Electricity Generation Using Propeller Shaft of Vehicle

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Abstract- *A vehicle such as a large truck Can generate electricity for operating a hybrid engine or recharging batteries by use of an electricity generating driveshaft.*
The electricity generating driveshaft is comprised of a magnetized driveshaft which acts as a rotor, and a series of copper wire coils surrounding the magnetized driveshaft which acts as a stator in an electrical generator.

As the magnetized driveshaft spins as a result of power from the hybrid engine, an electrical field is created which is captured by the copper wire coils and used to power the hybrid engine or recharge a super capacitor.

Keywords- hybrid engine, magnetized driven shaft, copper wire, capacitor.

I. INTRODUCTION

Electric power generation in ships has been traditionally carried out by using either separate auxiliary genets or by using so-called shaft generators connected to the main engine. Auxiliary genets typically consist of a constant-speed, 4-stroke diesel engine equipped with a standard asynchronous or synchronous generator. The system can operate both in generator and motoring mode, providing active power and ancillary services to the ship's grid, and driving the main shaft under emergency conditions, respectively Although the literature in the design and optimization of the individual components is vast, the subsystems and their interactions should be studied in tandem in order to accurately evaluate the benefits of implementing such solutions in real-world applications**.** A vehicle such as a large truck Can generate electricity for operating a hybrid engine or recharging batteries by use of an electricity generating driveshaft. The electricity generating driveshaft is comprised of a magnetized driveshaft which acts as a rotor, and a series of copper wire coils surrounding the magnetized driveshaft which acts as a stator in an electrical generator. As the magnetized driveshaft spins as a result of power from the hybrid engine, an electrical field is created which is captured by the copper wire coils and used to power the hybrid engine or recharge a super capacitor. To transmit power from one point to another in a smooth continues action. In trucks and construction equipment, the propeller shaft is designed to send torque through an angle from the transmission to the axle (or auxiliary transmission). The Propeller shaft must operate through constantly changing relative angles the between transmission and axle. It must also be capable of changing length while transmitting torque. The axle of a vehicle is not attached directly to the frame, but rides suspended by springs in an irregular, floating motion.

Problem Statement:

In Current Vehicles Following Are the Concern, by using chain and belt mechanisms with the alternator with engine these are the problems

- Loss of power
- More friction
- Wastage of energy
- Less quantity of fuel on earth

OBJECTIVE

1. Save energy
   Propeller shaft is used as energy source in this project due to rotary energy is directly converted to electrical energy & store in battery.
2. Reduce friction
   Dynamo mechanism or regenerative braking system not used in this project coils & magnet concept to generate electricity frictionless.
3. No air & environment pollution
   No fuel is required to run this project due to which no exhaust of pollutants takes place.
4. Easy power generation
   As the vehicle is running the power generation takes place by itself and no need of extra efforts to generate power.

Catia model

Design Model of our assembly system prototype is generated in a Catia v5

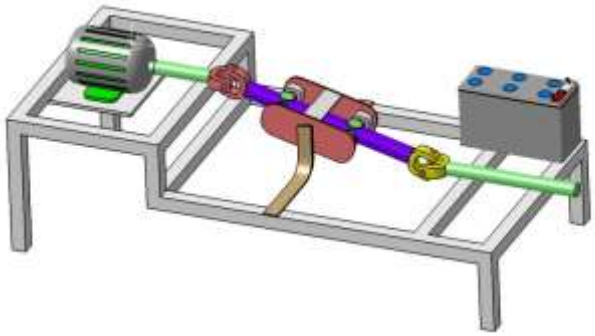

Figure no. 1: CAD Model in catia

We can Introduce Research about Electricity generation using Propeller shaft of Vehicle

Electric power generation in ships has been traditionally carried out by using either separate auxiliary genets or by using so-called shaft generators connected to the main engine. Auxiliary genets typically consist of a constant-speed, 4-stroke diesel engine equipped with a standard asynchronous or synchronous generator

As the magnetized driveshaft spins as a result of power from the hybrid engine, an electrical field is created which is captured by the copper wire coils and used to power the hybrid engine or recharge a super capacitor.

II. LITERATURE REVIVEW

"Praveen, M. Arun'', [1].
Kinetic energy recovery system in bicycle

Kinetic Energy Recovery System (KERS) is a system for recovering the moving vehicle's kinetic energy under braking and also to convert the usual loss in kinetic energy into gain in kinetic energy. When riding a bicycle, a great amount of kinetic energy is lost while braking, making start up fairly strenuous. Here we used mechanical kinetic energy recovery system by means of a flywheel to store the energy which is normally lost during braking, and reuse it to help propel the rider when starting. The rider can charge the flywheel when slowing or descending a hill and boost the bike when accelerating or climbing a hill. The flywheel increases maximum acceleration and nets 10% pedal energy savings during a ride where speeds are between 12.5 and 15 mph.

"Jussi Puranen" [2].

Electric power generation in ships has been traditionally carried out by using either separate auxiliary gensets or by using so called shaft generators connected to the main engine. Auxiliary genets typically consist of a constant speed , 4 stroke diesel engine equipped with a standard asynchronous or synchronous generator. The main benefit of this concept is that due to constant speed operation, the generator feeds constant voltage and frequency into the ship's electric grid, and therefore, no power electronis are needed for frequency conversion. Additionally, since this concept is independent of the propulsion power generation can continue during maneuvering and harboring. The main drawbacks are that auxiliary gensets require more space, more maintainance, and they cannot run with cheaper heavy fuel oil(HFO) without expensive auxiliary equipment, such as pre-heaters to reduce viscosity.

