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Generation of Electricity by Both Mega Hydro and Tidal Power Systems

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ABSTRACT

Electricity is now an important part of homes and industries. Almost all the devices at homes, businesses and industries are running because of electricity. Mega hydro is hydro power with a maximum electrical output. Hydro power or water power is power derived from the energy of falling water or fast running water, which may be harnessed for useful purposes. Hydropower is fuelled by water, so it is a clean fuel source. Hydro power systems of this size benefit in terms of cost and simplicity from different approaches in the design, planning and installation than those which are applied to larger hydro power. Tidal energy is one of the sources of ocean energy. Tide is a periodic rise and fall of the water level of sea which are carried by the action of the sun and moon on the water of earth. Tides are produced mainly by the gravitational attraction of the moon and the sun on the water of solid earth and the oceans. About the 70% of the tide producing force is due to the moon and 30% due to the sun. A tidal generator converts the energy of tidal flows into electricity. Greater tidal variation and higher tidal current velocities can dramatically increase the potential of a site for tidal electricity generation. Tidal power or tidal energy is a form of hydropower that converts the energy obtained from tides into useful forms of power, mainly electricity. Although not yet widely used, tidal energy has potential for future electricity generation.

Keywords: Generation of electricity, mega Hydro, Tidal Power Systems

I. INTRODUCTION

Mega hydro is hydro power with a maximum electrical output. Hydro power or water power is power derived from the energy of falling water or fast running water, which may be harnessed for useful purposes. Hydropower is fuelled by water, so it is a clean fuel source .The energy generated through hydropower relies on the water cycle, which is driven by the sun, making it a renewable power source. It is also a versatile power source.AC electricity can be produced enabling standard electrical appliances to be used and the electricity can be distributed to a whole village.

Tidal power or tidal energy is a form of hydropower that converts the energy obtained from tides into useful forms of power, mainly electricity. Although not yet widely used, tidal energy has potential for future electricity generation. Tides are more predictable than the wind and the sun. Tidal energy has the potential to produce great deal of free and green energy.

II. METHODOLOGY

This project consists of two parts, one is mega hydro and other is Tidal power system

The working of mega hydro is as follows. When water is being pumped to the overhead tank, there is a lot of energy being wasted. We utilize this to generate electricity. We divide the Water using a t junction pipe. There are two stepper motors placed at the end of both the pipes. When the water is rushed out of the pipe it rotates the turbine which is coupled to the generator and hence electricity is produced

In the other part of the project is the Tidal energy systems. There are 3 main parts for this systems. They are Float, Shaft and the Dynamo.The float is a device which is used to convert the kinetic energy of the waves to the linear energy. As the name suggests the float is an floating device which is pushed up when there is a swell in the wave and pulled downwards when there is a Dip in the wave.

The Shaft is a devices which converts the linear motion created by the Float into rotational motion. This is achieved by the use of two chains When there is a swell one chain is pulled which will rotate one chain sprocket while the other sprocket remains in neutral. When there is a dip in the wave the first chain sprocket is in neutral and the second rotates. Thus Rotational motion is achieved in the same direction in both swell and dip of the wave.

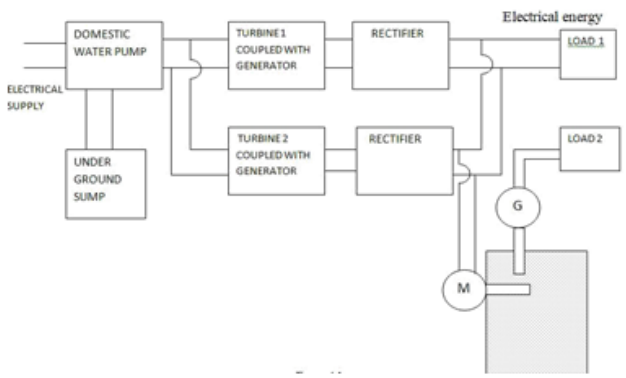
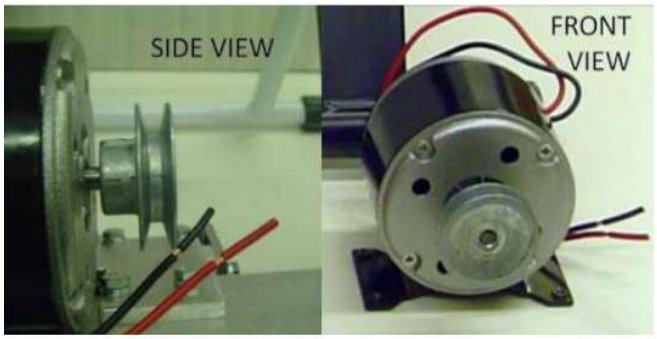


