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Water Tank Electricity Generator

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Abstract
Water tank Electricity generator is the most efficient type of renewable energy Source. Through this paper the design and structural unit of water tank power generation system using household tank water. Water flows through the household pipes has kinetic energy that has the potential to generate electricity for general uses like garden lighting. According to the above detail, electricity generation is challenging once. To overcome this drawback a three existing components namely the air bladder nozzle for water pressure maintenance, U-tube piping, and broad nozzle pipe are connected at the end. These help us to give better resultant in electricity generation. This method is used to reduce a small amount of fuel consumption like coal and petroleum. By Arrange the required component the electricity is generated in case if the overhead household tank is kept at a minimum of 3 meters or more than 3 meters then the kinetic energy produce by the water in a pipeline is high. Hence this paper gives an idea to develop a small amount of electricity using a household water tank in daily life.

Key-words: Water Tank, Hydro Technology, U-tube Piping, Kinetic Energy.

1. Introduction

Water tank electricity generator is idea derives from the famous electricity generation unit called hydro electricity generation plant for example if the hydroelectricity generation plant generates 5kw /sec then these model generate 0.005 w/sec. The recent improvement and innovations in hydro technology have helped to improve these models very efficiently. This most reliable source of Energy for household daily uses as a light bulb, television, and other small electricity consumption component. The main aim of a water tank electricity generator is to generate electricity simply in our daily life and reduce fuel costs. The future is fully dependent on renewable resources so this forced humans to search for a new type of renewable energy with low-cost efficiency. This is most effective because the component used to develop these models is very cheap. So then everyone can adapt these models easily and it required very small area. The main advantage of this system is to generates electricity at a low cost. As we compare to solar energy the consumption cost of water tank electricity generator is very low per kilowatt. So that water tank electricity generator is more effective and reliable model. And this model is more effective in the regular water flow area. Water tank electricity generation is a source with the best life-cycle to balance the energy ratio between input and output electricity generation (e.g., power) and this energy is used to manufacture, install, operate and give an idea for developing these model through the equipment needed. Water tank electricity generator has further advantages compared to much larger hydropower facilities at dams, weirs, and run-of-river schemes, including high water quality, enabling long lifetime and low-maintenance operation, and it has no environmental impact at the same it has good economical support. Thanks to technical progress, on Water tank Electricity Generator. It is visible even at a low level of Water. In the range of approximately produce 25 watts per hour. Practical methods and easy-to-use design tools play an important role in facilitating the implementation of such projects.

2. Technical Analysis

The design of the Water tank Electricity energy generating system is also used to store the electricity for further uses. The analysis of this system is provided in this paper which gives the electricity generation capacity of the Water tank Electricity generation model. Moreover, gives the electricity generation capacity for all water storage dam are located in metur and Tamil Nadu respectively. The Water tank is used for preliminary analysis of this concept. In this analysis, it will be shown that both the traditional need for water pressure and the new need for energy storage can be facilitated within a Water tank electricity generator.

The first method, that the water pressure at the base of a traditional water tank is directly proportional to the height of the water column in the tower. The pressure is given by,

$$p = \rho g h \qquad (1)$$

where ρ is the Water density, g is the gravitational (9.8m/s^-2), and 'h' is the Water Level of the Tank which represents height. If the Water level is higher than a minimum position of height 3metre it is more sufficient for generating electricity for household purposes or Store the energy in devices like batteries or inverter to used as backup power supply. In the other words, energy may be extracted from the water that exists when the water is above the minimum level which is more than

3.Second, Then the power required to pump water into the water tank is given by the below expression:

$$P_{in} = \frac{dE}{dt} = pQ \qquad (2)$$

If we assume that the water tank is under pressure then the volumetric flow of water through the pipe is high, as given below.

$$Q = \frac{dv}{dt} = A\left(\frac{dh_s}{dt}\right) \qquad (3)$$

Where 'A' is the Area of a cross-section of the tank. Now Substitute equation '3' and '5' in the equation '2' then the equation give the total amount of energy generated from the tank at a particular height

$$\int_0^E dE = \int_0^{h_s} \rho g(h_p + h_s)Adh_s \qquad (4)$$

$$E = \rho g A\left(h_p h_s + \frac{1}{2}h_s^2\right) \qquad (5)$$

For Example:

Assume that the Water tank is kept at 3m above the ground level. And the water tank is located 2.5 m above the generating area. And the diameter of the water tank is 10.2m. Where the density of the water tank is 1000kg/m3.(gravitation is always constant its value is 9.81m/s2).