"Sam Anvari, Denton"[3].
Drive shaft electric generator/braking system

An electricity generating driveshaft for a truck comprising: a magnetized driveshaft a series of copper coils Surrounding said magnetized driveshaft; whereby, when said magnetized driveshaft spins as a result of power from an engine, electricity is generated which is captured by said copper coils for use to power a hybrid engine or recharging a Super capacitor

A truck braking system comprising: a driveshaft which is selectively magnetized; an actuator attached to said truck braking system which

Selectively magnetizes said driveshaft; a series of copper coils Surrounding said magnetized driveshaft; whereby the selective magnetization of said driveshaft interacts with said series of copper coils slowing the rotation of said driveshaft resulting in a decrease in the speed of the truck.

Sarigiannidis G,et.al "Chatzinikolaou E, Patsios C, Kladas A''[1].

In this paper, we have demonstrated the merits of applying an optimized direct-driven SHG system on an actual Ro-Rovessel through a holistic approach from design to performance evaluation. The proposed configuration has been compared against an existing SHG system, establishing its advantages both in terms of design and operation. The suggested PMSG design presents a 40% improvement in torque ripple, 37%in stator voltage THD, and 8% in total losses at nominal operation against the conventional SPSG design often used in such configurations. A particular power converter controller that takes into account the nonlinearities of the machine has been introduced, in order to improve its performance under steady-state and transient conditions. The

coupling of the machine through this power converter has allowed full control over active and reactive power flows; therefore, enabling the system: 1) to play an important role in accommodating vital ship loads leading in significant reduction of fuel consumption;2) to support grid voltage acting as an STATCOM, replacing traditional static capacitor banks; and 3) to act as a motor during the loss of the ME. The system has demonstrated stable operation under all considered operating conditions, working in tandem with the ship DGs. It was shown that by exploiting the proposed solution's optimized design and flexibility, the power generation can be scheduled in a way that can lead to significant reductions in fuel consumption. A reduction of 3%in the SFOC was achieved during an actual journey; therefore we believe that by incorporating the proposed solution in ship energy management systems, great services can be obtained in terms of both fuel consumption and operating characteristics.

III. EXPERIMENTATION

Assembly Arrangement

Figure no. 2 Experimental Setup

COMPONENTS

1] Neodymium Magnets : we used this magnets because they are strong and high electromagnetic field.Specification:18mm dia.*3mm thick. Material of magnet is : NdFeB .

Figure no . 3 Types of Magnet

2] Motor: The purpose of motor, regardless of the application, change the electric power to mechanical power in order to provide rotational movement.

Figure no. 4: Motor

3] Propeller Shaft: we designing our attachment, the following consideration were taken into account.

The attachment should employ low cost materials and manufacturing methods.

Figure no. 5: Propeller shaft

4] Bearing: **Pedseal Bearing** we can use in this project
For 20mm shaft dia. We take standard bearing no. P204 from manufactures catalogs

Figure no. 6: Bearing

5] Coil: An electromagnetic coil is an electrical conductor such as a wire in shape of coil, spiral or helix. Either an electric current is passed through the wire of coil to generate a magnetic field.

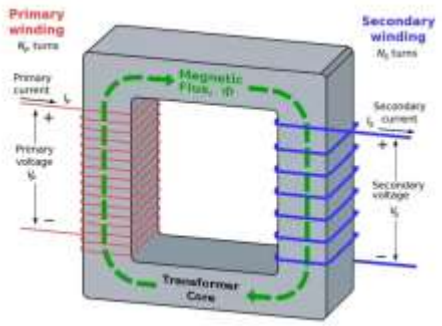

Figure no. 7: Coil

WORKING

When the propeller shaft is rotating at high speeds, the disc magnets also rotates with its axis

When the magnet spins, the magnetic field around the top and bottom of the coil constantly changes between a north and a south pole.

This rotational movement of the magnetic field results in an alternating EMF being inducted into the coil as defined by Faraday's law of electromagnetic inductions
Copper coils generates 10 to 30 AC volts, by using AC to DC Converter circuit, we can convert it to Dc and charge the batteries.

Further By using the power we run the vehicle in hybrid vehicles or electric vehicles

IV. OBSERVATION TABLE

Sr. No.	RPM	Voltage
01	380	3.52
02	560	5.50
03	650	6.30
04	700	7.44

VI. CONCLUSION

Electrical generators have been in use for many years in different applications. The general definition of generator is a device that converts mechanical energy into electrical energy. This is possible due to the principle of electromagnetism. As this electrical energy is produced, the generator will cause electric current to flow through an external circuit. Typically, generators are made up of an arrangement of magnets, copper winding and a rotor, which ultimately produce electricity from mechanical power. In generator powered by a diesel engine, the mechanical energy is provided from the chemical energy that stems from the combustion of diesel fuel by the engine This mechanical energy provided to the generator is eventually converted into electrical power based on the principle of electromagnetic induction. As the magnetic field is changed, a current is produced through the conductor within the generator**.** We found out the need of our project, for what the project is being made, what is the aim of the project, after deciding the need, we decided the mechanisms which will be used in the project, after choosing the mechanisms the analysis of forces to be done was necessary, after the analysis, which material should be used was decided, then the design of elements was done, the size was selected appropriate so as to overcome the stresses, some small modifications were to be done. Then the detailed drawing was made and the manufacturing of the prototype is to be made in the next semester.

VII. ACKNOWLEDGMENT

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