Power Distribution System for a CubeSat

Presented by :
Ansaf Niyaz | TRV19EE016 Govind Murali | TRV19EE025
Jijesh J. Kumar | TRV19EE029 Naveen A.B. | TRV19EE038

GEC Barton Hill,Thiruvananthapuram

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Guided by: Prof. Dinesh Gopinath

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Objective

To design and implement a fully autonomous power generation, storage and distribution system for a CubeSat

Project Outline

CubeSat(1U):

- Dimensions-10x10x10 cm
- Weight-2 kg.

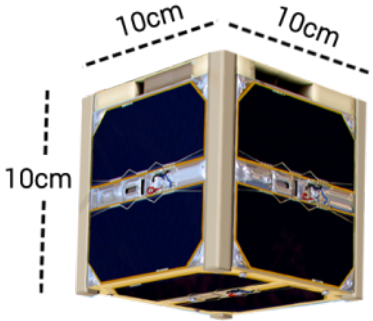

Figure 1: CubeSat 1U (Source: GIS Geography)

Project Outline (Contd.)

Electrical Power System (EPS):

- Harvests energy from the solar panels
- Manages power storage and distribution
- Protects circuits from damage
- Redundant architecture

System Architecture

Methodology

- Identifying the power requirements
- Literature Review
- Forming Specifications
- Architecture design and topology selection
- Design and simulation
- Procurement of components
- Fabrication and testing

Requirements

Equipments Requirements:

- SMD Soldering Station
- Oscilloscope
- Power Supply
- Function Generator

Software Requirements:

- MATLAB/Spice
- KiCad
- STM32 CubeIDE

Budget Estimate: Component cost

Sl. No.	Item	Amount (Rs.)
1	STM32 NUCLEO Development Board	3000
2	SMD soldering station	9000
3	Li-ion Cell (x2)	1000
4	Regulated Multi-Output Power Supply	5000
5	Solar Panel	2000
6	Components	5000+shipping

Budget Estimate: Fabrication cost

Sl. No.	Item	Amount (Rs.)
1	PCB Printing	3000
2	SMD soldering	?
3	Inductor Fabrication	1000