Tidal Wave Energy
Large Scale Conversion Technology

Author : Md. Moniruzzaman

Executive Engineer, PGCB Ltd. Dhaka, Bangladesh.

mmzbabu@gmail.com

Abstract— The objective of this paper is to describe how can we get maximum amount of working force from tidal wave energy. The paper starts with defining the various forces acting on a floating object. Then describe the theory how unnecessary forces can be opposes except the force which is useful and how this useful force can be increase hugely and how we can use the force safely. Using some hand sketch. Finally conclusion states the advantages.

Keywords— Tidal wave energy, Anchor, Pump, Electricity, Ship city.

I. BACKGROUND

The unlimited source of ocean tide has the potential to generate unlimited amount of electricity and to provide unlimited water demand. Since 1799 till now energy companies are not able to harness sufficient amount of energy from this constant source of energy. Existing projects are small, critical technology and so are not economic.

II. INTRODUCTION

Tidal force on a floating object has two elements: 1) Horizontal force (Hf): Is an one directional force create by tidal current. 2) Vertical force (Vf): Is a bidirectional force create by tidal wave. Fig: 1.

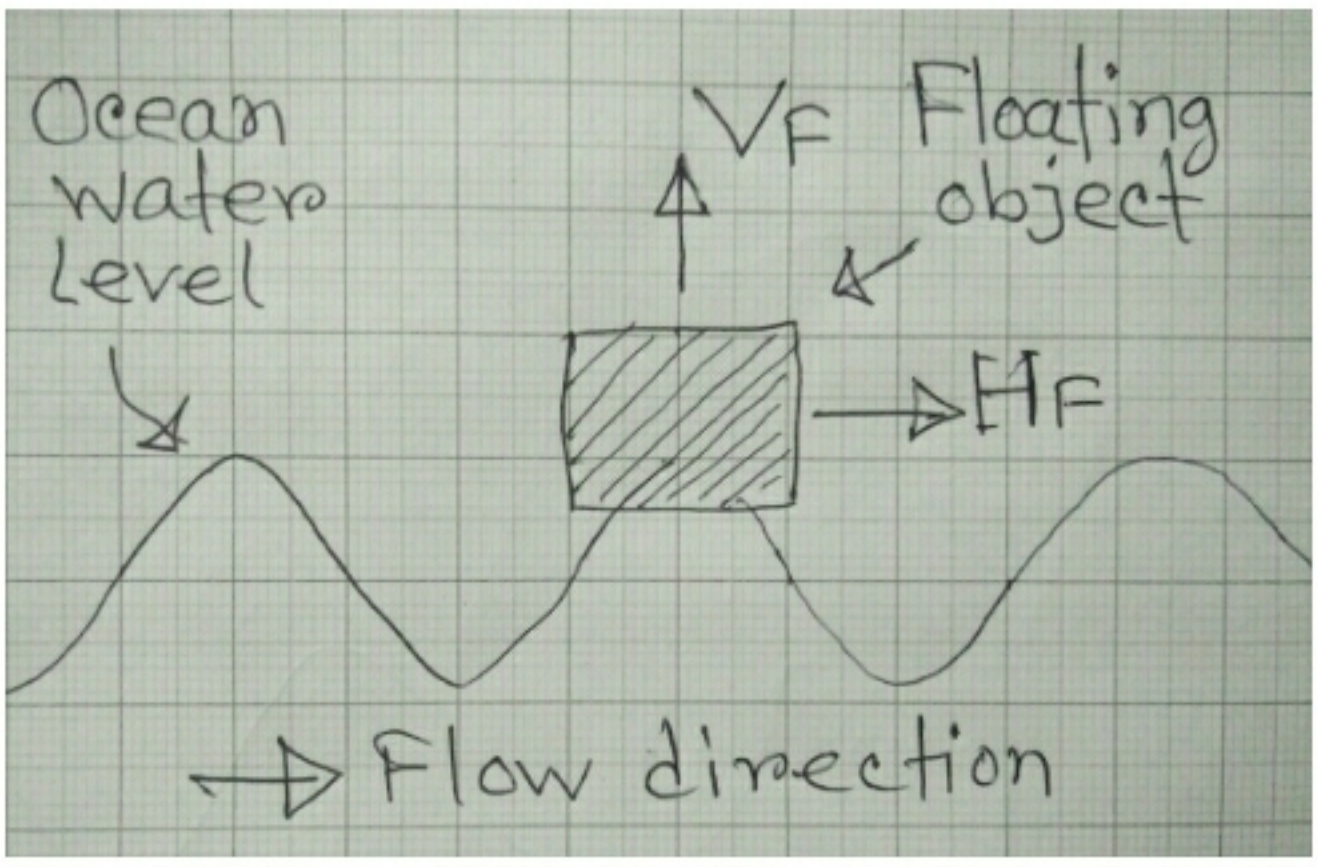
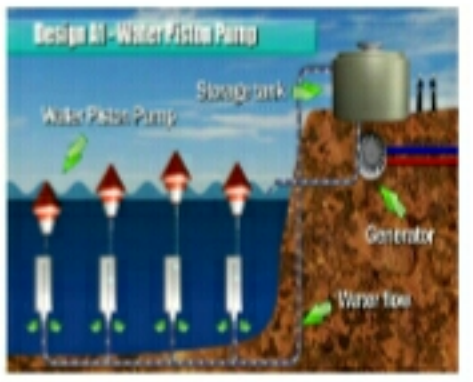


