To
The Principal
Nabajyoti College, Kalgachia
Barpeta, 781319

**Date:** 05 April 2023

Nabajyoti College, Kalgachia ★ Department of Physics ★ Estd.- 1971 Dist.- Barpeta (Assam)

**SUB: Energy Audit Report**

Respected Sir,

The data collected after completing the study on the college's electrical infrastructure from **November 2020** to **November 2022** has been analyzed and presented in the enclosed report verified by Mridul Hussain, Electrical Supervisor, Barpeta. The report focuses on recommendations to increase productivity, save energy, improve power quality, and reduce failure, thereby improving the Power, Productivity, and Profitability of our plant.

A concerted attempt has been made to depict the current situation as it may be improved. We trust you will find our observations and recommendations valuable and will make a serious effort to put the recommended ideas into action and reap the anticipated advantages.

We use this occasion to show our gratitude and thanks to the authorities and management for retaining trust in our potential and taking a constructive attitude.

Thank you once more, and we look forward to a long and fruitful association with your efforts to increase dependability and minimize energy losses in our institution.

Yours sincerely

05/04/23

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HoD & Associate Professor
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Anupam Deka (05/04/23)

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## 1. Analysis of the Electrical Distribution System

| Sl. No. | Particulars | Observation | Remarks |
|---|---|---|---|
| 1 | Is the distribution of load satisfactory? | YES | |
| 2 | Condition of electrical wiring | Good overall. In some rooms, worn-out wiring was observed | New ones must replace worn-out wiring |
| 3 | Type of wiring | Concealed and open | Casings must be put on loose wire connections |
| 4 | Whether electrical equipment pieces operating at a specified voltage or current? | YES | |
| 5 | Rating of fuses/junction boxes as per standards | YES | |
| 6 | Whether a single isolating switch is available for the whole premises | YES | Rating: 100 A MCCB |
| 7 | Earth pits identified | YES | 13 No. of pits identified |
| 8 | Condition of earthing | FAIR | Needs to be improved |
| 9 | Earth connection to equipment | Proper in most of the rooms | Needs Improvement |
| 10 | Cable laying condition | GOOD | |
| 11 | Cable terminations | PROPER | |
| 12 | Meter and Main condition | GOOD | |
| 13 | Panel Board condition | GOOD | |
| 14 | LED lights and energy-saving appliances | FAIR | LEDs must replace all the old energy-consuming Incandescent and CFL bulbs. |
| 15 | Rating of cables as per standards | YES | |
| 16 | Generator capacity and condition | 10 kVA and GOOD | |

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## 2. Analysis of incoming grid supply

| Parameters | | Reading | Normal Range | Remarks |
|---|---|---|---|---|
| The voltage at the incoming panel | L1-L2 → R-N | 373.08 V | 380-430 V | Needs to be improved |
| | L2-L3 → Y-N | 389.97 V | 380-430 V | Satisfactory |
| | L3-L1 → b-N | 377.24 V | 380-430 V | Needs to be improved |
| | R-N | 215.94 V | 200-240 V | Satisfactory |
| | Y-N | 225.15 V | 200-240 V | Satisfactory |
| | b-N | 217.80 V | 200-240 V | Satisfactory |
| | N-E | 0 V | | Satisfactory |
| Frequency of supply | | 50 Hz | | Satisfactory |

## 3. Energy Consumption

| Consumer's room description | Light | | | Fan | | Socket | | Exhaust fan | Inverter |
|---|---|---|---|---|---|---|---|---|---|
| | Bulb | Tube light | Halogen | Ceiling | Wall mounted | 6 A | 16 A | | |
| **Administration** | | | | | | | | | |
| Principal's chamber | 8 | - | | 6 | | 3 | 11 | - | 1 |
| Principal's office | 8 | 1 | | 6 | 1 | 12 | 18 | | |
| Exam Zone | 11 | - | | 6 | | 3 | 3 | 2 | |
| Conference Hall | 6 | 2 | 2 | | | | | | |
| Vice Principal's chamber | 2 | 1 | | 1 | | 2 | 3 | | |
| Exam cell | 9 | | | 6 | 1 | 6 | 10 | | |
| IQAC | 5 | | | 2 | 1 | 9 | 3 | | |
| Student's Union Cell | 2 | | | 2 | | 1 | 2 | | |
| **Academic** | | | | | | | | | |
| Physics | 22 | 3 | | 25 | | 8 | 40 | 2 | 1 |
| Zoology | 20 | 2 | | 19 | | 23 | 9 | | 1 |
| Chemistry | 26 | 2 | | 14 | | 11 | 7 | 5 | 1 |
| Botany | 28 | 1 | | 19 | | 6 | 13 | | 1 |
| Mathematics | 10 | | | 10 | | 4 | 31 | | |
| Arts Building (English, Economics, History, Arabic, Philosophy) | 11 | | | 8 | | 3 | | | |

