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IoT Based Water Pipeline Breakage Detection System

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Abstract:- In this paper, we analyse the idea of giving the pipeline breakage detection system by using simple embedded system.The ultimate aim is to detect the breakages in the pipelines and to stop the water flow of the pipeline. The Water flow sensors are used to find out the flow of the water which is fixed on the pipes and solenoid valve is used to stop the flow. Finally the message is displayed in the personal computer or mobile using IoT.

Keyword:- *Breakage detection, Node MCU, Pipeline Breakage, Solenoid valve, Wi-fi, Water Flow Sensor, Internet of Things (IoT).*

I. INTRODUCION

Water is a necessary natural resource required for the survival. Most of the earth is covered with the water. But only less percentage of water is available for the domestic purposes.The transportation of the water is mainly through the pipelines. Breakage of the pipelines causes more amount of water loss. Our paper gives the solution to find out the breakages and repair it as soon as possible.

II. RELATED WORKS

- *IOT Based Water Management*

This project mainly helps to manage the proper distribution of water supply to the household by repairing the breakages occurring in the distribution pipelines. The flow sensors are fixed on the pipelines which measures the flow of the water. By using the change of the flow the breakage is detected. Then the data will be stored in the cloud using mobile application. Using the mobile phone or the personal computer the data will be displayed to the control board. Then the necessary repair action will be taken.

III. PROPOSED MODEL

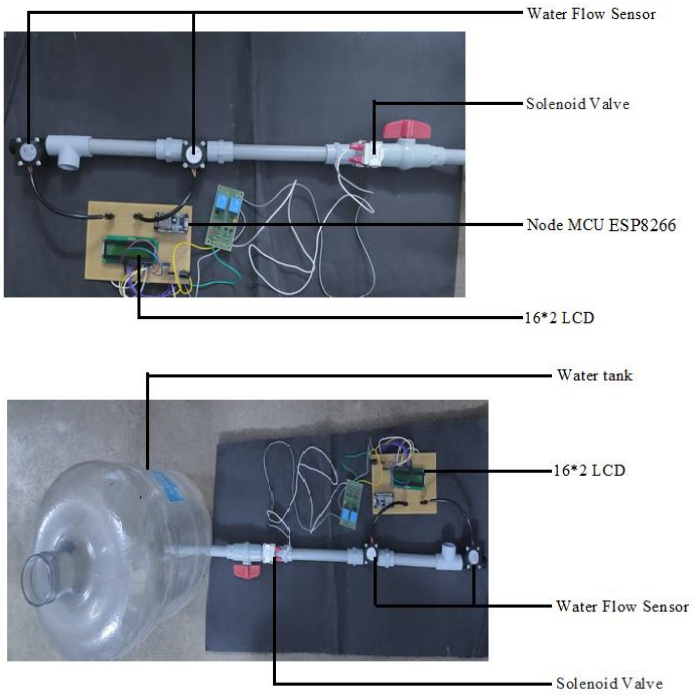

Fig 1:- Complete setup of breakage detection

The proposed system is to mainly findout the breakages in the pipeline which mainly consists of water flow sensor, solenoid valve, Micro controller, Micro computer, Liquid Crystal Display (LCD) and cloud infrastructure. Node MCU along with the Wi-fi connection will act as the micro controller. Relay logic circuit gives the necessary supply to the sensors and the controller. In this system the flow sensors are fixed in the inlet and outlet of the pipeline which gives the flow of the water by counting the pulses. By using the change of the flow rates the breakages in the pipeline is determined. A solenoid valve is fixed at the inlet of the pipeline to stop the flow of the water. The Node MCU is programmed to read the arudino signal, process the data and stores in data files. Then the data will be uploaded onto the web server.

IV. RESULTS

A. Indication of the Flow Rates

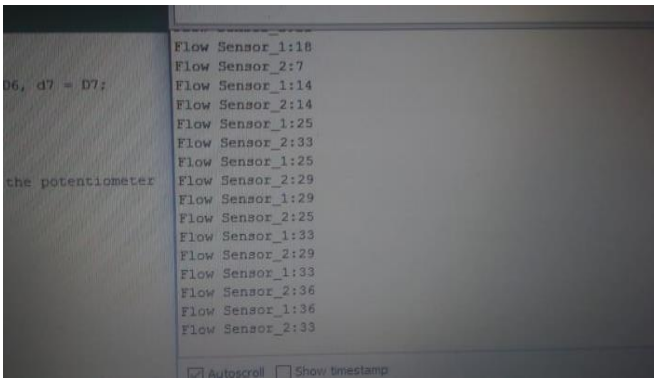

Fig 2:- Indication of the flow rate in the computer

Fig 3:- Indication of flow rate in LCD

These are the results taken from the proposed system. It gives the various flow rates of the water by using the sensors. The results are shown in the personal computer to the user reference or to the control board.

B. Identification of the Breakage

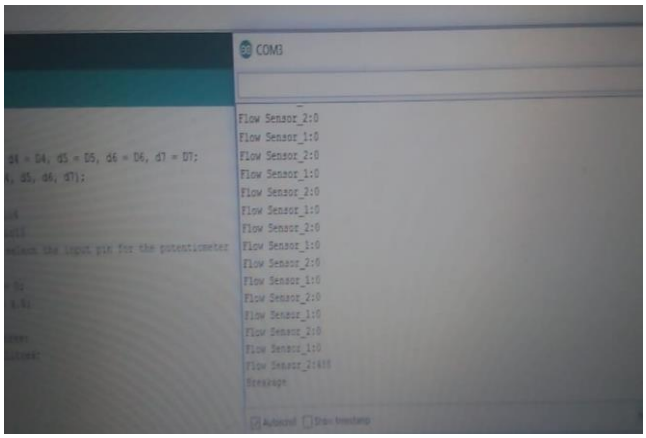

Fig 4:- Identification of the breakage

It is the result taken out while breakage occurs in the pipeline. It will be calculated by the change of the flow rate.

C. Displaying the breakage using IoT

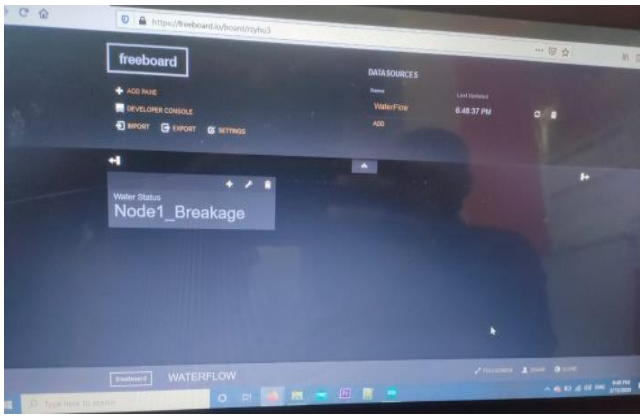

Fig 5:- Displying using IoT

Finally while the breakage occurs then the data will be displayed in the computer or mobile using the web server. Then the necessary repair actions will be taken.

V. CONCLUSION

Without any interpretation, evidently the solenoid valve saves the water by switching off the water supply line if any breakages occurs in that pipeline. Our concept has erased the excess time taken to repair the damaged pipelines using IoT. The system is able to determining the breakages in the pipelines.

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