



- CIN: U40106MP2016PTC0869
- MSME UAN: UDYAM-MP-24-0007644

GST IN: 23AAXCS5385C2ZY
Mobile: +91 87708 97703/05/07

Power Audit Certificate

This certificate attests that St. Aloysius College has conducted a Power Audit for the academic year 2022-2023, with the aim of assessing and optimizing the energy utilization across the campus. The audit focused on detailed measurements and analysis of energy consumption patterns to identify strategic opportunities for enhancing energy efficiency.

Audit Summary:

- **Date of Audit:** May 2022-23
- **Location:** Jabalpur, Madhya Pradesh
- **Total Energy Consumption:** 1007.742 kW
- **Major Contributors to Consumption:** Air conditioning units, computers, printers, ceiling fans, and lift.

Significant Findings:

- A variety of electrical appliances including 21 AC units, 280 computers, and 324 ceiling fans were audited.
- Key issues identified included varied voltage at plug points, extensive use of extension boards, and some earthing problems.
- Recommendations include upgrading to LED lighting, enhancing earthing systems, and implementing automated control systems for electrical devices.

Recommendations for Energy Efficiency:

- **Infrastructure Upgrades:** Replacement of old switches and boards, transition to LED lighting, and enhanced use of natural lighting.
- **Grounding Improvements:** Improvements in earthing practices to ensure equipment safety and efficiency.
- **Automation and Control:** Installation of smart switches and motion sensors to optimize energy usage.
- **Sustainable Practices:** Encouragement of recycling initiatives and the use of energy-saving power strips.
- **Enhanced Energy Practices:** Regular maintenance of appliances, education on energy-saving practices, and exploration of solar energy options.

Issued by:

SD Integrated Private Limited



Prakash Sarathe

Place: Jabalpur

Date of Issue: 17th November 2023



ST. ALOYSIUS' COLLEGE

(AUTONOMOUS), JABALPUR(M.P.)

Reaccredited 'A+' Grade by NAAC (CGPA 3.68/4.00)

College with Potential for Excellence (CPE) by UGC

DST-FIST Supported & Star College Scheme by DBT.

Power Audit

2022-23

The report of Power Audit of St. Aloysius College for the academic year 2022-23 was submitted by a team of three members:

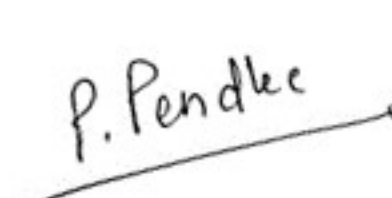
- Dr. Pramod Chaitenya (Head, Physics)
- Dr. Poonam Pendke (Asst. Prof. Physics)
- Dr. Abhilasha Shukla (Asst. Prof. Hindi)

The report outlines the energy consumption patterns of the college and identifies potential areas for energy conservation. It includes a detailed survey of all electrical appliances and systems, cataloging their quantity and individual wattage to assess their contributions to the total energy demand, which amounts to 1007.742 KW. Major contributors include air conditioning units, computers, printers, ceiling fans, and the lift.

The audit emphasizes the college's commitment to energy conservation and environmental safety, detailing initiatives such as the use of renewable energy sources, particularly solar energy. The findings and recommendations are designed to enhance energy efficiency and reduce costs, supporting the college's goal of creating a sustainable and eco-friendly academic setting.

This audit has been submitted to Awaneesh Nema and Associates for further review and action.


Head of the Dept of Physics,
St. Aloysius' College,
JABALPUR


P. Pendke




PRINCIPAL
St. Aloysius College (Autonomous)
JABALPUR- 482001 (M.P.)
INDIA



1, AHILYA BAI MARG, PENTINAKA CHOWK, SADAR, CANTT, JABALPUR, MADHYA
PRADESH, INDIA 482001



+917612620738



info@staloyuscollege.ac.in



ST. ALOYSIUS' COLLEGE

(AUTONOMOUS), JABALPUR(M.P.)

Reaccredited 'A+' Grade by NAAC (CGPA 3.68/4.00)

College with Potential for Excellence (CPE) by UGC

DST-FIST Supported & Star College Scheme by DBT.

Power Audit Report

2022-23

The power audit was conducted at St. Aloysius College with an aim to assess the energy consumption patterns and identify potential areas for energy conservation. The audit encompassed a comprehensive survey of all electrical appliances and systems within the college premises.

The following were the team members-

Methodology:

The audit began with a systematic enumeration of all electrical appliances, noting their quantity and individual wattage. The energy consumption of each appliance was then calculated to determine its contribution to the total energy demand of the college.

