ELECTRIC ENERGY GENERATION BY MAGENN AIR ROTOR SYSTEM (MARS)

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ABSTRACT

The Magenn Air Rotor System (MARS) is that the next generation of wind turbines with cost and performance advantages over existing systems. MARS may be a lighter-than-air tethered turbine that rotates a few horizontal axis in response to wind, generating electricity . This electricity is transferred down the tether for consumption, or to a group of batteries or the facility grid. Helium sustains the Magenn Air Rotor System, which ascends to an altitude as selected by the operator for the simplest winds. Its rotation also generates the “Magnus” effect. This aerodynamic phenomenon provides additional lift, keeps the MARS device stabilized, positions MARS within a really controlled and restricted location, and eventually , causes MARS to tug up overhead to maximise altitude instead of drift downwind on its tether. It’s become mandatory instead of choice to choose the renewable source of energy today within the whole world. For an equivalent requirements we'd like advance options for future, hence MARS proves its excellence to use for better future.

Keywords – Electric Energy Generation, Magenn Air Rotor System (MARS).

I.INTRODUCTION

MARS may be a lighter-than-air tethered turbine that rotates a few horizontal axis in response to wind, generating electricity.This electricity is transferred down the 1000-foot tether for immediate use, or to a group of batteries for later use, or to the facility grid. Helium sustains MARS and allows it to ascend to a better altitude than traditional wind turbines. MARS captures the energy available within the 600 to 1000-foot low level and nocturnal jet streams that exist almost everywhere. MARS rotation also generates the "Magnus effect" which provides additional lift, keeps the MARS stabilized, and positions it within a really controlled and restricted location and causes it to tug up overhead instead of drift downwind on its tether.

All competing conventional wind generators use bladed two dimensional disk-like structures and rigid towers. The Magenn Power Air Rotor system may be a closed three dimensional structure (cylinder). It offers high torque, low starting speeds, and superior overall efficiency because of its ability to deploy higher.The closed structure allows Magenn Power to supply wind rotors from very small to very large sizes at a fraction of the. value of current wind generators

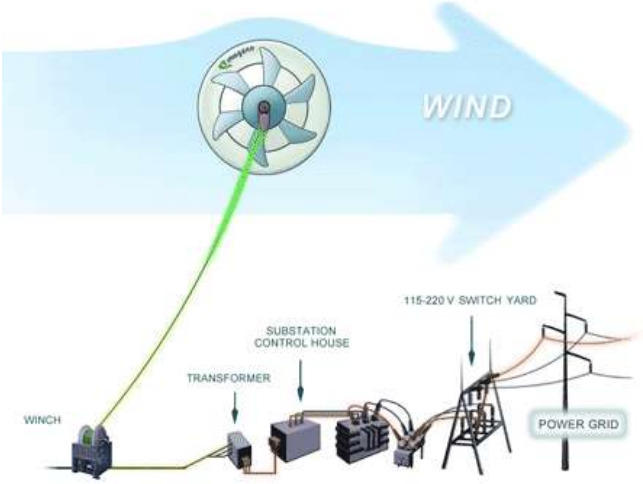

Fig.1 Magenn Air Rotor System (MARS)

The system Magenn air rotor system (M.A.R.S.) is one among the kinds of Offshore turbine . this type of turbine is lighter than the air. It uses the wind generation to supply electric energy. the rationale why it's possible to remain in higher level of atmosphere is that the Helium that's wont to fulfill the turbine. This helps the turbine to be in areas where wind has higher speed, than on the lower levels of atmosphere. The M.A.R.S. spins round the horizontal axis following the wind direction. this manner is produced more energy from the wind generation , which is transferred to the surface transformer station using the cables. it's tons of benefits comparing to the traditional OWT (Offshore wind energy) e.g. low cost of produced electric energy, lower noise, turbine is placed in higher location, lower constrains where it are often placed, high mobility level, and it's not required to use an important duty machines, lover risk to harm a birds or bats. The OWT M.A.R.S. are often taken out higher over the surface, than the traditional systems, so it can catch more power full wind. the traditional systems are placed in areas where the wind is higher over the surface e.g. coastlines or mountain terrenes. the foremost suitable areas are in national parks, areas distant from the consumers of the electrical energy, which agitate the energy losses during the longdistance power transmission. This mentioned problems are ready to be solved using the M.A.R.S.

II.MAIN COMPONENTS OF MARS

A. Tether

A tether may be a cord or fixture that anchors something movable to a point of reference which can be fixed or moving. Energy generated by a high-altitude system could also be used aloft or sent to the bottom surface by conducting cables, mechanical force through a tether, rotation of endless line loop, movement of changed chemicals, flow of high gases, flow of low-pressure gases, or laser or microwave power beams. A tether may be a long cable usually made from thin strands of high-strength fibers or conducting wires. The tether can provide a mechanical connection between two space objects that permits the transfer of energy and momentum from one object to the opposite . The electrical current that's generated travels down the tethering lines to a transformer at the bottom station, then is redirected to the facility grid.