Fig. 1 Tydal force on a floating object.

Application of Vertical force (Vf):



Oscillating Buoys drive pistons which pump water to an elevated storage tank. Water from the storage tank is channeled to rotate a fluid motor or a turbine, which in turn rotates a generator to produce electricity.

Diagram of Atmocean's 16 buoy pump system driven by wave energy.

ATMOCEAN

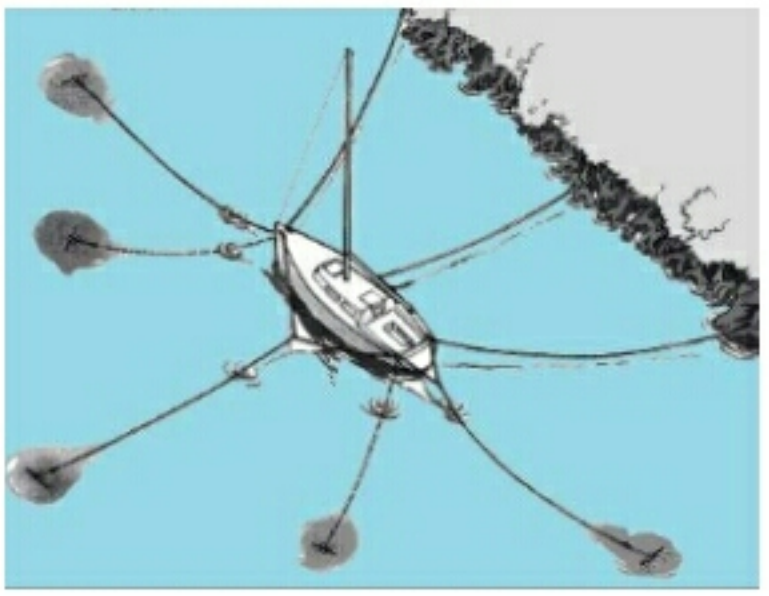
Application of Horizontal force (Hf):

Nippon.com

Marine Current Turbines Ltd is developing a twin-bladed version of its tidal stream energy device

III. DESCRIPTION

Tidal horizontal force (Hf)(along with others external amy kinds of wind forces) on a floating object can be oppose by anchore it properly (by using minimum four long distance anchors) so that the vertical force (Vf) remain almost same. This vertical force (Vf) is useful. This vertical force (Vf) of tidal wave can be very much useful as easily increase this vertical force (Vf) by increasing the size of the object. This bidirectional vertical force (Vf) is very much suitable for pumping purpose.



