WIRELESS DATA MONITORING AND FAULT IDENTIFICATION BY USING GSM IN THERMAL POWER PLANT

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Abstract- Thermal Power Plant has to operate regularly. It is difficult to monitor the parameters at each and every moment manually. In order to increase the reliability of thermal power plant, and to reduce maintenance and operating cost, remote monitoring is necessary. This paper develops GSM(Global System for Mobile Communications) based monitoring system. It consists of Temperature, Vibration and Level sensor. These sensor's data are processed by PIC controller which is transmitted through GSM module to remote place. . It provides current updates through SMS anywhere in the plant and outside the plant. An embedded system is a computer system with a dedicated function of larger mechanical and electrical system, often with the real-time computing constraints. . Embedded technology is a part of a complete device including hardware and software. Thermal Power plant is a coal-fired electric power plant. The main purpose of power station is to generate electrical power. Here, we are using embedded technology with GSM to automatically monitor the power plant status. As the demand for power increases, increasing the safety and reducing operation, the maintenance cost plays a vital role in increasing the reliability of the power plant. So remote monitoring is necessary. This project develops a GSM based remote monitoring system. This system deals with monitoring the fault of Fans and Boiler Drum using GSM technology This system mainly consists of temperature sensor, level sensor and vibration sensor. All the sensors data's are processed by PIC controller and transmitted through the GSM module to remote place so plant engineers can know the current status via SMS anywhere in the plant and outside the plant.

Keywords- PIC controller; GSM module; Thermal Power plant; Monitoring System.

I. INTRODUCTION

Thermal power plant, combustion of coal in boiler converts the water into steam in boiler tubs. This steam with high temperature and pressure flows into turbine and rotates turbine shaft. Turbine shaft is connected to the Generator shaft. By rotating turbine Shaft Generator shaft also rotates and Power can be generated. Pressure, Temperature, Vibration and level are the important four parameters to be monitored in fans and boiler drum. Boiler tubes will

puncture if the temperature of steam increases and also turbine fans will be tripped if bearing temperature increases. So, temperature of steam should be monitored constantly. Turbine shaft will damage if vibration increases. So, vibration must be monitored continuously. . The boiler drum has 50% of water and 50% of steam. Increase in % of steam in boiler drum has the chance of increasing the pressure in it. If the pressure in the drum increases then, the drum may blast. . So, the level of steam should be monitored constantly. This paper briefly explains how to monitor the pressure, temperature, vibration and level in the boiler drum and turbine fans. . GSM (Global System for Mobile Communications) is mainly used to monitor the various parameters in thermal power plant with relatively low power consumption.

II.EXISTING SYSTEM

Here we are going to monitor the boilers temperature and the steam's pressure. We use NTC type thermistor as a temperature sensor. This sensor output is given to the amplifier unit. After the amplification, the output is given to the PIC controller. . The pressure sensor is used to measure the steam's pressure in the boiler. This sensor output is given to the amplifier unit. After the amplification this output is given to the PIC controller. Here we have used the flash type reprogrammable PIC controller. In PC we give the set value. PC is connected with the PIC via RS 232. RS 232 is a serial communication cable. . If the temperature value is greater than set value, then TRIAC output becomes low automatically. Similarly the pressure value gets higher than the present value, automatically solenoid valve gets closed. It can be done with the help of relay with driver circuit.

III.PROPOSED METHOD

In Thermal Power Plant, it is necessary to monitor parameters like Temperature, Level and vibration because the equipment like Boiler, Turbine is affected by these parameters. If any of these blades in turbine gets damaged, it creates unbalanced condition so that vibration level gets increased. If vibration level increases, it causes desirable damages to system. If level of the steam increases, the pressure in the boiler tube also increases. If the temperature increases above the specified value, it leads to damage the system. This paper mainly concentrates on how to monitor the temperature, vibration and level in the boiler and theturbine.

3.1.PROPOSEDBLOCK DIAGRAM-

IV. SYSTEM SPECIFICATIONS

4.1. SOFTWARE REQUIREMENTS

- MP LAB
- PCB DESIGNING
- EMBEDDED C
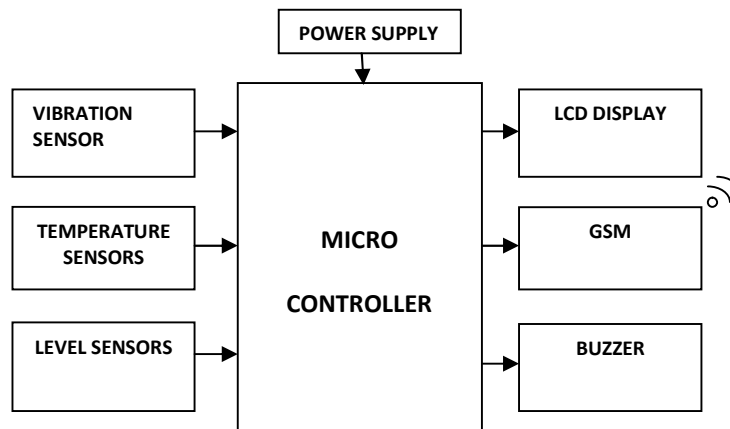
4.2. HARDWARE REQUIREMENTS

- PIC16F877A MICRO CONTROLLER
- LCD DISPLAY
- VIBRATION SENSOR
- TEMPERATURE SENSOR
- GSM
- POWER SUPPLY
- LEVEL SENSOR
- BUZZER

V. RESULT AND DISCUSSIONS

If the sensors value exceeds, then the corresponding actuator will be alarmed or tripped as required and the parameters will be monitored in virtual terminal in a PC. The parameters mainly monitored are Temperature, vibration, pressure and Level. The Proteus 7.10 software is used to display monitoring parameters in a PC.

VI. CONCLUSION

The hardware and software design of an embedded monitoring system for the real time applications is presented in this project by using GSM technology and hence the safety of plant and the efficiency can also be increased. In this proposed system the fault in thermal power plant is monitored using GSM technology with the verification of different levels. System can be monitored from anywhere in the plant and outside the plant like canteen, meeting hall, etc. This proposed system fault monitoring is implemented in one unit. In future we can develop to all the four units.

VII.FUTURE ENHANCEMENT

Wireless communication is one of the most active areas of technology development of our generation. GPRS (General Packet Radio Service) is a packet-based wireless data communication service which is used for replacing the current circuit-switched services available on GSM (Global System for Mobile communications) and TDMA (Time-Division Multiple Access) communication networks. Embedded system is a computer system with a dedicated function with larger mechanical and electrical systems, with real-time computing constraints. Embedded technology is a part of a complete device including hardware and software. Thermal Power plant is a coal-fired electric power plant. The main purpose of the power station is to generate the electrical power. Here, we are using the embedded technology with GPRS to automatically monitor the power plant status.

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