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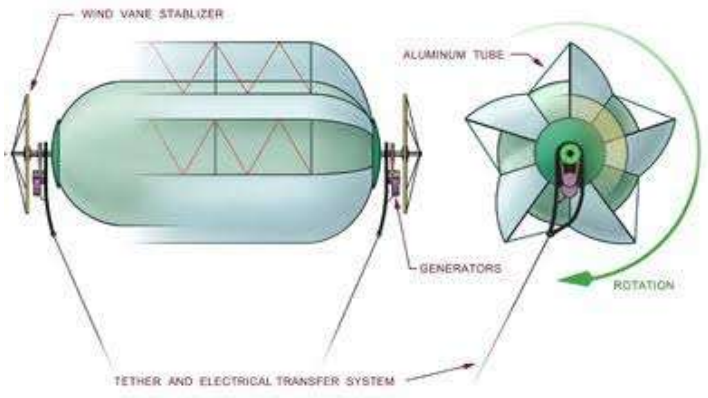

Fig. 2 Magenn Air Rotor System (MARS)

B. Helium balloon

A Helium balloon may be a balloon that stays aloft thanks to being crammed with a gas less dense than air or lighter than air. Today, balloons include large blimps and little rubber party balloons. Helium balloons work by an equivalent law of buoyancy. As long because the helium plus the balloon is lighter than the air it displaces,

the balloon will float within the air. Helium sustains the Magenn Air Rotor System, which ascends to an altitude as selected by the operator for the simplest winds

C. Helium

Helium is that the element with number 2 and an relative atomic mass of 4.002602, which is represented by the symbol He. it's a colorless, odorless, tasteless, non-toxic, inert monatomic gas that heads the inert gas group within the table . Its boiling and melting points are rock bottom among the weather and it exists only as a gas except in extreme conditions.

D. Blade

The blades are relatively thin because this suggests they need a greater area to volume ratio then are affected more by the wind. For an easy demonstration, consider the difference between fanning yourself with a flat piece of paper and a rolled up piece of paper. The flat piece causes a far greater movement of air and therefore the same goes in reverse. Air movement goes to affect the flat piece far more than the roll, although the load is that the same. The blades also are curved to extend their efficiency.

As the blades move they cause a shaft within the body of the turbine to start out turning. This leads into a gearbox. Gears transmit rotational energy during a similar manner to the cogs in an quaint clock. The gears within the gearbox of a turbine find yourself spinning far faster than the blades were. turbine blades turn at a speed of 10-50 revolutions per minute, and are equipped with regulators that shut the system down during hazardous weather to avoid having them spin of control.

Blade Specifications: Obviously, this is often the one variable that engineers can control. Longer, slimmer and lighter turbine blades can increase energy production. In his detailed May 5, 2010 article, wind generation Engineering Editor Paul Dvorak stresses the importance of turbine blades being as light as possible, yet durable enough to face up to high winds without breaking. Current blades range from 130-300 feet (40-90 meters), but future prototypes could also be as big as 435 feet (145 meters)

E. Turbine

There are two sorts of turbines. One is that the vertical-axis type. It works like an egg beater. It works for little power uses: pumping water and grinding grain. This turbine cannot produce enough energy for electrical purposes. The second turbine may be a horizontal axis, which has the capabilities of converting wind into electricity. this is often the design used today on wind farms. Turbines will generally last for around 120,000 hours, or about 20-25 years. Since they need moving parts, they require maintenance and repair, at a price of about 1 cent per killo watt hour produced, or 1-2% annually of the first cost of the turbine. The Honeywell turbine would measure 57 feet across and carry two one-megawatt turbines. In 34 MPH winds at 5,000 feet, the device would travel at 172 miles per hour and generate a megawatt of energy. The generator sits within the back of the device to feature stability. this is often done by the huge rotor blades, which form the visible a part of a turbine .

F. Generator

The turbine generator converts energy to electricity . Wind turbine generators are a touch unusual, compared to other generating units you ordinarily find attached to the electrical grid. One reason is that the generator has got to work with an influence source (the turbine rotor) which supplies very fluctuating mechanical power (torque). A generator situated 500-1000 feet above ground level would enjoy far more consistent strong wind - which is why the Magenn MARS system makes such a lot sense. it is a helium-filled rotating airship that spins within the wind on the top of a variable-length tether that also acts as an influence transmitter, and it's expected to work at

more like 50% of its rated capacity. On large wind turbines (above 100-150 kW) the voltage (tension) generated by the turbine is typically 690 V three-phase AC (AC). the present is subsequently sent through a transformer next to the turbine (or inside the tower) to boost the voltage to somewhere between 10,000 and 30,000 volts, counting on the quality within the local electrical grid. Large manufacturers will supply both 50 Hz turbine models (for the electrical grids in most of the world) and 60 Hz models (for the electrical grid in America).

