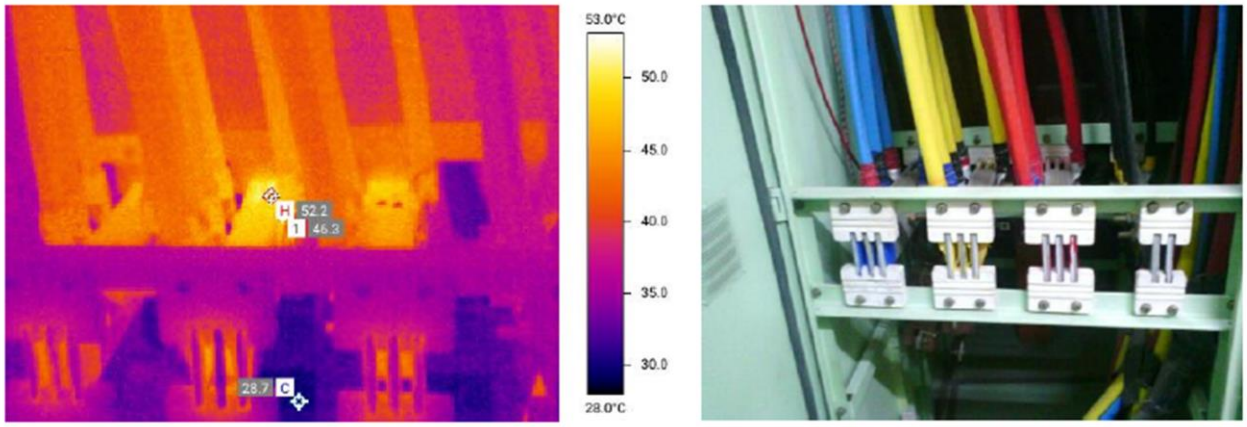
Measurement Results

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	32.4
2.	Cold Point	26.8
3.	Hot Point	54.1

Figure: 2

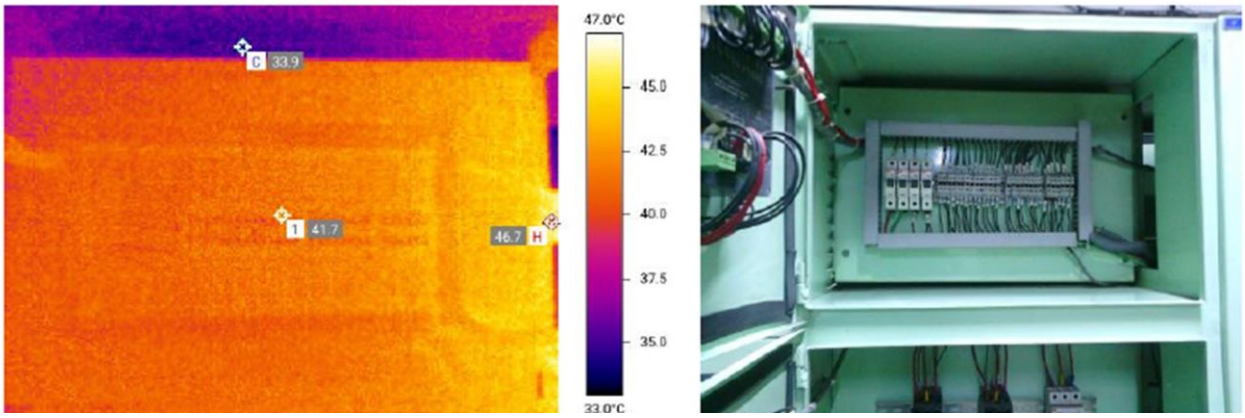


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	46.3
2.	Cold Point	28.7
3.	Hot Point	52.2

12 Panel Name: 400 KVAR CAP Panel
Panel No.: Panel-12
Panel Location: LT Room, Capacitor Panel

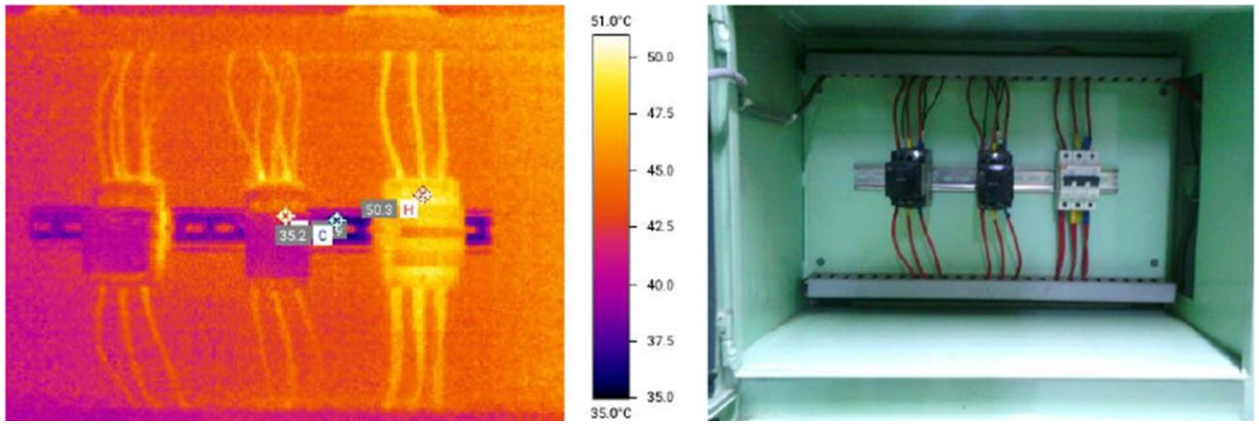
Measurement Results

Figure: 1



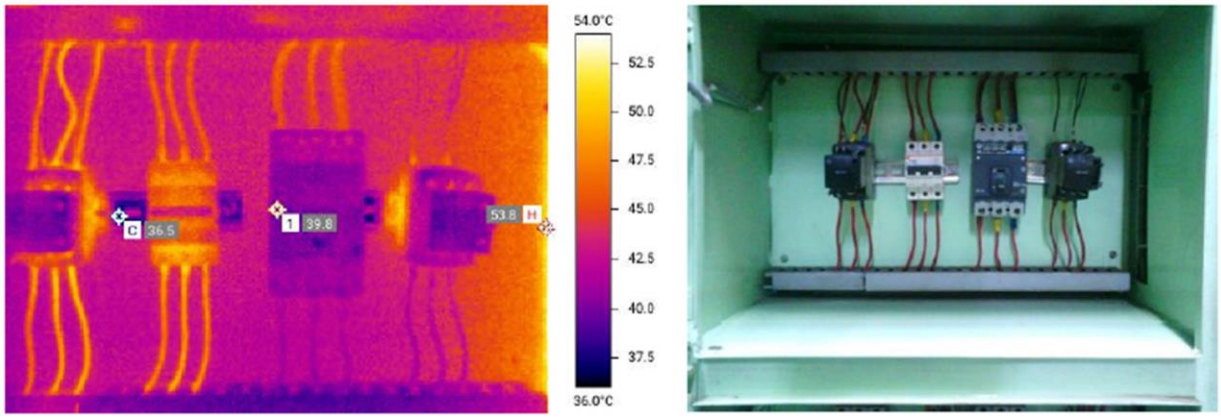
S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	41.7
2.	Cold Point	33.9
3.	Hot Point	46.7

Figure: 2



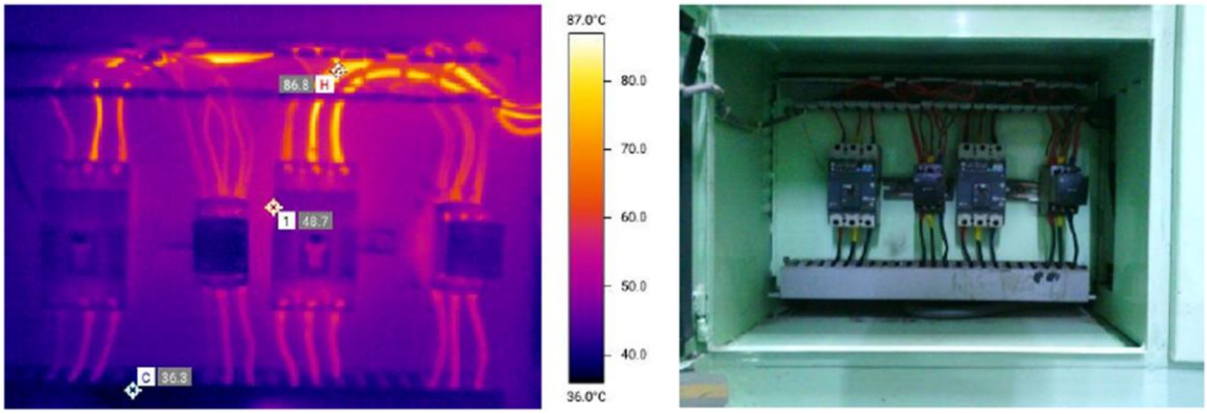
S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	41.9
2.	Cold Point	35.2
3.	Hot Point	50.3

Figure: 3



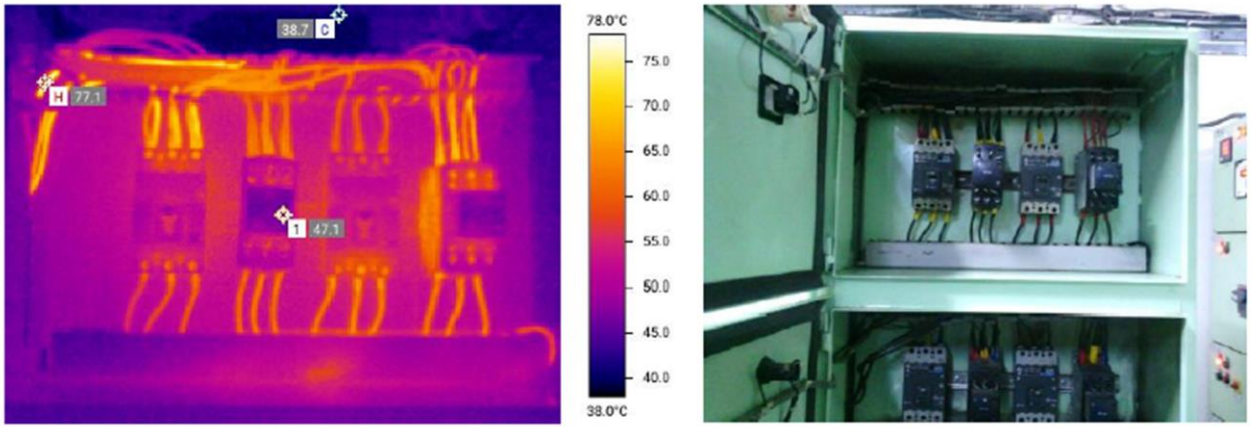
S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	39.8
2.	Cold Point	36.5
3.	Hot Point	53.8

Figure: 4



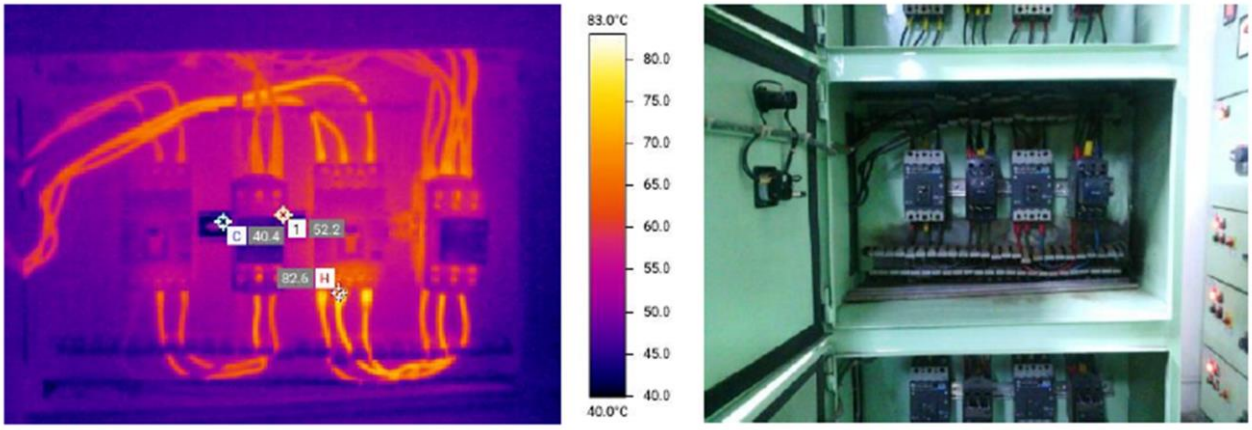
S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	48.7
2.	Cold Point	36.3
3.	Hot Point	86.8

Figure: 5



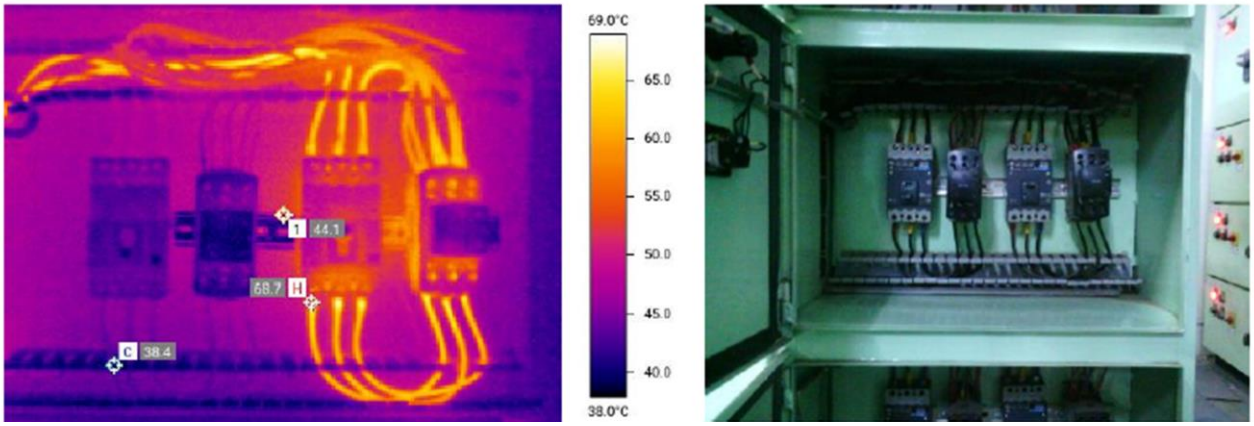
S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	47.1
2.	Cold Point	38.7
3.	Hot Point	77.1

Figure: 6



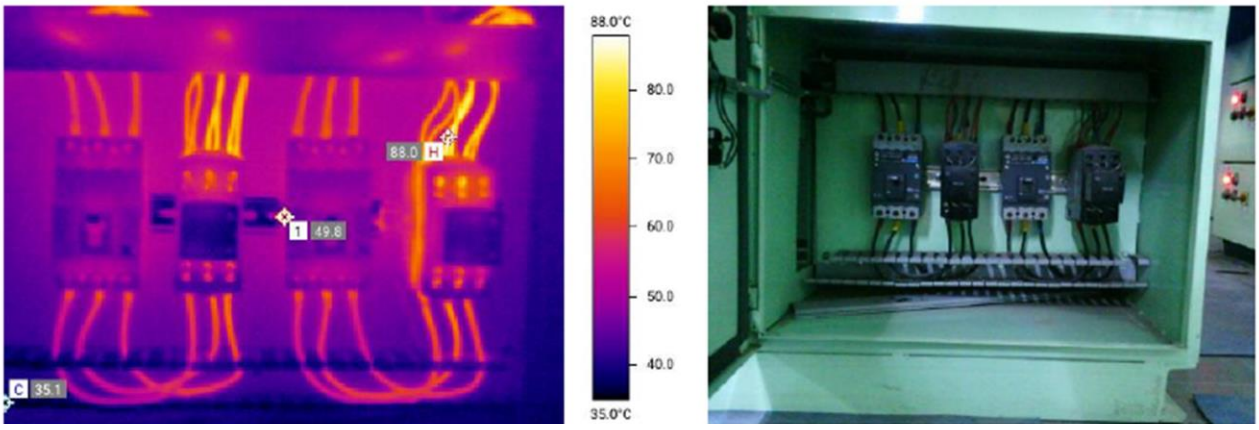
S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	52.2
2.	Cold Point	40.4
3.	Hot Point	82.6

Figure: 7



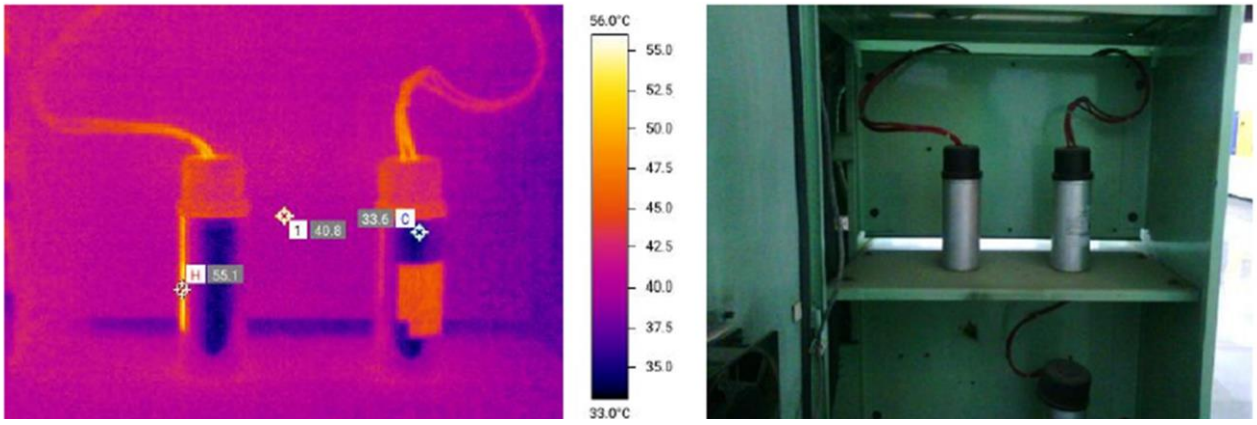
S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	44.1
2.	Cold Point	38.4
3.	Hot Point	68.7

