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An alteration to rapid transit: futristics approach

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----------**ABSTRACT**----------
With the increase in population and less power to provide; it has become an utmost priority to provide solution to these problems without hindering the environment .this research paper concentrates on altering the existing rapid transit system also known as metro. The results of this transportation system will produce electricity and clean water without changing the existing system of rapid transit system

KEYWORDS*: rapid transit, electricity, cleans water.*

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I. INTRODUCTION:

i. Rapid transit:

The **Rapid transit**, also known as **metro**, **subway** or **underground**, is a high-capacity public transport generally found in urban cities. Metro uses electric railways system that operate on an exclusive right-of-way, which cannot be used by pedestrians or other light and heavy vehicles, and which is constructed separately in tunnels or on elevated railways.

Modern services on rapid transit systems are provided on selected railway lines between stations typically using numerous electrical units on rail tracks, while some systems use guided rubber tyres , magnetic levitation, or monorail. The stations typically have high platforms, without steps inside the trains. They are typically incorporated with other public transport and often operated by the same public transport authorities, but does not hinders a fully isolated light rail transit. It has an ability to transport large numbers of people rapidly over short distances with limited use of land.

ii. Infrastructure:

Most Metro's are electric multiple units with lengths from 3 to 10cars. Power is commonly delivered by a third rail or by overhead wires. Most of them run on conventional steel railway tracks, although some also use rubber tires, for example the Montreal Metro and Mexico City Metro and some lines in the Paris Metro. Rubber tires allow steeper gradients and a softer ride, but have higher maintenance costs and are less energy efficient.

iii. Water turbine:

A water turbine is a rotary engine that takes energy from moving water.
Water turbines were developed in the 19th century and were widely used for industrial power prior to electrical grids. Now they are mostly used for electric power generation. Water turbines are mostly found in dams to generate electric power from water kinetic energy.

Centrifugal pumps are a sub-class of dynamic axis symmetric work-absorbing turbo machinery. Centrifugal pumps are used to transport fluids by conversion of rotational kinetic energy to the hydrodynamic energy of the fluid. The rotational energy basically comes from an engine or electric motor. The fluid enters the pump impeller along to the rotating axis and is accelerated by the impeller, flowing radially outward into a diffuser (casing), from where it exits.

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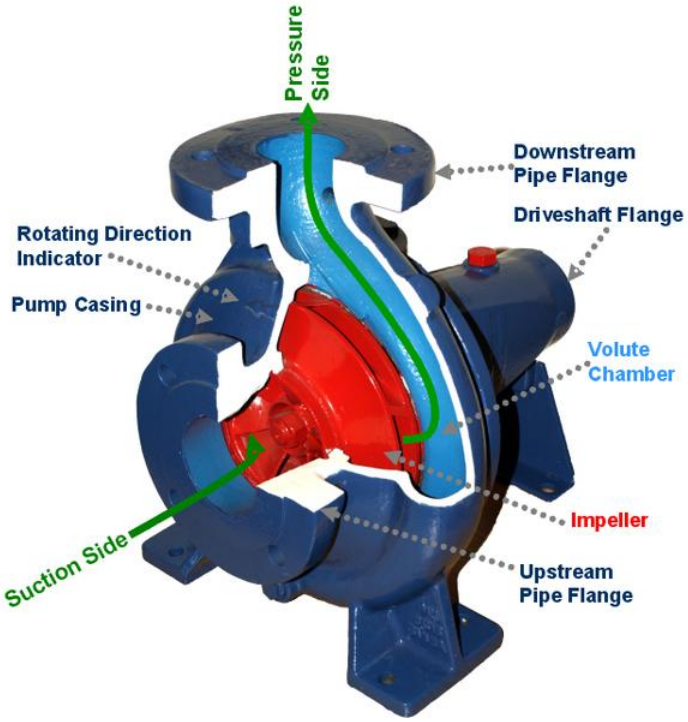

II. THEORY:

a circle system of rails are laid down in such an order that the maximum height of one column/pier be 12m(say), is reduc3ed in order to provide a slope & with smallest pier been 8m (say) .the rain water is collected by the pier top is transmitted to the lowest point where the height of the is less ,which creates a lot of kinetic energy (due to gravitation), when this water is discharged from pier it creates a lot of amount of head due to existing kinetic energy and gravitational force it experienced when it is allow to fall down ,which in turn rotates the blade of the turbine placed at the bottom of the smallest pier.

Let, the actual power available be $p_{a,\,W}$ be the weight of water equals to 9.810kn/m^3 , q equals to discharge, H equals to gross head

Then,

$P_a = wqhn_o$

Where n_o =overall efficiency of the plant (80%)

$P_a=9.81*q*h*n_o$

$N_{o=}80\%$

$P_a=.80*9.81*q*h$

$P_a=7.84qh$

Therefore,

Available energy E= (7.8484*365*24*) q*h

E= (68748.5) qh

The left over water is after passing through the turbine is stored to use it for daily consumptions, the electricity so produced and the water collected will be used for daily consumption.

III. PROCEDURE:

- A circle network is adopted to lay tracks for the metro.
- The tallest and the smallest pier are placed at opposite to each other.
- The intermediate pier are so placed that the size of the column increases towards the tallest pier and reduces towards the smallest pier.
- A water carrying unit mainly an open channel is provide on the pier and beneath the metro tracks in order to guide the water towards the smallest pier.
- The water from the smallest pier is then allowed to fall down freely under the effect of gravitation force which will create head over this section.
- The water with high velocity and head falls onto the blades of turbine which rotates the blades of turbine, thus in this phase the mechanical energy is been created.
- The turbine is coupled with the rotor which converts the mechanical energy to electrical energy.
- The water is then carried to the treatment plant.
- After the treatment of the water, this water can be used for daily consumption.

IV. CONCLUSION:

This method of harvesting water and electricity by altering the design of the metro is useful but the cost of construction and efficiency is less.

V. ADVANTAGE:

- Creates electricity
- Controls flood
- Provide quality water

VI. DISADVANTAGE:

- Cost of construction is high.
- Less efficient during summer.

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