Findings:

The total energy consumption of the college, based on the appliances listed, amounts to 1007.742 KW. The major contributors to this consumption include:

- Air Conditioning Units (ACs): With 21 units each consuming 1600 watts, they contribute a significant 201.6 KW. Given the high energy demand of ACs, it's crucial to ensure they operate efficiently.
- Computers: Used for labs, offices, and online classes, the 280 computers collectively consume 168 KW. Regular maintenance and ensuring computers are turned off when not in use can contribute to energy savings.
- Printers: 45 printers in the college consume a total of 67.5 KW. Implementing a policy of switching off printers when not in active use can reduce this consumption.
- Ceiling Fans: The 324 ceiling fans, though individually consuming only 60 watts, together account for 116.64 KW due to their sheer number.
- Lift: The single lift, with a consumption of 7500 watts, uses 45 KW. Regular maintenance can ensure its efficient operation.



1, AHILYA BAI MARG, PENTINAKA CHOWK, SADAR, CANTT, JABALPUR, MADHYA
PRADESH, INDIA 482001



+917612620738



info@staloysiuscollege.ac.in



ST. ALOYSIUS' COLLEGE

(AUTONOMOUS), JABALPUR(M.P.)

Reaccredited 'A+' Grade by NAAC (CGPA 3.68/4.00)

College with Potential for Excellence (CPE) by UGC

DST-FIST Supported & Star College Scheme by DBT.

Preface

For the period spanning July 2022 to June 2023, a power audit was conducted at St. Aloysius College (Autonomous), Jabalpur, Madhya Pradesh. This systematic evaluation aimed to assess and enhance the energy efficiency across the campus. Detailed data was gathered from every classroom, laboratory, and room, taking into account the number of tube lights, fans, air conditioners, and other electronic instruments. The contribution of each component to the overall electricity consumption was analyzed. In alignment with their commitment to energy conservation, the management of St. Aloysius College (Autonomous) actively advocates for the adoption of renewable energy sources, emphasizing the importance of solar energy.



1, AHILYA BAI MARG, PENTINAKA CHOWK, SADAR, CANTT, JABALPUR, MADHYA PRADESH, INDIA 482001



+917612620738



info@staloysiuscollege.ac.in



ST. ALOYSIUS' COLLEGE

(AUTONOMOUS), JABALPUR(M.P.)

Reaccredited 'A+' Grade by NAAC (CGPA 3.68/4.00)

College with Potential for Excellence (CPE) by UGC

DST-FIST Supported & Star College Scheme by DBT.

Aims and Objectives of Power Audit

Aim:

The primary aim of the Power Audit at St. Aloysius College is to systematically evaluate the college's energy consumption patterns and identify opportunities to enhance energy efficiency and reduce associated costs.

Objectives:

Survey and Data Collection: Conduct a thorough survey of the college premises to catalog all electrical equipment, from lighting fixtures to heavy machinery, and gather data on their energy consumption patterns.

Assess Energy Expenditure: Recognize that energy consumption is a significant cost factor for institutions. By understanding where and how energy is used, we can pinpoint areas of inefficiency and excessive expenditure.

Develop Comprehensive Energy Management Plans: Utilize the power audit as a foundational tool to design and implement a holistic energy management strategy for the college, ensuring that energy is used judiciously and efficiently.

Identify Power-saving Opportunities: By analyzing the data collected, determine areas where energy consumption can be reduced without compromising on the functionality or comfort of the institution.

Cost Reduction and Energy Conservation: Through the insights gained from the audit, implement measures that not only reduce the financial burden of energy costs but also promote sustainable and environmentally-friendly practices by minimizing wasteful energy consumption.



1, AHILYA BAI MARG, PENTINAKA CHOWK, SADAR, CANTT, JABALPUR, MADHYA
PRADESH, INDIA 482001



+917612620738



info@staloysiuscollege.ac.in



ST. ALOYSIUS' COLLEGE

(AUTONOMOUS), JABALPUR(M.P.)

Reaccredited 'A+' Grade by NAAC (CGPA 3.68/4.00)

College with Potential for Excellence (CPE) by UGC

DST-FIST Supported & Star College Scheme by DBT.

Introduction

St. Aloysius College's Power Audit is a systematic assessment focused on the institution's electrical infrastructure and usage. By collecting and analyzing data, the audit provides a comprehensive report detailing current energy consumption patterns. This report not only highlights how energy is being utilized but also pinpoints cost-effective opportunities for enhancing energy efficiency.