Figure: 8



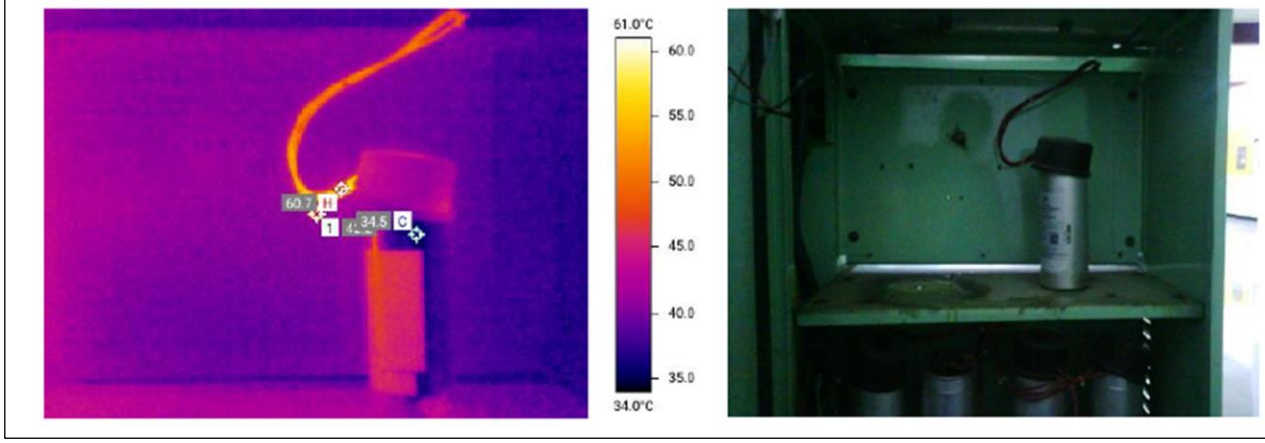
S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	49.8
2.	Cold Point	35.1
3.	Hot Point	88.0

Figure: 9



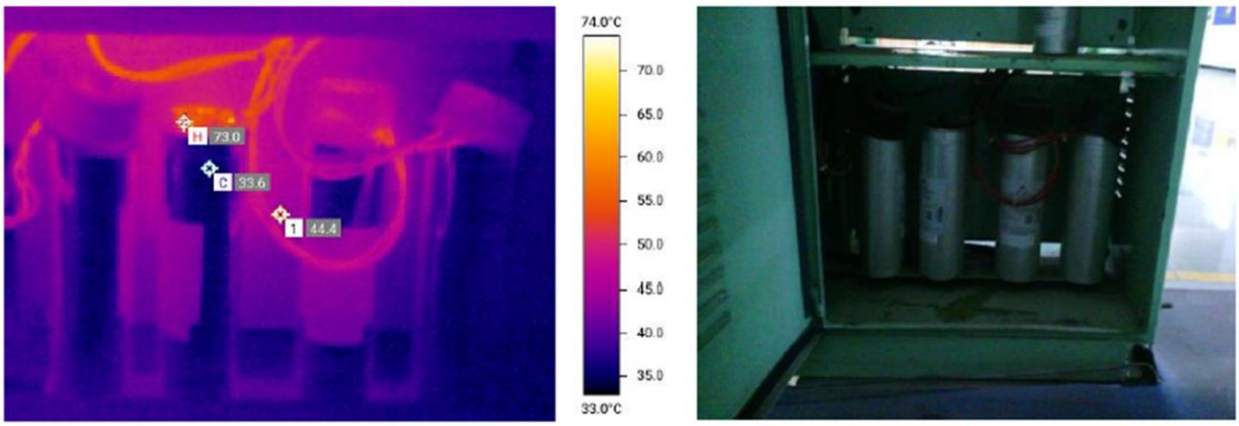
S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	40.8
2.	Cold Point	33.6
3.	Hot Point	55.1

Figure: 10



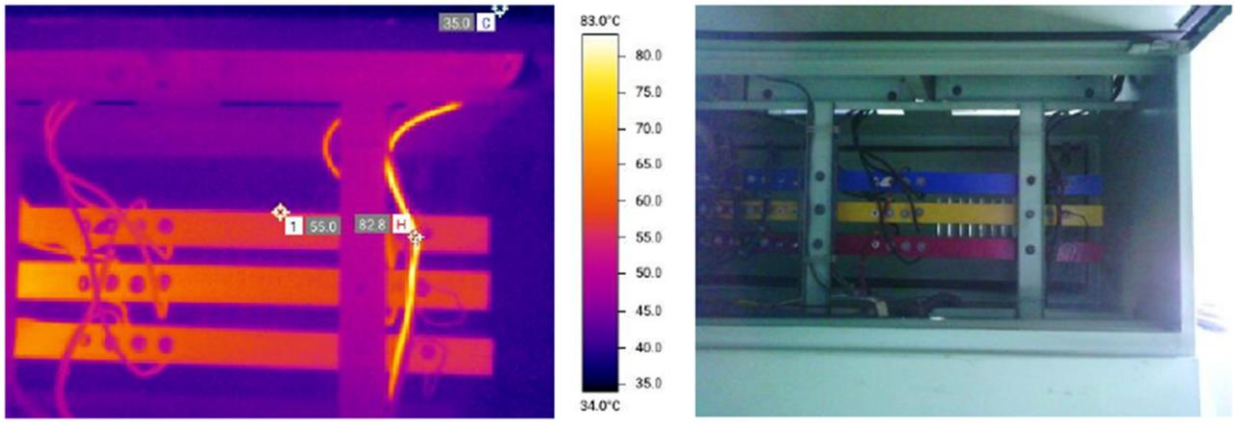
S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	42.2
2.	Cold Point	34.5
3.	Hot Point	60.7

Figure: 11



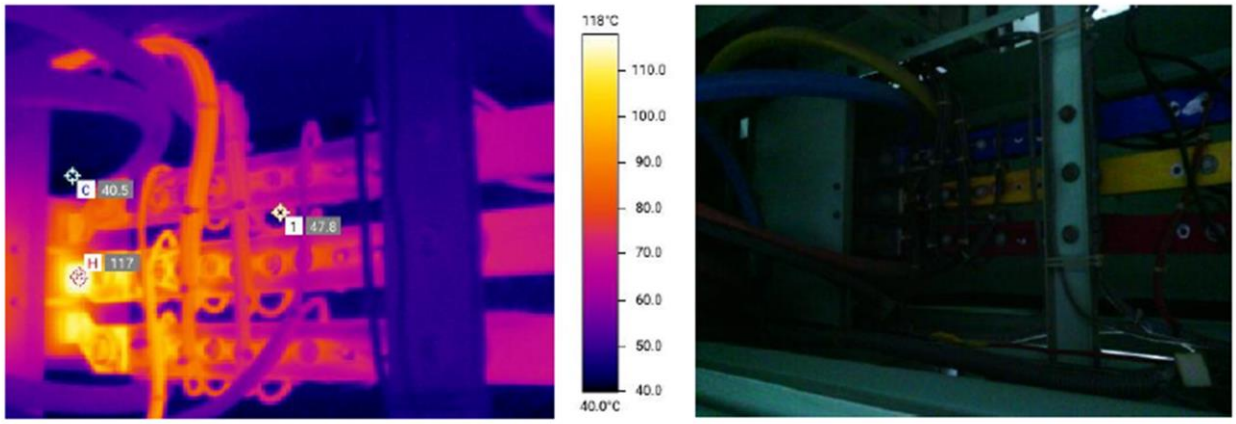
S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	44.4
2.	Cold Point	33.6
3.	Hot Point	73.0

Figure: 12



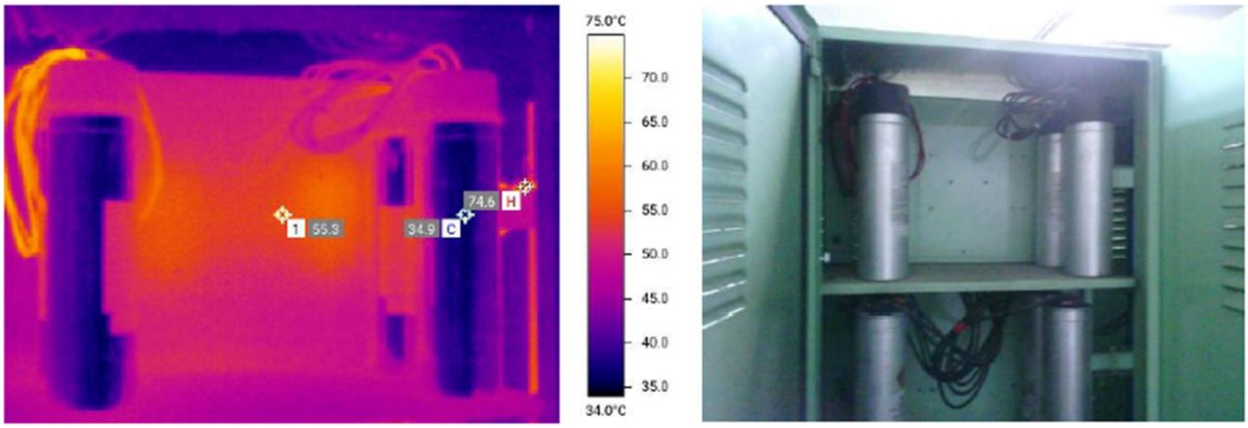
S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	55.0
2.	Cold Point	35.0
3.	Hot Point	82.8

Figure: 13



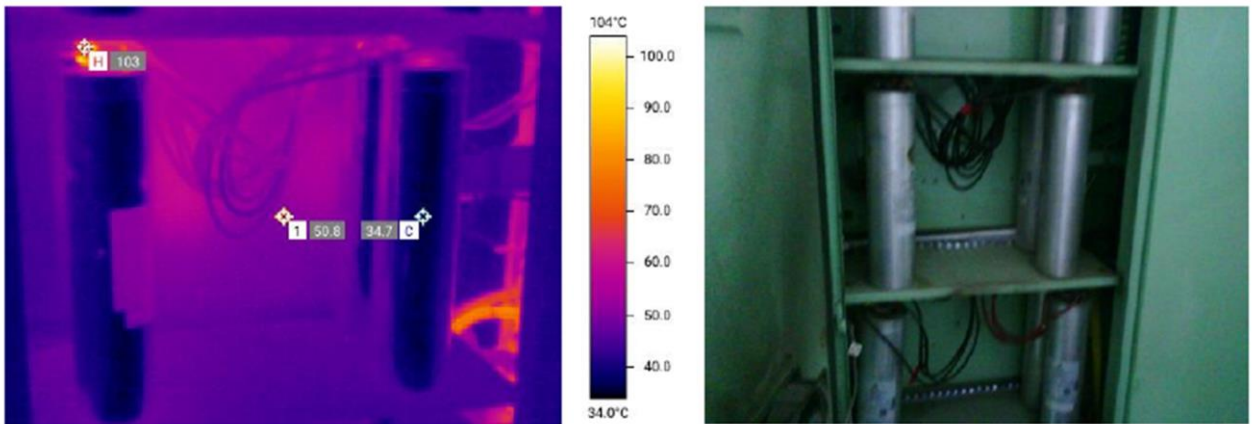
S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	47.8
2.	Cold Point	40.5
3.	Hot Point	117

Figure: 14



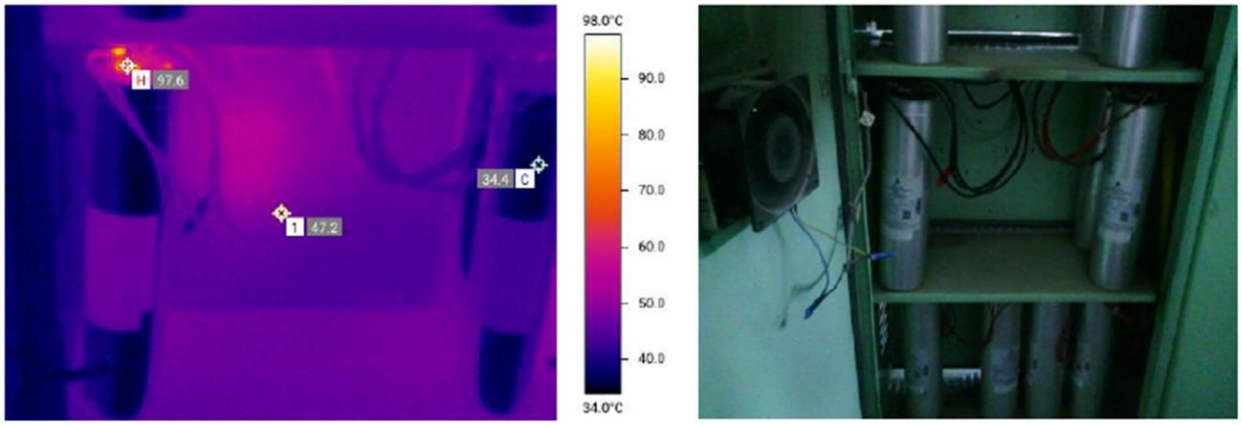
S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	55.3
2.	Cold Point	34.9
3.	Hot Point	74.6

Figure: 15



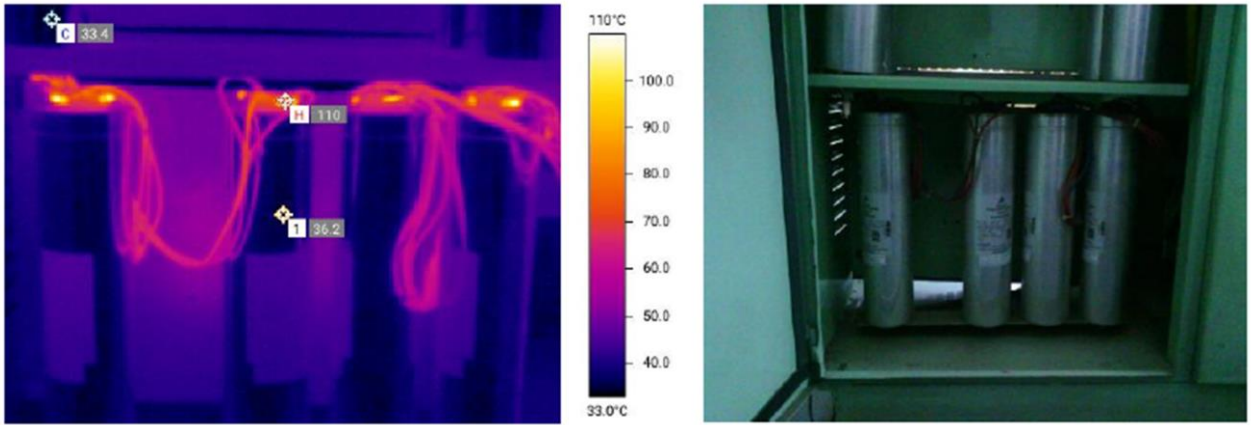
S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	50.8
2.	Cold Point	34.7
3.	Hot Point	103

Figure: 16



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	47.2
2.	Cold Point	34.4
3.	Hot Point	97.6

Figure: 17

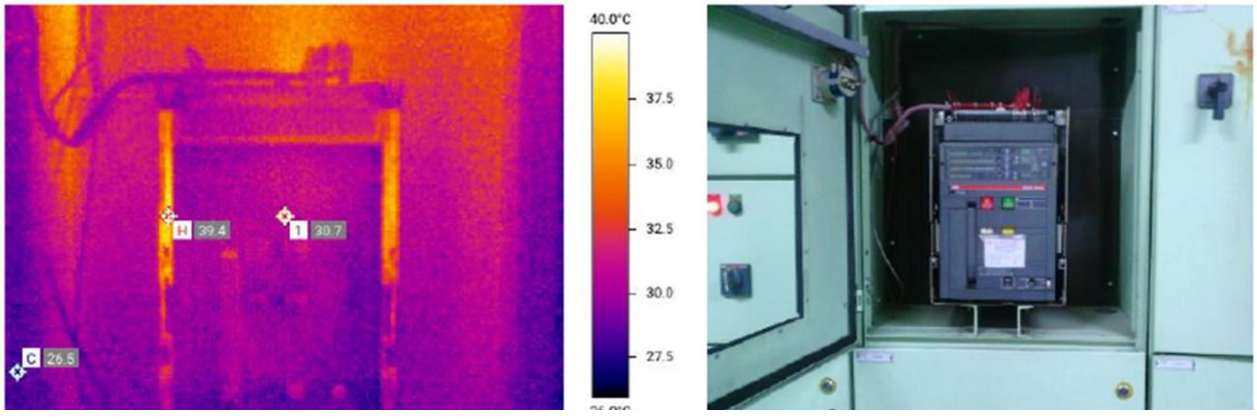


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	36.2
2.	Cold Point	33.4
3.	Hot Point	110

13. **Panel Name:** Main HVAC Panel
Panel No.: Panel-13
Panel Location: LT Room, Main LT Panel (Block-B)

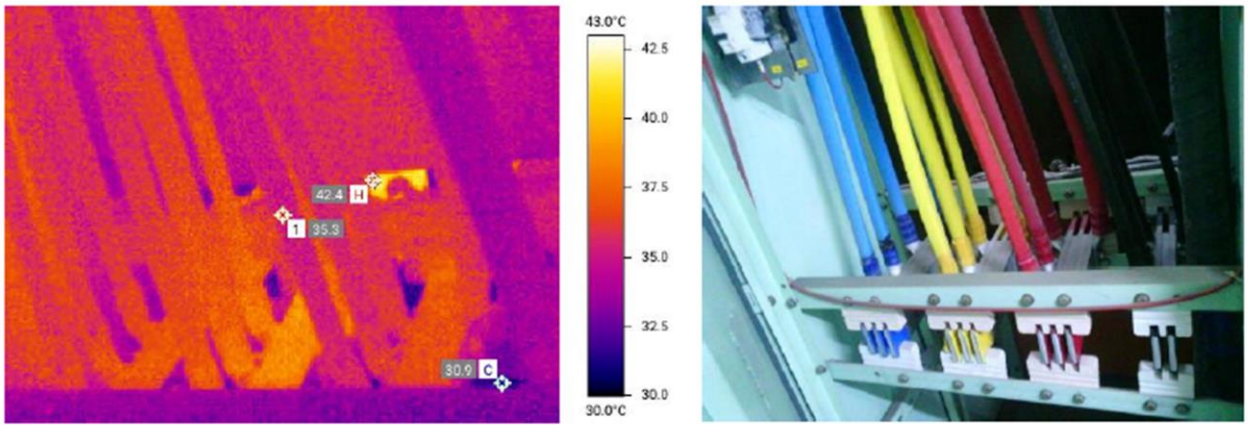
Measurement Results

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	30.7
2.	Cold Point	26.5
3.	Hot Point	39.4

