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Industrial wastewater treatment and intimate the river water pH level using GSM

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ABSTRACT

The pollution like water pollution due to the release of some chemicals in the industry affects the entire human environment. And finally, the entire eco system will be affected by allowing the waste water into the river that makes the water polluted. Water pollution can affect many body organs and systems in addition to the environment. In our project, we are designed to produce steam power through the industrial waste water. The high pressure of steam flow decides the rotating speed of the turbine, rotating speed is proportional to steam flow. PH sensor is placed on the water board where the river water is taken for domestic purpose, if the PH level of river water is above 8 the intimation will send to the pollution control board.12W battery can be charged from the steam of 100 liter waste water.

Keywords: *pH sensor, Water quality monitoring, Turbine, Dynamo, PIC microcontroller, Industrial Wastewater.*

1. INTRODUCTION

Driven by increasing concerns over the security of the nation's water supply and water quality infrastructure, reliable access to safe and clean drinking water has become one of the greatest global challenges. From the report given by World Health Organization (WHO), polluted water leads many risks to human life like irritation of the body, including skin diseases and eye irritation. The major effects of water pollutions are the death of aquatic (water) animals, disruption of food-chains, destruction of ecosystems, contaminated Drinking Water, increase in Algal Blooms, causes flooding, water-borne diseases are infectious diseases spread primarily through contaminated water.

To avoid these problems industries should not be placed certain kilometers around the river, industrial waste water and drainage water should not be mixed with river water. Drainage water can be treated and reused for agriculture. In our project, we are designed to produce steam power through the industrial waste water. Steam flow pressure makes the rotating speed of the turbine. PH sensor is placed on the water board where the river water is taken for domestic purpose, if the PH level of river water is above 8 the intimation will send to the pollution control board. Approximately more than 73% of power can be produced from the steam of industrial waste water than normal water. The 12W battery can be charged from 100 liters of waste water.

2. WORKING PROCESS

The purity of water content in Riverside is checked through a pH meter the purity of water should be beyond the standard specified by the pollution control board. This paper helps in neglecting those factors affecting the human environment through pollution. In this project, the micro controller plays a major role to detect the polluted water from the industry and location of drainage water leakage. The sensors like PH sensor which is used to detect the pollution and GSM modem helps to send the message to the control board. This project also exhibits a generation of power from industries waste water to steam.

A. Chemicals used in industries

Sulphur refers to non-metallic substance, **Asbestos** contains cancer-causing properties, **Lead and Mercury** refers to metallic elements and can cause risk to environmental and health, **Nitrates & Phosphates** refers to fertilizers, and are often taken from the soils causes problems for humans and animals, **Oils** they are not dissolved in water, it has a thick layer in the water surface. **Phosphates -** Cause eutrophication, problematic to the marine environment.

B. River side Block Diagram for pH measurement

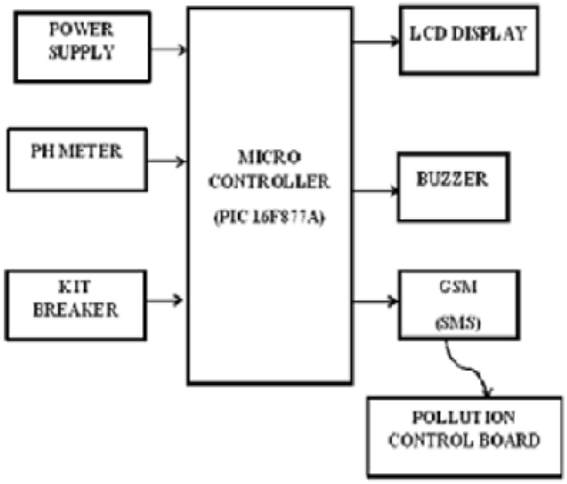

Fig 1. Block diagram of PH measurement

pH will measure the quality of river water.The maximum possible distance between sensor and transmitter to 3,000 feet (914meters). Kit beaker is used to intimate when the circuit kit gets a fault. Buzzer, LCD display is place in the pollution controlled board. If PH value of water gets increased message will be sent to higher authority through GSM that is shown in *Fig. 1*.

C. pH meter

In the process world, pH is an important parameter to be measured and controlled. The pH level indicator from the solution or water indicates the pH level of acidic or basic (alkaline) in it. The pH level shows the values of the ion concentration of hydrogen, that dynamically ranges from about 1 and 10^-14 gram-equivalents per liter-into numerical numbers between 0 and 14 is shown in *Fig, 2*

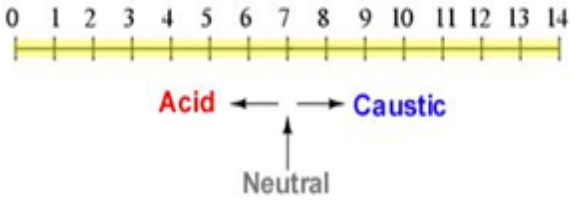

Fig 2. pH Scale

D. GSM Modem

A GSM modem is a wireless network interconnection that connects more networks, works similarly to a dial-up modem. Despite dial-up modem transmits and receives data with the help of a fixed telephone line, while a wireless modem transmits and receives data through radio waves.

With the help of GSM wireless modem able to do: Reading, writing and deleting SMS messages, Sending SMS messages, signal strength can be monitored, also Monitoring the charging status and charge level of the battery, Reading, writing and searching phone book entries.