Given that:

Density: ρ = 1000 kg/m3 gravity: g =9.81 m/s2

Diameter:d=10.2m

Distance between ground and tank: hp= 3m

Distance between generating point and tank: hs = 2.5m.

Solution

Area of the tank=pi*r^2=3.14*(10.2/2)^2

Area of the Tank A=11.3m2.

E=p*g*A(hp*hs+(1/2)(hs)^2)

E=1000*9.81*11.3(3*2.5+(.5)(100))

E=1108530(57.5)kg*m2/s2

Where 1kg*m2/s2=27.778*10^-7Wh

Then E=1108530*57.5*27.7778*10^-7.

Then E=17.7 Wh

The generating energy of 18kw is available when the volume of water is drawn from the fully stored tank. If considered that the volume of water drawn from the half water stored tank then the kinetic energy is low so that the electricity generation from the half-filled tank is given below.

Then,

E=18/2

E=9Wh

So the energy-generating capacity of the water tank is 69.5 Wh. Assumed that water discharge over 7 hours,

Solution:

Then

Power=69.5/7

Power=9.928W

So the power Generate capacity is 10W per hour. But it is not high energy to store, But it is one type of energy that can be used to reduce the uses of non-renewable energy sources.

A) Water Tank Storage Capacity

According to the data collected from the Department of Water Resource in Tamil Nadu, It shows that 39000 water tanks are available in Chennai which includes a storage tank in the ground. Across Tamil Nadu, 90% of water storage systems collect water from the underground. So we used the Water tank energy generation system to save half of the electricity from the motor pump consumption.

From the earlier discussion, we can store 10w of electricity from one water tank at a height above 3 meters. If we consider that the approximately that the 39000 water tank are located in Chennai. Then the Electricity generation is given below,

Power=10*39000

Power=390KW

Thus, it concludes that the energy-storing capacity for the cumulative water tank present in Chennai is 390KW.

3. Requirement Specification

A) Type of Turbine

Hydro turbine has two major categories: Impulse and Reaction. The Hydropower turbine selected for this project depends on the height of the water level which means "Head". And the flow, or volume of water, at the pipeline. Pelton turbine is the most common type of Inpulse turbine it is also known as Cross-flow turbine. On the other hand, the Francis turbine is the most common type of reactive turbine. And is also known as the Kaplan turbine.

B) Pelton Turbine

Pelton turbine is a model-like wheel. This turbine is categorized under the impulse Turbine. These types of a turbine are used to generate electricity from the high level or over head tank. This method is achieved by a fixed nozzle between the pipe and generator and the nozzle increases the speed of water which means that the kinetic energy is increased. And the nozzle is kept tangentially to the turbine buckets then the turbine produces an impulsive force on them

C) Components

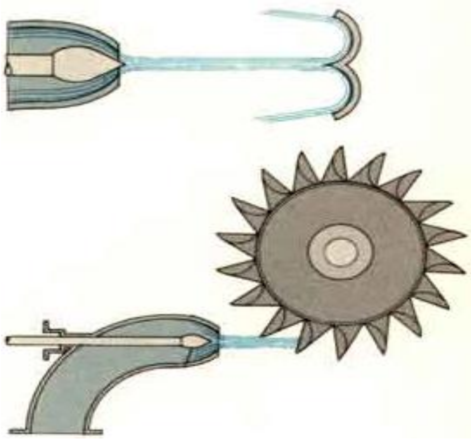
The main component of Pelton Wheel (Turbine):

Nozzle, Buckets (Runner), Casing, Breaking jet,

a. Nozzle

Pelton wheel contains a nozzle that has a circular guide mechanism is used to direct the flow of water from the overhead tank. At the same, it also regulates the water flow through the nozzle. And the needle inside the nozzle is used to regulate the water flow when the needle is moving forward in the nozzle it decreases the surface area of water flow. At the same time when the needle is pushed back then increases in the surface area of water flow. This moment is achieved by manual like push on the hand or automatic like using a stepper motor.

Figure 1 - Nozzles



b. Runner and Buckets

The runner is various cup-molded containers conveyed by round plate and put at equivalent distance around its boundary. Runner is by and large with heading and the containers are either projected indispensably with the plate or attached independently mounted on the flat shaft. Cans are comprised of cast iron, bronze or treated steel. To lessen the frictional protection from the water fly, the inward surface of the pails are cleaned.

c. Casing

Steel covers gave over the runner of pelton wheel is known as packaging. It doesn't play any water powered capacity, however is important to give the runner against mishap. The elements of packaging:

- It forestalls mishaps.
- Minimize the breeze misfortunes.
- Stops sprinkling of water.
- Facilitates to gather water.
- Transmission of water to the tail race.

d. Breaking Jet

At whatever point the turbine must be brought to rest the spout is totally shut. Because of idleness the runner of pelton wheel continues spinning. To acquire the runner to rest brief time frame, a little spout is given to coordinate the fly of water on the rear of pails. To diminishing the speed of the sprinter, little spout goes about as a brake.

