GAS LEVEL AND LEAKAGE DETECTION SYSTEM

Dr. Devipriya A1,4, Mr. Dinesh S2, Mr. Ajith C3
1Assistant Professor (Sl.G), Dept. of CSE, KPR Institute of Engineering & Technology, Coimbatore, Tamil Nadu, India
2, 3 UG Student, Dept. of CSE, KPR Institute of Engineering & Technology, Coimbatore, Tamil Nadu, India

ABSTRACT

Compressed Natural Gas (CNG) and Liquified Petroleum Gas (LPG) are mostly used gases today and they are used for transporting and cooking purpose. So, they are in high demand today. Therefore, there requesting a high need to create some technique that can helping to satisfies the need of the consumer’s greatly. This means that whenever the filling container is getting empty, there should be some mechanism that can suggest the user to arrange for the replacement of the current container with the another filled one or the system will automatically send the request to the gas agency itself, else the filling process may get stopped due to unavailability of the gas. Hence, this paper proposes a microcontroller based gas level sensing system that can help in providing the status of the gas level in the container. Gas seepage & gas limit identification is one of the crucial issues in day to day life. And the gas leakage and gas outlier is primary issue that can be solved. LPG is mainly a huge flammable & will cause severe disaster to consumer & assets. To overcome these scenario, a consistent volume of workforce have to be needed to develop flexible technology for detecting gas seepage and gas level inside the container. Our motive is to avoid the danger in the cooking area by using recent technology like Internet of Things. The primary goal is to implement the design & development of SMS (Short Message Service) depends Gas seepage and Low Level Gas Detection. MQ2 is used to identify the gas leakages in a cooking area by detecting the LPG gas presence in air. The same after discussion showed that the model is suitable for detection of the gas level in the container at the gas station too.

Keywords: Short Term Message, LPG, GSM, Internet of Things (IoT), CNG

I. INTRODUCTION

Liquefied Petroleum Gas (LPG) is currently the most commonly used gas in our home for cooking purposes. LPG gas is a highly flammable gas, if leakage happens this can cause major damage to consumer or the property. Hence it should be used in safe handling manner and additional care should be taken in order to prevent any gas leakage possibilities that might cause some severe damages. The main property of LPG is that being heavier than air, it doesn’t disperse from air easily and may lead to fire accidents when triggered.

The leaked gases if it gets ignited or triggered by any kind of electrical instruments may lead to explosion. The number of deaths and injuries due to the explosion of gas cylinders has been increasing now recent days. Now a days, people are having busy schedule and hence sometimes they are forget to book the gas cylinder from the gas agency. So it would be much better and helpful if there was a automated technique that book gas cylinder automatically.

A large amount of gas is being wasted due to the carelessness of consumer. Sometimes they forget to turn off the volve which may also can lead to damage. An added feature is that if the users accidently forget to turn off the gas volve, the system will inform by sending a message to user’s mobile phone when the gas leakage detected. So, the problem of wastage of the gas is solved.
II. LITERATURE SURVEY

1. T. Machappa, M. Sasikala, and M. V. N. Ambika Prasad exhibited a framework that electrical obstruction increments with increment at intervals the grouping of the gas. The variation of resistance depends on the dopents of the polyaniline, like metal oxides, bimetal oxides (ceramics), etc. conduction, the variation of resistance of the sensing material is either by activity of atmospherically substance on the sensing surface and/or by direct reaction of lattice substance or gap substance with the check gases unit the gas sensing mechanism. throughout this the gas sensing behavior of polyaniline and polyaniline salt composites unit given.

Corresponding author. Tel.+91-9600940078.
E-mail address: devipriya.a@kpriet.ac.in

1. Fabien Chraim, Yusuf Bugra Erol, Kris Pister had explained the gas leakage solution for industrial places. Since the leakage of gas in the industries are unknown, the gas sensors are kept around the places where the gas leakage is possible. The information from these sensors are then send to the single system. The two techniques used are fixed instrumentation and mobile sensing. The mobile sensors are placed in the respective sources and the readings are evaluated in that spot. These readings are then transmitted to the users or workers through wireless connection. But the main drawback is that the 2 localization accuracy is under 5m.

