SLUICE VALVE AUTOMATION

Alok K. Shelar[1], Akshay G. Bhalghare[2], Vitthal P. Karche [3], Dattatray V. Shelke[4], Abhijit V. Naik [5]

[1][2][3][4]UG Student, Department of Mechanical Engineering, D. Y. Patil College of Engineering

Ambi, Pune 410 506

[5]Assistant Professor, Department of Mechanical Engineering, D. Y. Patil College of Engineering

, Ambi, Pune 410 506

Abstract: The aim of this paper is to update its readers the various automation based techniques for gate/sluice valve open and close, and its required parts present by various researchers for a this technology. Where 'Catia and Analysis software' use for analysis parts, together with parts details. Various terms used for designing the gears, the SCADA system used, circuits processors used for automation and its coding etc.

 Keywords: Sluice valve, opening and closing, automation.

I. INTRODUCTION

In the papers they concluded the detail about the sluice valve and gate valve types. The functional components use in that are electric motor, Worm & worm wheel, Sluice valve, Arduino microcontroller and driving circuit etc. For opening, the sluice valve clockwise motion given to it & vice versa for closing anticlockwise motion.

In this paper they use processor ARDUINO ATMEGA 328 microcontroller. Pins of Arduino board are used for to control the signal of external devices. As we the worm gear drive, is velocity ratio is 60:1 is best choice for high speed reduction and it can be increase up to 100:1. Primarily, gate vale is used to restrict/permit flow of water for external devices. According to our application we use Plate type sluice valve in the project for easily opening and closing. From the worm wheel power is given to the sluice valve. In electronic components we used driving circuit which is used to control the motor speed which is given as input to the Arduino microcontroller. We used the software's such as eclipse and Arduino for the control purpose. Mohammed Shahanas[1]has presented this paper about interest of things. The population of the Arabian countries is increasing day by day, so to transform the cities into smart internet of things are so much important. The paper review about the different technologies and platforms that are required for the smart environment. An architecture design for smart water managements proposed and implementation detail of smart water monitoring system is discussed. R.Harisudhan[2] has presented this paper to explain the detail about the Arduino microcontroller. Arduino has program to rotate the stepper motor. By applying the 5v supply to Arduino it can be triggered. In this paper they explain various types of ATMEGA microcontrollers used for various application. From this paper we are going to use ATMEGA 328 microcontroller which having different number of analog and digital inputs. So we used this microcontroller in our project. Shaikh Mudassir Nadeem[3] has presented this paper for the smart city water supply control system with the help of PLC and SCADA. This system can be actually implemented in any developing smart city for better improvement of water supply, as the whole process can be controlled locally as well as manually from the panel or our personal SCADA system it improves the performance and also reduces human effort. Shashank s. Jadhav [4] the basic aim of this paper is to propose a design method that can be used to find the minimum required thickness for the functioning of the valve. The M- type gate valve design that is considered in this paper is a high pressure valve this is used under pressure of 5000 psi and tested under pressure of 7500 psi. and the cross section of the inlet and outlet gate valve is also according to the company standard. Thus the intent of the paper is to validate the design of M type gate valve and to calculate the optimum thickness of the valve to function under high pressure. R. Hari sudhan [5] in this paper we have to select the ATMEGA 328 microcontroller, which acts as a processor for the Arduino board. Nearly it consists of 28 pins. From this 28 pins, the input can be controlled by transmitting and receiving the inputs to the external device . it also consists of pulse with modulation (PWM). These PWM are used to transmit the entire signal in a pulse modulation. Input power supply such as Vcc and Gnd are used. This IC mainly consists of analog and digital input. Joao Figueiredo [6] this paper present a standard control strategy based on PI controller that was experimentally tested to

control a modern automatic irrigation canal prototype . These controlled modes are implemented through a PLC network installed on the automatic canal which is supervised by a SCADA software system. Dr. P.A. Makasare [7] the core of the paper is to worm and worm gear arrangement. The main objective of model is opening and closing of water mains sluice valve. In the model the primary worm is in mesh with worm wheel. The worm wheel is centrally aligned with the sluice valve key. The power is given to worm and further worm to worm wheel. since sluice valve key is connected to worm shaft , it will rotate clockwise and anticlockwise according to operator requirement.

II. MATERIAL AND METHODS

Gate valve consist of Cast iron, plain carbon steel alloy steel aluminium alloy. Worm material- normalized carbon steel(40c8) nickel chromium steel(15ni4cr1) Worm wheel is made up from gray cast iron, gun metal phosphor bronze nickel bronze aluminium bronze. There are various methods we used for the system. For the gear manufacturing we used the casting

III. DISCUSSION

In the earlies decades more effort is required to open and close the sluice valve with manual control. By using the above systems or components we can easily open and close the sluice valve. The system is easier to operate and handle. With the help of above papers we can easily understand how to implement the automation system in the water supply. Automation consists of Arduino microcontroller, motor and driving circuit. With help of Arduino microcontroller we give the input to the worm wheel and further to the sluice valve.

IV.CONCLUISION

In smart city water supply control system, the methods used in older times results into problems like overflow , leakage and empty running of city tanks . so   to overcome these problems the automation system is made to reduce the human effort . These procedures made for a particular city has proved important and effective for future implementation. the concept leads the efficient use of worm and worm gear arrangement as human require much effort to shut and open the valve , some benefits offered by system are low maintenance cost , easy to operate , no highly skilled person required.

IV. REFERENCES

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