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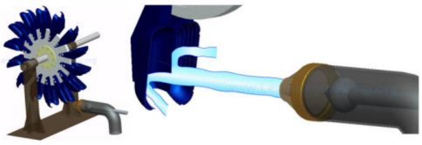
d. Function

Figure. 2 shows the motivation power created by the water fly due to pelton wheel drives turn. Spouts direct strong, high velocity surges of water against a rotational series of spoon-formed pails, otherwise called motivation sharp edges, which are mounted around the circumferential edge of a drive wheel. The shaped container sharp edges are encroaches upon by the water fly, the forms of the can shifts the course of water velocity. The force on the can and wheel framework are expanded by water drive energy and turning the wheel, the water stream itself does a "u-turn" and exits at the external sides of the can, decelerated to a low speed. All the while, the force is moved from water stream's to the haggle to a turbine. Consequently, "motivation" energy tackles job on the turbine. To arrive at most extreme force and productivity, the haggle framework is planned to such an extent that the water stream speed is double the speed of the turning cans. A little level of the water fly's unique motor energy will stay in the water, which makes the can be exhausted at a similar rate it is filled and subsequently permits the high-compel input stream to proceed continuous and without lost cause. To parting the water fly into two equivalent streams, Two containers are mounted one next to the other on the wheel. This adjusts the side-load powers on the haggle to guarantee smooth, proficient exchange of force of the liquid stream of water to the turbine wheel.

Figure 2 - Pelton Wheel Derives Rotation from Impulse Force Produced by the Water Jet



E) Applications

For hydro-power, pelton wheels are the appropriate turbine. The pressure driven head at low-stream rates when the accessible water source has somewhat high. Where the Pelton wheel is generally effective. Subsequently, more force can be removed from a water source with high-pressing factor and low-stream when contrasted with water source with low-pressing factor and high-stream, in any event, when the two streams contain a similar force. A long slender line, and A short wide line are the equivalent measure of line material is needed for every one of the two sources, one requiring Pelton wheels are made in all sizes. There exist multi-ton Pelton wheels mounted on vertical oil cushion direction in hydroelectric plants. The biggest units can be up to 200 megawatts.

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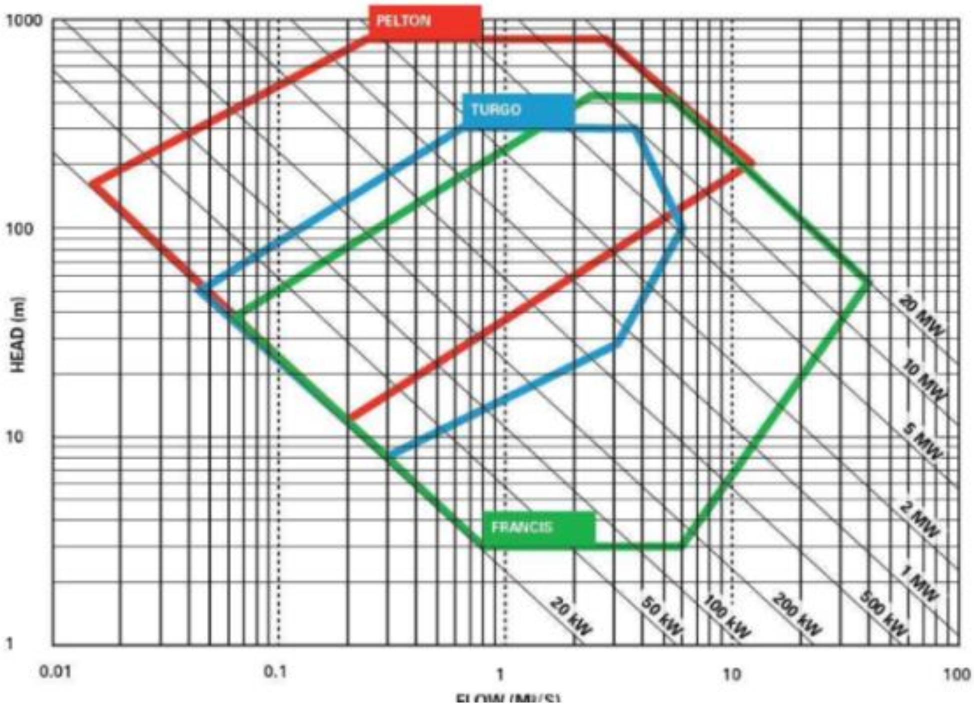
Figure 3 - Head vs Flow Rate