Figure: 2

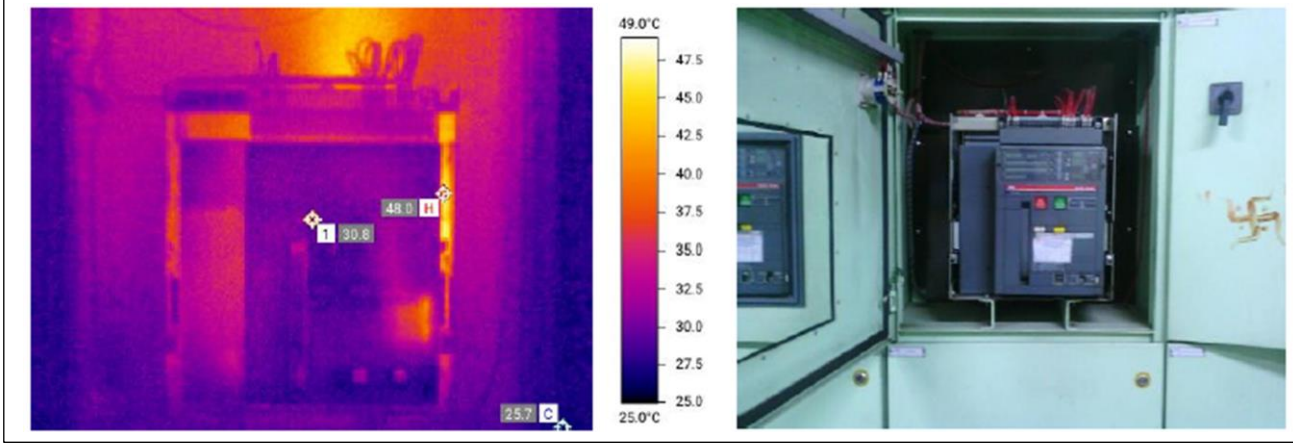


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	35.3
2.	Cold Point	30.9
3.	Hot Point	42.4

14. Panel Name: Incomer-1
Panel No.: Panel-14
Panel Location: LT Room, Main LT Panel (Block-B)

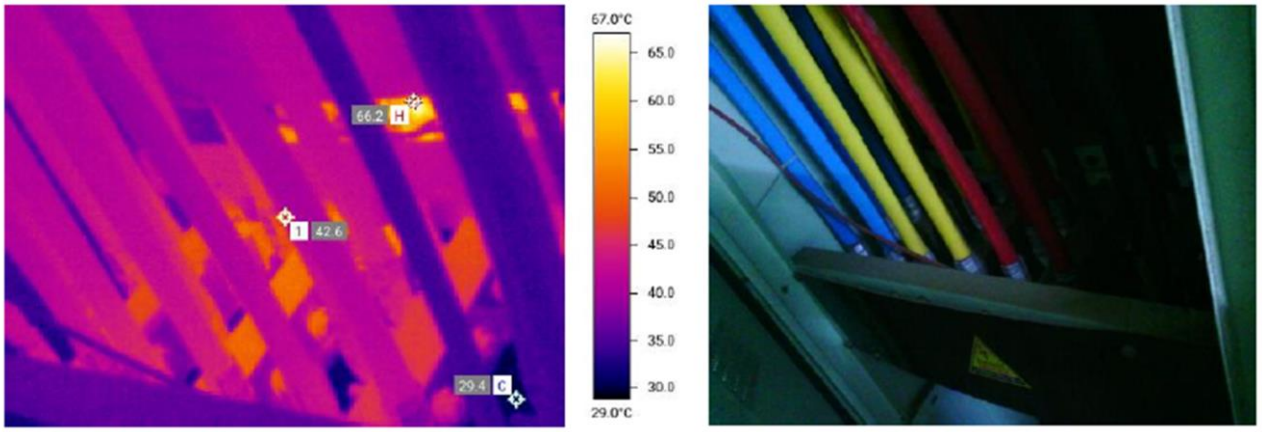
Measurement Results

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	30.8
2.	Cold Point	25.7
3.	Hot Point	48.0

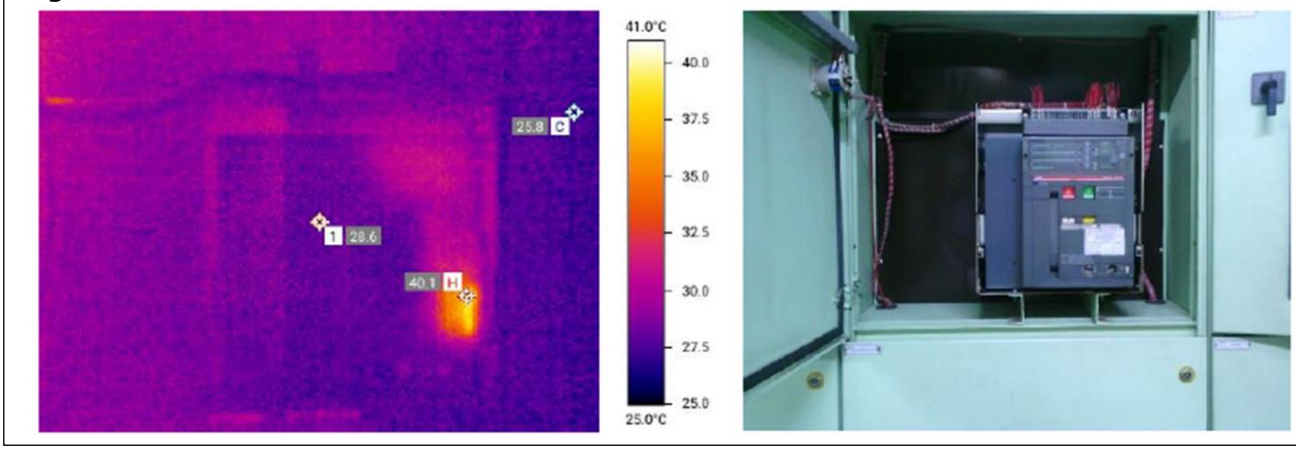
Figure: 2



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	42.6
2.	Cold Point	29.4
3.	Hot Point	66.2

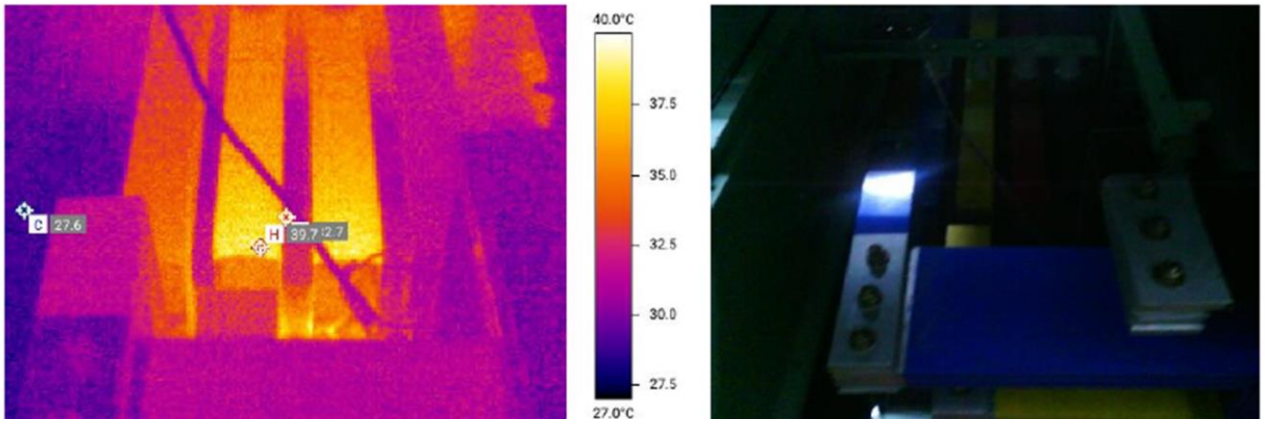
15. Panel Name: Bus Coupler-1
Panel No.: Panel-15
Panel Location: LT Room, Main LT Panel (Block-B)

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	28.6
2.	Cold Point	25.8
3.	Hot Point	40.1

Figure: 2

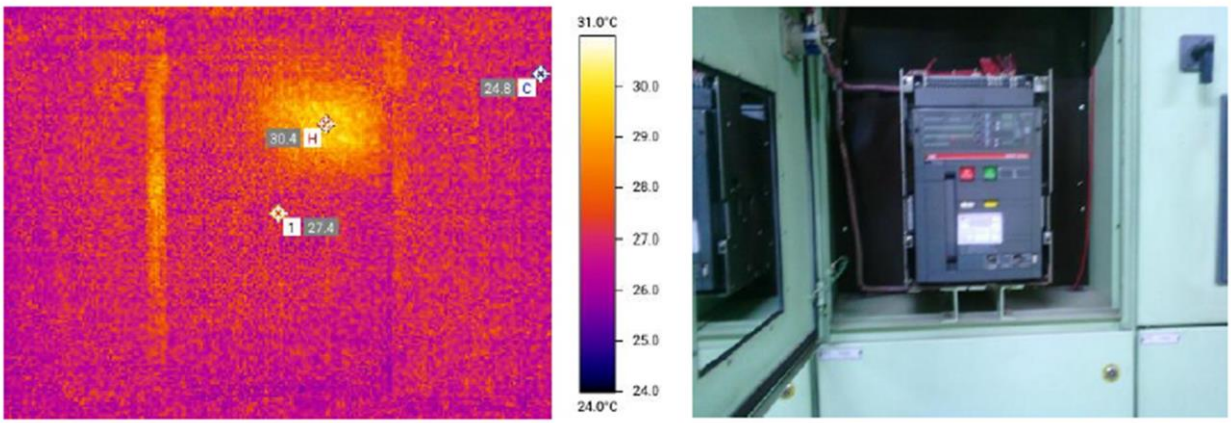


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	32.7
2.	Cold Point	27.6
3.	Hot Point	39.7

16. Panel Name: Main HVAC Panel-2
Panel No.: Panel-16
Panel Location: LT Room, Main LT Panel (Block-B)

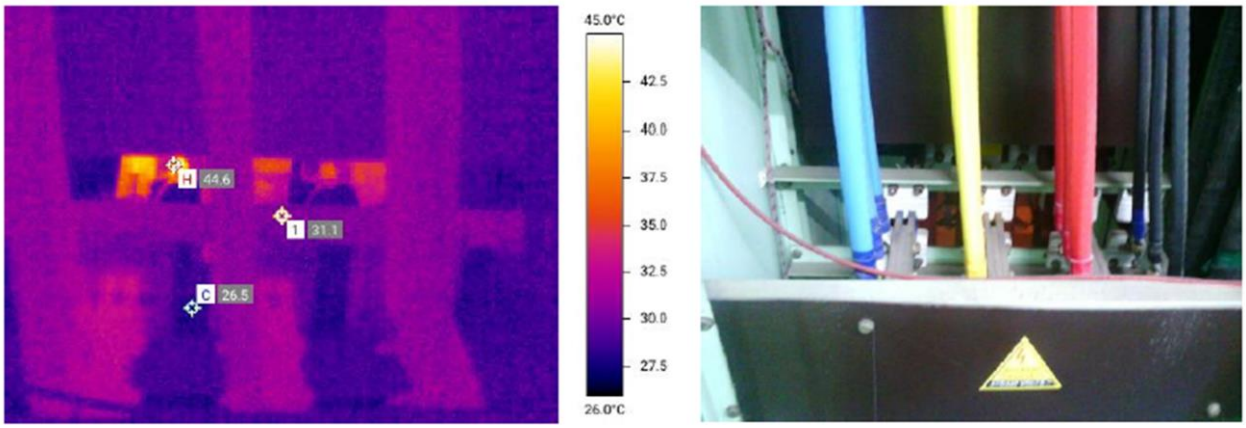
Measurement Results

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	27.4
2.	Cold Point	24.8
3.	Hot Point	30.4

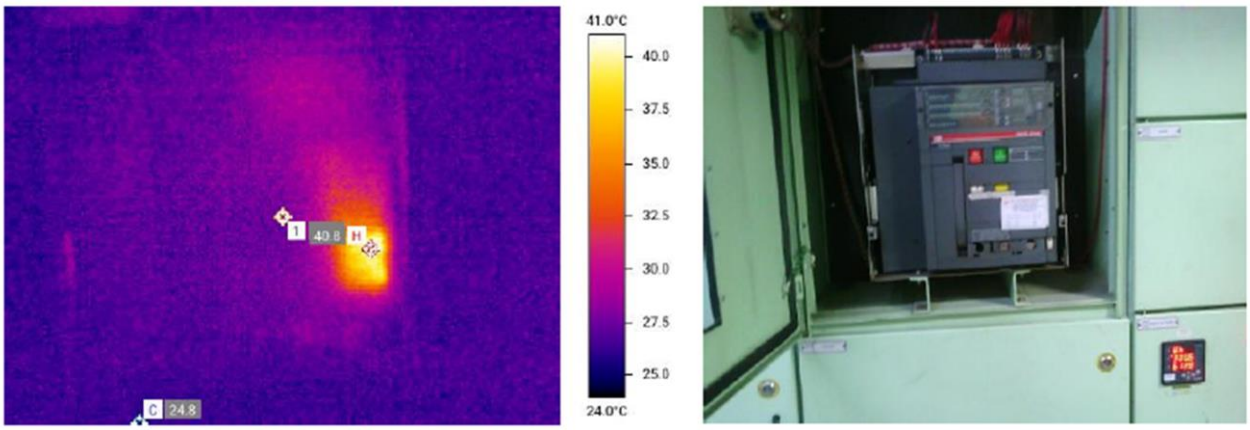
Figure: 2



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	31.1
2.	Cold Point	26.5
3.	Hot Point	44.6

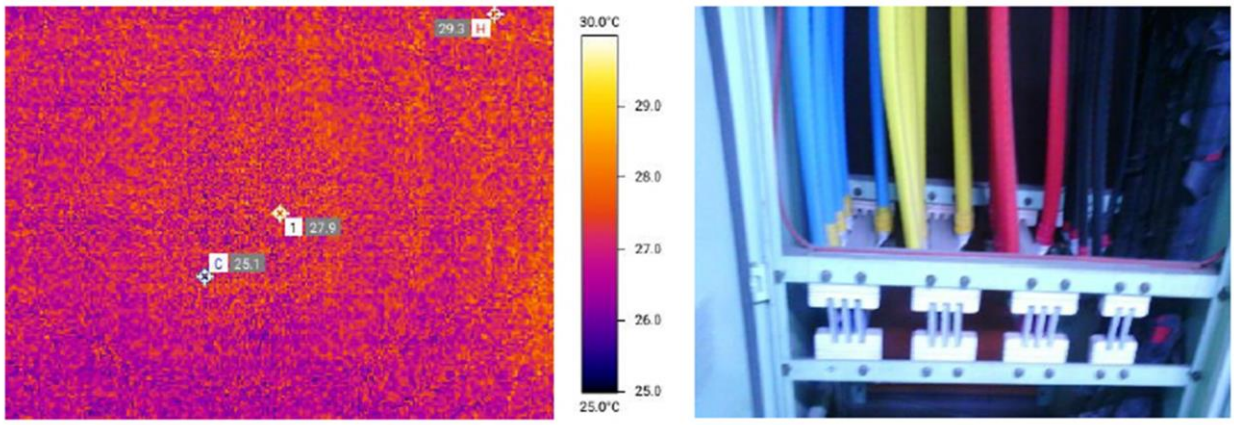
17. **Panel Name:** Incomer-3
Panel No.: Panel-17
Panel Location: LT Room, Main LT Panel (Block-B)

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	28.5
2.	Cold Point	24.8
3.	Hot Point	40.8

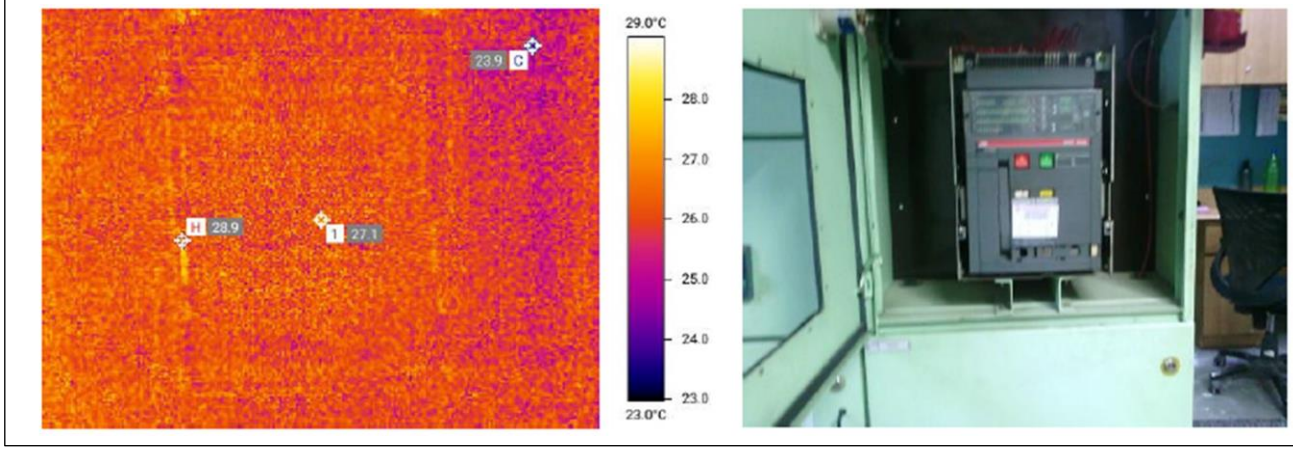
Figure: 2



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	27.9
2.	Cold Point	25.1
3.	Hot Point	29.3

