



Eco-Friendly Energy Production Using Whirlpool Turbine

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A REVIEW PAPER ON

EC0-FRIENDLY ENERGY PRODUCTION USING WHIRLPOOL TURBINE

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Abstract- Whirlpool turbine is a turbine that can power dozens of homes providing energy 24/7, given the rated stream of water, the only solution is to turn towards renewable resources. It is also called as gravitational vortex turbine water turbine, which mainly includes racer blades and basin, generates electricity by releasing the water in to the basin using gravitational vortex generated when the water drain from the bottom of the tank. The study tells us about the design and manufacture of a turbine to produce electricity for regular Waste water channel system using basic concepts of vortex and whirlpool. As it is eco-friendly, both cost efficient with low installation cost and does not harm the marine life it can be used in industrial sector, in remote areas and at the end of waste water channel can also be installed. By using this project design we can segregate the waste from water flowing through canal. The turbine is also cheaper to install and maintenance cost is also low

Keywords:- : *Renewable resources, Vortex turbine, Waste water, eco-Friendly, Cost efficient, low maintenance.*

I. INTRODUCTION

Whirlpool turbine is a low-pressure turbine fitted with a submersible generator, which generates electricity that is sufficient to power up to 60 houses 24/7 without harming the environment Whirlpool turbine installation requires a 1.5 m height difference in water level.

Whirlpool turbine can be installed in most rivers and canals. It uses the flowing water to produce eddy current, which, in turn, generates electricity Whirlpool turbine is also cheaper to install than conventional hydro plants. Construction of conventional hydro plants entails big dams or tunnels.

These require significant investments. In whirlpool turbine, the flow of the water creates a vortex that turns the rotor, which eventually extracts the energy from the water and generates electricity by making use of a submersible generator Whirlpool turbine is constructed in such a way that its design allows fish and other animal life to pass through the turbine unhurt.

II. LITERATURE REVIEW

[1]]. Study of Micro Hydro power plant for Rural Electrification IRJET July 2020

Prof. P.0020 Satarkar, Rahul B Lonkar, Hrishikesh D. sargar, Rakesh R. Sarda, Shubham B. Yadav

Technique Used:- Calculation for designing of vortex power plant
Outcome:- This paper shows the Calculation for designing of vortex power plant The study gives us the design calculation on flow properties. It also helps to design turbine based on its base & top width & depth of flow.

[2] Electrical power generation from canal systems using whirlpool vortex design Whirlpool turbines IEEE, 2019

Hassan Mehmood, Rabia Jamshaid, Fawzaan Fareed, Asad

Technique Used:- Whirlpool turbines

Outcome:- This paper shows the generation of electricity from waste water. And how It produces high amount of electricity using kinetic energy from water

[3] Whirlpool Hydro-power plant: IJESC, 2019: Patne Kirtikumar, Patil Smita

Technique Used:- Mini Hydropower plant

Outcome:- This paper shows the Working of Mini Hydropower plant. In future this generated electrical energy can be send to transmission line.

[4] Cost efficient Mini hydro plant with low water head whirlpool design methodology for rural areas iCoMET, 2019

Saran zeb, Asad Mujeeb, Mazhar Ali, Hameed Ullah

Technique Used:- Mathematical modeling

Outcome:- This plant with mini hydro turbine works on whirlpool flow motion of water with less than 2 m water head.

[5] Design and Fabrication of Portable power turbine IRJET, 2017 Damoder R, Mrutyunjay K.N., Naveen.

Technique Used:- Designing of turbine

Outcome:- This paper contains the Designing of turbine Designing of turbine blades & the gap with in the plates

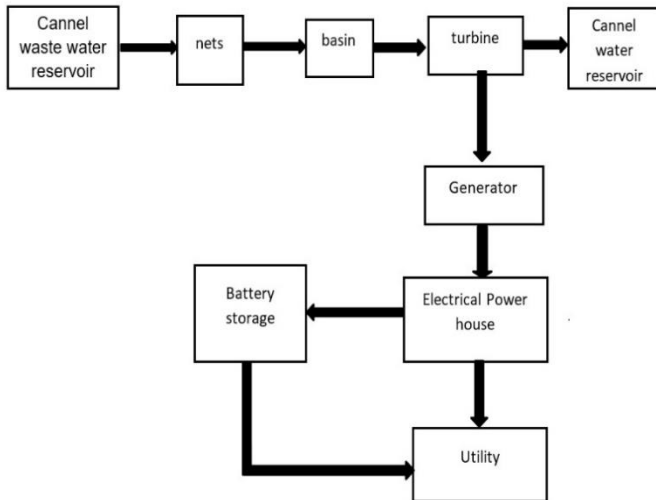
[6] Numerical Analysis of Water Vortex Formation for the Water Vortex Power Plant

Tze Cheng Kueh, Shia Lin Beh, Dirk Rillin

Technique Used:- Water vortex power plant

Outcome:- Construction of cylindrical basin with inlet & outlet channel

III. BLOCK DIAGRAM



IV. PROPOSED METHODOLOGY

The conventional Hydro-electricity generation methods require much civil work and resources. These conventional plants although produce energy much efficiently, are not able to provide enough power to fulfil consumption in remote and far-flung areas. These mini hydro-power plants are able to be built into normal rivers, canals and irrigation systems. Most of these mini-hydropower plants are using the principle of Whirlpool Vortex Flow. Where a whirlpool is a rotating column of water body formed due to the collision between two opposing water currents or running into an obstacle. These can be noticed clearly while we are draining water from something, mostly in our sink drains and bathtubs. The whirlpools having a proper downdraft are called vortexes, which flow in a vertical downward spiral due to gravity Hence, giving the name Whirlpool Vortex Turbine Systems.

A solution was proposed to use PVC (Poly-Vinyl Chloride) material for construction of the turbine blades. Not only is it lightweight and flexible, making it robust and durable, but it also poses a minimum threat for the fish and other marine life. Meanwhile making system maintenance much easier. We can install this surrounded by sluice gates. A sluice gate is traditionally a wood or metal barrier sliding in grooves that are set in the sides of the waterway. Sluice gates commonly control water levels and flow rates in rivers and canals. They are also used in wastewater treatment plants and to recover minerals in mining operations, and in watermills. The nets going to install at the end of the drainage system is of lycocell fiber material. The fact that synthetic materials are not biodegradable leads to major problems in wastewater treatment plants and potentially marine litter.

V. CONCLUSION

The conclusion of the paper is that we are producing electricity from the waste water. The motive of generating electricity in waste water is that, daily large amount of waste water is released from the houses so we can reuse it and also separate the waste (garbage) so that problems of water logging due to uncleaned canals would not arise.

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