The littlest Pelton wheels are a couple of creeps across are utilized to tap power from mountain streams having streams of a couple of gallons each moment. A couple of frameworks use family plumbing apparatuses for water conveyance. These little units are suggested for use with 30 feet (9.1 m) or a greater amount of head, to create critical force levels. Contingent upon water stream and plan, Pelton wheels work best with heads from 49–5,905 feet (14.9–1,799.8 m), despite the fact that there is no hypothetical limit. Figure. 3 shows the head versus stream pace of the Pelton wheel.

F) Francis Turbine

The Francis turbine is a response turbine where water changes pressure it travels through fran The Francis turbine is a reaction turbine where water changes pressure it moves through francis turbine, transferring its energy. A watertight casement is needed to contain the water flow. Generally such turbines are suitable for sites which located between the high pressure water source and the low pressure water exit such as dams. Today Francis turbines are the most common water turbine. They operate in a water head from 40 to 600 m (130 to 2,000 ft). The primary operation of francis turbine is to used for electrical power production. In this turbine, water enters horizontally in a spiral shaped pipe (spiral case) wrapped around the outside of the turbine's rotating runner and exits vertically down through the center of the turbine. Figues.4 shows the internal structure of Fransis turbine. cis

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turbine, moving its energy. A watertight casement is expected to contain the water flow. Generally such turbines are appropriate for destinations which situated between the high pressing factor water source and the low pressing factor water exit, for example, dams. Today Francis turbines are the most widely recognized water turbine. They work in a water head from 40 to 600 m (130 to 2,000 ft). The essential activity of francis turbine is to utilized for electrical force production. In this turbine, water enters evenly in a winding formed line (twisting case) folded over the outside of the turbine's turning runner and exits upward down through the focal point of the turbine.Figues.4 shows the interior construction of Fransis turbine.

G) Components

The main components of Francis turbine:

- Spiral casing.
- Stayring and stay vanes.
- Runner.
- Draft tube.

a. Spiral Casing

The twisting packaging is the water conductor between the penstock and the controlling mechanism. The get area through the winding packaging is consistently diminishing, the hindrance in cross segment causes an equivalent dissemination of water into the aide vane cascade. The more seasoned plans of twisting packaging was generally projected. The new plans of winding packaging is ordinarily made by plate portions welded together. The new plan diminished the creation cost and the vehicle costs without diminishing the productivity. The winding packaging in francis turbine is normally upward hub inserted in concrete for expanded help.

b. Stay Ring and Stay Vanes

The stay ring comprise of an upper and lower ring associated by welded stay vanes. The motivation behind stay vanes is to ingest the hub powers within the twisting casing. The stay vanes are given a great pressure driven shape to influence the water stream negligibly.

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c. Runner

The runner comprises of a center point, a cover and runner sharp edges interfacing them. The motivations behind runner to changes the energy in the water over to turning movement and force. The force is moved to the turbine shaft through a catapulted grating joint or a consolidated rubbing/shear joint. The runner can either be casted or welded. For a welded plan the center and cover is typically projected and welded along with hot squeezed plate vanes. The number of sharp edges utilized relies on the working head. Sprinters with higher head will require a higher number of edges, this is mostly a result of solidarity consideration. To diminish the pressing factor stacking on the blade, increasing the quantity of cutting edge to keep away from cavitation and furthermore forestall division at the runner bay during low loads. Likewise expansion in the quantity of blades, leads to more contact surface through the runner and along these lines an increment in the grinding misfortunes. To withstand the pressure driven powers, the thickness of the runner sharp edges must be enormous and the edge is exposed. For high head Francis turbines it is liked to shape the edge so that the fundamental piece of the pressure driven energy is used toward the start of the cutting edge. In this space the pressing factor distinction from the strain to the pull side will be enormous and subsequently likewise the powers on the sharp edge. It is normal to expanded thickness of the edge close to the channel and towards the power source gets more slender.

