ABSTRACT
This paper presents a wireless detection of explosive atmosphere in underground coal mines that can be implementation of safety jacket for coal mine workers, this jacket is equipped with methane gas, fire, smoke, temperature, and heart beat sensor and emergency key. This sensors sense the data and which is transmitted to master node through zigbee. The WSN sensor is connected at both end for transmission and reception of data. The threshold value is set at master end, if sensor value reaches beyond the threshold level, the master will trigger on the buzzer and keep the coal mines workers safe from upcoming accident.

KEYWORDS: WSN, ZIGBEE, smart jacket, PC, VB Software

INTRODUCTION
Demand of coal as energy sources is always important and significant. But thousands of workers have lost their lives in mining accidents. The main reason is these accidents occur due to the presence of methane gas and carbon monoxide gas in these mines. These gases are colorless, odorless and undetectable by human sensor. A continuous monitoring is necessary which is done by implementing microcontroller and sensors to alert workers before critical atmospheric level. To enhance both production and safety in mines, an authentic communication is established between fixed base station and workers. But the wired communication is difficult in coal mines so recently WSN technology evolved and provides better solution for data acquisition with a secured monitoring. A cost efficient Zigbee is supported by wireless monitoring system with sensor and PC.

Wireless Sensor networks (WSNs) is an emerging technology that is used in many applications include in environment monitoring, home and building automation, lighting control, medical and military applications. A wireless Sensor network consists through joining of several sensor nodes which have included communication and sensing capabilities. In this project we are designing a low power, cost-effective, and Zigbee protocol based wireless sensor network that provides an intelligent surveillance and safety system for underground coal mines. Here each packet is authenticated using a security algorithm hence increasing the overall security of system.

CONTRIBUTION BY THE PREVIOUS RESEARCHERS
Here different papers are studied and analyzed based on the approaches used by the different researchers and modifications are made to provide more reliability in the proposed system. “SCADA System for Detection of Explosive Atmospheres in Underground Coal Mines...”

The system is wireless system for detection of explosive atmosphere in coal mines using triangle Coward and diagram Bureau of Mines. The solution for this problem that exist in coal mine are mathematical analysis using WSN and LABVIEW.

SYSTEM OVERVIEW

Wireless Sensor networks (WSNs) is an emerging technology that is used in many applications include in environment monitoring, home and building automation, lighting control, medical and military applications. A wireless Sensor network consists through joining of several sensor nodes which have included communication and sensing capabilities. In this project we are designing a low power, cost-effective, and Zigbee protocol based wireless sensor network that provides an intelligent surveillance and safety system for underground coal mines. Here each packet is authenticated using a security algorithm hence increasing the overall security of system.

The sensor node is placed on the Miner itself. These nodes are interfaced with sensor such as temperature, Pulse, fire and methane gas. This node will continuously sense and send the data to master.

A. slave
This node is used for sensing data, packet handling, data buffering, Data authentication, link quality indication and packet timing information. The slave consists of ARM7, sensors and emergency switch, The sensor sense data and transmit through zigbee to master node. In the coal mines have hazards gases for worker health which are colourless and undetectable. But it can be detect by using sensors. The slave gives information to master of each event after every two seconds.

B. Master
By using VB software at base station observer can visualize all situations, this can be done by ARM7 and XBEE the values are sending to the monitoring unit. When temp level exceeds the saturation level, the command gets produced in the underground unit as “Emergency Temperature abnormal”.This Node consists of a PC on which we can see all the data in real time with help of Tables and graphs. For this we can use Visual basic / MATLAB s/w / LAB VIEW software.

BLOCK DIAGRAM
RESULT AND SIMULATION

In this section we discuss the result of VB system which is done on PC. The sensor values continuously show on VB screen with respect to time.

CONCLUSIONS AND FUTURE WORK

The work proposal is to identify hazards at various locations in coal mines. The advanced gas detection techniques been used in saving many lives. In the field of monitoring and sensing innovative application can be developed by WSN technology. The zigbee module monitors the underground parameters, not only parameters but also can be automatically generating alert message to workers.
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