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|---|---|---|---|---|---|---|---|---|---|
| Political Science | 2 | | | 2 | | 1 | 1 | | |
| Assamese | 2 | | | 2 | | 1 | | | |
| Education | 2 | 4 | | 1 | 1 | 4 | | | |
| Library (Ground floor) | 19 | | | 17 | | 11 | 26 | | |
| Library (1st floor) | 3 | | | 3 | | 3 | 22 | | |
| Dept. of Yoga | 4 | | | 6 | | 2 | | | |
| Computer lab | | 6 | | 6 | | 77 | 2 | | |
| **Classrooms** | | | | | | | | | |
| Room 1 | 3 | | | 8 | | | 2 | | |
| Room 2 | 3 | | | 6 | | 1 | | | |
| Room 3 | 2 | | | 6 | | | | | |
| Room 4 | 3 | | | 4 | | 1 | | | |
| Room 5 | 6 | | | 9 | | 2 | | | |
| Room 6 | 4 | | | 9 | | | | | |
| Room 7 | 6 | | | 18 | | 3 | | | |
| Room 18 | 2 | | | 4 | | 1 | | | |
| Room 19 | 4 | | | 8 | | 2 | | | |
| NB-001 | 4 | | | 7 | | 2 | 1 | | |
| NB-002 | 4 | | | 7 | | 2 | 1 | | |
| NB-003 | 4 | | | 7 | | 2 | 1 | | |
| NB-101 | 5 | | | 7 | | 2 | 1 | | |
| NB-102 | 5 | | | 7 | | 2 | 1 | | |
| NB-103 | 5 | | | 7 | | 2 | 1 | | |
| DB-01 | | 6 | | 6 | | 10 | | | |
| DB-02 | | 6 | | 6 | | 10 | | | |
| DB-03 | 2 | 6 | | 6 | | 4 | | | |
| DB-04 | 6 | 4 | | 7 | | 6 | | | |
| DB-05 | 4 | 4 | | 6 | 1 | 10 | | | |
| **Non-academic** | | | | | | | | | |
| Career Guidance Cell | 2 | | | 1 | | 1 | | | |
| Student's Union | 2 | | | 2 | | 1 | 2 | | |
| Gymnasium | 8 | | | 2 | | 2 | | | |
| Canteen | 6 | | | 4 | | 2 | 2 | | |
| **Hostels** | | | | | | | | | |
| Boy's Hostel | 109 | | | 40 | | 22 | 5 | | |
| Girl's Hostel | 37 | 5 | | 17 | | 16 | 3 | | |
| **Outskirts of the College** | | | | | | | | | |
| | 59 | | 3 | | | | | | |

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## 4. Analysis of Power Consumption

1. The **Consumer Account No.** for Nabajyoti College, Kalgachia is **64000003012**.
2. The total power consumption of the Nabajyoti College, Kalgachia, and the Boy's Hostel of the college from November 2020 to November 2022 is **50,373.48 kWh**. The corresponding average power consumption during the same period is **2014.94 kWh**.
3. The total power consumption of the Girl's Hostel of the Nabajyoti College, Kalgachia from November 2020 to November 2022 is **19,957 kWh**. The corresponding average power consumption during the same period is **798.67 kWh**.
4. The average power factor from November 2020 to November 2022 is **97.47**, which is satisfactory.
5. The maximum demand is **71 kVA** during the period November 2020 – November 2022.
6. The connected load is **60 kW**.
7. The contracted load is **71 kW**.

## 5. Recommendations:

1. Open wiring is often observed, which should be replaced with concealed wiring.
2. Although thirteen earth pits have been created, they may not be enough to accommodate all of the equipment and gadgets used in laboratories and workplaces. As a result, it is proposed that extra earthing pits be included. The earthing connections should be examined regularly.
3. The bulk of the lights used are constituted by CFLs or filament type, which should be replaced with LED lights to reduce power usage.

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