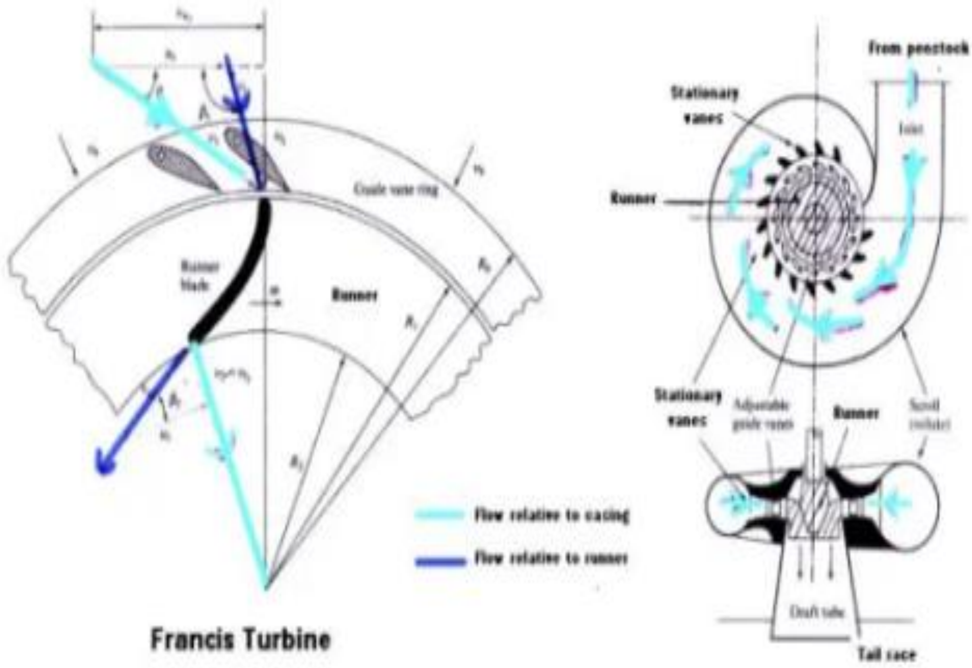
d. Draft Tube

The draft tube is the water channel from the sprinter to the power source entryway. The motivation behind draft tube is to change over the motor energy at the sprinter outlet to pressure energy at the draft tube outlet. This is conceivable by expanding get segment by driving the water through the channel. The draft tube comprises of a cone and a plate cover. The draft tube cone is a welded plate plan and typically comprise of two sections, upper and lower cone. The upper piece of the cone is mounted to the lower cover. The lower some portion of the cone is regularly planned as a destroying piece. This is associated with the draft tube cover by a spine.

f) Function

Water streams from the penstock into the twisting packaging. In the twisting packaging, the water is dispersed around the total outskirts. The water is then directed by the stay vanes and guide vanes in the right point towards the runner.

Figure 4 - Internal Structure of Francis Turbine

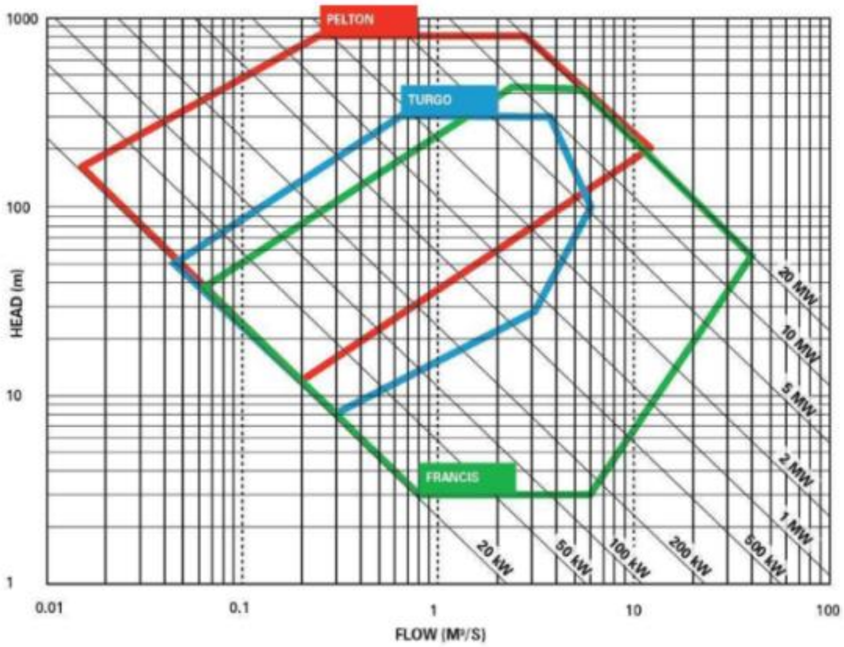


The point contingent upon the delta and outlet states of the turbine are movable and changed by guide vanes. They are constrained by a lead representative servo engine. The sprinter moves the energy from the pressing factor and speed in the water to a rotational force. The water exits through a draft tube that extricates the leftover energy in the water. The force created in the sprinter is moved to a force delivering generator through a shaft. The figure. 6 shows the head versus stream pace of Francis turbine.

