

Gas Leakage Detection and Prevention

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ABSTRACT:

Gas leakage tragedies and mishaps have lead to heavy losses over the decades. So it is very important to detect any gas leakage and cease any disaster. So here is a proposal of a system to detect LPG gas leakage cases and provide a security alert system to consumers. It is a proposal to build a system using a MQ6 gas detection sensor and interface it with microcontroller along with GSM modem. The GSM modem sends out an alert message to the authorized people or owners on the android application so that they may handle the issue by closing the valve through the application itself. Then the electric power supply system is also shut down to prevent fire accidents.

KEYWORDS: GSM (Global System for mobile communications), LPG (Liquefied petroleum gas), Gas sensor MQ-6, PIC Microcontroller (PIC16F877A), Relay

INTRODUCTION:

Liquefied petroleum gas contains mixture of gases like propane and butane. Leakage can easily detected by adding Ethyl Mercaptan as a odorant. These gases can catch fire easily. LPG is used as propellant, power source, fuel and as a refrigerant. When a leak occurs, the leaked gases may lead to fire and explosion. So the leakage should be controlled to protect people from dangerous hazards.

Bhopal gas tragedy is an example of disasters due to gas leakage. Gas leakage detection is not only important but controlling the leakage is also necessary.

Natural gas is another widely used fuel in homes. Both gases burns to produce clean energy, however there is a grave danger of their leakage. The gases are heavier than air and do not disperse easily and may lead to suffocation. And when inhaling the gas leakage into the air, it may lead to explosion. Due to the explosion of LPG gas the number of deaths has been increasing in recent years. To cope with this problem there is a need for a system to detect and prevent leakage of LPG.

This paper provides a cost effective and highly precise system, which not only detect gas leakage but also alerts (Beep) and turns off the main power supply and gas supply, and send an SMS to the owner. GSM module system is used which alerts the user by sending an SMS. In order to provide high accuracy gas sensor MQ-6 is used.

LITERATURE SURVEY:

1. Leakage detection and real time gas monitoring system, by Meenakshi Vidya:
In this system, the gas leakage is detected and controlled with the help of exhaust fan. The level of LPG in cylinder is also continuously monitored.
2. Design of wireless LPG monitoring system by K.Padmapriya :
In this project, the user is informed about the leakage via SMS and the main power supply is turned off
3. Selvapriya et.al.. proposed the system in which the leakage is detected by the gas sensor and produce the results in the visual forms. It provides a design approach on software as well as hardware.
4. V.Ramya et.al... proposed the system that uses two different sensors for detecting the leakage and requires resetting manually after every situation.

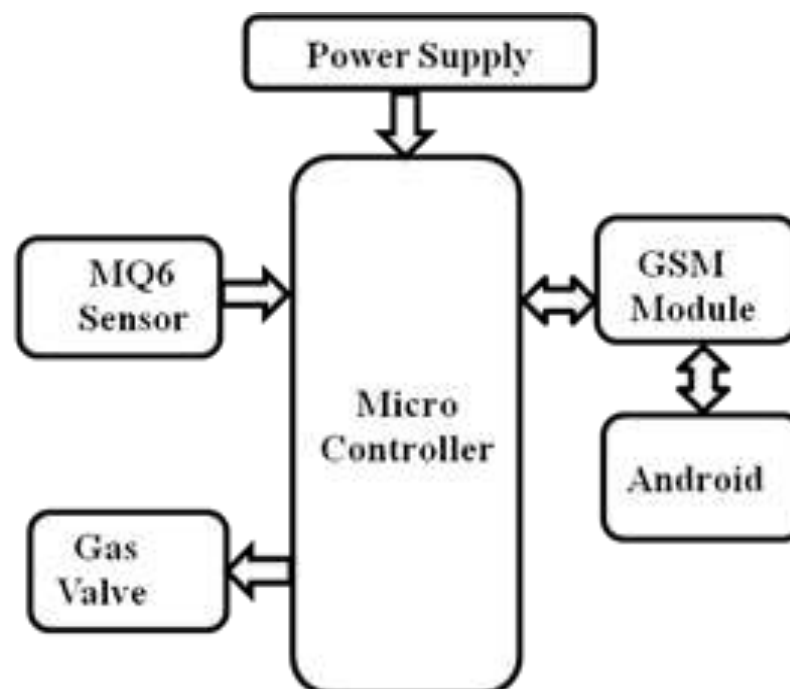
5. L.K.Hema et.al.. proposed the smart sensor technology. In this a flexible gas detection system is developed. In this, the leakage is detected and controlled by using exhaust fan.

