



SHIP WITH WIND MILLS

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ABSTRACT

Energy is a measure of all kinds of work by human beings and nature. today, every country draws its energy needs from a variety of sources. we can broadly categorize these sources as :

Conventional sources and non-conventional sources there is a fear that conventional sources of energy will get exhausted in the next century. therefore other systems based on non-conventional sources are being tried in many countries. one of the non-conventional energies is the wind energy. wind energy can be utilized to run 'wind mills' to produce electricity.'

The latest technologies of wind mills say that the offshore wind mills have high output as offshore is free from obstacles and full of non stop high speed winds. the power developed by windmills is said to be dependent on the cube of velocity of air that passes through the turbine. offshore wind mills have only 97% of time wind available which ,means technology is yet to be developed to be more efficient.

So Solution To This Problem Is Ship With Wind Mills

Keywords: Wind Available For 100% Of Time, Blade Design, Classical Darrieus Design, Reduces Noise Pollution, High Scope In Future.

I. INTRODUCTION

Ship with wind mills is a ship which will carry wind mills into open sea and add its velocity component to the wind so as to get wind for 100% of time. when calculations are made it is evident that this method is generating power such that ,a fraction off output is sufficient to run the ship and the left over can be made use of.

A wind turbine, windmill or wind generator is a device for converting wind power to mechanical rotation with a low velocity turbine designed for compressible fluids (air)

The power in the wind can be extracted by acting on a moving wing (or rotor), which convert some of that into torque on the rotor .the amount of power transferred depends on the wind speed and the mass of air swept by wing (i.e the kinetic energy present in the wind)

Wind results from air in motion. air in motion arises from a pressure gradient. local winds are caused by two mechanisms, the first is the differential heating of land and water. the second is caused by hills and mountain sides. kinetic energy in the wind can be converted into mechanical energy that can be utilized to perform useful work, or to generate electricity.

Most machines for converting wind energy into mechanical energy consist basically of a number of sails , vanes, or blades radiating from a hub or central axis. the axis may be horizontal or vertical. when the wind blows against the vanes or sails they rotate about the axis and the rotational motion can be made to perform useful work.



II. OFF SHORE WIND MILLS

Wind mills loose efficiency because they are located in places where the wind is not available for 24 hours. most of the wind mills are located in hill areas and coastal areas where the wind is not available with same intensity at all times and the power also depends on density of air. so we have to choose the area where we can get air with more density and with high velocities. this can be fulfilled by installing the wind mills offshore.

Wind often flows briskly and smoothly over water since there are no obstructions. offshore wind turbines are less unsightly and can save money by using shorter towers. in areas with storms, it is often practical to replace or supplement solar cells with a wind generator. the greatest reservoir of wind energy is in the open oceans.

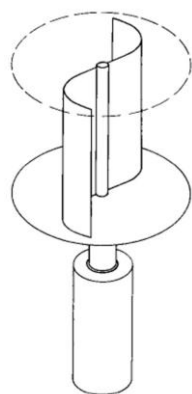
III. SHIP INTEGRATION OF WIND TURBINES

The most important factor to be considered while design of ship with wind mills is the blade design.

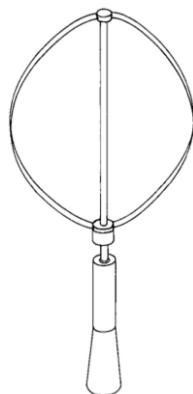
In order to improve the performances and reduce the loads and noise in a wind turbine, several solutions for the blade design have been tested. most of them are coming from the aeronautical industry and are implemented on large scale wind turbines.

IV. BLADE SHAPE

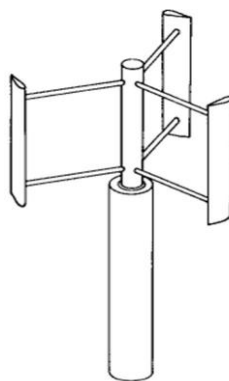
The most common blade shape is the classical darrieus design (eggbeater). the main advantage of this design is the ideal troposkein shape of blades that includes the minimum load on the blade and hence on the structure.



1) Savonius



2) Darrieus Classic



3) H-Darrieus



4) Helical Darrieus

These are different design of blades shown above which are generally used on ship carrying wind mills further detail study on this can prove beneficial and improve efficiency

V. CALCULATION

A ship needs a power of 35 mega watts (maximum) to run at a speed of 90-150 km/h . When the ship runs with this speed, the power developed by one single propeller type turbine (42% efficient) will be 8.07 mega watts (considering ship's speed = 120 km/h ; wind's speed = 15 m/s ; density = 1.22 kg/m³ ; diameter of wing = 60 m)

If conditions are as mentioned above, then five (since 35/8.07) windmills are sufficient to run this ship and the energy produced by other windmills will be stored

VI. ADVANTAGES

Its Advantages Are As Follows:

- 1) Generate More Power Than On Land
- 2) On One Hand If We Are Losing Fuel For The Ship And It's Maintenance, On The Other Hand We Are Gaining More Power
- 3) One Important Point Is That When The Wind Mills Start Producing Power The Ship's Fuel Supply Can Be Stopped And The Energy From The Wind Mills Can Be Used To Run The Ship.
- 4) Density Of Wind Is More On Water Than On Land. As Temperature Decreases The Density Of Air Increases Which Adds To The Power Developed
- 5) Another Complain Is That Wind Mills Kills Many Birds And Bats, But If Wind Mills Are Far In The Oceans, There Wont Be Any Birds Or Bats To Get Killed
- 6) The Developed Power Can Be Stored In Large Capacity Batteries And The Stored Power Can Be Used Afterwards.

VII. ELECTRICITY AND ITS STORAGE

- Storing Wind Energy Effectively Is The Key To Its Long Term Use. Today There Are Number Of Ways To Store Wind's Energy. Windmills Are Used To Charge Electrolyte Batteries. Lead Acid Or Lead Cobalt Car Batteries Are Commonly Used As Well. Ni-Fe, Ni-Cd And Zn-Air Are Often Used As Well. This Tend To Be More Efficient

VIII. SCOPE FOR FUTURE WORK

- 1) When The Wind Mills Are Being Exposed To A Higher Velocities The Design Of Rotor Blade Is An Important Point To Be Considered, So Research Can Be Done To Get An Optimum Design Of Rotor Blade.
- 2) The Material Used For Construction Of Blades Can Also Be The Topic To Study To The Design Of The Rotor Blade.

IX. CONCLUSION

To Reach The High Demands Of The Rapidly Developing Generation, We Have To Be As Efficient As Possible.

If We Are Not Able To Use Free Available Air, Staying On Land, Then We Have To Go Into The Sea, Face The Wind And Grab The Energy Through It.

If We Are Gaining By Using A Ship Then Why Shouldn't We Do It And Generate Power.

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