g. Applications

For wide range of heads and flows, francis turbine is constructed. And it is also called high efficiency turbine in the world.40 to 600m(130-2000ft) head range cover units produce 800mw just from a few kilo watts.90 percentage of the efficiency is the highest water head possible efficiency. And is used for designed for operate to each of each at the given water supply. For more electrical production generator is driven by turbine and it is used to produce power during demand. The power is produced because generator act as a electrical motor. To store the excess of large amount of electrical energy storage resevoirs pump is used in elevated reservoirs it is one of the capacity for excess of electrical storage for future use.

Figure 6 - Head vs Flow Rate



f) Advantages and Disadvantages of Francis Turbine over a Pelton Wheel

Advantages:

It can be more easily controlled by variation in the operating load.

- The operating heads of maximum and minimum ratio can be even.
- When compared to total head water level variation in the tail in relatively large and it can be utilized by operating end.
- The mechanical efficiency of Pelton wheel decreases faster with wear than Francis turbine.
- It is small and economical in generator, power house and size of the runner, for same power generation the Francis turbine is used instead of Pelton wheel.

Disadvantages:

- It can cause very rapid wear in Francis turbine as high head when the water is not clean.
- Comparatively, it is more difficult in overhaul and inspection.
- The danger is present for an ever in cavitation
- The water hammer effect is more troublesome with Francis turbine.
- If Francis turbine is run 50 percent below head for a long time it will cause danger more seriously and also lost its efficiency.

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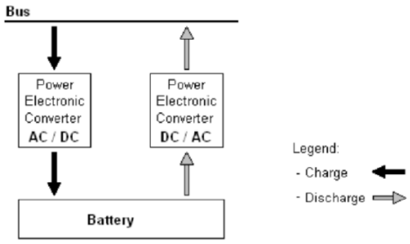
G) Battery

A battery is a gadget that changes over compound energy contained inside its dynamic material straightforwardly into electric energy by the methods for an electrochemical oxidation-decrease (redox) response. This sort of response includes the exchange of electrons starting with one material then onto the next material straightforwardly. The progression of electron gives an electric flow that can be utilized to work. It's anything but an electro compound cell that can be changed electrically to give a static potential to control or delivered electrical charge when required. A battery for the most part comprises of an anode, a cathode and an electrolyte. A battery is the mix of at least two cell associated in series to deliver greater power.

A battery keeps up with almost a steady charge in electric potential across its terminals. There is an energy put away in the battery as substance likely energy. At the point when the electrons move from cathode to anode, they increment the substance expected energy, along these lines charging the battery; when they move the other bearing, the believer this synthetic possible energy to power in the circuit and release the battery.. The association of the framework to the lattice, as displayed in Figure 7, infers the utilization of force electronic converters to amend the substitute current during the battery charge periods and to alter current drying the battery release periods.

Figure 7 - Battery Device Operation Diagram



In energy stockpiling framework gadget Batteries are the most mainstream. The term battery is utilized in s a few innovations applying for various activity standards and materials. Thus, ideas, electrochemical and redox – stream are the differentiation between two significant batteries therefore underlined. Electrochemical battery is a gadget that creates an electric flow from energy delivered by an unconstrained redox response. Electrochemical cells have two conductive terminals, called anode and cathode. The anode is characterized as the terminal where oxidation happens. It is two sorts galvanic, additionally called voltaic and electrolytic. Galvanic cell drives its energy from unconstrained redox response, while electrolyte cells include non