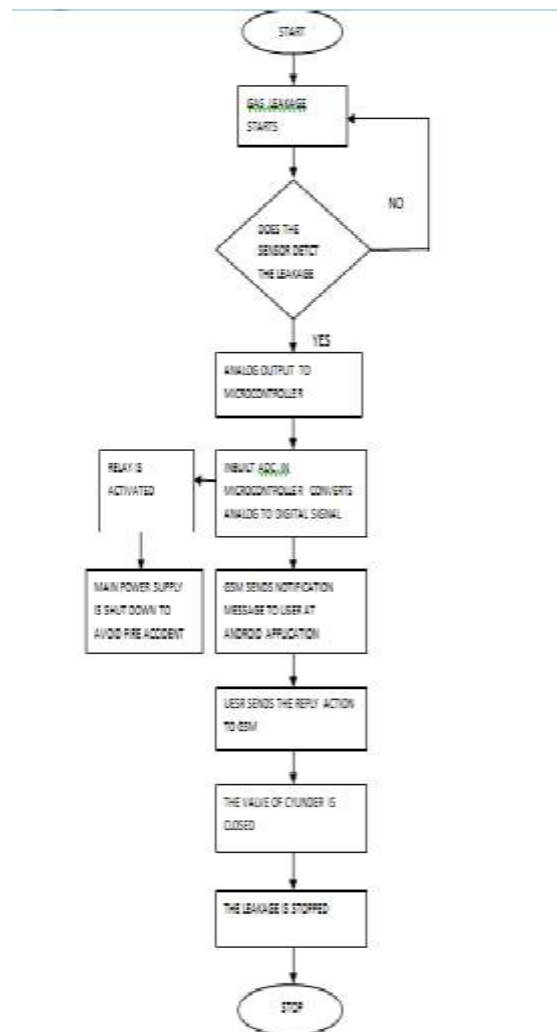
EXISTING METHODOLOGY:

In the present method, various gas sensing technologies are used. The LPG gas leakage is detected through semiconductor sensor. Nowadays the main reason accidents is due to the leakage of LPG. This leakage of LPG takes place when the regulator valve is not closed. This is the basis of these kinds of accidents. Already there may be some sorts of preventive measures like when the leakage is detected, message can be sent to the fire station. The other measure is that exhaust fan can be switched on when leakage is detected. The first mentioned method has the disadvantage that it needs a manual controlling which puts human into direct risk. The second method has the disadvantage of explosion due to improper wiring of exhaust fan. In all these method above, no control action is taken.

PROPOSED METHODOLOGY:

The proposed system takes an automatic control measure after the detection of LPG leakage. This control action provides a mechanical handle for closing the valve. We are increasing the security by means of relay which will shutdown the electric power to the house. By using GSM, an alert message will be sent to the user so that the valve can be closed through the android application by the user.

BLOCK DIAGRAM:



RESULT:

This is an efficient method for automatically detecting and controlling the LPG gas leakage. If there is any gas leakage this system detects gas leakage and if gas leakage exceeds certain level then this system automatically alert the people by sending the message on the android application and prevent the accident by closing the gas valve through the app itself avoiding any damage. The system also shut down the main electric power supply to avoid any further accident.

REFERENCES:

1. GSM:” Architecture, protocols and services” by Jorg Eberspacher, Christian, Hansjoerg vogel, Christian Hartmann, John Wiley Son Ltd, 2009
2. Luay Friwan,Khaldon Lweesy,Aya Bani-Salma,Nour Mani , “A Wireless Home Safety Gas Leakage Detection System”, IEEE 2011
3. “GSM based gas leakage detection system” by Ashish Shrivastava, Ratnesh Prabhaker, Rajeev Kumar and Rahul Verma,2013
4. “Gsm based LPG leakage detection and controlling system” by Prof.M.Amsaveni,A.Anurupa,R.S.AnuPreetha,C.Malarvizhi,M.Gunasekaran, 2015
5. L.K.Hema, Dr.D.Murugan, M.Chitra,” WSN Based Smart System for LPG Detection & Combustible Gases”, published in 2013
6. P.Meenakshi Vidya, S.Abinaya, G.Geetha Rajeswari, N.Guna ,“Automatic LPG detection and hazard controlling “ published in April 2014