Key features of the Power Audit include:

Energy Analysis: The audit offers insights into potential areas for energy conservation, ensuring optimal utilization.

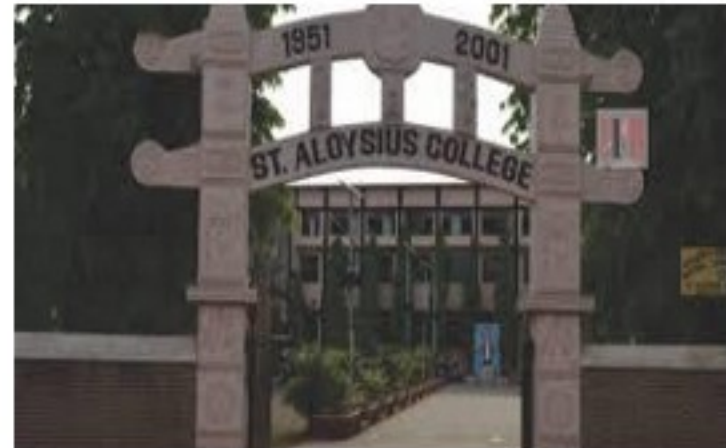
Efficiency Identification: It underscores both low-cost and capital-intensive strategies to save energy, promoting the use of efficient equipment.

Annual Commitment: The Power Audit is an annual endeavor, reflecting the college's dedication to consistent energy-saving practices.

Practical Conservation: Beyond theoretical insights,

the audit provides actionable, economically viable solutions for energy conservation within a set timeframe.

Core Objective: The primary aim is to identify methods to reduce energy usage, ensuring both sustainability and cost-efficiency for the institution.



1, AHILYA BAI MARG, PENTINAKA CHOWK, SADAR, CANTT, JABALPUR, MADHYA PRADESH, INDIA 482001



+917612620738



info@staloyuscollege.ac.in



ST. ALOYSIUS' COLLEGE

(AUTONOMOUS), JABALPUR(M.P.)

Reaccredited 'A+' Grade by NAAC (CGPA 3.68/4.00)

College with Potential for Excellence (CPE) by UGC

DST-FIST Supported & Star College Scheme by DBT.

Observation and Analysis:

During the observation phase, a systematic collection of data was executed, which was subsequently processed and analyzed. The initial step involved quantifying the energy consumption across distinct blocks within St. Aloysius College. This quantitative data was then subjected to visual representation for a clearer understanding.

Load Specifics:

St. Aloysius College in Jabalpur is architecturally segmented into three levels. Each level encompasses a variety of functional spaces, including classrooms, laboratories, a library, a reading room, and dedicated areas for extracurricular engagements such as sports, health club, NCC, and NSS.

In this load analysis, our objective is to project the potential power consumption under a scenario termed as 'full load.' This hypothetical scenario envisions a situation where every single electrical appliance and system within the college premises is operational simultaneously. This estimation provides a benchmark for the college's maximum energy demand.



1, AHILYA BAI MARG, PENTINAKA CHOWK, SADAR, CANTT, JABALPUR, MADHYA
PRADESH, INDIA 482001



+917612620738



info@staloysiuscollege.ac.in



ST. ALOYSIUS' COLLEGE

(AUTONOMOUS), JABALPUR(M.P.)

Reaccredited 'A+' Grade by NAAC (CGPA 3.68/4.00)

College with Potential for Excellence (CPE) by UGC

DST-FIST Supported & Star College Scheme by DBT.



1, AHILYA BAI MARG, PENTINAKA CHOWK, SADAR, CANTT, JABALPUR, MADHYA
PRADESH, INDIA 482001



+917612620738



info@staloyuscollege.ac.in



ST. ALOYSIUS' COLLEGE

(AUTONOMOUS), JABALPUR(M.P.)

Reaccredited 'A+' Grade by NAAC (CGPA 3.68/4.00)

College with Potential for Excellence (CPE) by UGC

DST-FIST Supported & Star College Scheme by DBT.