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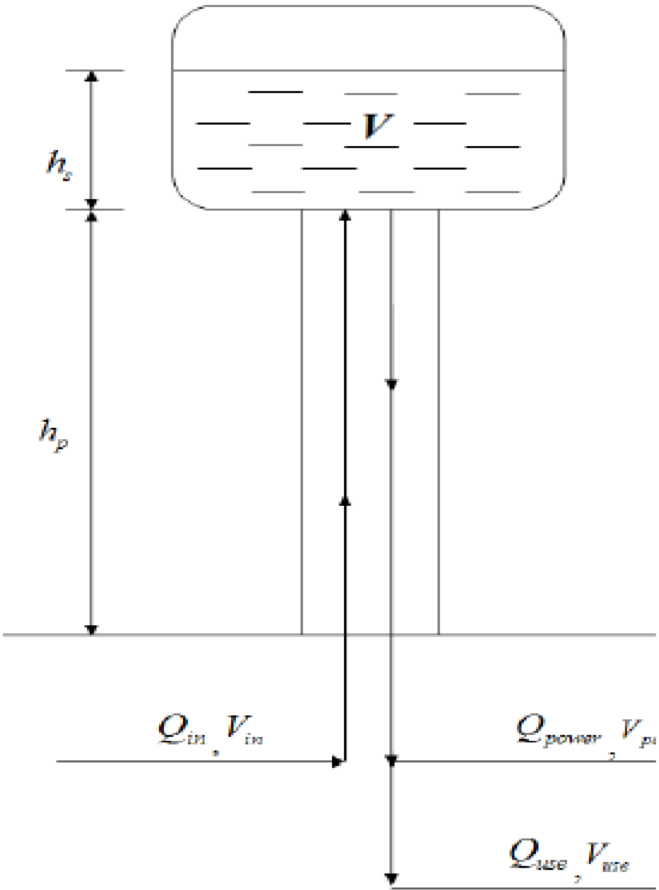
unconstrained response and consequently require an outer electron source like a DC battery or an AC power source. There are a number of battery technologies under consideration for energy storage, the main being:

1) Lithium ion
2) Sodium sulphur
3) Nickel metal-hydride
4) Lead acid

4. Proposed Methodology

As discussed earlier, research shows that in Chennai there are 39000 water tank and 204,671 water tank present in Tamil Nadu (approx.). The important goal of this paper is to generate electricity not only that but also water tank not only supplying water to house hold. So, from single water tower 10W of electricity is generated, we have to design the typical system of water tower with standard specification used for existed water towers.

Figure 8 - Water Tank



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A) Volume Capacity of a Water Tower

As discussed, 11.3 m2 the area of water tank must be placed. Electricity generated from the volume of water tank should be calculated and also knows the required water suppliences for house hold appliances.

The typical water tank shown in figure.8 which has a volume capacity. It is assumed in paper that one half is used for collecting water and another half is used for generating electricity.

V=Volume of water tank

V=Pi*D^2(hs)/4

V=3.14*1.2*1.2*10/4

V=11.31m3.

We know that,

1m^3=1000liter

V=11.3*100

V=1130L

Thus, volume of the water tower V is 1130 Litre. Generating electricity is the first half and another is used to pump water. The water from the inlet and outlet pipe flowing rate is necessary to calculate.

B) Flow Rate of Water at Outlet of the Water Tank

There are two stream pace of water, one is utilized for family reason and another is utilized for producing power. The stream pace of both outlet line ought to be determined.

a) Flow Rate of Water Use for House Hold Purpose

It is accepted that half measure of volume of water for providing water for Pump engine reason. It is considered to utilize half measure of water in water tank for House hold machines: then,

v=1130/2 liter

v=565liter

Therefore, 565 liter of water can be use for full power generation purpose.

Thus, the flow rate of water use for house hold purpose for 10hours is

Q-use=1.05liter /sec

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b) Flow Rate of Water Use for Generating Power

The half amount of water (565 litre) in the tank is using for generation of electricity and water is extracting for 8 hours. Therefore, flow rate of water use for generating power is Q-power= 1.2liter/ sec.

C) Flow Rate of Water at Inlet of the Water Tank

It is considered that pumping water in to the water tank will be done during night for 0.5 hours and the volume of water is 0.5liter /sec.

Therefore, Inlet Flow rate is given by,

Q=1000/(0.5*6*6)litre/sec.

Q=0.55liter/sec.

The rate of flow of water per second is 0.55.

D) Number of People Using Water Tank

The fundamental objective of this paper is to utilize existed water tank not exclusively to use for age of power yet additionally to use for siphoning water for the underground, hence, it is likewise expected to figure the quantity of time water siphon serves by the measure of water, however before that, it is important to ascertain the normal utilization of water per individual each day which will be talked about in this part. This investigation is Shown underneath.

Bath	A full tub is above 30 litre
Shower	3liter per minute. Old shower 6 litre per minute
Teeth brush	<2 litre, especially if water is turned off while brushing. Newer bath faucets use above 1liter per minutes, whereas older model use over 2 litre.
Hand/Face Washing	1.5 litre
Face Shaving	2 litre
Dish Washer	10-25 litre/load depends on efficiency of dishwasher.
Dish Washing by hand	20-35 litre.
Clothes washer	75-110 litre /load newer, as older consume 5% extra
Toilet Flush	15-20liter per flush
Glass of Water Drunk	Minimum 25-30 litre
Outdoor Watering	80-120 litre per litre
Swimming pool	10000 litre/week

Thus average water use per person per day is 170 litre/person therefore, the number of people (Np)feed by 4-10

Then,

Liter per day=170*4

Liter per day=680(minimum usage)

Thus, 4 people can be serves by the use of 700 liter of water per day.

