Gas Leakage Monitoring & Alerting System for Industries

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Abstract: GAS is a main source of fuel in most Industries, especially in urban areas because it is clean compared to firewood and charcoal. Gas leakage is a major problem in the industrial sector, residential premises, etc. Nowadays, home security has become a major issue because of increasing gas leakage. Gas leakage is a source of great anxiety with ateliers, residential areas and vehicles like Compressed Natural Gas (CNG), buses, and cars which are run on gas power. One of the preventive methods to stop accidents associated with the gas leakage is to install a gas leakage detection kit at vulnerable places. The aim of this paper is to propose and discuss a design of a gas leakage detection system that can automatically detect, alert and control gas leakage. This proposed system also includes an alerting system for the users. The system is based on a sensor that easily detects a gas leakage. This will detect the harmful gases in environment and alerting to the society member through alarm and sending notification.

INTRODUCTION

Now a day the industries safety detection system plays the important role for the security of workers. Since all the workers from the industries goes to work on daily bases. Internet of Things aim towards making life simpler by automating every small task around us. As much is Iot helping in automating tasks, the benefits of Iot can also be extended for enhancing the existing safety standards. Safety has always been an important criterion while designing home, buildings, industries as well as cities. The increased concentration of certain gases in the atmosphere can prove to be extremely dangerous. These gases might be flammable at certain temperature and humidity conditions, toxic after exceeding the specified concentrations limits or even a contributing factor in the air pollution of an area leading to problems such as smog and reduced visibility which can in turn cause severe accidents and also have adverse effect on the health of people. Most of the societies have fire safety mechanism. But it can use after the fire exists. In order to have a control over such conditions we proposed system that uses sensors which is capable of detecting the gases such as LPG, CO2, CO and CH4. This system will not only able to detect the leakage of gas but also alerting through audible alarms. Presence of excess amounts of harmful gases in environment then this system can notify the user. System can notify to society admin about the condition before mishap takes place through a message. System consists of gas detector sensors, Aurdino board, and ESP8266 and Cloud server. One Society authority person can register the all flat member user to our system. Society admin can add the details of per flat user such as user name, mobile number, per user flat sensor details information. Society admin can configure the threshold value of each sensor. System hardware can be deployed on each flat. Sensors can sense the value per time. System can send the values to cloud server. Server can Check that the sensor values was existed the threshold value. If sensor value can cross the limit the server can send the command to hardware for buzzing the alarm. Server also sends the notification message to user.

OBJECTIVE

The design of a sensor-based automatic gas leakage detector with an alert and control system has been proposed. This is an affordable, less power using, lightweight, portable, safe, user friendly, efficient, multi featured and simple system device for detecting gas. Gas leakage detection will not only provide us with significance in the health department but it will also lead to raise our economy, because when gas leaks it not only contaminates the atmosphere, but also wastage of gases will hurt our economy. The need for ensuring safety in workplaces is expected to be the key driving force for the market over the coming years.

LITERATURE SURVEY

We did a survey over the possible sources that we could access. In our exploration, we did find the authors.

Authors: Nuga, Olubusola Olufunke and Amusa, Kamoli Akinwale and Olanipekun, Ayorinde Joseph "Gsm-based gas leakage detection and alert system "in the year 2017, an efficient method of detecting the leakage of cooking gas and alerting people about its occurrence via the use of existing Global System for Mobile Communication (GSM) infrastructure was developed. The GSM-based gas leakage alert system utilizes a gas sensor to detect leakages in the event that it occurs and then send short message to a predefined telephone number. MQ2 gas sensor, PIC 16F877A microcontroller, GSM modem and a DC stepper motor are the main hardware components employed in the development the gas leakage detection and alert system. The proposed system plays two roles in the event of gas leakage: alerting people about the leakage of gas by sending short message to the predefined telephone number and by closing of the cylinder head to prevent further leakage by using the stepper motor. The developed GSM-based gas leakage detection and alert systems is suitable for deployment in homes, laboratories and restaurants to check undesirable event of gas leakages and attendant risks.

Authors: Kodali, Ravi Kishore and Greeshma, RNV and Nimmanapalli, Kusuma Priya and Borra, Yatish Krishna Yogi "IOT based industrial plant safety gas leakage detection system" in the year 2018, 4th international conference on computing communication and automation (ICCCA), This low cost project includes MQ6, MQ4 and MQ135 gas sensors which detect LPG, Methane and Benzene gas leaks respectively and uses ESP-32 as a Wi-Fi module. The concentration levels of the above mentioned gases are uploaded in the UBIDOTS cloud and the login details are included in the alert message so that the user can check, if needed. The prototype of the proposed system generates a sound alert using buzzer on detection of a dangerous leakage and sends an SMS to the concerned person using IFTTT web service. Different color LEDS are used to specify the gas leaked for example, RED LED indicates the presence of LPG.

Authors: Khan, Mohammad Monirujjaman "Sensor-based gas leakage detector system" in the year 2020, Liquefied Petroleum Gas (LPG) is a main source of fuel, especially in urban areas because it is clean compared to firewood and charcoal. Gas leakage is a major problem in the industrial sector, residential premises, etc. Nowadays, home security has become a major issue because of increasing gas leakage. Gas leakage is a source of great anxiety with ateliers, residential areas and vehicles like Compressed Natural Gas (CNG), buses, and cars which are run on gas power. One of the preventive methods to stop accidents associated with the gas leakage is to install a gas leakage detection kit at vulnerable places. The aim of this paper is to propose and discuss a design of a gas leakage detection system that can automatically detect, alert and control gas leakage. This proposed system also includes an alerting system for the users. The system is based on a sensor that easily detects a gas leakage.

Authors: Shrivastava, Ashish and Prabhaker, Ratnesh and Kumar, Rajeev and Verma, Rahul "GSM based gas leakage detection system" in the year 2013, Gas leakage is a major problem with industrial sector, residential premises and gas powered vehicles like CNG (compressed natural gas) buses, cars. One of the preventive methods to stop accident associated with the gas leakage is to install gas leakage detection kit at vulnerable places. The aim of this paper is to present such a design that can automatically detect and stop gas leakage in vulnerable premises. In particular gas sensor has been used which has high sensitivity for propane (C3H8) and butane (C4H10). Gas leakage system consists of GSM (Global System for mobile communications) module, which warns by sending SMS. However, the former gas leakage system cannot react in time. This paper provides the design approach on both software and hardware.

Authors: Zinnuraain, SM and Hasan, Mahmudul and Hakque, Md Akramul and Arefin, Mir Mohammad Nazmul "Smart gas leakage detection with monitoring and automatic safety system" in the year 2019 organization IEEE, in this paper, we have proposed LPG (Liquefied Petroleum Gas) leakage detection with monitoring and automatic safety system. With the drastically increased demand and use of LPG, this system would be helpful to monitor the usage of LPG on a regular basis and to take safety about any hazards that may occur due to LPG leakage. We have designed a system that notifies the user using IOT (Internet of Things) through mobile app about the amount of LPG so that appropriate measures can be taken. Since LPG is a highly hazardous and inflammable

gas, we have also designed a safety system to with the help of IOT (Internet of Things) through mobile app, when any leakage occurs in LPG so that necessary safety can be taken to avoid an explosion.