MONITORING PHYSIOLOGICAL VARIBLES OF MINING WORKERS AT HIGH ALTITUDE USING WIRELESS SENSOR NETWORK

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ABSTARCT:

To monitor High altitude climate conditions in mining industry using wireless sensor network and protect the mining workers using protection jacket which can maintain the stable climate and send the persons health information to the control unit continuously. Industrial safety is one of the main aspects of industry specially mining industry. In the mining industry safety is a very vital factor. To avoid any types of unwanted phenomena all mining industry follows some basic precaution and phenomena. Communication is the main key factor for any industry today to monitor different parameters and take necessary actions accordingly to avoid any types of hazards and also maintain the stable temperature inside the jacket using multiple sensors and actions automatically .This systems continuously monitor the inside the mining area conditions and update to the control unit wirelessly using zigbee wireless sensor network.

INTRODUCTION

Mining includes extraction of any non-renewable resources such as petroleum, natural gas or water. In other words, mining is the technique of tearing out minerals or geological materials from the earth. Mining processes comprise extraction of the desired materials and final reclamation of the land after the mine is not open. Mining operations creates a negative impacts on both environment and mineworkers health. Mining techniques can be classified into two: surface mining and sub-surface mining [1]. Surface mining is the process of removing surface vegetation and impure matter. Surface mining, contains open-pit mining, quarrying, strip mining, removal of mountaintop and landfill. Surface mining is a most frequently used method. Certification of mines with good practices occurs to the

International Organization for Standardization (ISO). ISO 9000 validated an "auditable environmental management system" [2]. Also certification is available through ceres Global reporting initiative. A mine-worker is a person that extracts minerals like ore, coal etc. from the earth through mining procedure. Mining is a greatest threatening operations, causes lots of health problems [3] [4]. Asthma is due to the various dust produced during the process mining. Some of the gases like acetylene, phosgene etc. and metals such as iron, copper, silver and so on causes cancer or harmful effects on mine-workers. Mining also encompasses skin randomness [5]. Temperature and humidity variations in environment is dangerous to the worker's health. It will cause physical illness. There are many technologies developed to save the life of mining workers at very high altitude. Best way to save their life is the proper monitoring of workers' health [6]. This paper introduced a new system to monitor the health of mine-worker and also monitor the variations in surroundings. Thereby improve worker's safety and ensures a comfortable working environment. For this purpose, the system consists of a variety of sensors, microcontroller, SMS alert system and a monitoring system [7]. This system is a wearable monitoring system and it is implemented on a T-shirt.

GOAL

Mining surroundings in general has hidden dangers inside along with toxic gases, which would also additionally gift immoderate wellness exposures to the human beings going for walks within mining. These gases ought to be detected at instances and told the hazardous project in appropriate time for the security of miners. Wired community monitoring procedures have assisted the mine guard exceptionally, nonetheless it is not notion for all varieties of mining environment. The be trained investigations to be carried outwith the next goals:

1. Detection of precise toxic gases inside mining environment

2. Establishment of wi-fi Sensor Network

3. Design of a distinct-time monitoring device

PURPOSES OF CHALLENGE:

Coal mine Industries Mining.

RELATED WORK:

There are some systems used to monitor the health of mine workers is already existing. The history is starts with Igo B. Shirkov,

who recommend a system called, "microwave autodyne sensor for monitoring of cardiac rhythm of mine workers" [9]. In his work a sensor is used to calculate the cardiac rhythm of mine workers. The sensor is works on the principle of Doppler Effect. Key element is a Microwave sensor, searching the people under mine.

Che-Wei Lin, Jeen Shing Wang, and Pau-Choo Chung narrate method [10], used to find heart rate of mine workers. In this paper, heart rate is calculated by HRV analysis. HRV is a simpler method. This was performed in three steps. So this is easy to apply. Valdo Henriques and Reza Malekian establishes a new system in 2016 named as "Mine safety system using wireless sensor network" [8]. Many sensors help to monitor temperature and humidity in air. The main aim of the system are to create a good working environment for the workers. Ishan Tripathi develops "Wireless environment parameters monitoring and SMS alert system" [7]. In this work, GSM based SMS alert mechanism is used, because wireless systems consume less power. GSM acts as an SIM card which sends the information on the form of SMS.

PROPOSED WORK:

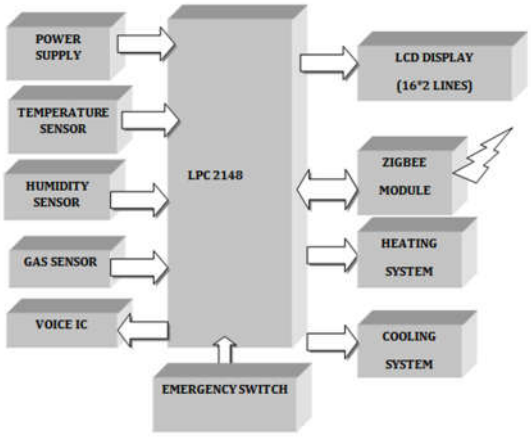

Fig: : Block diagram of miner jacket (at worker) monitoring physiological variables of mining staff a immoderate altitude making use of wirless sensor group

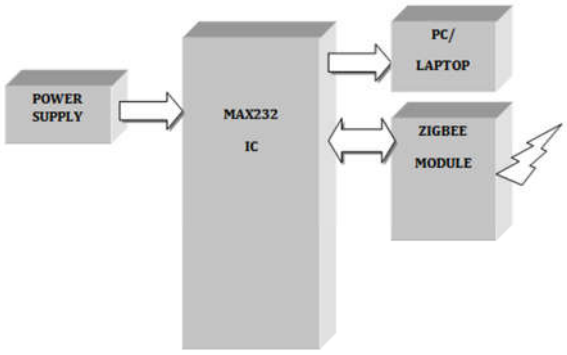

Fig: Block diagram of rx section (manipulate sections at ground) monitoring physiological variables of mining workers a immoderate altitude utilising wsn

The proposed system is divided into two sections. First is a hardware circuit that will be attached with the body of the mine workers. This may be preferably fitted with the safety jacket of the workers also. The circuit has a sensor module consisting of some sensors that measures real-time underground parameters like temperature, humidity and gas concentration. Gas concentration is meant for the harmful gases like methane and carbon-monoxide.

A microcontroller is used with the sensors to receive the sensor outputs and to take the necessary decision. Once temperature is more than the safety level preprogrammed at microcontroller, microcontroller decodes the headset speaker connected with controller once the measured humidity value is more than the safety level preprogrammed at microcontroller; Similarly when gas concentration crosses the safety level. Different sensors values are displayed in the LCD of mine workers section. A voice announcement is given when the sensor levels exceed the threshold levels. In control station the information is received by ZigBee module and the status of the sensors is monitored in the Mobile Phone.

CONCLUSION:

For that reason, the coal mine security Monitoring computer suggest listed here lovely meets the need of coal mine defense monitoring. Typical mine defense gadget may also be effectually replaced by way of the surveillance and safeguard laptop proposed within the task. The example variant messages to the registered phone are validated in above investigate. Along with Temperature and Humidity used get the indications related to moistures and unstable gases if detected on the net page of the Sensor node. This method can accelerated for a couple of tunnels by way of utilizing the use of sensor community.

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