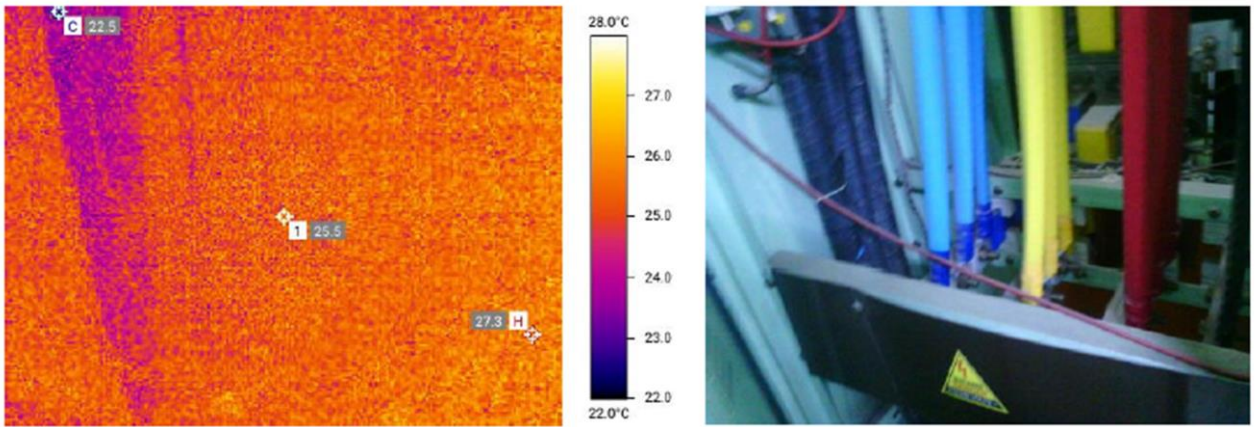
18. Panel Name: HVAC Panel
Panel No.: Panel-18
Panel Location: LT Room, Main LT Panel (Block-B)

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	27.1
2.	Cold Point	23.9
3.	Hot Point	28.9

Figure: 2

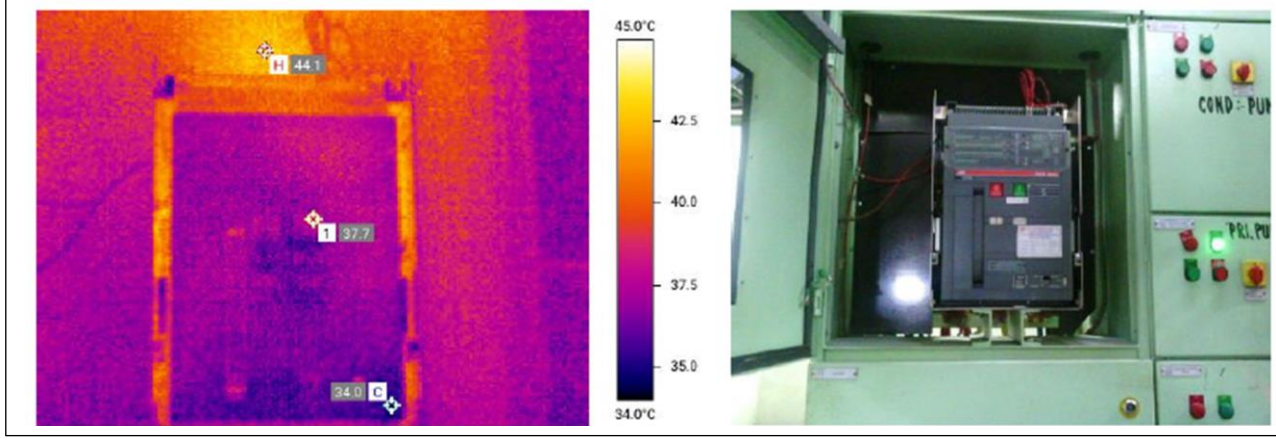


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	25.5
2.	Cold Point	22.5
3.	Hot Point	27.3

19. Panel Name: Incomer-1
Panel No.: Panel-19
Panel Location: Chiller Plant Room (New Building) MCC Panel

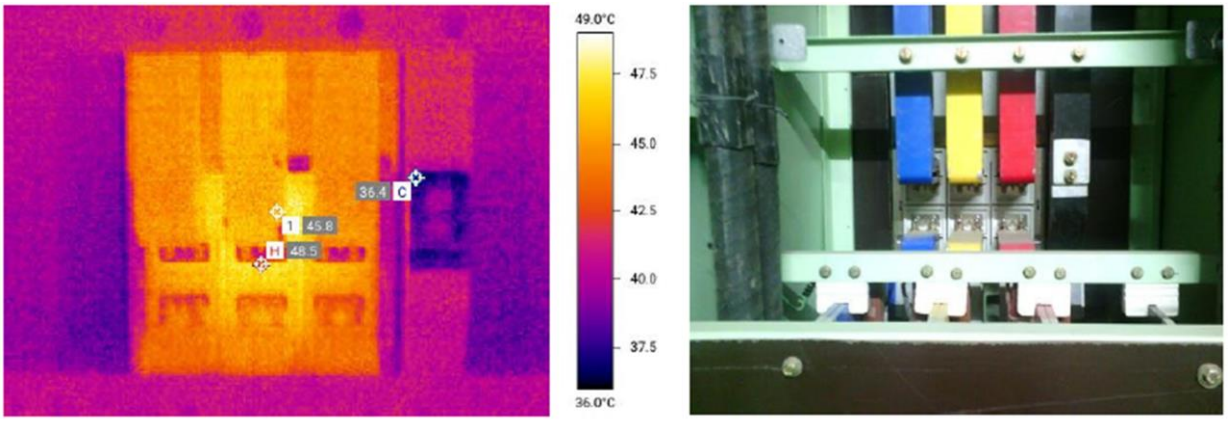
Measurement Results

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	37.7
2.	Cold Point	34.0
3.	Hot Point	44.1

Figure: 2

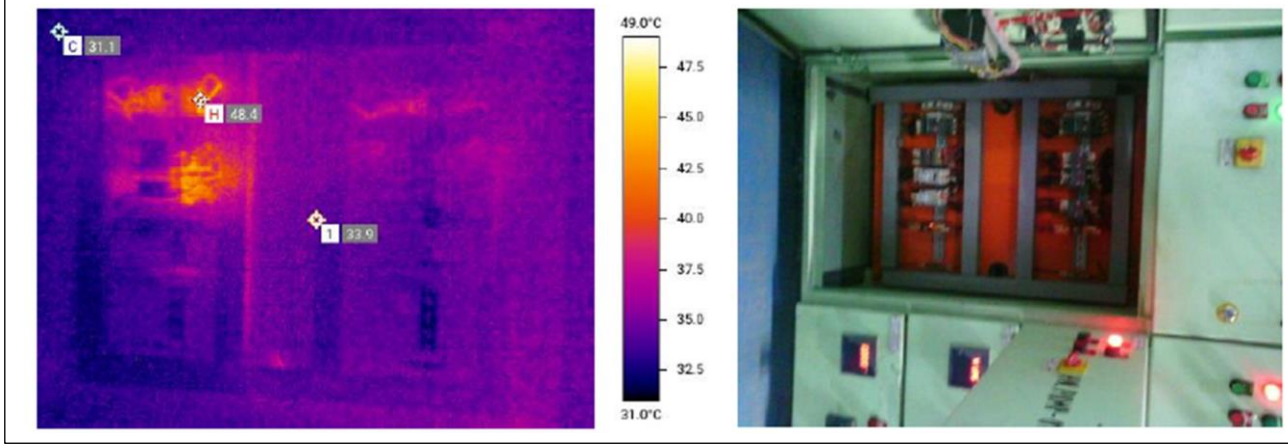


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	45.8
2.	Cold Point	36.4
3.	Hot Point	48.5

20. Panel Name: Cooling Tower Fan-2
Panel No.: Panel-20
Panel Location: Chiller Plant Room (New Building) MCC Panel

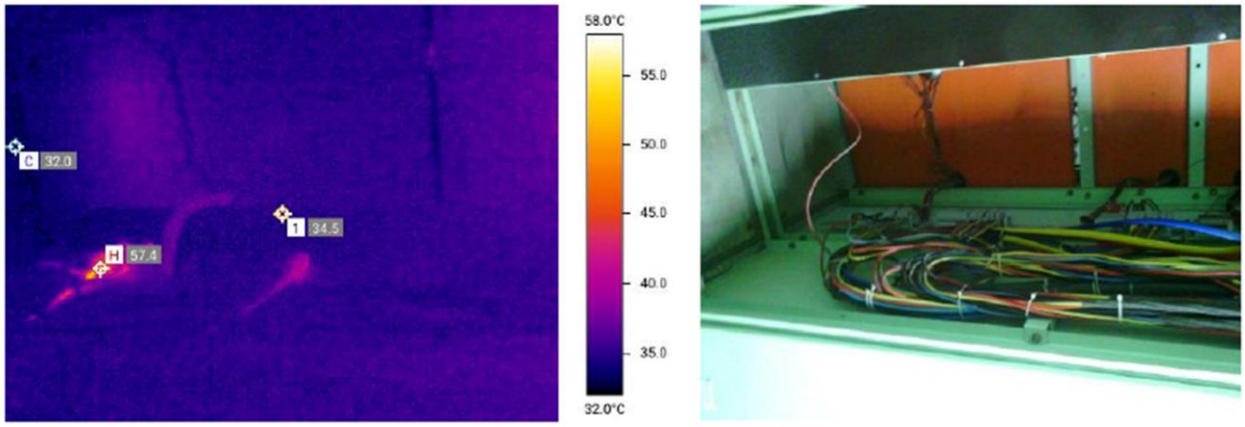
Measurement Results

Figure: 1



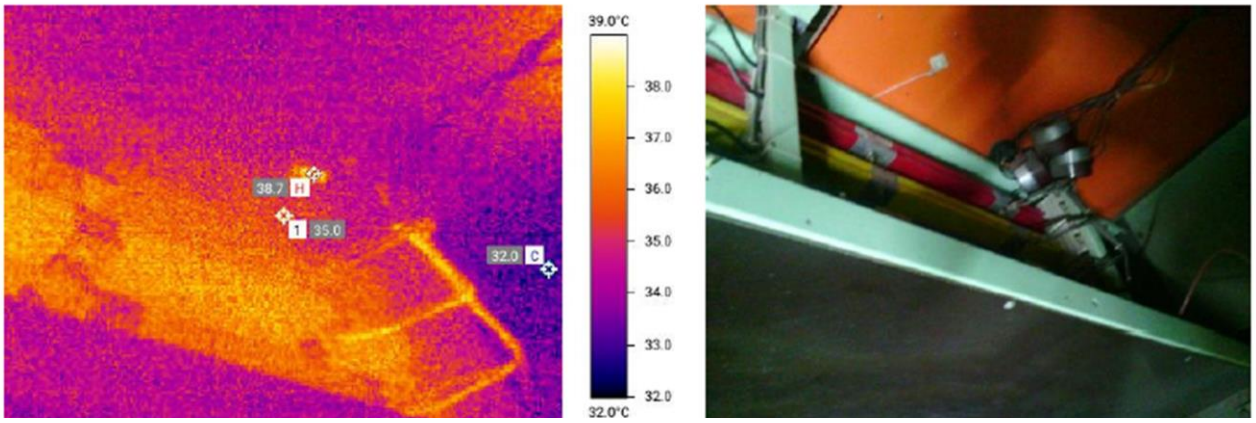
S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	33.9
2.	Cold Point	31.1
3.	Hot Point	48.4

Figure: 2



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	34.5
2.	Cold Point	32.0
3.	Hot Point	57.4

Figure: 3

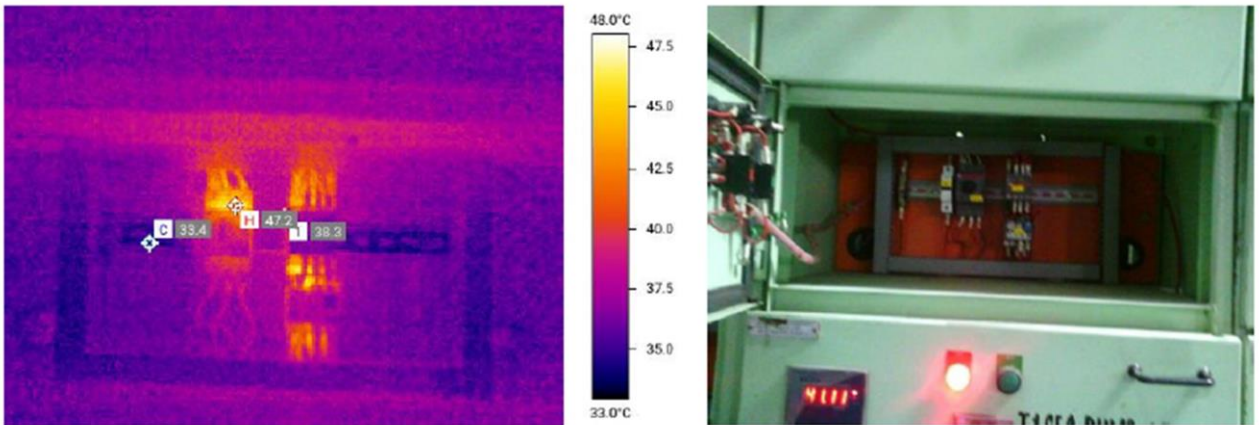


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	35.0
2.	Cold Point	32.0
3.	Hot Point	38.7

21. **Panel Name:** Hot Water Pump-1
Panel No.: Panel-21
Panel Location: Chiller Plant Room (New Building) MCC Panel

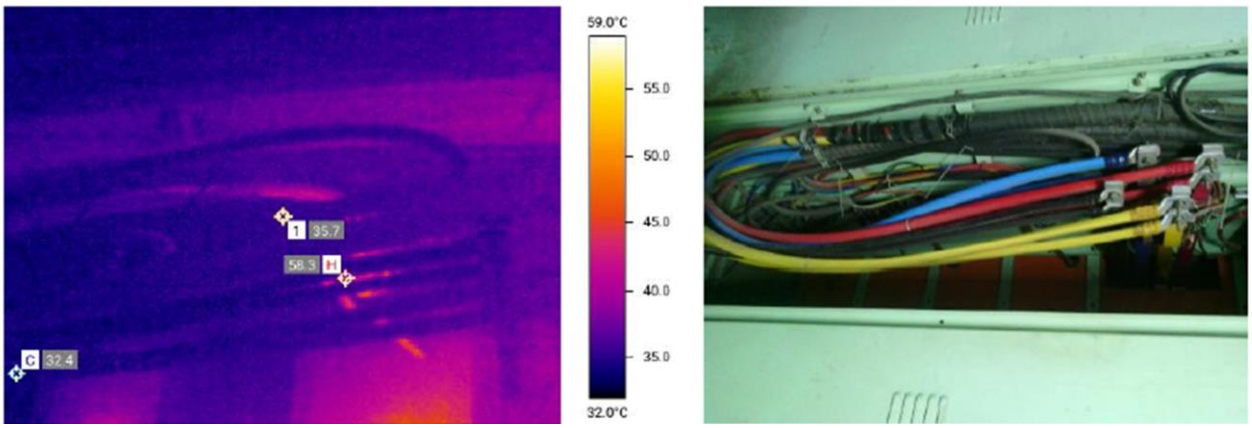
Measurement Results

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	38.3
2.	Cold Point	33.4
3.	Hot Point	47.2

Figure: 2

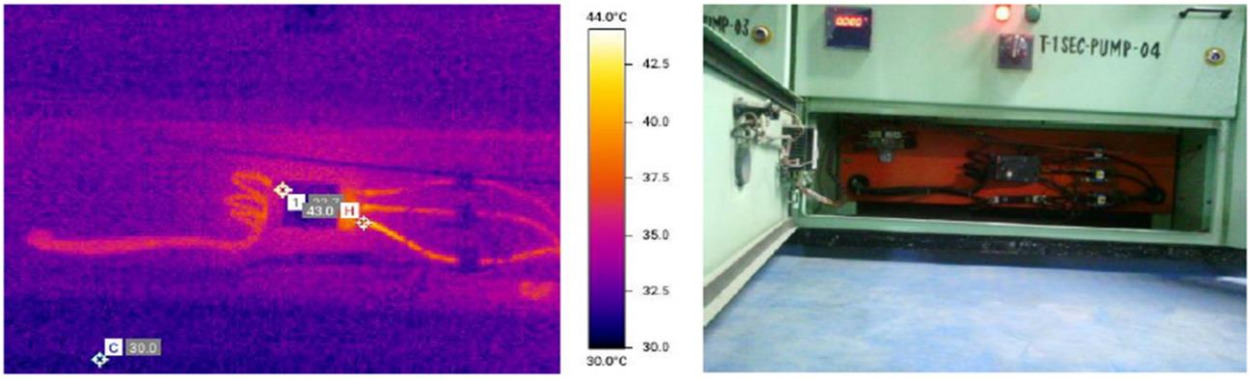


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	35.7
2.	Cold Point	32.4
3.	Hot Point	58.3

22. **Panel Name:** 25 HP Secondary Chiller Water Pump-2
Panel No.: Panel-22
Panel Location: Chiller Plant Room (New Building) MCC Panel