The estimation of the approximate power consumption is mentioned here

S.No.	Appliances'	Total No.	Wattage (per Appliance)	Consumption (KW)
1	Celling Fans	324	60	116.64
2	Wall Fans	25	100	15
3	Pedestal Fans	2	100	1.2
4	Exhaust Fans	15	60	5.4
5	Tube Lights	135	40	32.4
6	Street Lights	8	25	1.2
7	LED Bulb	263	9	14.202
8	LCD TV	6	150	5.4
9	Computers (Lab+ Office + online Classes)	280	100	168
10	Printers	45	250	67.5
11	Projector	35	100	21
12	AC	21	1600	201.6
13	Xerox Machine	6	1000	36
14	Water Cooler	6	250	9
15	Water Filter	5	600	18
16	CCTV Camera	160	80	76.8
17	Water Pump	2	2100	25.2
18	Microwave	5	1000	30
19	Electrical Kettle	8	1500	72
20	Refrigerators	6	80	2.88
21	Deep Freezer	3	1000	18
22	Induction	1	1500	9
23	PA System(Prerna)	1	250	1.5
24	PA System(Staff Room, Physics & CS Lab)	3	80	1.44
25	Home Theater	2	40	0.48
26	Room / window Coolers	7	250	10.5
27	Miscellaneous (Various scientific instruments at central lab)	2	200	2.4
28	Lift	1	7500	45
Total Consumption (KW)				1007.742



1. AHILYA BAI MARG, PENTINAKA CHOWK, SADAR, CANTT, JABALPUR, MADHYA PRADESH, INDIA 482001



+917612620738



info@staloyuscollege.ac.in



ST. ALOYSIUS' COLLEGE

(AUTONOMOUS), JABALPUR(M.P.)

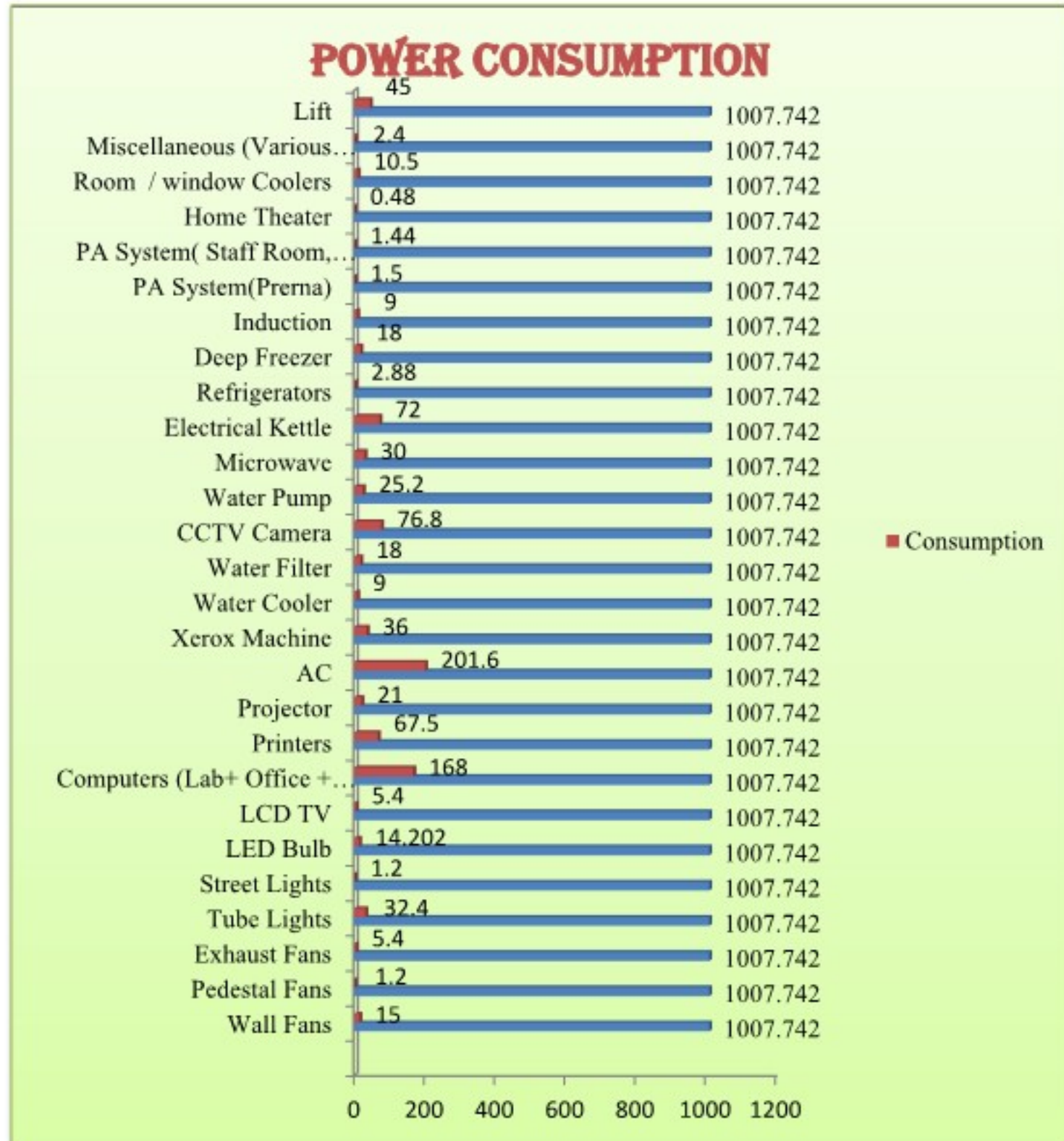
Reaccredited 'A+' Grade by NAAC (CGPA 3.68/4.00)

