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PERFORMACE IMRPOVMENT OF MAGNETIC GENRATOR BY COIL WINDING MODIFICATION

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Abstract: This paper presents a Magnet Generator in the latest renewable applications. There we do design base work in which we gone do winding modification with respect to the magnet place and on which factors it will be depends and how to do design by which performance of magnetic generator can be improve.

Index Terms – Magnetic Generator, Magnets, winding, losses, changing in place of magnet, angle transformer, and single phase generator.

I. INTRODUCTION

Growing populations and higher living standards are the main reasons for the high rate of increasing demand for electrical power. Even if we fulfill this power demand, we still cannot risk polluting our environment. The world is focused on clean energy not only because fossils fuels are being depleted but also to achieve minimal to zero negative impact on our environment. Our main concern is to produce electricity using renewable energy sources that can become substantial enough to completely meet electricity demands on their own [1]. We can improve power generation by winding modification here we do some modification analyses it and conclude which can be good and which limitations we gone face and how can we overcome it.

Permanent Magnet Synchronous Generator in the latest renewable applications. A technical review followed by a methodological analysis have been provided for each case with current trend, limitation of the developed systems and future scope [2].

The meantime, the nation's energy needs are expected to grow by 33 percent during the next 20 years. It uses the permanent magnetic field of the magnets to generate the required force to move the motor. This concept of generating magnetic field from the permanent magnets became practical only after introducing Neodymium magnets which are much power full than the previous Ferrite magnets. The main advantage is that it does not require continuous electric supply.

These magnetic energy devices provide pollution free energy and they will not deplete our natural.

II. RESEARCH MOTIVATION

Non Renewable sources was limed when we talk about wind energy it's also use magnetic generator for generation and solar energy can be useful only at which place where sunrays are available in needed quantity maybe at that time PMG was costly but in future it will be necessary to use that and we can try and do some modification on which bases we can improve power generation.

More than 90% world's power is being generated using electromagnets based on the Faraday's law of electromagnetic induction. Many new technologies were discovered with time which led to a drastic change in the perception of electric energy. But at the same time, there is the misconception of FREE ENERGY. Energy becomes free only at a point after which we don't have to pay for power generation after commissioning the unit. By using magnets we can generate continuous motion (Energy) with help of the magnetic flux produced the poles of the magnets.

The basic principle of power generation lies under the magnetic effect. It states that "When a conductor is rotated in a magnetic field, a voltage is induced in the conductor". So here we will be dealing with such conductors. Engine's powered by magnetic generator I governed by electrical energy. In a simple motor, the magnetic field is created by the electric coils generally Cu, Al coils. These motors continuously need an electrical supply to produce a magnetic field. There are a huge amount of energy losses. But the Magnetic Motor consists of no such coils. Hence there will be minimal losses according to Hysteresis Loop.

It uses the permanent magnetic field of the magnets to generate the required force to move the motor. This concept of generating a magnetic field from the permanent magnets became practical only after introducing Neodymium magnets which are much powerful than the previous Ferrite magnets. The main advantage is that it does not require continuous electric supply.

III. RESEARCH OBJECTIVES

- Due to higher efficiency, power factor and maintenance free operation, permanent magnet synchronous machines are recent trends in motoring or generating mode for low and medium power levels..
- Different kind of winding and its effect on the performance
- The challenges of PMSG technology are high cost and non-availability of magnets. Still owing to their several advantages researchers and engineers are working to reduce the cost of these by improving machine design so by which simulation machine will give more In that sense this work may be of value both academic researchers and industrial engineers.

IV. POWER GENERATION

When we talk about power generation there are many sources by which we generate power like Geothermal energy, tidal energy, nuclear power plant, combustion turbine solar energy, wind energy etc. thermal power generation is most common widely used method in which crude oil is use for operation of energy generation. Nuclear power generation can also generate huge amount of energy with small amount of combusting material but it have high cost of maintenance and also have huge side effect on nature as well as person whom works at there. Hydro power generation Solar power generation and Wind power generation is also take in note which was going to increases in use day by day. Power generating by magnetic generator can be also use for generation and it can be also use with wind as well as solar plant.

V. TYPE OF WINDING

Stationary (Stator) Winding:

The winding wound either on the induction machine's stator or on the field system of a dc machine is termed as a stationary winding.

Dc Armature Windings:

There are two kinds of dc armature windings that are the lap and wave windings. For development of dc armature windings, a number of pitches related to the types of dc armature windings are back pitch, Front pitch and Winding pitch.

Wave Winding:

While the finishing end of the first coil is connected to the starting end of the next one coil, as displayed in the diagram below that starts from the next adjacent pole in which the first coil started is termed as wave winding

Lap Winding

In this type of winding, the connection of the conductors is done in such a way that their parallel poles & lanes are similar. The last part of every armature coil can be connected toward the nearby section on the commutation.