Measurement Results

Figure: 1

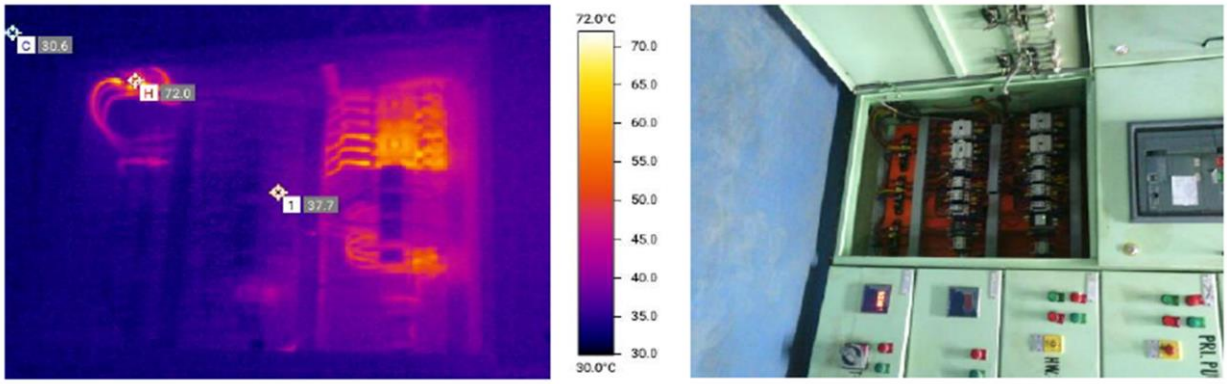


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	33.7
2.	Cold Point	33.0
3.	Hot Point	43.0

23. **Panel Name:** Transformer-1 Secondary Pump-4
Panel No.: Panel-23
Panel Location: Chiller Plant Room (New Building) MCC Panel

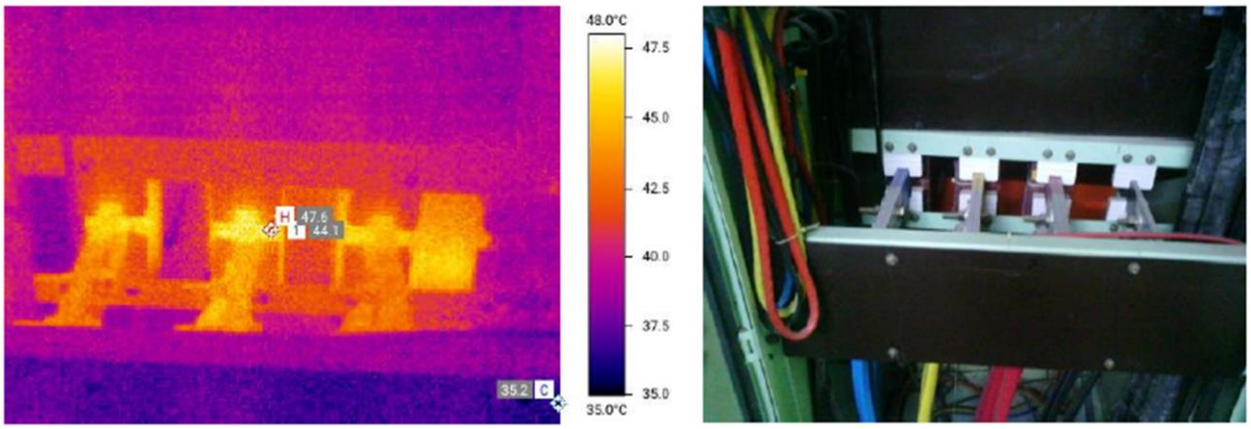
Measurement Results

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	37.7
2.	Cold Point	30.6
3.	Hot Point	72.0

Figure: 2

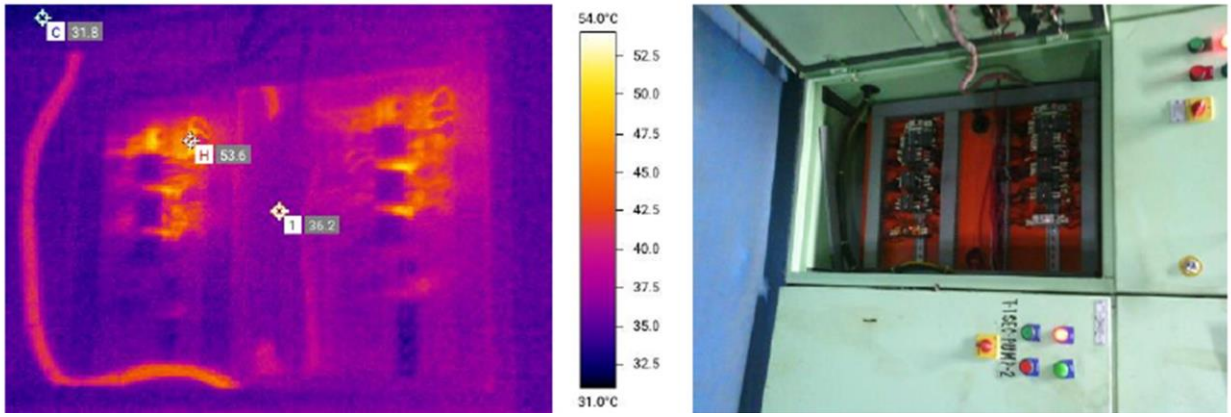


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	44.1
2.	Cold Point	35.2
3.	Hot Point	47.6

24. Panel Name: Cooling Tower-1
Panel No.: Panel-24
Panel Location: Chiller Plant Room (New Building) MCC Panel

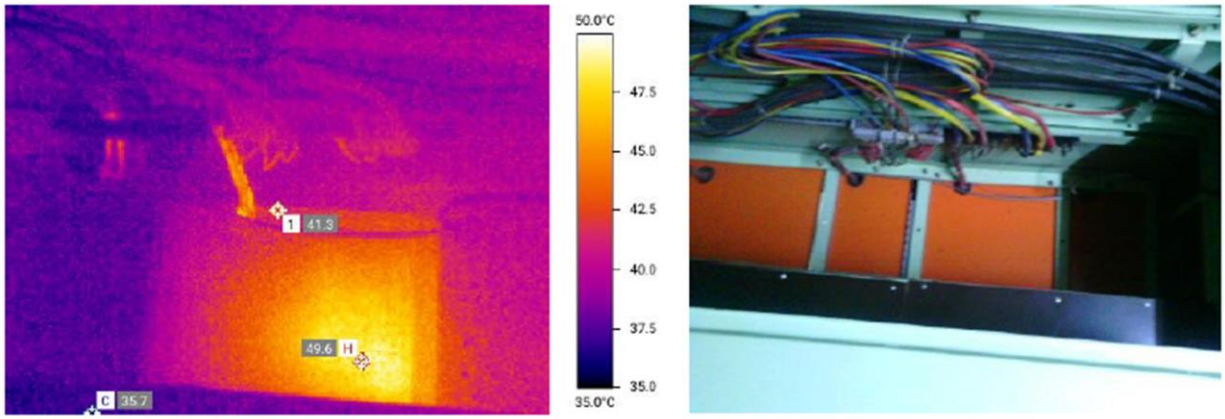
<u>Measurement Results</u>

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	36.2
2.	Cold Point	31.8
3.	Hot Point	53.6

Figure: 2

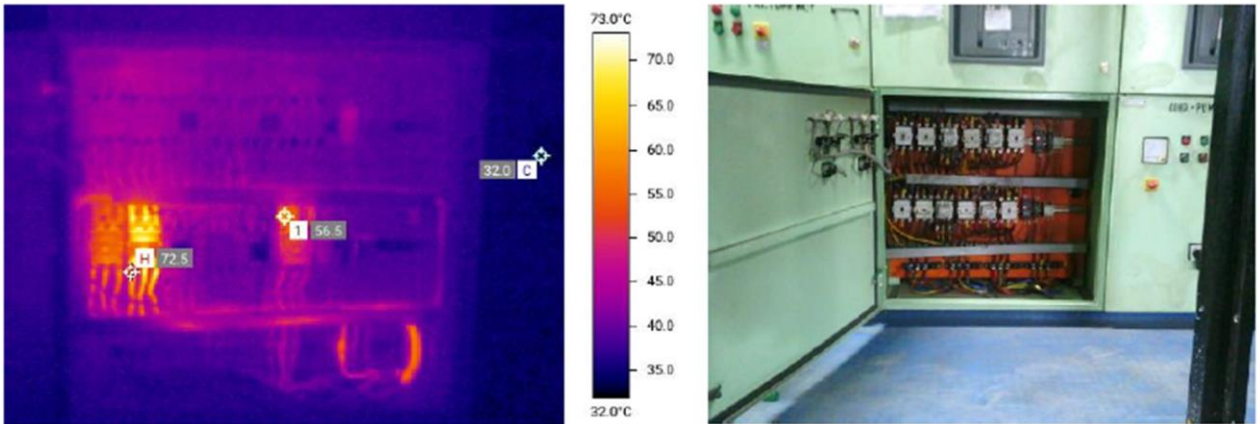


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	41.3
2.	Cold Point	35.7
3.	Hot Point	49.6

25. Panel Name: Tr-1 Secondary Pump-2
Panel No.: Panel-25
Panel Location: Chiller Plant Room (New Building) MCC Panel

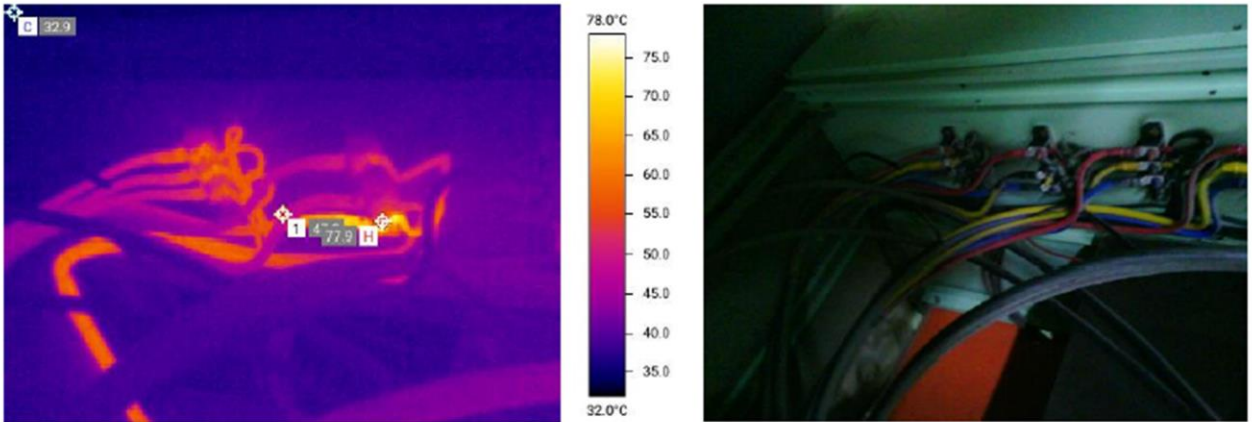
<u>Measurement Results</u>

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	56.5
2.	Cold Point	32.0
3.	Hot Point	72.5

Figure: 2

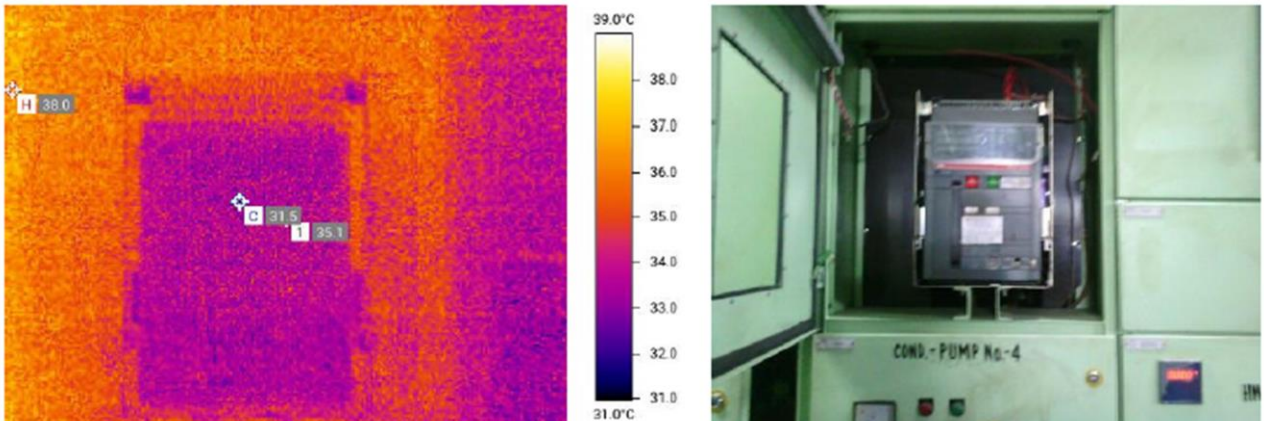


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	47.8
2.	Cold Point	32.9
3.	Hot Point	77.9

26. Panel Name: Incomer-3
Panel No.: Panel-26
Panel Location: Chiller Plant Room (New Building) MCC Panel

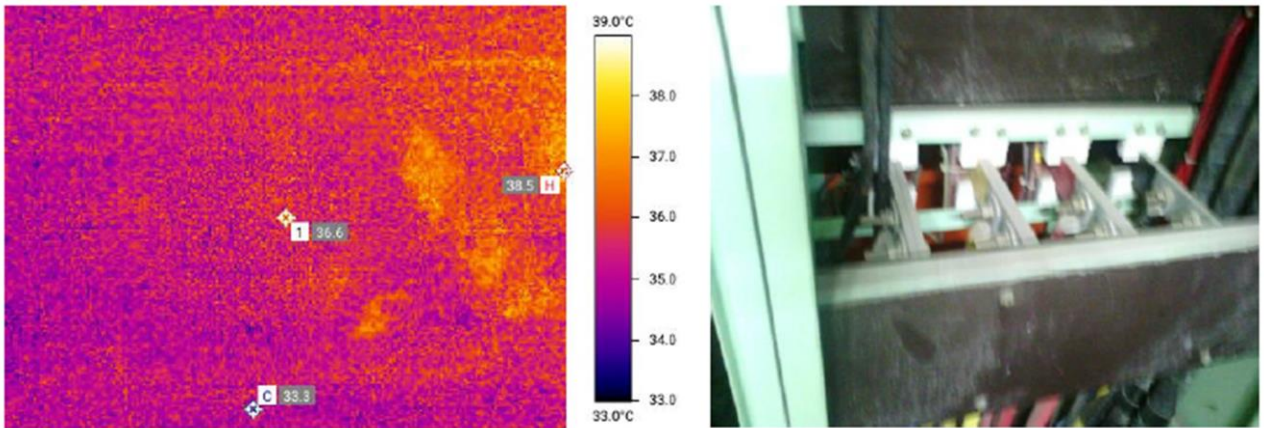
<u>Measurement Results</u>

Figure: 1



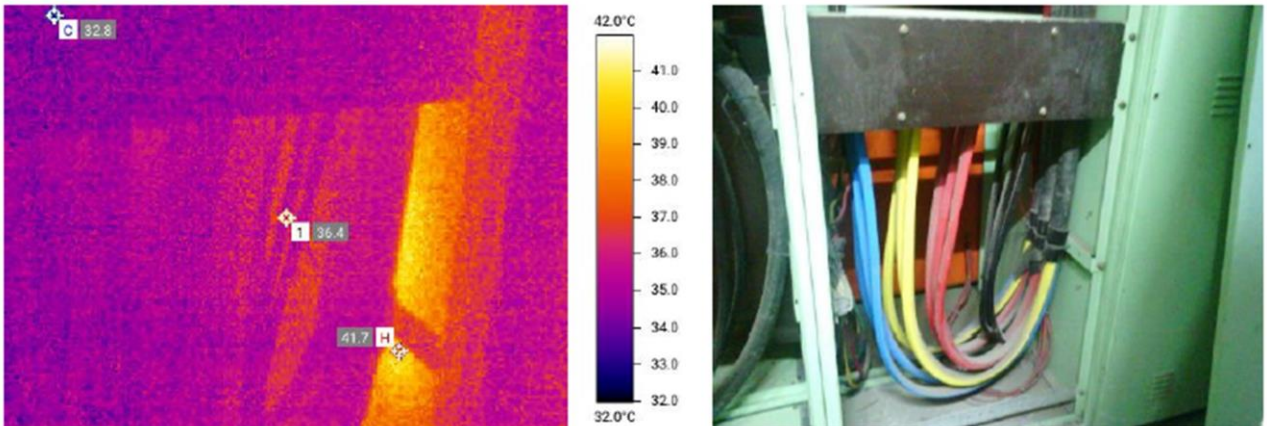
S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	35.1
2.	Cold Point	31.5
3.	Hot Point	38.0

Figure: 2



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	36.6
2.	Cold Point	33.3
3.	Hot Point	38.5

Figure: 3

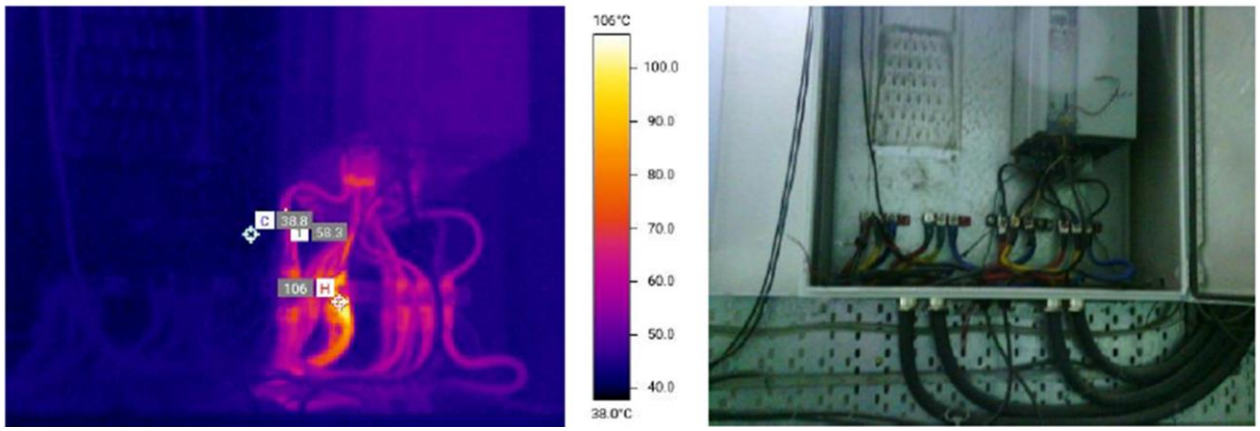


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	36.4
2.	Cold Point	32.8
3.	Hot Point	41.7

