

**Power Audit Report**  
**of**  
**St. Aloysius College**  
**(Autonomous),**  
**Jabalpur, M.P.**  
**[www.staloyuscollege.ac.in](http://www.staloyuscollege.ac.in)**

## Power Audit [2011-2016]

### Load Details:

The structure of St. Aloysius College, Jabalpur can be divided into three floors, each floor consisting of various class-rooms, laboratories and rooms allotted for various extra-curricular activities like sports and NCC. In the following load survey we are estimating the approximate power consumption if the college is running on full load i.e. load that the college would be using in case all the appliances are operational at the same time. The estimation of the approximate power consumption by various class rooms and laboratory is mentioned here as under:

### Ground Floor

S.No.	Room No	PC	Fan	Tube light	CFL	LED	AC	DLP	CCTV	Printer	Total (in kW)
1	001		2	2			1				2.47
2	002	10	6	8					2	9	3.11
3	004		4	4					1		.44
4	005		4	4					1		.44
5	008	1	1		2				1	1	0.34
6	009		4	6					1		0.54
7	010	1	1	2					1	1	0.41
8	011		1	1							0.11
9	012	1	1	1		1			1	1	0.368
10	018	9	5	8					2		1.6
11	019	2	1	1	1		1		1		2.575
12	021		21	19				1	3		2.13
13	022		7	9					1	2	1.27
14	025		1	2							0.16
15	026		3		3		1				2.475
16	029	1	1		3					1	0.355

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### First Floor

S.No.	Room No.	PC	Fan	Tube light	CFL	LED	AC	DLP	CCTV	Printer	Total (in kW)
1	101		8	7					2		0.83
2	102		4	3					1		0.39
3	103		4	3					1		0.39
4	104	4	3	3					2	3	1.18
5	105		4	4					1		0.44
6	106	24	2			2			1	1	2.686
7	107		6	5					1		0.61
8	117		5	3					1		0.45
9	118		5	3					1		0.45
10	119		5	3					1		0.45
11	120	8	6	4				1	1	1	1.61
12	121	2	7	9			1		2	1	3.47
13	122	3	3	14		1			3	2	1.488
14	123		6			1		1	1		0.468
15	124	6	16	16		2	1	1	2	1	4,876
16	Staff Room		4	4			2	1	1		5.04
17	Economics	1	1	1						1	0.36
18	Management	1	1	1						1	0.36
19	History		1	1						1	0.26
20	Hindi	1	1	1						1	0.36
21	Political	1	1	1						1	0.36

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### Second Floor

S.No	Room No.	PC	Fan	Tube light	CFL	LED	AC	DLP	CCTV	Printer	Total (in kW)
1	201		4	3					1		0.39
2	202		8	3				1	1		0.73
3	203		9	3		3		1	1		0.814
4	204		6	3					1		0.51
5	205		5	3					1		0.45
6	206		5	4				1	1		0.6
7	207	5	9	6			2		1		5.84
8	208	4	7	3	4		1		2		3.28
9	209		3		2			1			0.31
10	210		2		6				1		0.21
11	211	1	5	1	10			1	2		0.7
12	212		1	1							0.11
13	214		4	4				1	1		0.54
14	215		4	1					1		0.29
15	216	1	5	4		1		1	1		0.708
16	217		4	1				1	1		0.39
17	218		4	1				1	1		0.39
18	219		1	1					1		0.11
19	220		4	1				1	1		0.39
20	221	97	14		40	0	9	2	9	3	32.04
21	227	8	4			8	3		2	1	8.004

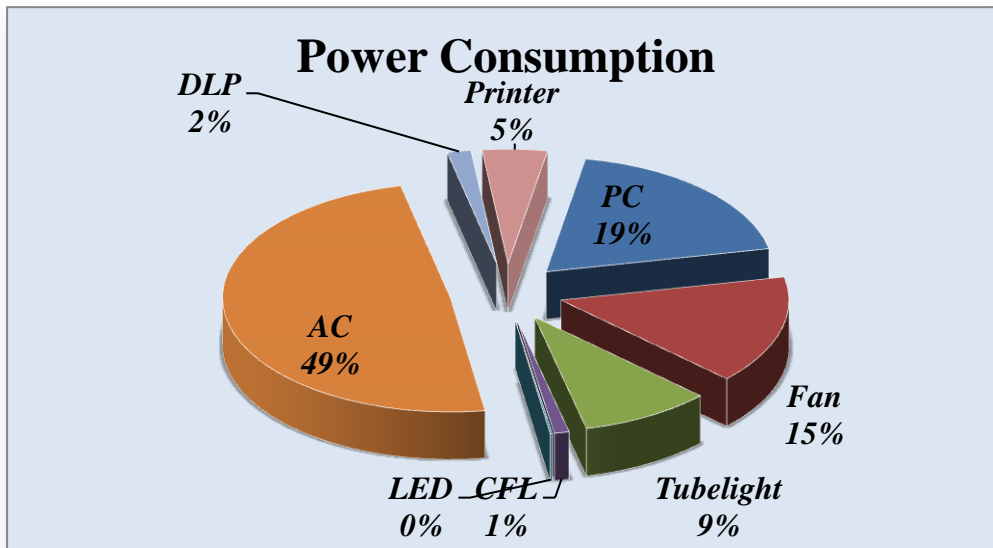
So, in all we have the following appliances and their respective power consumption in kW

	PC	Fan	Tube light	CFL	LED	AC	DLP	Printer
<b>Total</b>	192	258	188	71	19	22	17	31
<b>Power (in kW)</b>	19.2	15.48	9.4	1.065	0.152	49.5	1.7	4.65

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### Percentage Share of Different Load

The total power consumption in case of full load comes out to be 101.147 kW. The percentage contributions towards total load the by various appliances is depicted in the following pie-chart:



Besides the above mentioned, we have the following appliances are also installed in our campus:

S.No.	Appliances	Nos.	Power Consumed(in kW)
1	5 Hp motor	2	1.5
2	Refrigerator	5	0.75
3	Water Cooler	8	2
4	Window Cooler	3	0.75
5	Exhaust	20	3

On combining this data with the above total the estimated full load consumption comes out to be 109.147 kW. The average consumption of our college during the summers varies in the range between 80-95 kW whereas in the remaining duration it hovers between 60-80 kW.

### 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:

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S.No.	Location / Equipment	Earth Resistance Value in Ohms ( $\Omega$ )	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.

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 Colour Coding is used to indicate Correction work priority

Priority	Colour Code
High	
Medium	
Low	

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### Power Measurements at Main Incomer

Phase Voltage			Current Measurements			kW / Phase			Total Load
R	Y	B	R	Y	B	R	Y	B	kW
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
<b>Average Load in kW</b>									<b>50.4</b>

#### Observations:

- We observed that at plug points voltages were different.
- Some switch boards are old and damaged.
- Some sockets and plug points are damaged
- Extensive use of extensions boards
- Earthing problems was observed at some points.
- Tube lights and CFL are still being used.

#### Suggestions:

- Old switches and switch board need to be replaced.
- Earthing problems need to be addressed by increasing salt at the earth pit.
- Replace tube lights and CFL by LED's to reduce power consumption
- Automated switching on/off of appliances must be implemented,
- Old unused appliances must be discarded