The digit of brushes in this winding can be similar toward the digit of parallel lanes, & these brushes are separated evenly into positive as well as negative polarity winding. The applications of lap winding mainly include high-current, low voltage machines. lap windings are classified into three types which include the following.

1). Simplex Type Lap Winding

In this kind of winding, the ending of one coil is connected to the commentator section as well as the beginning end of the secondary coil can be arranged under a similar pole, and also the digit of parallel lanes is equal to the digit of poles of the windings.

2). Duplex Type Lap Winding

In this type of winding, the digit of parallel lanes among the pole is double the digit of poles. The applications of lap winding mainly involve in huge current applications. Such kind of winding is obtained by arranging the two same windings on the similar armature as well as linking the even number commutator bars toward the primary winding & the off number to the secondary winding.

3). Triplex Type Lap Winding

In this type of winding, the windings are associated with the 1/3rd of the bars of the commentator. This lap winding has several lanes as well as therefore the applications of triplex type lap winding mainly involve in huge current applications. The main drawback of this winding is that it uses several conductors which will enhance the winding cost.

Whole Coil Winding:

A whole coil winding is one where the number of coils per phase is equivalent to the number of poles in the machines. In this sort of winding, as displayed in the below diagram (a), each slot consists of two coil sides. Though, it is not strictly a double layer winding, like the coil sides are places side by side and not one above another.

Concentrated Winding:

If in any winding, the number of coils or pole or phase is one, and after that the winding is termed as concentrated winding. In this type of winding, each coil side takes place of the one slot.

Distributed Winding:

In this type of winding, number of coils or pole or phase is more than one arranged in dissimilar slots and is termed as distributed winding. In this case, each coil has similar pole pitch.

Unbalanced winding:

If each pole of similar phase has not equal number of coils, after that the winding is termed as unbalanced winding.

Single Layer Winding:

In this sort of winding, as displayed in the diagram below (a) each slot consists of only one coil side. The meaning of it is a coil occupies two complete slots. The number of coils in the machine is equivalent to half the number of slots in the rotor or stator and armature.

Double layer Winding:

In this sort, as displayed in the diagram below (b), each slot consists of two coil sides, housed one over another. The number of coils is equivalent to the number of slots in the armature and stator.

Single Phase Winding:

The winding that comprise only one group of coils per pole, that placed in one slot or various slots relies on whether or not the winding is concentrated or distributed.

Three Phase Winding:

For three phase windings, three single phase windings are employed, spaced 120 degrees apart.

Concentric Winding:

This winding is single layer windings. This winding comprises two or more than two coils in a group and the coils in every group have similar center.

Chain Winding:

In that winding the number of coils, pole or phase is more than one and having dissimilar pitches and the coils overlap each other in the form of a chain.

VI. METHODOLOGY

Magnetic Generator coil winding design with respect to place of magnet:

1. Single-phase generator with coils normal Angle coil winding:

In fig. 1 there is Power coil having a wire diameter of 0.05 cm and each coil weighing 251g, was denoted as D, where related wire density (d) was 10 g/cm3. The length of the wire to 1000 g could be solved by implying 1000 g into the following equation,

1000g/10cmπ4×0.05cm2×10g/cm2=1227 (M).

Currently weighs of each coil is 250 g. And the length is calculated as 221 M (1227 M ÷ 4).

The number of turns with respect to the length of 221 m was calculated (the middle value for the inner and outer diameter was taken).

The circumference of each coil = 3.14 × 0.03 M = 0.0942 M

Power generated by 8 coils = 38 V × 8 = 304 V

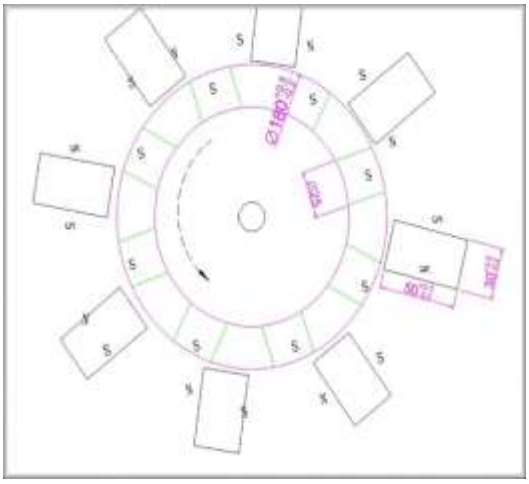

Fig. 1

2. Single-phase generator with angle transformation coil winding:

In Fig. 2, the coils is arranged in an angle transformation, where 6 coils were arranged in a sideway direction, and the left and right coils are arranged in longitudinal direction. The left vertical coil is in the polarity of apposite to the right vertical coil. Therefore, these coils need to advance by one position to achieve the in-phase condition to simultaneously generate the positive phase voltage.

