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ELECTRICITY GENERATION FROM OVER HEAD ATER TANK

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Abstract

Green renewable electric power generation has been designed using the water flow from anoverhead tank during regular consumption of water of domestic use. Kinetic energy of the fallingwater is used to rotate a micro turbine coupled with a DC generator... The generated DC power isstored in a battery. When the energy stored in the battery is sufficient an inverter is switched on to generate AC power for domestic use.Rest of the timeloadgetspowerfromthe normal commercial line. Potential energy of the water stored in the overhead tank is thus utilized to supplement someenergy used in the form of hydro-electric Yearly recovery of energy is quite substantial. SufficientQuantity of water will be stored into underground water tank. This water is pumped into overheadtank and allowed to fall into the turbines thereby turbines will rotate. Turbines shaft both the sidewill be connected with multiple stage pulley system to increase the RPM and then with alternator.Whenturbinerotatesautomaticallyalternatorswillrotateandpowergenerationwilltake place.Thefalling water will again will go into underground water tank through a cannel. Cannel water forcealsowill rotate theturbines and alternators.

INTRODUCTION

DemandofRenewableEnergyTodayRenewableenergyisenergythatisgeneratedfromnaturalprocessesthatarecontinuouslyreplenished.Thisincludessunlight,geothermalheat, wind,tides,water,andvariousformsofbiomass.Thisenergycannotbeexhaustedandisconstantlyrenewed.Alternative energy is a term used for an energy source that is an alternative to using fossil fuels. Generally,itindicatesenergiesthatarenon-traditionalandhavelowenvironmentalimpact.Thetermalternativeisusedto contrast with fossil fuels according to some sources. By most definitions alternative energy doesn't harmthe environment,a distinctionwhichseparatesitfromrenewable energywhichmay or maynothavesignificantenvironmentalimpact.Renewableenergyisgoodforcustomers,the environmentandthebottomlineofcorporationsthatruntheiroperationswithit.IntheUnited States,though,renewables(includingsolar, wind, hydropower and biomass) account for only about 10 percent of all energy used and 13 percentof totalelectricitygenerated – even as corporate contracts for renewable energy nearly tripled from 2014 to2015.Iftherearechallengesnow,whencapacityandusearelow,whatwillhappentobusinessmodels,technology and financing when renewable power penetration reaches 30, 40 or even 50 percent of the U.S.market?Sincethere'splentyofcorporate demand,theproblemissupply,whichinturndependsonadequateinfrastructure to deliver it. Historically, U.S. utilities have decided what fuels to use to generate electricity,withscantincentivetoincreasethe percentageofrenewablesintheenergymixortoexploretechnologytoencouragethatkindofshift.Weknowthere'sanappetiteformanymoregigawattsofrenewablecapacity,butit'sexcessivelydifficultforlargecompaniesintheUnitedStatestobuyasmuchrenewableenergyastheywant.Whileretailcustomersinmanystatescanarrangetobuysolarorwindpowerfromlocalutilities,companiesneedalarge,sophisticatedteamtogetaccesstorenewableenergyoptionsatthescaletheyneedifthoseoptionsareavailableatall.Tochangethispicture,it'stimetolook tothedemandside,wheremultinationalcorporationsarejoiningtogethertomaketheirpreferenceformorerenewablepowerfelt.2FacebookandMicrosoftareamong60companiesandover50leadingprojectdevelopersandserviceprovidersparticipatinginanewnetwork,theRenewableEnergyBuyersAlliance,knownasREBAthataimstobreakdownbarrierstolower-carbonenergy.Theallianceaimstosee60gigawatts–thesameamountoftotalgeneratingcapacityof Turkey—ofrenewableenergydeployedintheU.S.by2025.That'sahugejumpfromthe3gigawattsofrenewablepowerpurchasescompaniessigned in2015,whichwasabouttripletheamount fromthepreviousyear.

METHODOLOGY

Overhead tank on buildings stores water for every day use. Energy can beextracted from flowing water when it is supplied to apartments. A micro hydro turbine may be fitted inwater pipe lineto convert potential energy of water into electrical energy.Paper describes techno-economicfeasibility of the concept.Study is done on 5 storied building. The literature survey carried by authorindicates that, no such micro turbine generator set is available in market which exactly matches theapplication.Paperbriefsonperformanceof MHTGsetsavailableinthatrangeofHeadanddischargewhichare meant for other applications. Electrical energy generation for 5 storied building is estimated on per dayand per year basis. Itis shown that, energy generated is not just sufficient to power staircase lighting of thebuilding,but alsoinadditionconservesubstantial part ofenergy requiredforliftingwater.