E) Amount of Power Required to Run the Water Pump

During the execution, a breeze turbine is utilized for creating some measure of power to run the electric engine which runs the water siphon to siphon water at the stature of 130m. along these lines, it is needed to compute the measure of power needed to run the water siphon which will assists with deciding the size of water siphon required. So, power needed for the water pump to pump water into the water tank is given by,

WHP=Q/3960*Hp.

Where, WHP=Water horse power

Qin =flow rate in liter/min=35 liter /min

Now, calculate power required for water pump from ground level.

WHP=0.5HP=375Watts.

Therefore, power required for water pump to pump water into the underground is 375 watts.

5. Results And Discussion

The power storing and generation capacity of single water tank, tank in Tamilnadu. Besides, the plan and designing of the water tower needed for execution is given above. It is also given the quantities such as volume capacity, inlet and outlet flow rates, and number of people used the water day to day life that used for storing power. Once more, it is discussed the basic parts needed for the execution. This section split into two sections: first Section gives a synopsis of all outcomes that obtained in previous sections and second Section presents the cost of the energy stored per Wh.

A) Summary

A summary of results is given below. The result table starts with the outline values of water tower, follows with energy storing and generation capacity of single water tank and generation capacity of towers in Tamil Nadu, and then it gives brief summary of other quantities of water tank such as volume and flow rates.

Quantity:	**Result:**
Height of the water Tank Hp	Min 7m
Height of Water level in tank Hs	More than 1m
Area of water Tank	11.02 m2
Storage Capacity of single water tank	18 Wh
Capacity of single water tank	10Wh
Capacity of water tank in normal house	360Kw
Volume of tank	Min 1000 litres
Number of people used tank water per day	Min 4
Flow rate of water used for outlet of water tank	1.5 litres/sec
Flow rate of water used for generation energy	1.2 litres/sec
Flow rate of water used for fill the tank	0.5litres/sec
Power required for pump	350Watts
Name of the component	**Price (Rs)**
Water turbine	1500
Converter	14-27 rupees/watt
DC to DC Converter	1000
Generator	Min 5000
Battery	9.2-14 rupees/watt
Automatic water level indicator	2000
Total	44,000

A) Energy Storage Cost per kWh

By taking lead of the reality of utilizing the parts those are as of now accessible with the existed water tank framework, the quantity of essential parts required for execution turns out to be less. This additionally decreases the necessary expense of the parts thus it assists with accomplishing the principle point of diminishing the energy stockpiling cost per Wh. It needs three principle parts, for example, water turbine, battery and generator unit. The expense of these segments presented in gives cost needed for this parts and which assists with figuring the expense of energy. Thus the total cost of the product is 44,000 and price per watt is given by,

Price per watt=44000/180

Price per watt=245.

6. Conclusion

This paper reports the requirement for more proficient force stockpiling framework because of the greater expense of putting away energy (close around 10/kWh/month). There are loads of substitutes accessible to store power as far as present moment and long haul release energy putting away innovations. Differentiation to these existed putting away advances, the water tank energy stockpiling framework are displayed to have a lower related expense.

This paper gives the overview of the single water tank energy stockpiling framework and computes that the capacity and age limit of single water tank are 18Wh and 10W individually. In addition, it talked about the age limit with regards to water tanks present in Chennai and guarantee the consideration of force age limit up to 18Wh. This paper discusses the computation of the other plan esteems need to finish the demonstrating of the model and furthermore tells about the essential segments needed for the model which assists with ascertaining the all out cost of the water tower energy stockpiling framework.

This paper gives the short discussion on the outcomes got from 1 to 3. Also, it examined about the energy stockpiling cost per Wh of this water tank energy stockpiling framework. Again, utilizing this assurance the saving of cost of power needed to run the water siphon. Along these lines, on account of less energy stockpiling cost and saving in power accommodated siphon, it demonstrates that this framework is least expensive energy stockpiling framework than different advances.

7. Scope of Future Work

The research done during the course of this proposal provides important perception on the operation of a water tank energy storage system. Although, there is room to improve and build upon the work in this proposal. Foremost, this proposal is carried in a virtual environment; real-world testing is required to state the conclusions obtain in this document.

Apart from refining the results of the proposal, actual model presentation is crucial to test the system which should be researched as well. The energy that is extracted from the water tower will be combined into the actual house hold power grid using power electronics. After this experiment, a commercial scale validation will proposed for the site of house hold water tank building.

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