Movement of this ship due to the tidal wave is only vertical and the amount of energy it carry is big. The vertical upward force of this ship can be use.

By installing pump protected by RCC structure using vertical upward force of the wave continuously sufficient water pumping possible for hydro power station as shown in Fig: 2.

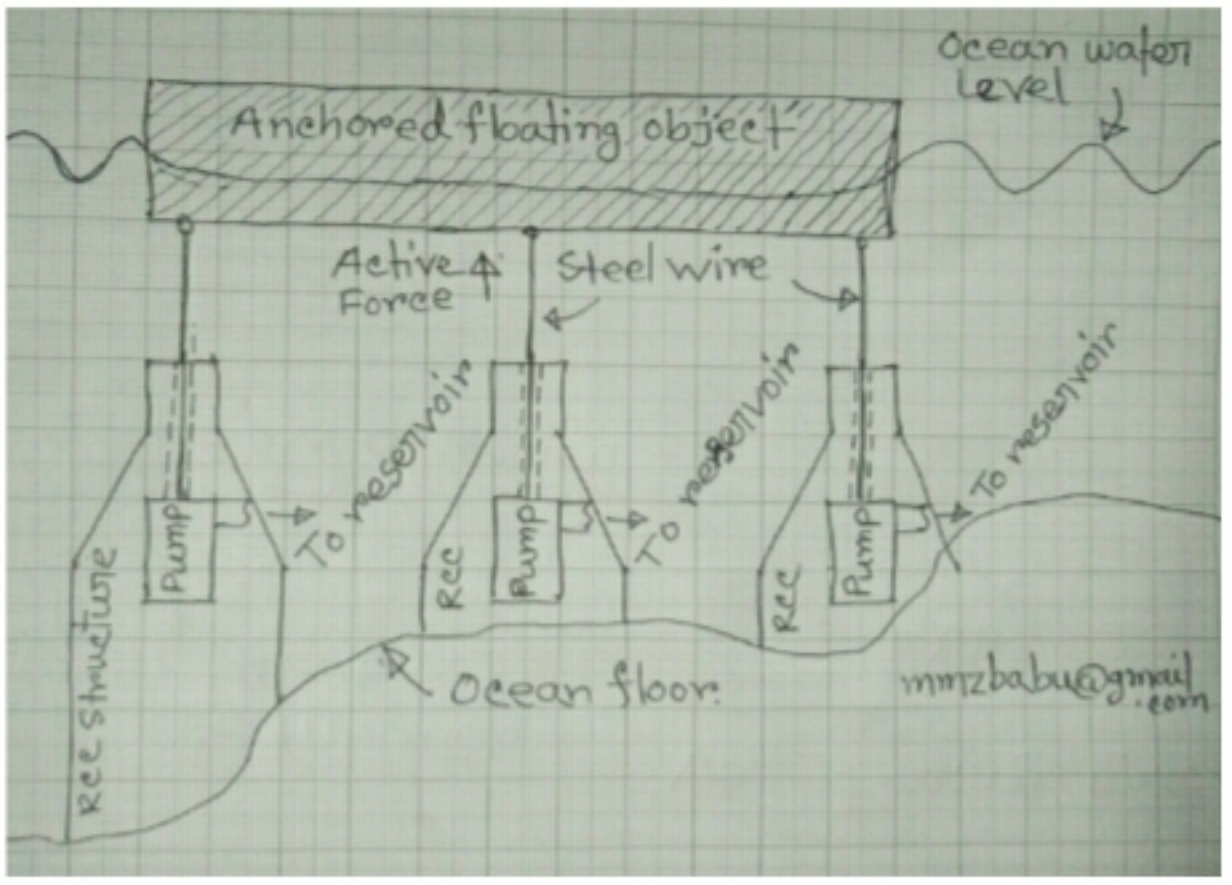


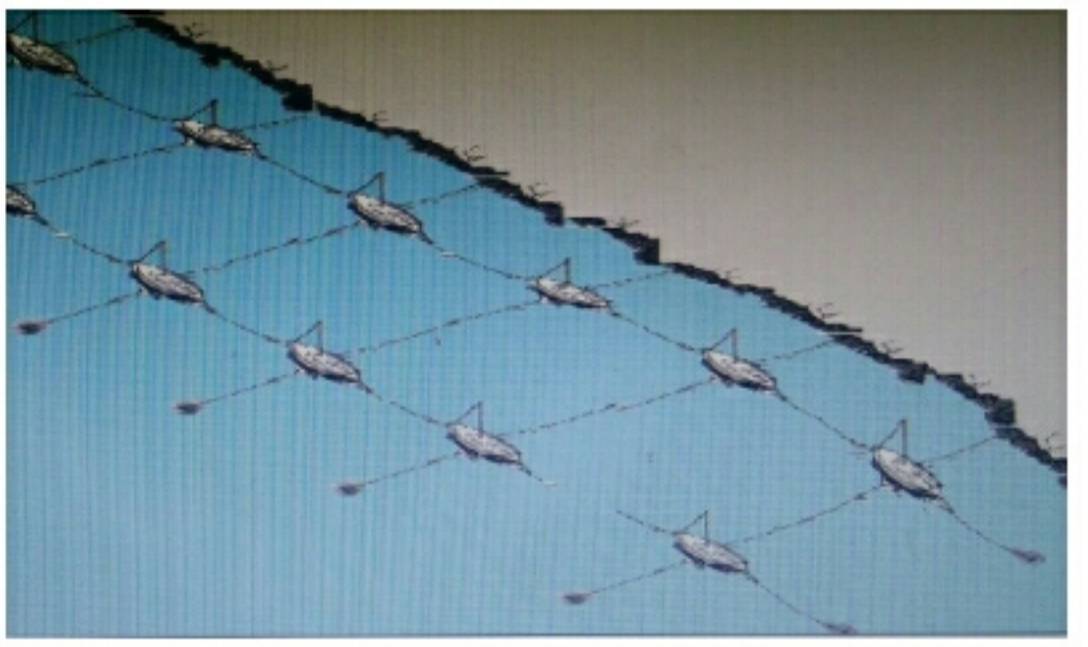
Fig. 2 Vertical force of Tidal waves are using for pumping water to hydropower station's reservoir.

To use vertical downward force which is equal to the weight of the floating object need separate RCC structure to collect the force from the top of the object.

IV. CONCLUSION

This is a very easy technique to harness energy from ocean tidal energy as already running some small projects. Capacity can be increase as required by increasing the size of the object and pump very easily. Expensive waterproof devices not required for this easy technique. Compare to the other hydro power stations dam, big reservoir, big catchment area not required so cost effective. Also other facilities will be there.

Advantages:
1/ Zero emission, Low cost Renewable Energy.
2/ Very safe.
3/ Reject ships can be use as a floating object so that form a ship city.
4/ Very simple pumping operation so that pump can be design for any size of wave.
5/ Continuous pumping so no need a big reservoir for hydro power station.
6/ Economic.
7/ Easy technology.
8/ Relaible.



Some anchored big ships can provide Electricity and Water demand of a big City.

V. REFERENCES

http://www.lamtengchoy.com,
youtube:Australia zero emission electricity,
youtube: Many way to make electricity from wave energy -zero emissions,
https//www.seabased.com,
The Potential of Marine Energy/ Nipon.com,
Ocean Power: Wave and Tidal Energy Review/Nippon.com,
Energy Engineering news, conferences and careers,
Siemence abandos tidal energy- Wave and Tidal.

**********----------THANKS ----------**********