CONCEPTOFPROTOTYPEMODEL

Thestorageofwaterintheoverheadtank onmultistorey building used for domestic purpose. This water possesses potential energy because of head createdit can be converted into mechanical energy with the help of turbine. By using velocity or water force aturbine can be rotated and electrical energy is generated. In this project we are going to generate a DCpower by using DC generator. This method of generation of electrical energy has become very popularbecause it has low production and maintenance cost. Incentives for larger turbines throughout the 1980sand later. Local activists in Germany, nascent turbine manufacturers in Spain, and large investors in theUnitedStatesintheearly1990sthenlobbiedforpoliciesthatstimulatedtheindustryinthosecountries.Latercompanies formed in India and China.As of 2012, Danish company Vestas is the world's biggest wind-turbinemanufacturer

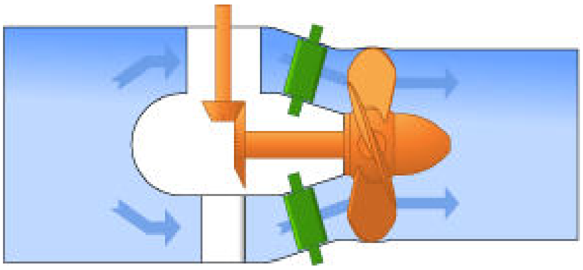

FIG1:TUBE TURBINE

KaplanTurbine:Boththebladesand thewicketgatesareadjustable,allowingforawiderrangeof operation. Thisturbinewas developed byAustrian inventorViktor Kaplan in 1919.

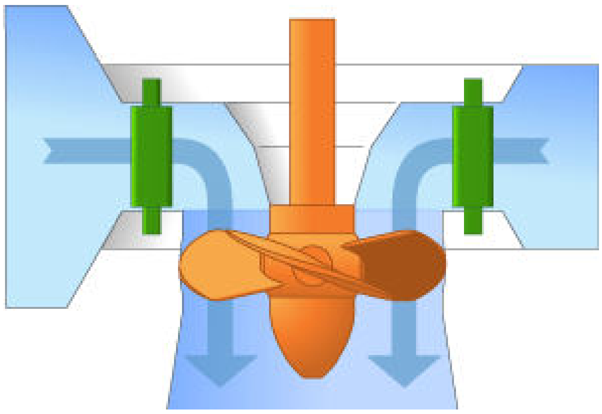

FIG2: KAPLANTURBINE

AimandObjectives

- Designingapowerprojectthatproduceselectricityfromwaterflow.
- Thereisthepossibilitythatthisprojectwillcreate asystem thatisactuallymoreaffordable.
- Togeneratepowerfromwaterenergy.
- Tostoretheexcessgeneratedenergyforfurther use.
- Tousetheenergyof waterinanoptimizedway.
- Toincorporatemo rerenewableenergytothepo wersystem.
- **Designofpowerg enerating systemfromoverheadtank**

DesignChallenges

Thegoalofthisprojectwastodesigna systemthatcouldgeneratepowerun derrelativelylowwatervelocities.T o accomplish thisgoal, theobjectivewereto

1) Analyzehowdifferent geometryofturbinewithinvariousenclosures affect output.
2) Testhowtovibratio nscausedfromrotationsofblade saffectstructureofturbine.Tom eettheseobjectives,thetask wereto:

- Completebackgroundresearchon overheadtank
- Designbladesfortesting
- Createexperimentalsetup
- Manufacturepartsandbuiltmodel house
- Developfuturedesignrecommendations

BackgroundResearch

Backgroundresearchincludesreviewingapreviousproject,Lowcostfor groundwaterliftingdeveloped by Muhammad MehtarHussain and Mushtaq Ahmad, which provided a foundation forcurrent project. Using that information's and suggestions, we then studied new areas in order tocompleteourresearch.

EffectofNumberofBlade

Comparisonofcoefficientofefficiency betweentwobladeandthreeblade.three,six,andtwelve bladesystem.Themajorfactors involved indecidingthenumberofbladesincludes:

1. Theeffectonpowercoefficient;
2. ThedesignTSR(tip-speedratio);
3. Themeansofyawingratetoreduce thegyroscopicfatigue.

EffectOfBladeNumber

Various experiments results was publish in internet or book what

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the exact number of blade that havegood aero dynamicperformance?Solidityofmaterial,kindofmaterial,coefficientoffrictiononthebladesurface chord (width) of blade turbine and much others. 18 One that very interesting to make conclusion anddiscussion is relation between number of blade and coefficient of performances of wind turbinemachines.The best blades number from 3 until 12 When designing number of blade, the number ofbladethatwechooseinfluencetheaerodynamicperformancelikecoefficientofperformances.Modernwind turbines areneither built with many rotor blades nor with very wide blades even though turbineswithhighsolidity (definedastheratiobetweentheactualbladeareastothesweptareaofarotor)havethe advantage of enabling the rotor to start rotating easily because more rotor area interacts with thewind initially. Since, our current goal is to convert the wind energy into electricity, rotors will notbenefit with high solidity because it is neither cost effective nor efficient. The number of the blades ofaturbinehasgreatimpactonitsperformance.Picturebelowshowncoefficientofperformancesbetween3,6, and 12 blades with same solidity and same speed 5 m/s,from this picture we can concludes that 3blade have the most efficient number of blades, as we know almost 70% modern wind turbine use 3blades.

FACTOR	TYPICAL EFFICIENCY
Rotor to Shaft	50 – 70 %
Pump	40 – 60 %

FIG3:POWERLOSSESIN THESYSTEM

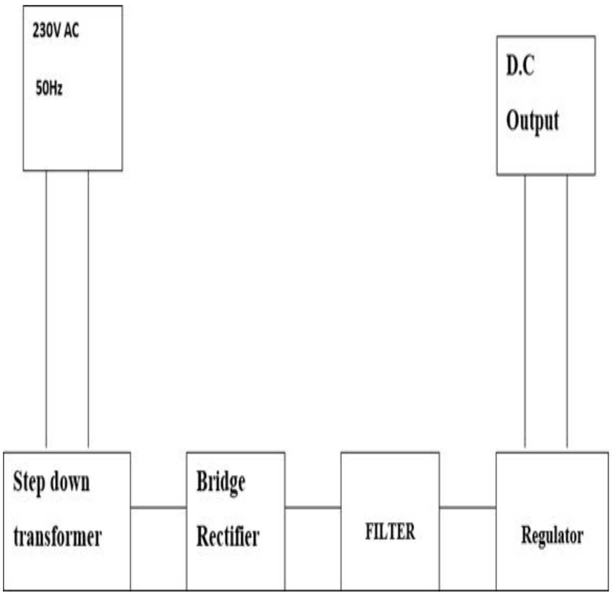

FIG4 BLOCKDIAGRAMOF POWERSUPPLY

METHODOLOGY

Overhead tank on buildings stores

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water for every day use. Energy can be extracted from flowingwaterwhenitissuppliedtoapa rtments.Amicrohydroturbinemaybe fittedinwaterpipeline toconvertpotential energy of water into electrical energy. Paper describes techno-economic feasibility of theconcept.Studyisdoneon5storiedb uilding.Theliteraturesurveycarriedb yauthorindicatesthat,nosuchmicro turbine generator set is available in market which exactly matches the application. Paper brief sonperformance of MHTG sets available in that range of Head and discharge which are meant for otherapplications.Electricalenergyg enerationfor5storiedbuildingisestim atedonperdayandperyearbasis.It is shown that, energy generated is not just sufficient to power staircase lighting of the building,butalsoinadditionconserve substantialpartofenergyrequiredforl iftingwater.

Fabrication

Blades

It consists of small paddles mounted radially to a horizontal shaft, which moves in close fitting concavetrough,therebypushingwate raheadofthem.Thenumberofbladesd ependsonthesizeofwheel,whichmay be8 for1.2mand up to 24 for 3 to 3.6m diameters

FIG6 BLADES OFTURBINE

FinalModelPicture

FIG7 :Final product

WORKING

Aconventionaldamholdswaterinaman-madelake,orreservoir,behindit.Whenwateri sreleasedthrough the dam, it spins a turbine connected to a generator that produces electricity. The waterreturnsto theriver on thedownstream sideof the dam.

CONCLUSION

The project power generation from over head tank is designed, tested and implemented successfully which isthe best solution for rural areas where frequent power failure occurs. It is much easy and cost effective. Thesameconcept is used in all the power generation systems.

FUTURESCOPE

Thisprojectcanbeimplementedinalarg escaleandexcessenergyproduced canbetransmitted to thegrid.Thissystemcanbecombinedwi thasolarpanelfor higherenergyproduction.Theexcesse nergycan alsobegiventonearbyhighways.Since, renewable energy is the future of the power generation as electricity to all by Shri NarendraModi.AsmallMHTGset should bedevelopedwhich can befittedinwater pipe line andthat modelshouldbefixed on eachfloor ofmulti storey buildings.

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