E. Microcontroller (PIC 16F877A)

Microcontroller **PIC16F877A** is a family of the PIC microcontrollers which is popular in the market, from beginner to professionals. Since it is features of PIC16F877A are advanced and not complicated, it uses FLASH memory technology so it can be readable and writable till thousand times. PIC16F877A is the superiority of all RISC type Microcontrollers which are of 8-bit architecture especially with the speed of and compression of the code. **PIC16F877A** is a 40 pin dual in-line package in that of 33 pins are used for I/O.

PIC16F877A particularly fits for many uses, like automotive industries and home appliances control industrial instruments, remote sensors, electrical door locks and safety devices. Due to low consumption, it is also ideal for smart cards as well as for battery supplied devices.

EEPROM memory utilizes whereas more parameters have to be stored in a permanent storage for devices is needed (codes for transmitters, motor speed, receiver frequencies, etc.). Low cost, low consumption, easy handling flexibility are the features of PIC16F877A which are mostly used even in areas where microcontrollers had not previously been considered (example:, interface replacement in larger systems, timer functions coprocessor applications, etc.). In System Programmability of this chip (along with using only two pins in data transfer) makes possible the product flexibility, after completion of assembling and testing and the assembly line production creating capability is also used, calibration data will be stored only after final testing, or it can be used to improve programs on finished products.

F. Kit Breaker

If the whole kit gets breaked or not worked kit breaker will help to intimate to the higher authority through GSM message.

G. Steam Power Generation Block Diagram

All the industrial waste can be collected in a particular boiler tank and steam produced at the temperature (100^0C to 180^0C) or (212^0F – 356^0F). The steam will pass through the nozzle to rotate the turbine are shown in *Fig.3*.Power will produce from the dynamo and stored in the battery. Recycled water can be cooled and reused for industries. Normal water temperature about (49.6^0F) or (5.889^0 C)

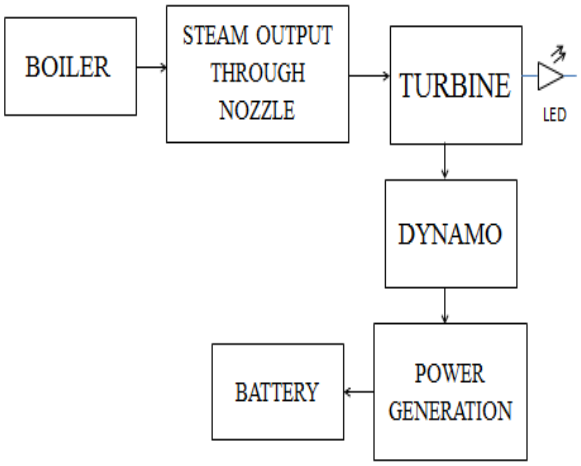

Fig 3. Block diagram of a power generation

H. Dynamo

A dynamo is an electrical generator which produces & supplies direct current with the help of a commutator. Dynamos are the electrical generators which are the first and capable of delivering electrical power to industry, based upon this foundation later many other electrical generators and power conversion devices including an electric motor, alternating current alternator, and the rotary converter.

Today, the later device alternator dominates large-scale power generation with all the electric power generators, for efficiency, reliability and cost reasons. The mechanical commutator is the main disadvantage of the dynamo. Also, power rectification devices are used to convert an alternating current to direct current (vacuum tube or more recently solid state) is effective and usually economic.

Inside the dynamo, a permanent magnet is rotated in the middle of some coil of wore. Slip rings are not needed and instead of coils, magnets are rotated. The rotating magnet produces a changing magnetic field and this generates electricity in the coils of wire. The top of the dynamo is touched against the rim of the tire's which rotates when the bicycle is moving.

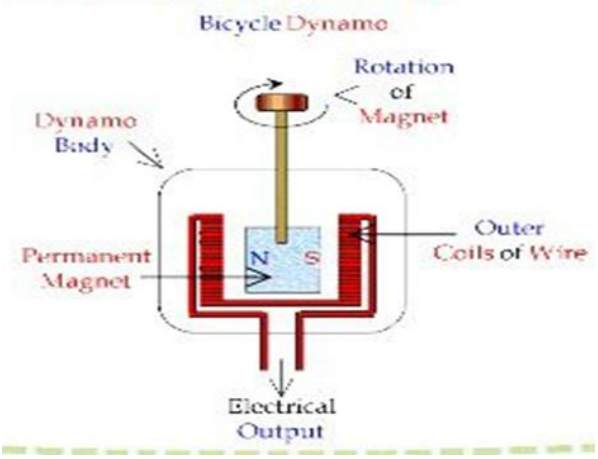

Fig 4. Circuit diagram of a Bicycle dynamo

I. ADVANTAGES

- Avoid contamination of river water.
- Prevents diseased from polluted water.
- Waste water can be reused for agriculture and also for industries.
- Power can be produced more than 73% from wastewater steam than from normal water.
- Effects of aquatic life can be reduced.

3. CONCLUSION

With recent developments of industries and more number of wastages from sewages, textile finishes and synthetic dyes are in the rapid flow of entering in the market till a new structure has been implemented by taking necessary actions. Solid suspensions potentially existing in the sample need to be filtered as well for high sensitivity and reliability, which will be our future research focus. The environment and public cannot able to know immediately about the effects caused by chemicals and dyestuffs used in textile industry. These wide ranges in electricity percent savings for the wastewater sector are due to the difference in wastewater flows analyzed in each individual scenario of our analysis.

In this case, the low end represents the use of existing energy recovery processes and the high end illustrates potential energy recovery from widespread implementation of anaerobic digestion with biogas utilization and/or bio solids incineration with electricity generation. The population that is allergic to chemicals will grow to 60 percent by the year 2020. The R & D needs to step up and step in to give us “Value Products” in a “Value Environment”. We all need to join in the race to go green.

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