27. Panel Name: VED Panel Sec-Pump 37kw
Panel No.: Panel-27
Panel Location: Chiller Plant Room (New Building)

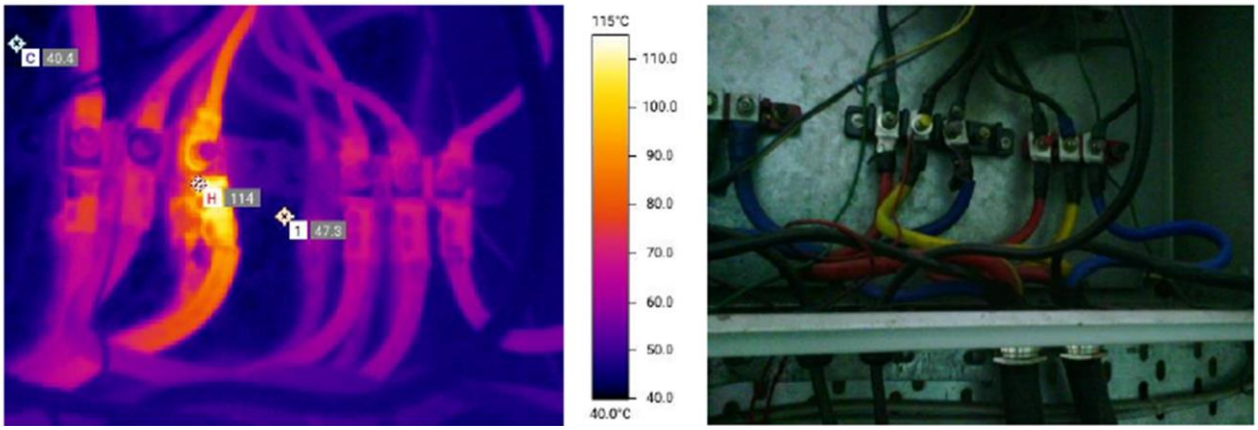
Measurement Results

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	58.3
2.	Cold Point	38.8
3.	Hot Point	106

Figure: 2

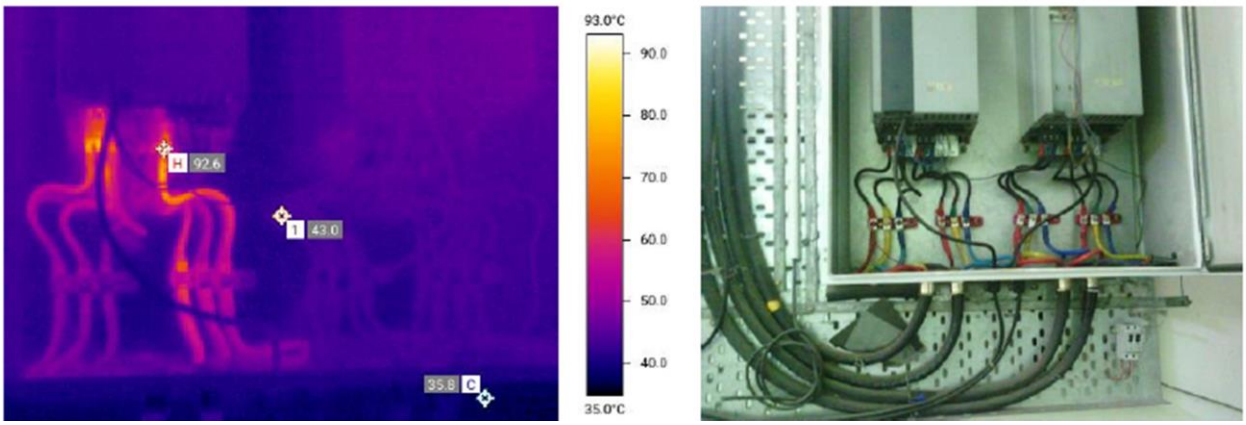


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	47.3
2.	Cold Point	40.4
3.	Hot Point	114

28. Panel Name: VED Panel Sec-Pump 30kw
Panel No.: Panel-28
Panel Location: Chiller Plant Room (New Building)

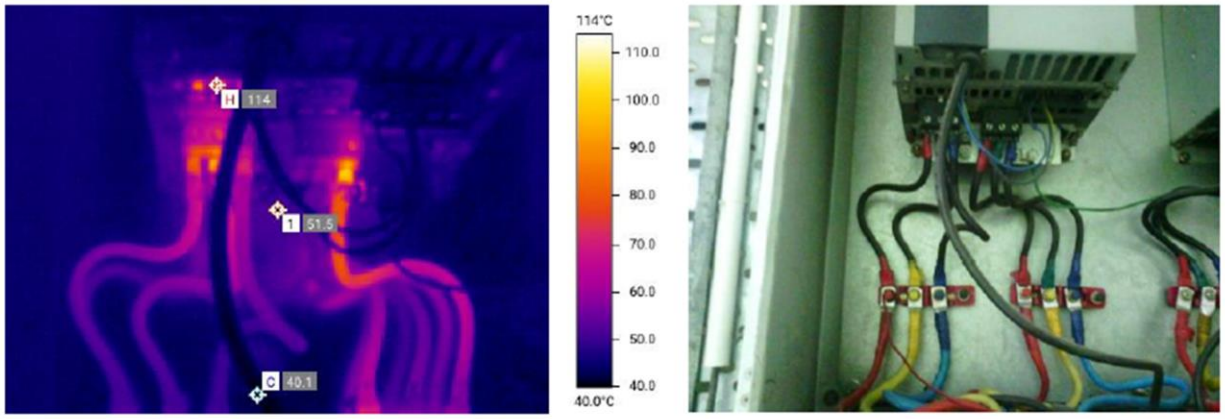
Measurement Results

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	43.0
2.	Cold Point	35.8
3.	Hot Point	92.6

Figure: 2

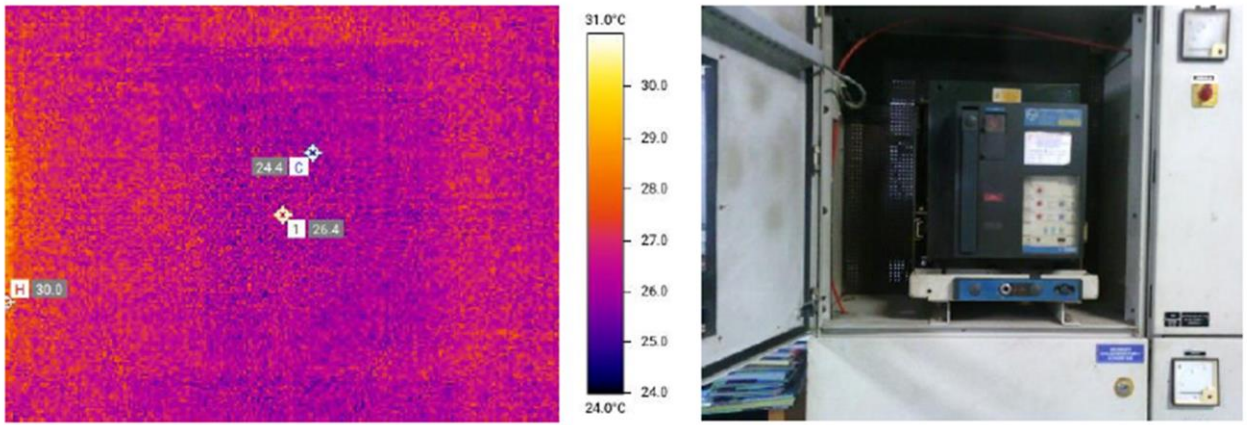


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	51.5
2.	Cold Point	40.1
3.	Hot Point	114

29. Panel Name: Chiller-1
Panel No.: Panel-29
Panel Location: Tower-1, Chiller Plant

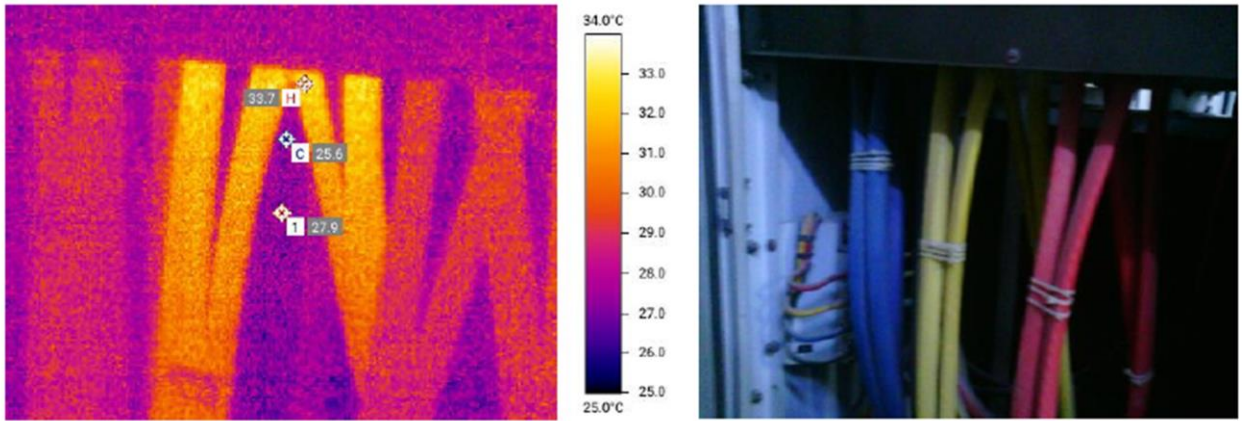
Measurement Results

Figure: 1



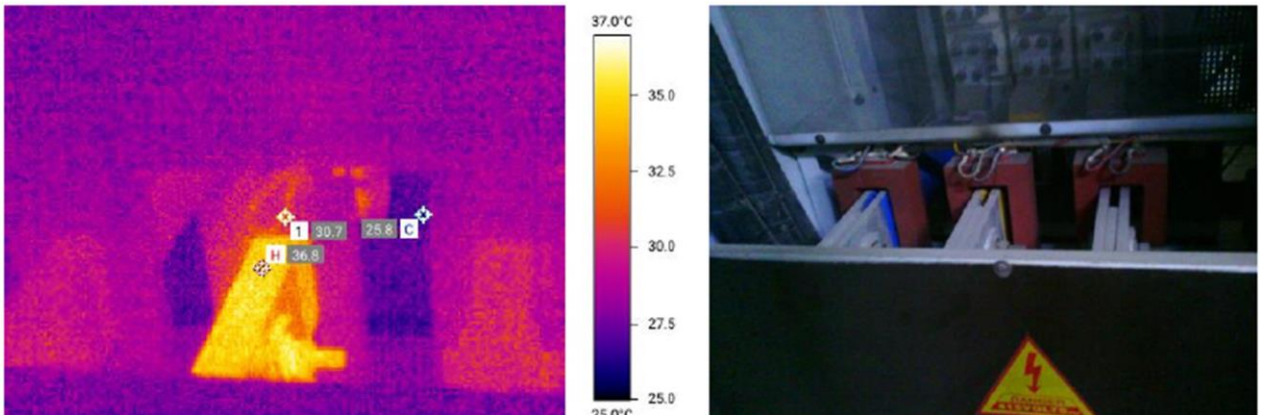
S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	26.4
2.	Cold Point	24.4
3.	Hot Point	30.0

Figure: 2



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	27.9
2.	Cold Point	25.6
3.	Hot Point	33.7

Figure: 3

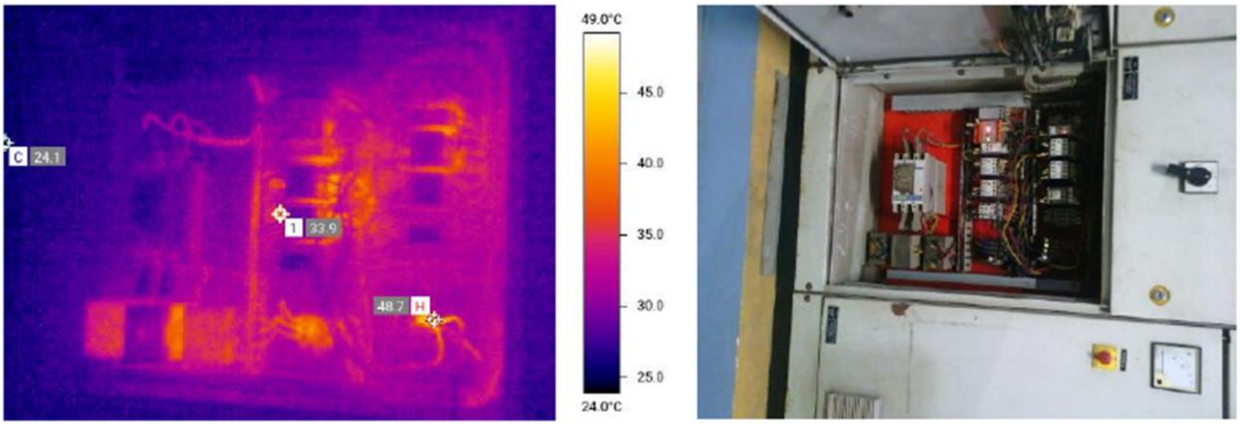


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	30.7
2.	Cold Point	25.8
3.	Hot Point	36.8

30. Panel Name: Cooling Tower-3
Panel No.: Panel-30
Panel Location: Tower-1, Chiller Plant

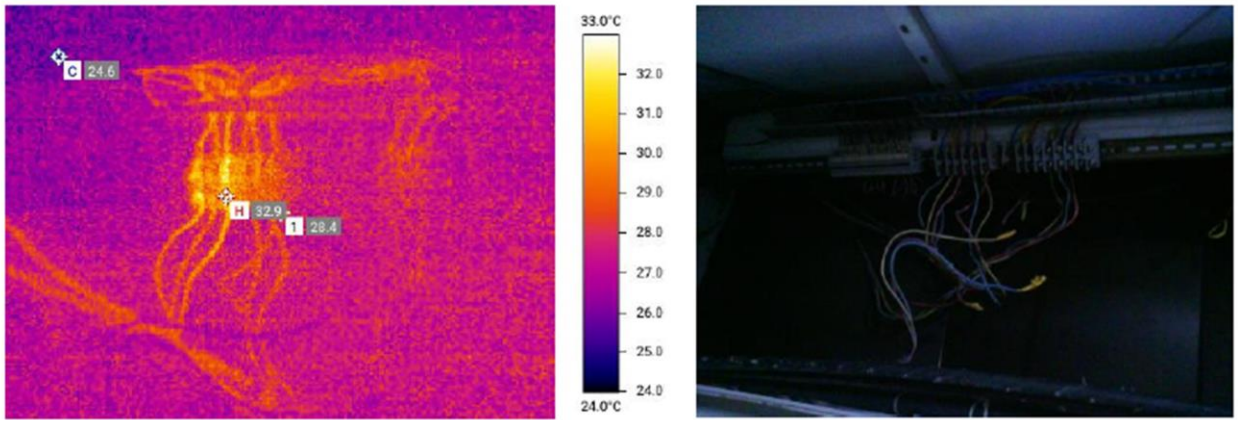
Measurement Results

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	33.9
2.	Cold Point	24.1
3.	Hot Point	48.7

Figure: 2

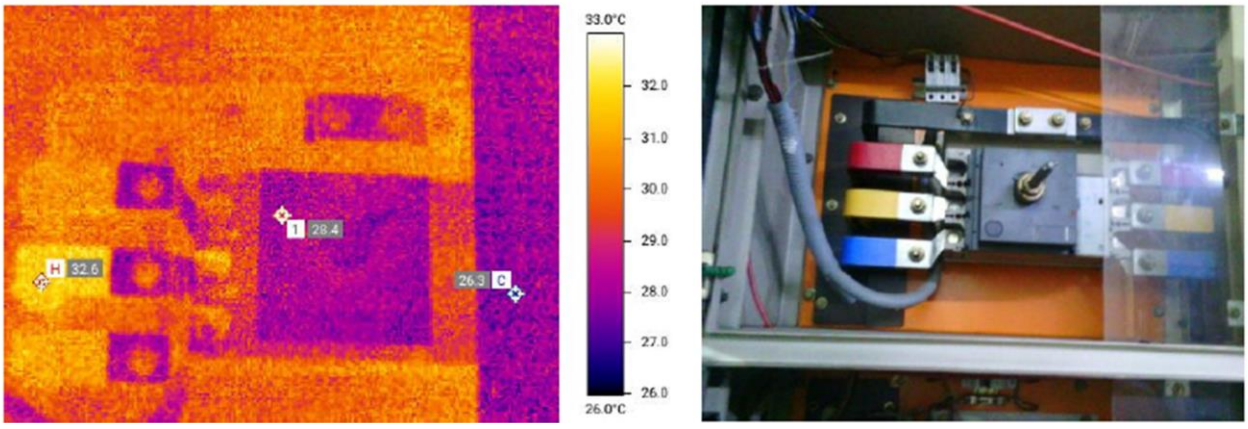


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	28.4
2.	Cold Point	24.6
3.	Hot Point	32.9

