GAS LEAKAGE MONITORING AND ALERTING SYSTEM FOR INDUSTRIES

LITERATURE SURVEY

1.TITLE: LPG monitoring and leakage detection system

AUTHOR: Shruthi Unnikrishnan; Mohammed Razil; JoshuaBenny; Shelvin Varghese; C. V. Hari

YEAR OF PUBLICATION: 2017

ABSTRACT: In this paper, we have proposed a Liquefied Petroleum Gas (LPG) monitoring and leakage detection system. With the large demand and use of LPG, this system would be helpful to monitor the usage of LPG on a regular basis and to alert about any hazards that may occur due to LPG leakage. We have designed a system that alerts the user of the amount of LPG left so that appropriate measures can be taken. Since LPG is a highly hazardous and inflammable gas, we have also designed a system to alert the user with an alarm when there is a leakage of LPG so that measures are taken to avoid an explosion.

2. TITLE: On-line gas monitoring for increased transformer protection

AUTHOR: Mickel Saad;Ed teNyenhuis

YEAR OF PUBLICATION: 2017

ABSTRACT : Transformers are vital and high cost components of the electric power system. On-line monitoring is a tool that can assess the condition of these valuable assets in real time. The importance of a monitored transformer and the economic consequences of a failure, provide the basis for selecting a monitor with its potential cost benefits. The most basic and important transformer monitoring equipment is the on-line Dissolved Gas Analysis (DGA) monitor. This paper discusses the importance of on-line DGA monitoring for power transformers, types of available sensors and various qualities to examine when choosing a monitoring device.

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

AUTHOR: Kumar Keshamoni;Sabbani Hemanth

ABSTRACT: This journal explains about 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 a 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. When ever any

change is subjected in any of the sensors (load cell, LM35, Mq-2) a siren (60db) is triggered.

4.TITLE: Monitoring and Detection of Combustible Gas Leakage by Using Infrared Imaging

AUTHOR: Binglu Liu;Haocheng Ma;Xiaoping Zheng;Lihui Peng;Anshan Xiao

YEAR OF PUBLICATION: 2018

PUBLISHED IN: 2018 IEEE International Conference on Imaging Systems and Techniques (IST)

ABSTRACT: In this paper, an infrared thermal imaging system is developed for combustible gas leakage monitoring and detection. The related imaging processing and gas leakage detection algorithms are presented. The gas leakage monitoring and detection experiments regarding three different scenes, including two indoor scenes and one outdoor scene, are carried out. The preliminary results show that the proposed imaging system and the algorithms are of detecting the leakage of 1% isobutane at 0.2L/min.

5.TITLE: Hardware Design of Factory Toxic Gas Leakage Monitoring System Based on CC2530

AUTHOR: Chunlong Ma;Nan Li;Xin Pang;Shaohua Wang;Yue Yang

YEAR OF PUBLICATION: 2018

PUBLISHED IN: 2018 10th International Conference on Intelligent Human-Machine Systems and Cybernetics (IHMSC)

ABSTRACT: In order to solve the problem of inflexible location, dead angle and large measurement error of the network node of the

wire monitoring system for factory toxic gas leakage, a toxic gas monitoring and alarm system based on CC2530 wireless sensor network is designed. The hardware design of the monitoring system and the hardware design of the CC2530 network node are mainly studied. The system guarantees the mobility of the poisonous gas monitoring node, the absence of monitoring dead angles, and the improvement of measurement accuracy.

6. TITLE: Hazardous Gas Detection and Notification System

AUTHOR: Maribelle JUALAYBA;Kristian REGIO;Harold QUIOZON;Adrian DESTREZA

YEAR OF PUBLICATION: 2018

PUBLISHED IN: 2018 IEEE 10th International Conference on Humanoid, Nanotechnology, Information Technology,Communication and Control, Environment and Management (HNICEM)

ABSTRACT: Hazardous gases like propane and methane are combustible and could cause explosion if confined in a close room. The study described in this paper comprises a system that involves detection and notification of hazardous gases present in an area. The system has three sensors; hydrogen sensor, Liquefied Petroleum Gas (LPG) sensor, and methane sensor that serve as switches with different set-points. Every level of gas detected is send to the Arduino that serves as the controller which analyze the level of gas present. The controller is also in charge for triggering the lamp, exhaust fan, buzzer, Liquid Crystal Display (LCD) monitor and Global System Mobile (GSM) module. The system has three lamps that indicate the level of gas being detected. Green light means "safe level", yellow means "medium level", and red for "danger level". The exhaust fan is activated as the controller detects medium level, which is simultaneous with the lighting of the yellow light and will only be deactivated when the system detects again safe level. The buzzer is activated as the controller detects danger level which is synchronized with the lighting of the red light. The LCD monitor displays the level of gas being detected and the GSM module sends Short Message Service (SMS) as notification to concern people.

7. TITLE: Smart Gas Leakage Detection with Monitoring and Automatic Safety System

AUTHOR: S.M. Zinnuraain;Mahmudul Hasan;Md. Akramul Hakque;Mir Mohammad Nazmul Arefin

YEAR OF PUBLICATION: 2019

PUBLISHED IN: 2019 International Conference on Wireless Communications Signal Processing and Networking (WiSPNET)

ABSTRACT: In this paper, we have proposed a LPG (Liquified 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 notify 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.