If we give 20W as input, the single-phase generator with an angle transformation coil winding arrangement is enables to give output of 21 W, magnetic assistance arrangement could help to achieve positive output efficiency, which indicated by angle transformation arrangement of generator we can achieve good output effects.

Fig. 2

After Studying both concept 1. Single-phase generator with coils normal Angle coil winding 2. Single-phase generator with angle transformation coil winding. Single-phase power generation does uses best combination of angle transformations with an efficiency near by 130%.

- The eddy current generated by the generator is interrupted by the angle change of the coil in each turn to reduce the drag, so the single-phase power generation can reach 130% efficiency.

- The voltage value is measured in parallel with the voltmeter, and the current value is measured in series with the ammeter, and test load using high power Led lights.

- The single-phase angle transformations magnetic power generator uses the special arrangement of coil to make the force of the magnet to generate the thrust and to achieve the energy-saving effect. Therefore, the highest efficiency of 130% includes the force of the magnet itself and the input of the motor does not violate the energy conservation.

3. Three-phase power generator in delta connection:

In Fig. 3, 8 magnets and 12 coils are in three-phase delta or Y connection, where the difference of each phase is 120° and 4 coils simultaneously generate power in each phase.

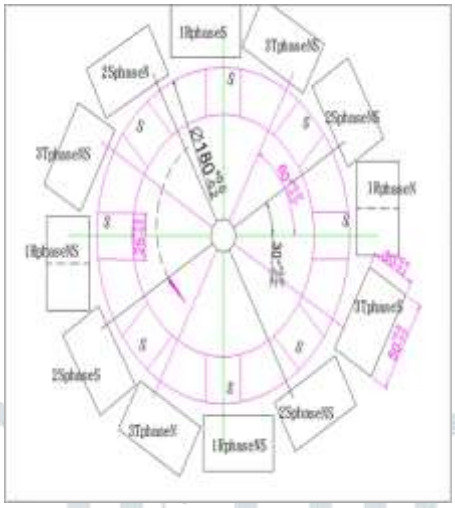

Fig. 3

A generator with single-wire wound coils in three-phase delta connection is tested for rectification efficiency.

With an input of 80 W, the generator with single-wire wound coils in three-phase delta connection and with a rectification function enables an output of 55 W. The efficiency is near by 70%, indicating that efficiency of a generator with rectification is higher than that of a generator without rectification.

Six-wire wound coils in three-phase delta connection are tested for rectification efficiency.

If we give input of 74.9 W, the generator with six-wire wound coils in three-phase delta connection and with a rectification function enables an output of 61.56 W. The efficiency is up to 82%, indicating that the six-wire wound coils could achieve higher efficiency than the single-wire wound coils

ELRCTRIC MACHINE

Electrical rotating machines and power electronics for new aircraft equipment systems are described in [3]. Machine selection and initial design of an aerospace starter/generator are studied in [4]. In [5], researchers reported the study results of using solid oxide fuel cells in combination with a GT as a hybrid APU system for a commercial aircraft. [6] Gives a brief description of the constant frequency of electric power systems (EPS), variable frequency EPS and advanced high voltage EPS and power electronics in the three EPS are overviewed. [7] Examines the problem of the installation of the electric machine in the high pressure shaft to increase the electrification of aircraft engines and create more electric engine.

- Study on different kind of winding design related to magnets pattern that's effect on performance and efficiency.
- By doing configuration of generator in which different Pattern of coil winding and different pattern of Magnets we can take the high efficiency by which generation will be improved and losses can be decrees.
- Take out information about losses cost and reliability of different configuration of different pattern winding its connection related to different number of magnet.
- Run out design on computer based software.
- For those who want study the high efficiency generator, they can understand the principle and data analysis through the experimental process, and can quickly go to a higher level development.
- Currently the worldwide faces power shortages, and hopes that this study can reduce the problem of power shortage and create social happiness with low-cost electricity.
- SOLIDWORKS, Fusion 360, on shape. Inventor, Solid Edge, CATIA, AutoCAD Mech, and SolidWorks Simulation etc. can be used for designing purpose.

VII. CONCLUSION

Type of winding and with respect to that place of magnet can be change by which lots of modifications is possible by which we can do batter design, by new modification power output can be increases. Cost of magnetic generator is more, we can try some modification by which power output will be improve and it will be useful power generation unit in future with lesser cost than current.

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