31. Panel Name: CT SIM UPS 160KVA
Panel No.: Panel-31
Panel Location: Building No. 1, LT Room (Main LT Panel)

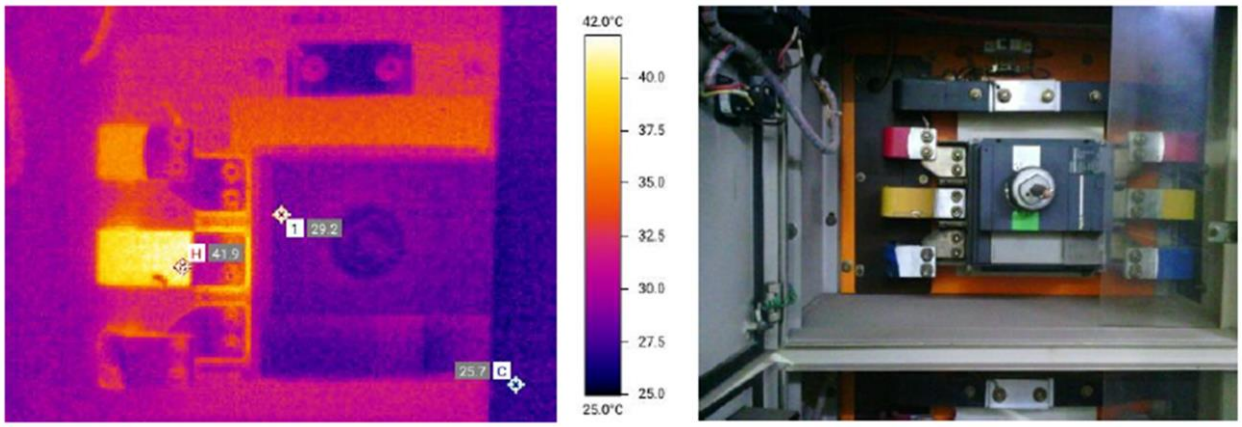
Measurement Results

Figure: 1



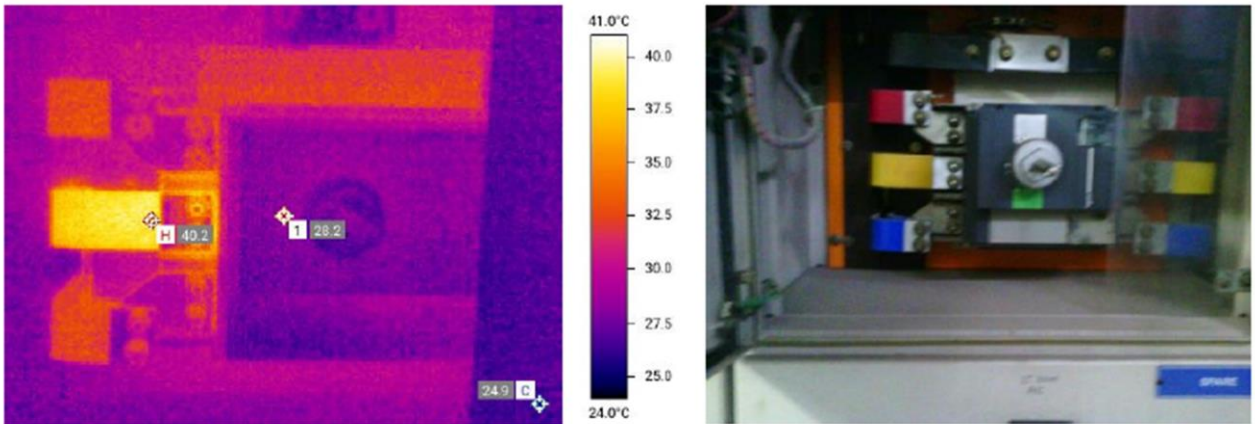
S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	28.4
2.	Cold Point	26.3
3.	Hot Point	32.6

Figure: 2



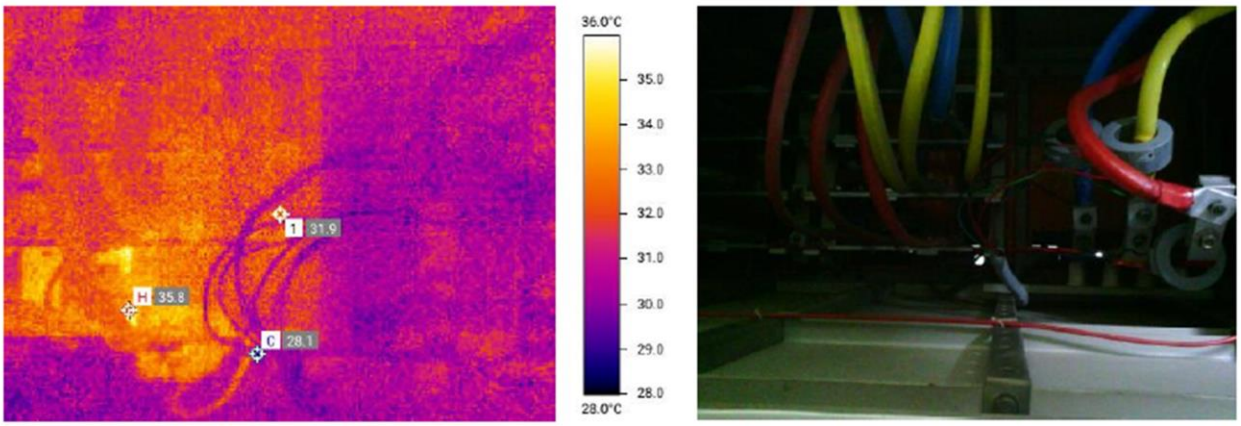
S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	29.2
2.	Cold Point	25.7
3.	Hot Point	41.9

Figure: 3



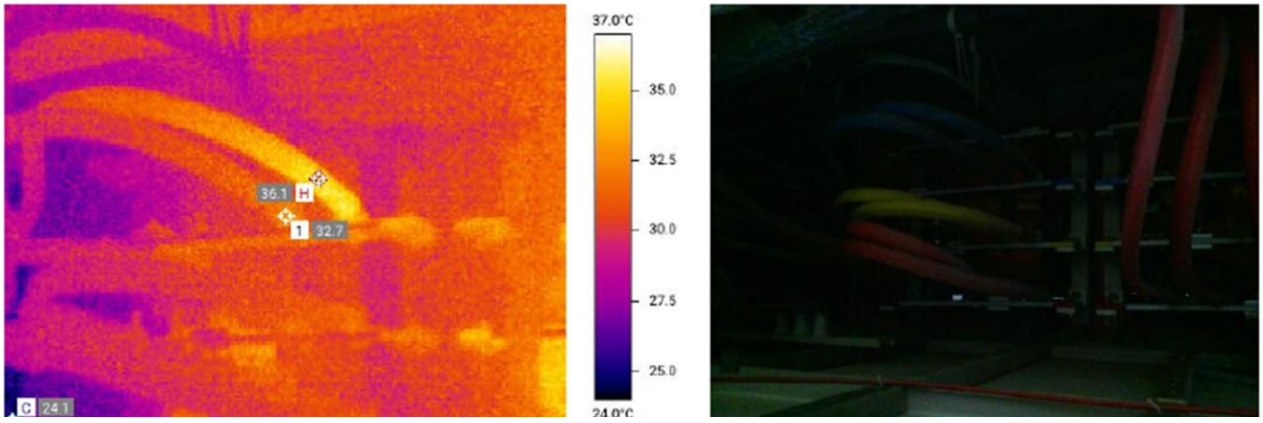
S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	28.2
2.	Cold Point	24.9
3.	Hot Point	40.2

Figure: 4



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	31.9
2.	Cold Point	28.1
3.	Hot Point	35.8

Figure: 5

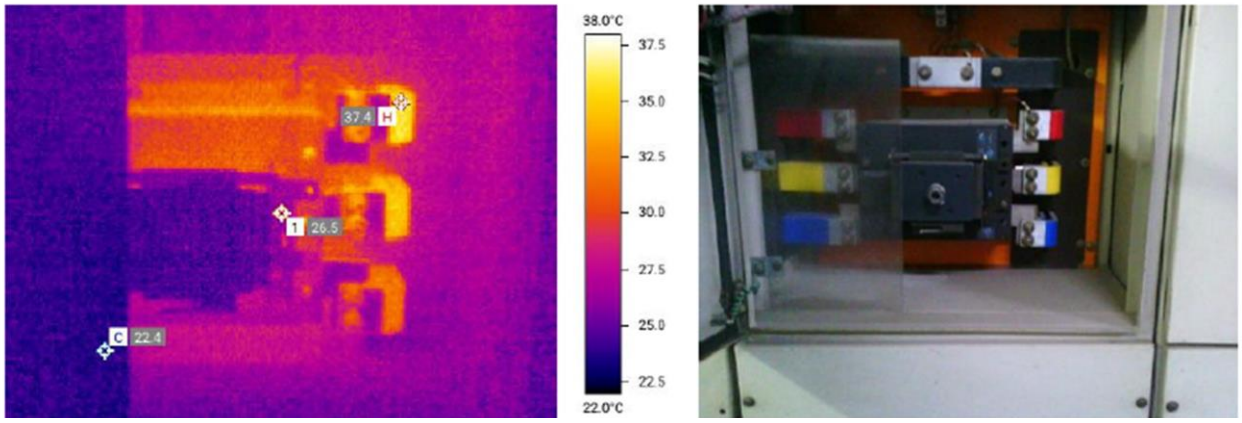


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	32.7
2.	Cold Point	24.1
3.	Hot Point	36.1

32. Panel Name: CT SIM UPS 160KVA
Panel No.: Panel-32
Panel Location: Building No. 1, LT Room (Main LT Panel)

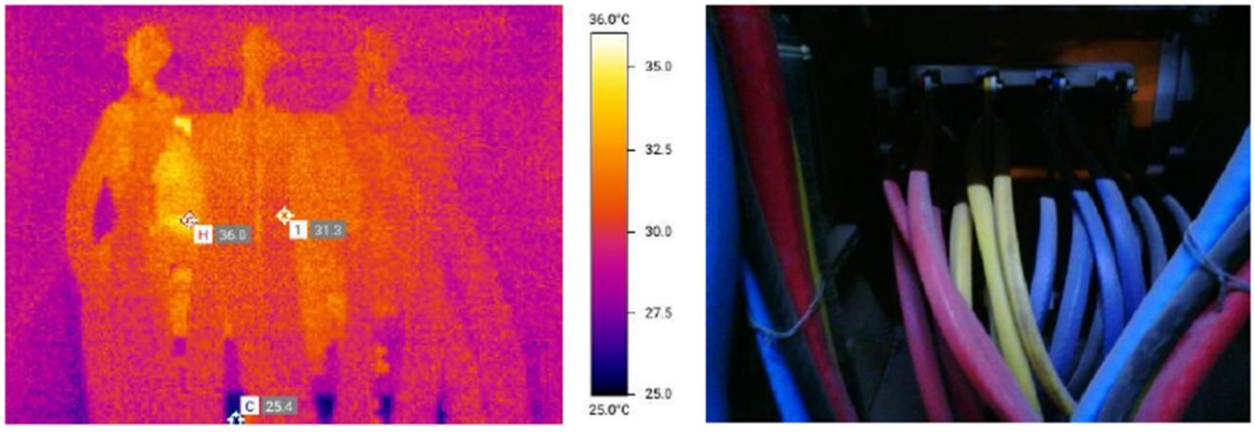
Measurement Results

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	26.5
2.	Cold Point	22.4
3.	Hot Point	37.4

Figure: 2

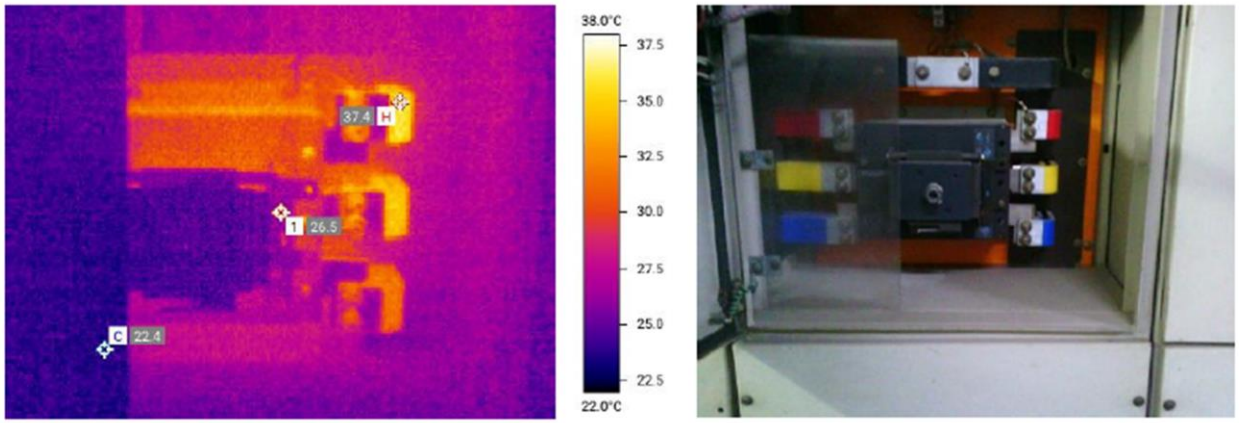


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	31.3
2.	Cold Point	25.4
3.	Hot Point	36.0

33. Panel Name: UPS 200KVAx2
Panel No.: Panel-33
Panel Location: Building No. 1, LT Room (Main LT Panel)

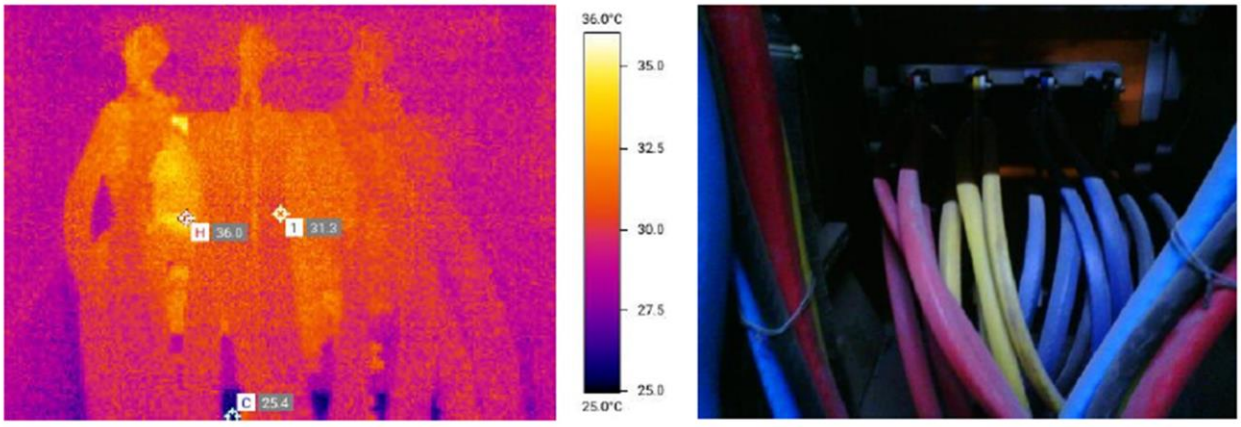
Measurement Results

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	26.5
2.	Cold Point	22.4
3.	Hot Point	37.4

Figure: 2

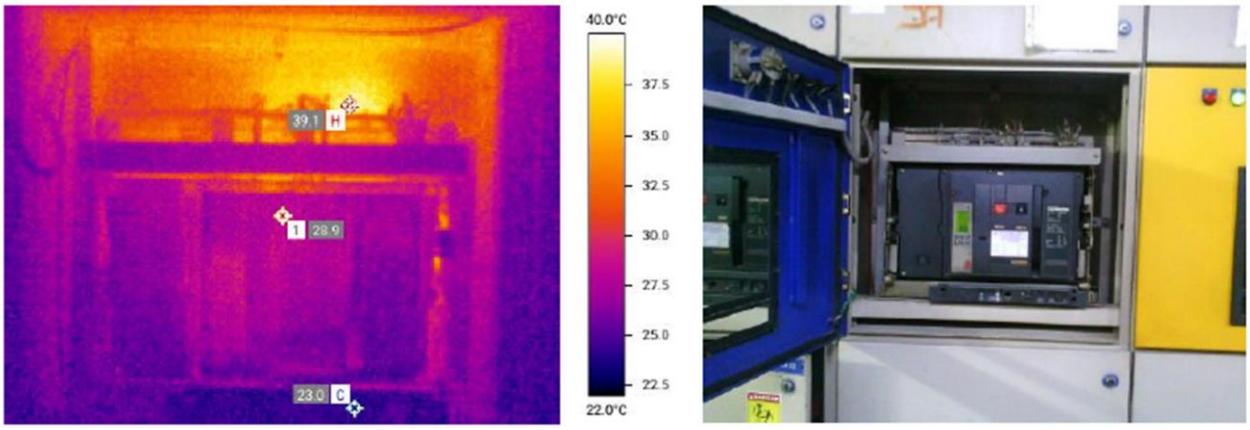


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	31.3
2.	Cold Point	25.4
3.	Hot Point	36.0

34. Panel Name: Incoming Supply From 750KVA Transformer
Panel No.: Panel-34
Panel Location: Building No. 1, LT Room (Main LT Panel)

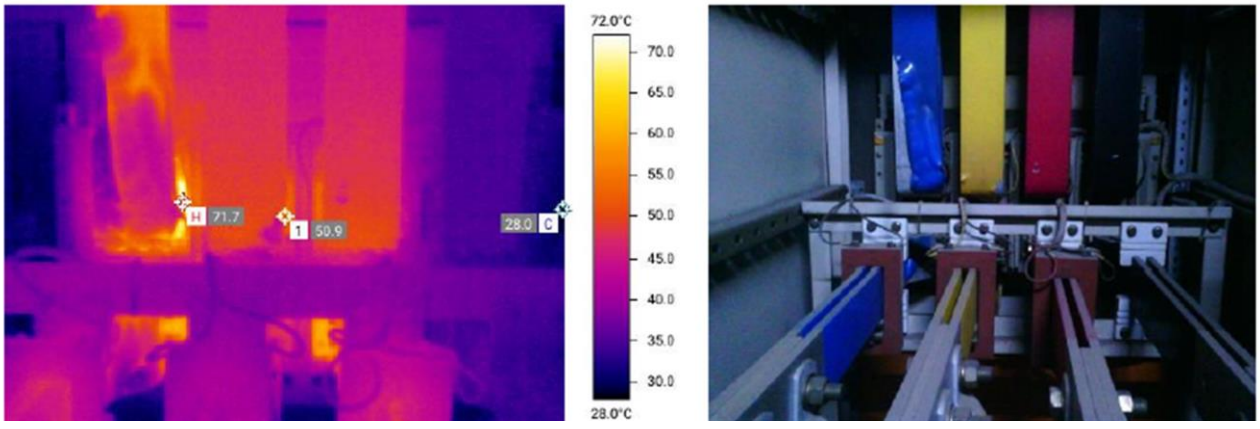
Measurement Results

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	28.9
2.	Cold Point	23.0
3.	Hot Point	39.1