8. TITLE: Methane Leakage Monitoring Technology for Natural Gas Stations and Its Application

AUTHOR: Bing Han;Qiang Fu;Yi Huang;Hanfang Hou

YEAR OF PUBLICATION: 2019

PUBLISHED IN: 2019 IEEE 5th International Conference on Computer and Communications (ICCC)

  ABSTRACT: In natural gas stations, leakage monitoring technologies are of great significance for immediately identifying gas leakage and minimizing various losses caused therefrom. The Fiber Bragg Grating (FBG) sensing technology is applied to monitor key areas and equipment in natural gas stations that may suffer methane leakage, considering the shortcomings of existing leakage monitoring technologies applied for the natural gas stations, i.e. high false alarm rate, poor stability, easy to be interfered by background gas, etc. The false alarm rate can be effectively reduced by simultaneously monitoring the leakage vibration and methane concentration. Results of laboratory tests indicate that the monitoring technology proposed in this paper enjoys such advantages as low cost, easy-to-install and high reliability, and can be extensively applied for monitoring the methane leakage in natural gas stations and valve chambers of long-distance and gathering pipelines.

9. TITLE: Pipeline Gas Leakage Detection And Location Identification System

AUTHOR: M. Pajany;A. Hemalatha

  ABSTRACT: Every diminutive task in this planetary is machine-controlled by cyberspace of belongings which makes our life easier. Now internet of things is used for safety purpose also. Nowadays outflow of gas in pipeline is the major difficulty. The chief mental object of this project is to detect the leakage of gases in the pipeline. Pipeline will be monitored with in an regular intervals using gas detection sensors. If there is any leakage in the pipeline then it will be detected and information such as name of the gas, pressure rate of the gas and its location where there is leakage of gases will be passed to the mobile phone, laptops, etc using IOT. The accurate location for the gas leakage will be detected using the GPS.

Advantages of this employment is,used to prevent failure of lives due to blow up, fire, etc.

10. TITLE: IoT and ML based Smart System for Efficient Garbage Monitoring: Real Time AQI monitoring and Fire Detection for dump yards and Garbage Management System

AUTHOR: Dev V. Savla;Amogh N. Parab;Kaustubh Y. Kekre;Jay P. Gala;Meera Narvekar

YEAR OF PUBLICATION: 2020

PUBLISHED IN: 2020 Third International Conference on Smart Systems and Inventive Technology (ICSSIT)

ABSTRACT: There is always a significant amount of challenges associated with waste and its disposal, which can be essentially mitigated by the use of technology. As the urban population increases, the amount of waste disposal is also increasing at an unprecedented rate. The inappropriate disposal of this waste will lead to many hazards including the risk of fires in the dump yards that leverages poisonous smoke in the atmosphere by adversely affecting the safety of nearby residential areas. Monitoring the occurrence of fire in huge dumping grounds manually is a tough task and thus developing an automatic fire extinguishing system is highly required. The advanced technologies can be leveraged to ensure the protection and safety of people by eliminating such hazardous risks. The air quality index (AQI) is an indicator of daily air quality report that shows how air quality affects a person's life in a very short time. AQI plays a key role in ensuring the safety of residential areas. The proposed system aims to aid the possible hazardous risks associated with the dump yard and waste management.

11. TITLE: Sulfur Hexafluoride Gas Leakage Monitoring and Early-Warning Method for Electrical Power Facilities

AUTHOR: Chunrui Liu;Fujie Deng;Lei Shi;Feng Wang

ABSTRACT: Most transformer substations in power supply facilities rely on sulfur hexafluoride electrical equipment. A sulfur hexafluoride gas leak can cause serious health concerns if effective measures are not adopted in time. Therefore, in this study, a sulfur hexafluoride gas leakage monitoring, early-warning, and emergency disposal model was established. First, taking the main transformer chamber of an underground transformer substation as the research object, a 3D-model was built, and a numerical simulation was performed. Second, the simulation results were utilized to determine the dispersion and concentration distribution of the sulfur hexafluoride gas, identify concentration-sensitive areas, and arrange sensors based on the simulation results, to ensure early-warning in case of leaks. Then, a sulfur hexafluoride gas leakage monitoring and early-warning model was built based on the data collected using sensors at the monitoring points; thereafter, a construction method was developed for a sulfur hexafluoride gas leakage emergency disposal model, which can be referenced to establish a leakage gas recycling system. This paper also provides some recommendations regarding the determination of the optimal conditions for this emergency recycling device, which can be utilized to maintain the concentration of sulfur hexafluoride gas below a specified value and to construct a recycling time prediction model. The results of the study can provide a theoretical basis for sulfur hexafluoride gas leakage early-warning and emergency disposal, which will contribute to the prevention of suffocation-related accidents.

12. TITLE: A Smart Natural <mark>Gas Leakage</mark> Detection and Control <mark>System</mark> for <mark>Gas</mark> Distribution Companies of Bangladesh using IoT

AUTHOR: Hilton Paul;Mohammad Khalid Saifullah;Md. Monirul Kabir

ABSTRACT: This paper proposes a smart mobile based model of gas leakage detection and control for gas distribution system of Bangladesh using IoT, called as smart natural gas leakage detection and control system (SNLDCS). The proposed SNLDCS has been implemented in both software and hardware modules. The existing researches are about Liquefied Petroleum Gas (LPG) leakage detection that are used for cylinder gas. Therefore, these models are not suitable for gas distributions companies of Bangladesh where natural gas leakage is being controlled from remote placesThe experimental results confirm that, implementation of SNLDCS model in gas distribution system in Bangladesh can provide the quickest detection and rapid resolve of gas leakage. As a result, it will increase safety, decreases system loss and reduces Greenhouse Gas (GHG) emission in the air.

SUBMITTED BY

MOTHIKA R

MANI K V

PADMESH G N

SREE VARSHA S V