Project Title:

DESIGN AND DEVELOPMENT OF NODAL SAFETY SWITCH

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1. Executive Summary

In order to conserve energy during energy utilization, it is important to control when, how and where to use the energy. Safety is of great importance when dealing with electricity, thus, switches are provided to supply the flow of electrical current when needed and disengage when not required.

Nodal safety switch is designed to help conserve electrical energy, and at the same time protect our electrical appliances and equipment against any power surge resulting from line short-circuits and lightening power surge

especially when the switch is deliberately left in the “ON” position after the previous power supplied was interrupted.
Moreover, this safety switch was designed to give an improvement on the non protective nature of conventional switches and also to help reduce the loss of energy due to poor and inadequate management of electricity energy by consumers.

This proposal seeks NASENI’s support for the design, development, and commercialization of **well packaged and portable Nodal Safety Switch**.

2. **Significance of the Nodal Safety Switch**

In the design of this switch, a number of factors were considered to help enhance and prolong the life span of electrical appliances and equipment connected to it in our homes, offices and business places. The factors include the following

- ✓ Over current Protection
- ✓ Electrical fire outbreak reduction
- ✓ Prolong life span of equipment connected to it
- ✓ protection of the appliances connected to it from initial power surge.
- ✓ Load isolation
- ✓ Energy saving
- ✓ Cost effectiveness

3. Areas of Application

This Nodal Safety Switch can be used in direct connection with the following devices:

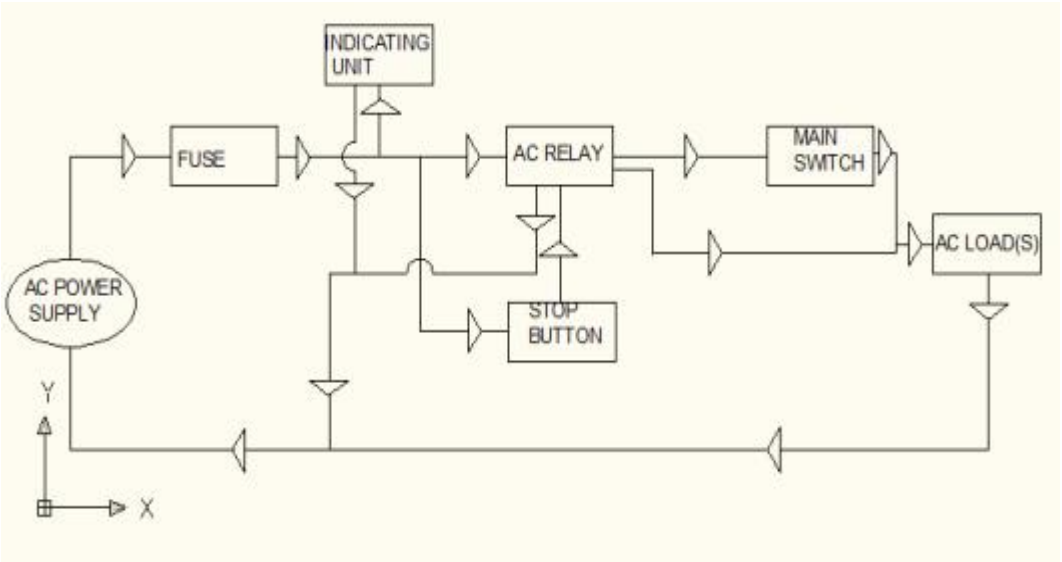
- ❖ Lighting
- ❖ Socket outlets for other devices
- ❖ Surface pumps

❖ Changeover

This switch can as well be used to control power input Shopping malls, Schools, other kinds of buildings to prevent fire out break associated with electricity.

4. Principles of Operation of Nodal Safety Switch

The principle of operation of Nodal Safety Switch is based on switching principle of an AC relay to either connect the load(s) or isolates the load(s) from the power source. Whenever there is desire to switch "ON" light or load connected to this switch, the start button is pushed, which automatically energizes AC relay through its coil. The retaining current of the relay in its energizing state was achieved through the common contact (CC) and normally open contact (NC). When one desires to isolate the load from the power source, the relay coil should be de-energized by pressing the push button connected on the main (live) via the fuse with adequate protective rating. The design circuit diagram of this safety energy saving switch is shown in figure below.



Block diagram of a Protective Switch/ Socket Outlet

5. Implementation

Phase	Duration	Activity	Deliverable
1	Month 1-2	Design finalization, material sourcing	Livewire software
2	Month 3-5	Fabrication and Finishing	Prototypes
3	Month 6-7	Performance testing & design optimisation	Test reports
4	Month 8-9	Pilot deployment	20 pieces
5	Month 10-12	Commercialization, training workshop	Adoption report

6. Budget Breakdown (N)

S/N	Item Description	Amount
1	Engineering Design and Simulations	10,000,000.00
2	Machining and Fabrication Equipment	25,000,000.00
3.	3D Printing Machines	23,000,000.00
4	Metal Stamping Equipment	13,000,000.00
5	Fitting and Assembly equipment	15,000,000.00
6	Circuit Board Printing Machines	15,000,000.00
7	Testing and Quality Assurance	15,000,000.00
8.	Labour Cost	15,000,000,00
9.	Consumables	15,000.000,00
10,	Training and support	12,000,000,00
	TOTAL	**153,000,000.00**