College with Potential for Excellence (CPE) by UGC

DST-FIST Supported & Star College Scheme by DBT.

Power Consumption Data

GRAPH



1, AHILYA BAI MARG, PENTINAKA CHOWK, SADAR, CANTT, JABALPUR, MADHYA
PRADESH, INDIA 482001



+917612620738



info@staloysiuscollege.ac.in



ST. ALOYSIUS' COLLEGE

(AUTONOMOUS), JABALPUR(M.P.)

Reaccredited 'A+' Grade by NAAC (CGPA 3.68/4.00)

College with Potential for Excellence (CPE) by UGC

DST-FIST Supported & Star College Scheme by DBT.

Measurements & Observations in Earthing system:

Earth resistance testing is carried out for different equipment & distribution board in college premises by earth tester. Test results are tabulated as under:

S. No.	Location/Equipment	Earth Resistance Value in Ohms (Ω)	Remark	Recommendation
1	DG Body (40 KVA)	40	Earth resistance is a bit higher	Earthing network connection should be checked & corrected for the proper connection from equipment to earth pit & salt water can be added to earth pit for improving earth resistance.
2	Earth Neutral	0.47		
3	DG Body Earth Pit	4.65		

Besides this a DG set of capacity 40kVA/36kW/62.6A has been installed in the campus for back up during power loss. But as load is unbalanced and non-linear, DG set should not be run above 80% of its capacity i.e.28.8kW for reliable operation. The following chart approximates the fuel consumption of a diesel generator based on the size of the generator and the load at which the generator is operating at. The table is an estimate of how much fuel a generator uses during operation and is not an exact representation due to various factors that can increase or decrease the amount of fuel consumed.



1, AHILYA BAI MARG, PENTINAKA CHOWK, SADAR, CANTT, JABALPUR, MADHYA PRADESH, INDIA 482001



+917612620738



info@staloysiuscollege.ac.in



ST. ALOYSIUS' COLLEGE

(AUTONOMOUS), JABALPUR(M.P.)

Reaccredited 'A+' Grade by NAAC (CGPA 3.68/4.00)

College with Potential for Excellence (CPE) by UGC

DST-FIST Supported & Star College Scheme by DBT.

Generator Size (kVA)	Generator Size (kW)	1/4 Load (ltr/hr)	1/2 Load (ltr/hr)	3/4 Load (ltr/hr)	Full Load (ltr/hr)
40	36	3.4	5.8	7.9	9.9

Testing of Earth Continuity at different Plug points.

Testing of Earth Continuity at different Plug points is carried out on sample basis and results are tabulated as under: Following Color Coding is used to indicate Correction work priority

Priority	Colour Code
High	Red
Medium	Yellow
Low	Blue

Power Measurements at Main Incomer

The Power Audit has unveiled crucial insights into St. Aloysius College's energy consumption patterns. While the college has made commendable efforts in managing its energy resources, there's room for improvement. Addressing the identified concerns, especially regarding earthing and lighting, can lead to enhanced safety and energy efficiency. The college's commitment to regular power audits underscores its dedication to sustainability and cost-effective energy management.

Phase Voltage Measurements			Current Measurements			kW / Phase			Total Load In kW
R	Y	B	R	Y	B	R	Y	B	
230	230	230	50.8	49.5	57.1	16.2	15.8	18.2	50.2
228	229	229	52.9	48.5	55.5	16.7	15.4	17.6	49.7
228	230	230	54.4	49.3	57.4	17.2	15.7	18.3	51.2
Average Load in kW									50.4



1, AHILYA BAI MARG, PENTINAKA CHOWK, SADAR, CANTT, JABALPUR, MADHYA PRADESH, INDIA 482001



+917612620738



info@staloyuscollege.ac.in