SOLAR POWERED RAILWAY TROLLEY

PROJECT PROPOSAL NO.:39S_BE_0451

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OBJECTIVES:

1. Should be able to run smoothly on railway track.
2. Should use renewable source of energy.
4. Able to carry a load of 4 human and run constantly.
5. Light weight design so as to increase power-weight ratio.
6. Less friction between the surfaces of the wheels and tracks for smooth travel.
7. Zero emission.
8. Low cost and efficient design.
9. Safety for both operators and surrounding environment.
10. Marketability.

METHODOLOGY:

1. Problem Statement
2. Objectives and Goals of the design
3. Requirements
4. Functions of the design
5. Design alternatives and the chosen design
6. Refining of the chosen design
   Cad model, Analysis
7. Bill of material
8. Fabrication

PROBLEM STATEMENT:

To design and fabricate a railway trolley which is powered by solar energy, so as to detect the flaws on railway tracks.

DESIGN:

Goals of the Design:

1. Should be able to travel at 15-20kmph with carrying 2 human load.
2. Should be low cost i.e., less than 50000.
3. Solar panels should supply current continuously.
4. Also able to travel on beside platforms so as to carry required limited loads.
5. Able to lift the trolley from track as soon as possible.

Requirements of the Design
1. Assumed Gross vehicle weight = 300 kg
2. Required tractive effort to be overcome= 462.39 N
3. Required Torque = 58.72 Nm
4. Required velocity = 10 Kmph
5. Payload weight capability = 250 kg

Functions of the Design
1. Precise location in design for flaw detector.
2. Self-steering vehicle on tracks
3. Able to charge the battery when not in use.
4. Wheels should be act like insulation to the sensor detector on the railway tracks.
5. To move in both forward and reverse direction at any instant
6. Basic comforts to technicians along with utility cabin in vehicle.

Expected Outcome of the project:
1. Vehicle Torque = 64 Nm
2. Vehicle speed = 20 kmph
3. Mass of vehicle = 300 kg
4. Battery discharge time = 3.25 hrs
5. Deformation of the rollcage = 0.77mm
6. Factor of safety = 3.41

Application of the project:
1. To run the trolley on railway tracks irrespective of gauges.
2. To detect flaws on tracks if flaw detectors are installed in it.