GAS LEAKAGE MONITORING AND ALERTING SYSTEM FOR INDUSTRIES

LITERATURE SURVEY:

1.Smart Gas Level Monitoring, Booking & Gas Leakage Detector over IoT:

This project proposed the most common problem experienced in our day- to-day lives that is regarding GAS container going empty. We bring this paper to create awareness about the reducing weight of the gas in the container, and to place a gas order using IOT. The gas booking/order is being done with the help IOT and that the continuous weight measurement is done using a load cell which is interfaced with a Microcontroller (to compare with an ideal value). For ease it is even has been added with an RF TX & Rx modules which will give the same information. When it comes it to security of the kit as well as gas container we have an MQ-2(gas sensor), LM 35(temperature sensor), which will detect the surrounding environment for any chance of error. Whenever any change is subjected in any of the sensors (load cell, LM35, Mq-2) a siren (60db) is triggered.

a. LM 35 (temp. sensor) For the sensors, if any fire is to be happened then the temperature sensor will sense an high change(positive change) in temperature and will send an pulse to microcontroller which intern will send an update to the internet through IoT, and as well it will trigger an siren alarm in the RF Rx kit(sub board).

b. BMQ-2 (Gas Sensor) MQ 2 sensor is basically an LPG (liquefied petroleum gas) which is composed of propane & butane, so when a gas leakage is sensed by the sensor it will send an high pulse to the Mc which will update it in the IoT, and even an buzzer is heard in the RF Rx kit. And the problem can be sorted & solved. Thus the overall components & sensors play role in the paper as explained above.

2. Gas Leak Detection and Localization System through Wireless Sensor Networks :

In this project we proposed a prototype of a Wireless Sensor Network (WSN) to monitor and locate gas leaks of a complex indoor environment. Specifically, a mobile node is moving inside a building to monitor any leakage of carbon dioxide (CO_2), supporting and displaying the level and the location of the leakage. Throughout the demonstration, the technological advantages of cognitive networking along with multichip routing are explored.

3. Cloud Connected Smart Gas Leakage Detection and Safety Precaution System

 The project design and develop a cloud connected smart LPG gas cylinder platform, acting as a safety device for detecting LPG gas leak at low levels to avoid any possible accidents. It is also capable of sensing fire breakout in the area and weight of the gas in order to provide real time monitoring and alert over Internet. If an abnormal condition is detected, the device sends an alert to the smartphone app of the user and also generates an alert e-mail to other authorities. In addition to this upon detecting a gas leakage or a fire breakout, the device automatically takes safety precautionary measures, like

gas valve closing, ventilation opening, fire sprinkler activation and home electrical power supply cut-off. The device connects to the internet via Wi-Fi and thus increasing the mobility of the platform within the premises of the house. A Wi-Fi capable ARM Cortex-M4 microcontroller is used to implement the system. This device offers a complete, low cost, powerful and user friendly way of real-time monitoring and remote control of gas leakages and prevention mechanisms in household and industrial areas.

Features of system hardware:

a) Live-Monitoring and Control The smartphone app can show the amount of LPG gas remaining, present room temperature other device status. These data are updated every few seconds providing real-time live monitoring. In addition to this, the actuators connected on the device can be controlled from the smartphone app giving additional benefits for the user.

b) On-Demand Automatic Reordering Facility If the device is configured in automatic reordering mode, whenever the gas level comes below a certain threshold, the device automatically sends a gas cylinder requesting e-mail to the gas vendor or gas distributor. The user must save the e-mail address of the gas distributor before enabling this feature.

c) Low Weight Alert Every time when a new gas cylinder is delivered, the user must press a button on the device which starts the process of measuring the weight of the cylinder and if it detects low weight cylinder, which means a low fuel content, it will immediately alert the user smartphone app about this as well as send an e-mail alert to the gas agency company to register this case. This is a useful application in finding and avoiding a low weight gas cylinder at the time of delivery.

d) Actuators A servo motor is used to control the gas valve position, whereas DC fan motor mechanism acts like a ventilation/exhaust fan [4]. Another DC electrical motor will do the work of a fire sprinkler motor. All these motors are controlled using appropriate PWM signal generation. An AC relay circuitry is used cut-off the mains electrical supply.

e) Local Audio Alarm A loud beep alarm sound is generated intermittently to alert the neighbouring people.

f) Device User Interface Notification LED's are used to indicate Wi-Fi provisioning and cloud server connection status.

4. Gas Leakage Detection and Smart Alerting and Prediction Using IoT IoT is an expanding network of physical devices that are linked with different types of sensors and with the help of connectivity to the internet; they are able to exchange data. Through IoT, internet has now extended its roots to almost every possible thing present around us and is no more limited to our personal computers and mobile phones. Safety, the elementary concern of any project, has not been left untouched by IoT. Gas Leakages in open or closed areas can prove to be dangerous and lethal. The traditional Gas Leakage Detector Systems though have great precision, fail to acknowledge a few factors in the field of alerting the people about the leakage. Therefore we have used the IoT technology to make a Gas Leakage Detector having Smart Alerting techniques involving calling, sending text message and an e-mail to the concerned authority and an ability to predict hazardous situation so that people could be made aware in advance by performing data analytics on sensor readings.