

Automatic Gas Leakage Detection And Prevention System

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Abstract - The current problem in gas leakage detection systems are not in proper conditions. It doesn't have a prevention system. In Existing, The gas leakage systems used in hospitals at the time of firing it only detects and keeps on alarming to evacuate people form the danger zone, it doesn't close the valve automatically, This can cause fire to be spread in all over the area in a instance of time. To Overcome this, We have designed a robotic drive which is capable of detecting the gas leakages in pipelines and it will detect the leakage and automatically closes the valve by using arduino controller. Since, We are using GSM Module for communication the gas leakage is communicated to the authority via SMS, As soon as the alarm will rang and LED Display shows the leakage point to the control room.

Keywords: GSM Module, Arduino Controller, Gas detection.

1. INTRODUCTION TO GAS LEAKAGE DETECTION AND PREVENTION SYSTEM

LPG consists of mixture of propane and butane which is highly flammable chemical. It is odorless gas due to which Ethanol is added as powerful odorant, so that leakage can be easily detected. LPG is one of the alternate fuels used now days. Sometimes liquefied petroleum gas is also known as LPG, LP gas, Auto gas etc. This gas is commonly used for heating appliances, hot water, cooking, and various other purposes also. LPG is also used as an alternate fuel in vehicles due to soaring in the prices of petrol and diesel. Some people have low sense of smell, may or may not respond on low concentration of gas leakage. In such a case, gas leakage security has systems become an essential and help to protect from gas leakage accidents. A number of research papers have been published on gas leakage security system. Embedded system for Hazardous gas detection and Alerting has been proposed in literature. Where the alarm is activate immediately, if the gas concentration exceeds normal level. Bhopal gas tragedy was an example of gas leakage accident in India. This was world's worst gas leakage industrial accident. Gas leakage detection is not only important but stopping leakage is equally essential. This paper provides a cost effective and highly accurate system, which not only detect gas leakage but also alert (Beep) and turn off main power and gas supplies, and send an SMS. GSM module is used which alert the user by sending an SMS. In order to provide high accuracy gas sensor MQ-6 has been used. Toxic and inflammable gases are widely used in industry, heating systems, home appliances and vehicles. This includes combustible gases like propane, ethane, butane, methane, ethylene etc. Liquefied Petroleum Gas (LPG), also referred to as propane or butane are normally stored in pressurized cylinders in liquid form and vaporize at normal temperatures. A leakage can ignite and cause explosion. Therefore, the leakage detection of gases has gained more interest in recent years especially in fields of safety, industry, environment, and emission control. A conventional gas leakage system uses on-site alarms as a warning to indicate the leakage. The drawback of the conventional leakage system is that it becomes ineffective in the absence of first response team on-site. Therefore, there is a need for a system to detect the leakage and send the information to the first response team through wireless media. A leakage detection system that initiates a warning call or SMS will be more effective in the absence of people on-site.

LITERATURE SURVEY

A.Mahalingam et.al. proposed a gas leak detector that meets the UK occupational and health standards. Gas leakage is a major concern with residential, commercial premises and gas powered transportation vehicles. One of the preventive measures to avoid the danger associated with gas leakage is to install a gas leakage detector at vulnerable locations. The objective of this work is to present the design of a cost effective automatic alarming system, which can detect liquefied petroleum gas leakage in various premises.

K Padma Priya et al. proposed an embedded system for Gas Cylinder maintenance, the proposed system consists of three main modules a GSM and PIC module, leakage detection module and protection circuitry. The detection module detect the gas leakage and sends SMS to the consumer through GSM. The GSM module is used to send short messages about the possibility of gas leak and as an added feature indicate that it may book a refill cylinder or can program the device to automatically book the cylinder via SMS. The weight of the cylinder is monitored by interfacing load cell to micro-controller.

Sunithaa.J et al. designed a wireless LPG leakage monitoring system for home safety. The proposed system detects the leakage of the LPG and alerts the consumer using GSM about the leakage and it will switch on the exhaust fan. This system also has a feature that the consumption is approximately indicated in terms of the total weight. Whenever the system detects the increase in the concentration of the LPG leakage it immediately alerts by activating an alarm and simultaneously sending message to the particular mobile phones. The fan is switched on to exhaust gas and an LPG safe valve fitted to the cylinder is closed through signals to avoid further leakage. The device assures safety and prevents explosion.

Jolhe et al. have designed a microcontroller based system where a gas sensor (MQ6) is used in detection of LPG leakage. This unit is also integrated with an alarm unit, to sound an alarm or give a visual indication of the leakage. The sensor has high sensitivity with quick response time at affordable cost. If leakage is detected, message to the particular user or to family member using cellular network called GSM is sent automatically. It also measures the weight of LPG cylinder and displayed in LCD display. A gas quantity of less or equal to 10kg, it requests for the new cylinder by automatically sending text message to a distributor. Also when cylinder weighs less than or equal to 0.5 Kg, it informs the consumer by sending a message to refill the cylinder.

DESIGN DIAGRAM

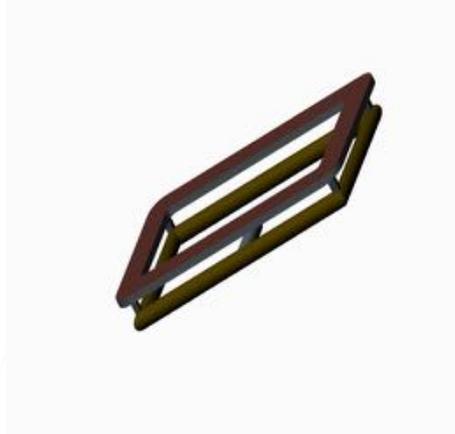


FIG 7.1 CONCEPTUAL DESIGN

CONCLUSION

The integration of fire detection and alarm systems with other building systems should increase fire safety in the building. The fire detection system will be able to communicate with other building systems, correctly discriminate between fire and non-fire threats, identify the exact location of a fire in the building and provide continuous estimates on smoke and fire spread in the building. However, the integration technology may also create new risks. Sensor technologies, for example, will need to be robust enough to prevent false alarms, and ensure that vital information such as the location of occupants is not lost due to data overload during a fire. Integrated building systems will need to be designed not only to give fire safety priority over other building activities but also that fire emergencies do not crash the building service system.

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PHOTOCOPY



FIG AUTOMATIC GAS LEAKAGE DETECTION AND PREVENTION SYSTEM ROBOT