G.COOLING:

Generators need cooling while they work. On most turbines this is often accomplished by encapsulating the generator during a duct, employing a large fan for air cooling, but a couple of manufacturers use water cooled generators. Water cooled generators could also be built more compactly, which also gives some electrical efficiency advantages, but they require a radiator within the nacelle to urge obviate the warmth from the liquid cooling system.

III.WORKING OF MARS SYSTEM

Wind spins a turbine's blades, which, in turn, cause an attached generator to also spin. The wind blows through blades (made of fiberglass-reinforced polyester – this makes the blades lightweight and yet strong enough to face up to the force of the wind).The blades change the wind's energy into a rotational shaft energy (think of a typical fan).The shaft connects to a drive train with a gear box that uses the rotation of the blades to Spin the magnets within the generator to supply energy This energy is imparted to the shaft within the hub of the turbine and causes an excellent amount of torque to develop on the shaft. At the opposite end of the shaft, a gearbox. transfers the energy to a secondary shaft. The intensify gearing causes higher revolutions per minute (rpm) within the secondary shaft and consequently lower torque. A generator or alternator is mounted on the secondary shaft, and converts the energy originally imparted by the wind to the turbine. A protective covering , "nacelle", houses the shaft, drive train and generator.

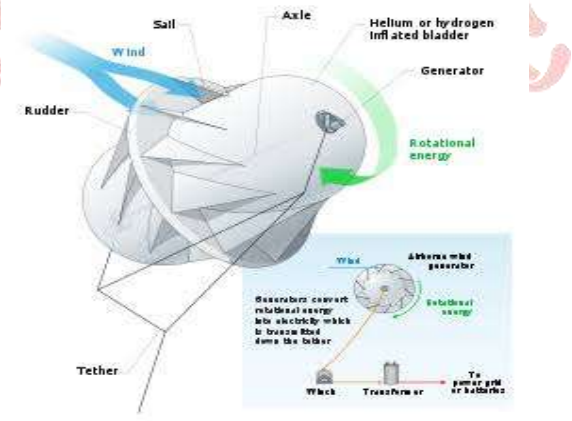

Fig. 3 Rotor Balloon

The generator then converts that moving energy of the wind into electricity using electromagnetic induction, which involves using the other charges of a magnet to make an electrical current. The generators are at each end of the rotor with an immediate output power connection to the dual cables. Outboard of the generators at each end of the rotor are weathervane stabilizers within the sort of conical wheels. The deviation within the trajectory of a spinning projectile caused by the Magnus force. The deviation is toward the direction of the spin and results from pressure differentials within the spinning projectile. The Magnus effect is greatest when the axis of spin is perpendicular to the direction of relative fluid velocity The Magnus effect, related to the rotor rotation, also provides additional lift, which stabilises the rotor position causing it to tug up overhead, instead of drift

downwind on its tether. Wind causes the blimp to rotate: That movement gets converted into electricity and is then transferred down the tether. rather than the massive pinwheel blades that are typical of wind turbines though, the blades of the M.A.R.S turbine are literally a part of the three-dimensional blimp itself. The blades catch the wind, causing the whole blimp to spin . After the generator converts that movement into electricity, it's transferred down the turbine's long tether. Whereas most regular turbines capture winds at altitudes of 200 to 300 feet (61 to 91 meters), the MARS turbine can reach winds from 600 to 1,000 feet (183 to 305 meters) above ground level. Winds at these higher levels are significantly faster than low-level winds because they do not encounter the maximum amount resistance from objects on the bottom like trees and buildings. Research shows that with each doubling of elevation, there's a 12 percent increase in wind speed with each doubling of wind speed there's an eightfold increase in wind generation .

Fig. 4 Air Stabilier

The wind pushes the rotor blades, converting K.E. to rotation . This spins a low-speed shaft, which turns a gear at the lower end. The gear successively drives a smaller gear on a high-speed shaft that runs through generator housing. A magnetic rotor on the high-speed shaft spins inside loops of copper wire that are wound around an iron core. This creates "electromagnetic induction" through the coils and generates an electrical current. the present must be regulated for the strength of current desired (110 w within the US for household AC current). it's then fed into a grid or routed into A battery bank for later use

IV.CONCLUSION

MARS is best , cost effective, eco friendly, mobile, low maintenance way of generating electricity out of wind energy it might be a perfect for the country like India which has vast varieties in geographical landmark to implement such power stations because it might be installed where it might be . it's the simplest solution for the power-crises faced by the planet .

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