2. L.P. Deshmukh, T.H. Mujawar, M.S. Kasbe, S.S. Mule, J. Akhtar and N.N. Maldar provides the abstract design so as to watch the outpouring of LPG within the atmosphere. The LabVIEW programming environment is developed to connect large area. The leakage level of a gas concentration is done using the LabVIEW GUI. The nodes and network are configured in this program. The measurements which is taken by the sensor nodes through the coordinator node using USB and ZigBee interface are also captured in this program. When the system detects the gas leakage, it sends a SMS alert to the user and also it activates the alarm. The gas flow emission is also controlled by using the solenoid valve. The output of the system is supervised using the personal computer or laptop.

[8][9][10] Kumar Keshamoni and Sabbani Hemanth planned the sensible Gas Level observance, Booking and Gas outpouring Detector victimization IoT. During this the gas amount within the instrumentation is ceaselessly monitored and it additionally intimates the various branch so as to position the new LPG cylinder. The Radio frequency module is used in order to make the user to use it easily and this module consists of the transmitter and receiver kit. The transmitter is an encoder kit which is fixed in the main board and the receiver is a decoder kit which is fixed in the sub board. In addition to easy usage, it also have the advantage that it gives the same information. The temperature sensor is also used in order to detect the errors which occurs due to the surrounding environment. The main drawback in this system is that the use of processor instead of the controller and moreover there is no security for the user.
III. EXISTING SYSTEM

The system detects the level of gas in the air by checking whether it exceeds the safe. It sends an SMS to the consumer using GSM modem and activates the audiovisual alarm which includes LED and a Buzzer to alert the user at home. This system alerts only the resident. Chances are there for Fire Accidents to occur if the resident is intimated late due to certain reasons. And more over if the resident is not present in the house at that particular time then there is no use of giving an alert.

IV. PROPOSED SYSTEM

In this system, A new technology IOT (Internet of Things) is used to get fastest notification of gas leakage. For that we used a Microcontroller called a Arduino UNO. In this we need to write coding and also some constraints needs to be set to get the notification on Mobile phone.

The user can receive two types of messages based on the situation.

- Low gas level detection message.
- Gas leakage detection message.

The Low gas level detection message will sent only if the gas container weight decreased less than 10 lbs. And the gas leakage detection message will sent when the presence of LPG in air greater than 200 metrics.

V. IMPLEMENTATION DETAILS

LOW LEVEL GAS DETECTION METHOD:

Since for the detection off low level gas and gas leakage we have used the load cell and MQ2 sensor. For detecting the low level gas we have set the minimum gas level in the container should be greater than 10 LBS. If the gas in the container decreases less than 10 LBS the GSM will get triggered to send the SMS. The SMS will consist of the details of the customer that is Gas number and Name of the user.

GAS LEAKAGE DETECTION METHOD:

Here for the detection of Gas leakage in the air, The MQ2 sensor is used. Basically this sensor is used to identify the gas in air. If the gas exceeds the threshold value then the GSM is triggered to send the SMS to the user. The SMS will consist of Gas leakage alert. Then user can manually turn off the volve.
Figure 3 – Diagram for Detecting Gas leakage VI.

**Code for gas detection system**

```plaintext
COM3

AT+CMGF=1
AT+CMGS="+919787081776"
GAS LEAKAGE
☐
Reading: 1.6 lbs
Gas =128ppm
GAS NUMBER : 111111 NAME : XXXX
AT
AT+CMGF=1
AT+CMGS="+918526281947"
GAS NUMBER : 111111 NAME : XXXX
☐
GAS LEAKAGE
AT
AT+CMGF=1
AT+CMGS="+919787081776"
GAS LEAKAGE
☐
```

Figure 4 Low Gas Level Detection
Figure 5 Gas Leakage Detection
VI. CONCLUSION

In the current scenario the usage of LPG gets increased as a greater manner. As a result of this usage, the damages to the consumer’s or the property also gets increased. Mostly they are caused by the leakage of gas, this issue also increasing day by day. Our proposed system explains the completely automated technique towards the booking of the gas cylinder. This system alert’s the user when any gas leakage is detected and also when the gas level is critically low that is below 10 LBS. Our proposed system is very effective and ecofriendly due to the reason of detecting the leakage of gas presented in air and alert the user. Using IOT, it allow us to book a gas from the gas agency, when the weight of the gas cylinder reducing below the minimum value. Hence, the cost effective gas level detection and gas leakage detection with alert system is proposed, designed and implemented successfully.

REFERENCES