Figure: 2

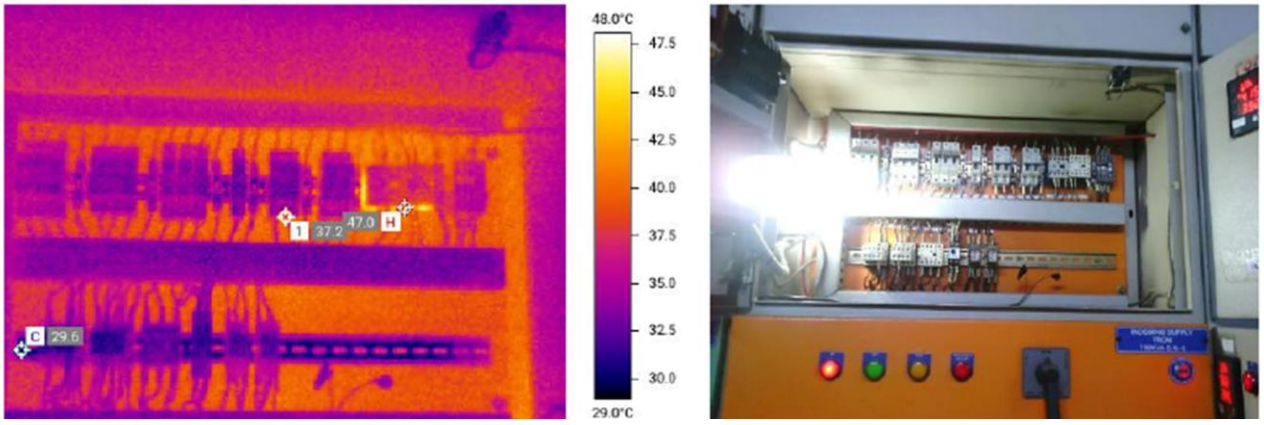


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	50.9
2.	Cold Point	28.0
3.	Hot Point	71.7

35. **Panel Name:** Incoming Supply From 750KVA DG-2
Panel No.: Panel-35
Panel Location: Building No. 1, LT Room (Main LT Panel)

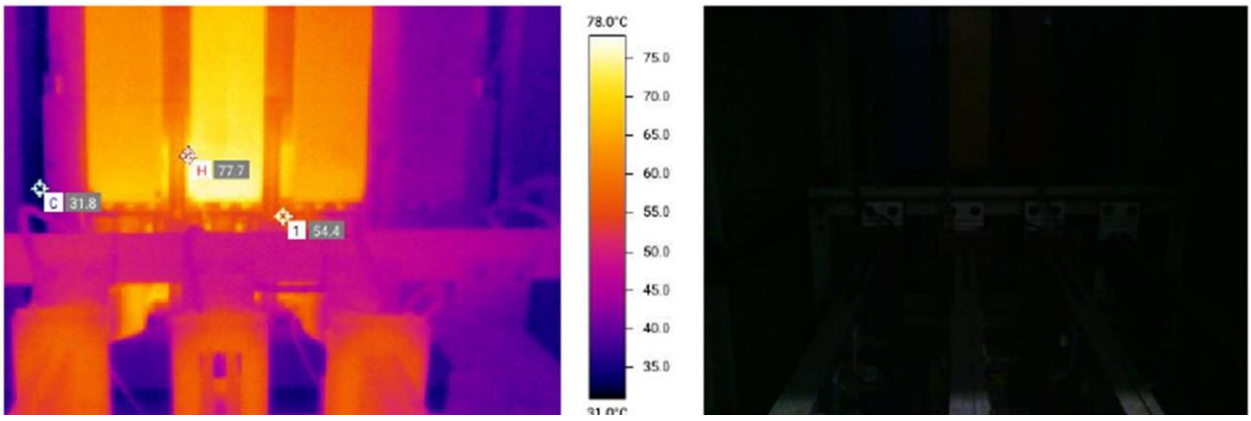
Measurement Results

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	37.2
2.	Cold Point	29.6
3.	Hot Point	47.0

Figure: 2

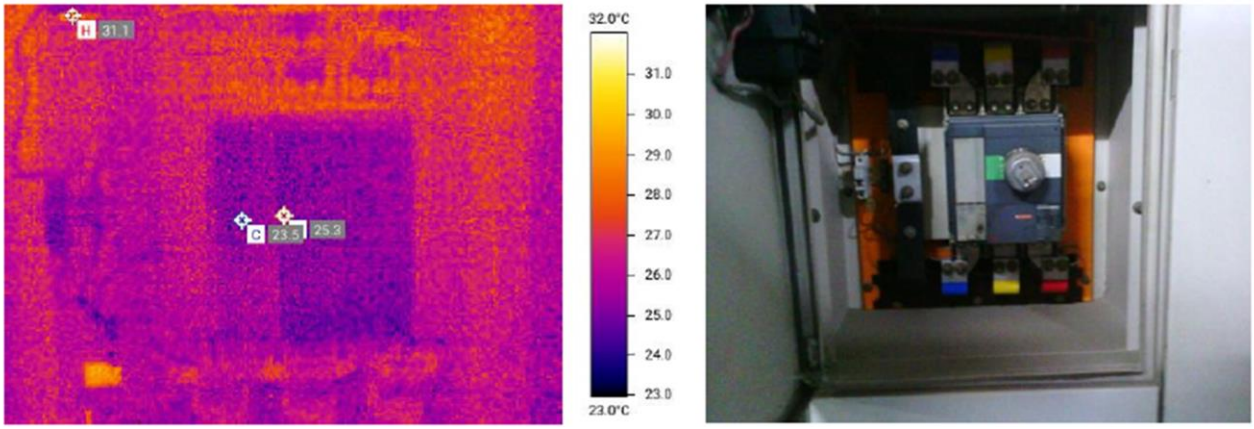


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	54.4
2.	Cold Point	31.8
3.	Hot Point	77.7

36. Panel Name: 120KVA Tomotherephy UPS
Panel No.: Panel-36
Panel Location: Building No. 1, LT Room (Main LT Panel)

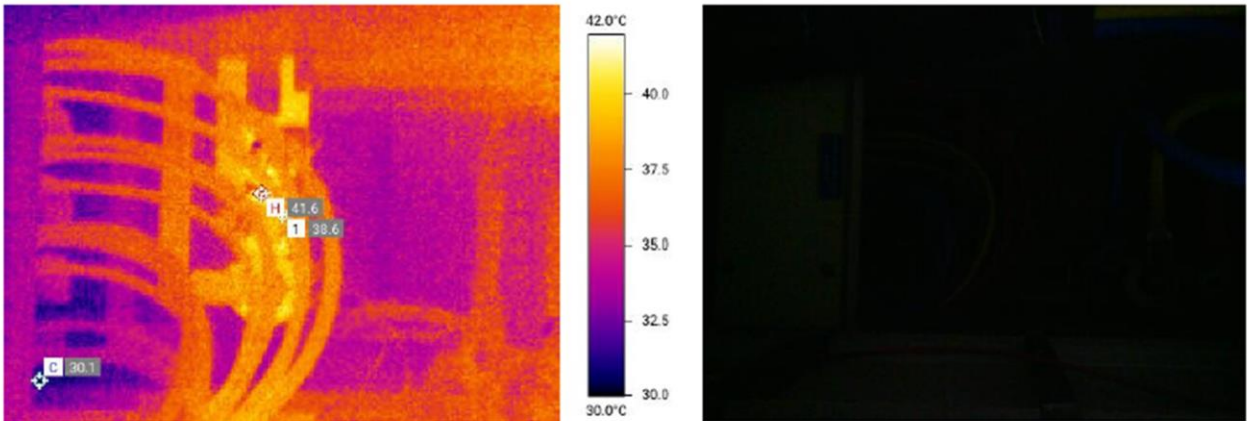
Measurement Results

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	25.3
2.	Cold Point	23.5
3.	Hot Point	31.1

Figure: 2

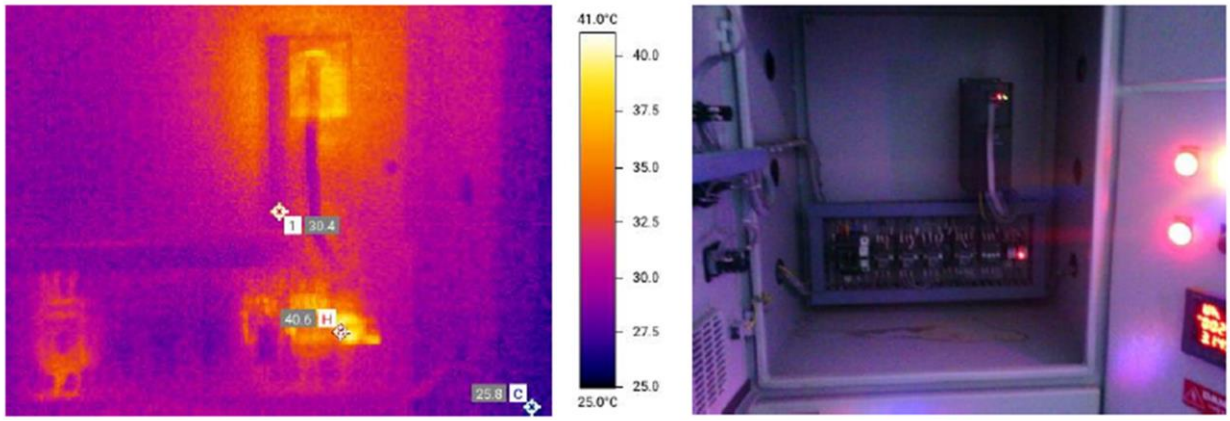


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	38.6
2.	Cold Point	30.1
3.	Hot Point	41.6

37. Panel Name: Heat Pump Plant
Panel No.: Panel-37
Panel Location: Building No. 1, LT Room (Main LT Panel)

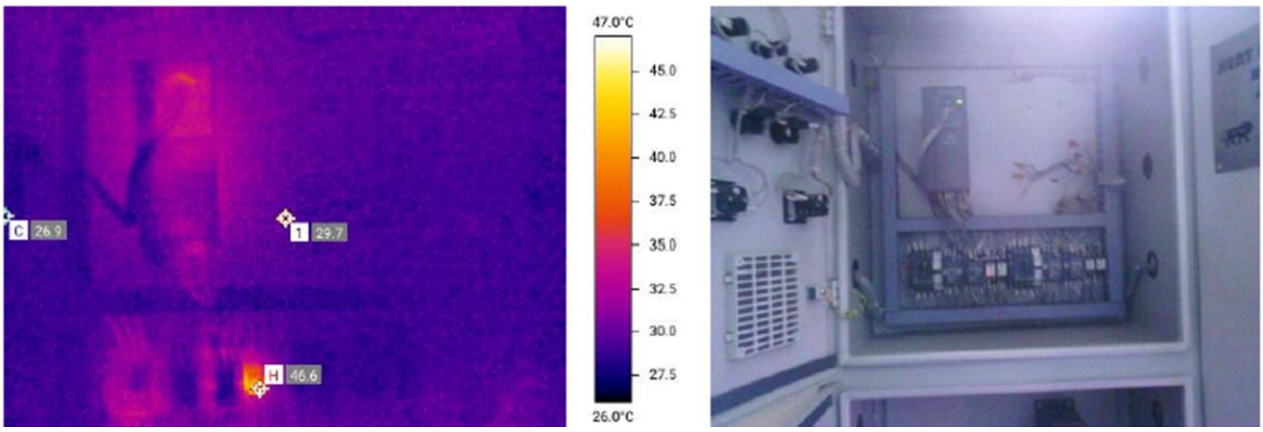
Measurement Results

Figure: 1



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	30.4
2.	Cold Point	25.8
3.	Hot Point	40.6

Figure: 2

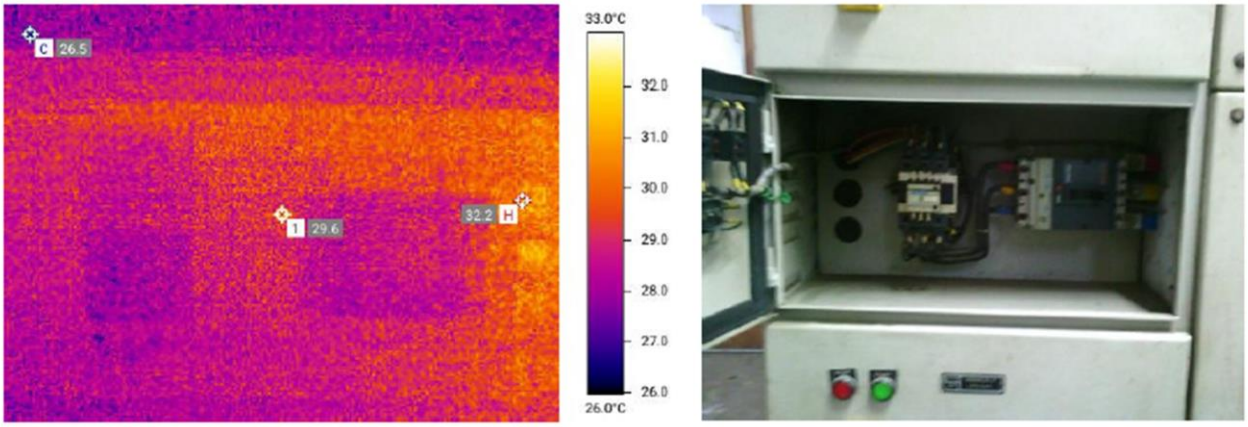


S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	29.7
2.	Cold Point	26.9
3.	Hot Point	46.6

38. Panel Name: 400KVAR Capacitor Panel
Panel No.: Panel-38
Panel Location: Building No. 1, LT Room (Main LT Panel)

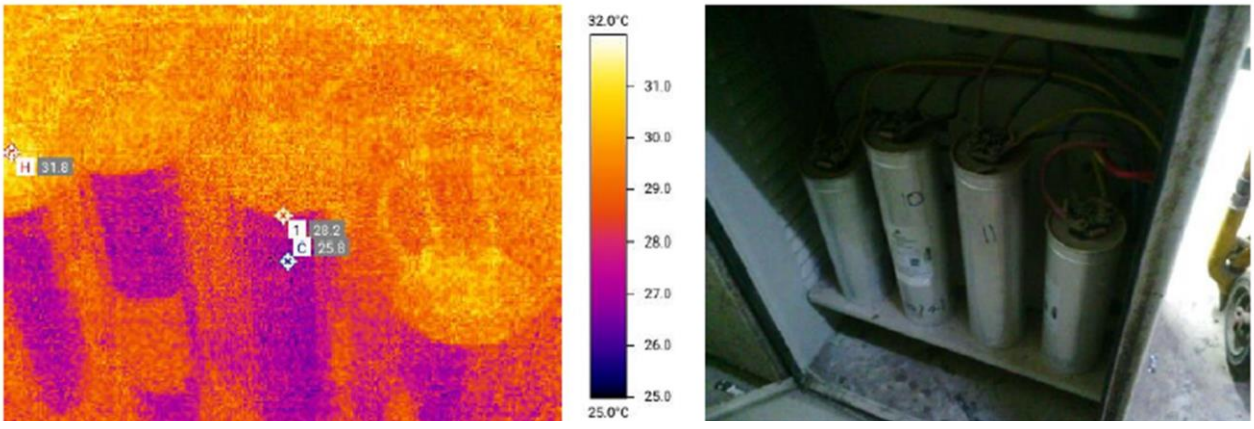
Measurement Results

Figure: 1



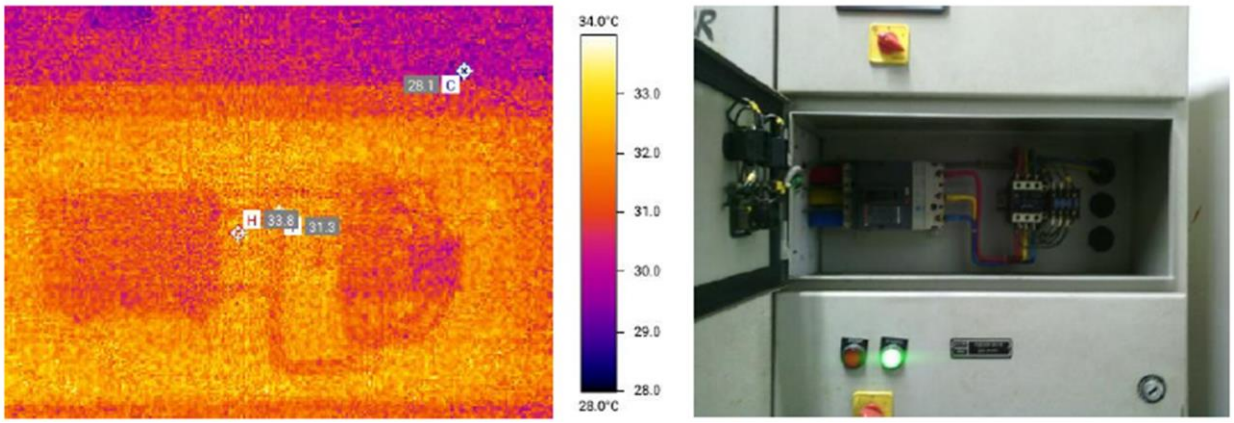
S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	29.6
2.	Cold Point	26.5
3.	Hot Point	32.2

Figure: 2



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	28.2
2.	Cold Point	25.8
3.	Hot Point	31.8

Figure: 3



S. No.	Measuring Points	Temperature of Standard (^{0}C)
1.	Average Point	31.3
2.	Cold Point	28.1
3.	Hot Point	33.8