Figure 1. Block diagram

The Dynamo is coupled to the shaft using a gear box. This gearbox is required so increase the low RPM of the shaft to higher RPM. The dynamo then converts the rotational motion to electric energ

A.Dynamo

industry,large scale power generation, f and usually economical.A dynamo is another type of genera revolution.



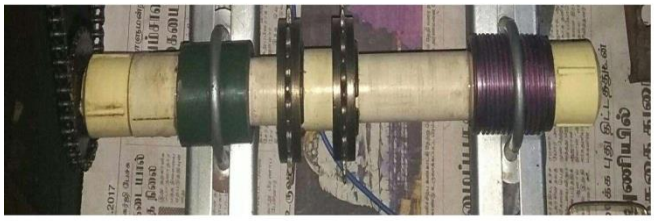


Figure 2. Dynamo

B.Gearboxproduce a much performance characteristics

- ✓ Low noise
- ✓ Low vibration
- ✓ Light weight
- ✓ Long operating life

Figure 3. Gear Box

G. The Distribution System connects the electricity supply from the generator to the houses. This is often one of the most expensive parts of the system.

H. The Consumer Loads are usually connected inside houses. Electrical load is a general name which refers to any device which uses the electricity generated. The type of electrical loads that are connected on a Mega hydro scheme will partly depend on the amount of power that is generated. Fluorescent lights are preferred because they use much less power for an equivalent amount of light as filament light bulbs do. This means that more lights can be connected to the same generator.

H. Design

1) Kinetic Energy

The kinetic energy of the stream flow flowing across thecross section with a velocity is given by

$$KE=1/2*\rho*V\ 3 \qquad (1)$$

ρ is the density of sea water
(kg/m3) Cp is the power
coefficient
A is the area of cross section of the channel
(m2) V is current velocity (m/s)

The power output or the efficiency of the turbine depends on the design of the turbine. The power output for a turbine from these kinetic systems can be obtained by the following equation

$$P=1/2*\xi*V\ 3 \qquad (2)$$

ξ is turbine efficiency
P is power generated (in watts)
• is density of the water (seawater is 1025
kg/m³) V is velocity of the flow

2) potential Energy

The potential energy is mainly dependent on the tidal prism of the basin. Potential energy obtained due to the stored water can be calculated as$E=1/2*A*g*h^2$

h is the vertical tidal range
A is the horizontal area of the barrage basin is the density of water = 1025 kg per cubic meter (seawater varies between 1021 and 1030 kg/m3) g is the acceleration due to the Earth's gravity = 9.81 m/s2

From equation 3, it can be seen that the potential energy varies with square of tidal range. So, a barrage should be placed in such a location where it is possible to achieve maximum storage head.

III. CONCLUSION

Hydropower is important from an operational standpoint as it needs no "ramp-up" time, as many combustion technologies do. Hydropower can

increase or decrease the amount of power it is supplying to the system almost instantly to meet shifting demand. With this important load-following capability, peaking capacity and voltage stability attributes, hydropower plays a significant part in ensuring reliable electricity service and in meeting customer needs in a market driven industry. In addition, hydroelectric pumped storage facilities are the only significant way currently available to store electricity.

Hydropower's ability to provide peaking power, load following, and frequency control helps protect against system failures that could lead to the damage of equipment and even brown or blackouts. Hydropower, besides being emissions -free and renewable has the above operating benefits that provide enhanced value to the electric system in the form of efficiency, security, and most important, reliability. The electric benefits provided by hydroelectric resources are of vital importance to the success of our National experiment to deregulate the electric industry.

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