Study on Development of CNG car fire protection system for human safety.

S. S. Sable, **Harshal Mulay, Mahesh Paval, Divya Pawar**, **Kalpesh Shirke**

Electrical Engineering Department
D.Y Patil Institute of Engineering And Technology Ambi,Pune

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Abstract - Natural gas as engine fuel is a commercially very attractive option for cars. From the second side, fuel can be dangerous if handled improperly. Recent fire accidents involving natural gas car have shown that cylinders may explode through complaint with current UN ECE R110 regulation. Such a repeated scenario is certainly not acceptable having in mind the tremendous amount of energy released when compressed cylinder burst. This article highlights the need of fire protection system in CNG cars.

The massive industrialization of today's world is causing the industries to grow. Industrialists frequently don't construct high-rise buildings according to the necessary regulations. Mishaps of all kinds result from this; fire accidents are among the most frequent [1]. making it difficult for the neighborhood fire department and police to keep up with the issue. Automatic fire alarms, smoke detectors, and water sprinklers are all commonly used in many industries to detect and put out fires. Because of urbanization, fire-related mishaps are getting more serious. 6% of all accidental deaths occur in India [2] and are the result of fires. The explosion of gas stoves and gas cylinders is responsible for roughly 1/6th of all fire-related fatalities between 2010 and 2014. [3]. 7,743 people died from electrical short circuits in the same years [2]. There are around 54 fire-related fatalities every day in India, according to reports [4]..

Key Words: CNG, Safety , advance technology, Sensors ,Fire Protection, Investigation.

1. INTRODUCTION

In order to protect people and property from fire, it is crucial to build a real-time monitoring system for fire. The prevention of fire accidents and the dangers associated with them have given rise to a variety of strategies and methodologies. These days, keeping track of fire accidents and controlling fires are major concerns. The need for more technology in the fields of monitoring and firefighting is emphasized by the importance of public safety. The advancement of science and technology in mitigating fire-related calamities has received particular focus in literature. The use of cuttingedge technology like the Internet of Things in the field of firefighting and monitoring is now causing the researchers considerable anxiety. In order to handle the complicated business information, the internet of things has great scalability and the capacity to share resources. Additionally, it is essential for monitoring fire control facilities, managing fire alarms, and managing fire equipment. IoT and firefighting combined can be beneficial for monitoring fire, monitoring hazard source, fire-fighting rescue, early warning of fire, early disposal, and preventionThe current fire detection and alarm system technologies have a number of shortcomings. Poor fire detection accuracy, latency, and a rigid network

interface system are the downsides. The number of malfunctions that occur frequently in the current systems is high, and one of their key problems is time delay. Therefore, it is crucial to create a framework that addresses these drawbacks and satisfies the demands of the current user base. The development of fire alarm and detection systems is responsible for the automatic detection of fire and the notification of the user. The automatic fire detection systems' additional purpose is to notify the fire department and emergency response agency automatically. Finding a fire is vital, but so is alerting others and taking the appropriate measures. Sometimes a person might not be there when an accident occurs, or even if he is, he might not be able to act because of shock or a lack of equipment. The result could be an emergency off-site. This study provides an automated fire detection system that is ARC-GIS and IoT based. Different sensors and modules are used by the system to operate normally. The buzzer that continuously makes noise for a local alert is activated by Arduino after the IR sensor detects a fire. The customer and the system owner are both notified through the android application. The fire brigade authorities also have a different Android app that they can use to get notifications. Additionally, this program provides the best path to get them to the scene of the incident.

2. Body of Paper

2.1 Literature Survey

The most serious danger facing the automobile and residential sectors is gas leaks. Recently, safety has been a major factor in home security against gas leaks. The development of a system for the monitoring and control of gas leaks is the primary objective of this article. The flammable gas sensor MQ-2 that is used to detect liquefied petroleum gas was the gas sensor used in the development of this approach (LPG). Gas concentrations of 200 to 10,000 ppm are detected by the sensor. The ESP32 Microcontroller is attached to the sensor's output. One of the major issues with the industrial sector, residential areas, and gaspowered vehicles like CNG (Compressed Natural Gas) buses, autos, etc. is gas leakage. Installing a gas leak detection system at potential accident sites is one of the preventative measures to stop accidents caused by gas leaks. The system employs a gas sensor to detect LPG leaks, and then it uses GSM and SMS to notify the user of the leak. The sensor detects gas leakage when the amount of LPG in the air exceeds a particular level and the output of the sensor changes to LOW. The gas sensor performs the detection, which is then processed by the microprocessor, LED, and buzzer. Home fires have been occurring frequently, posing an increasing hazard to both human lives and property in recent years. Due to its great flammability, LPG can burn even some distance from the leak. The majority of fire incidents are brought on by a poor-quality rubber tube or by the regulator not being turned off. Even after the regulator is turned off, gas continues to flow from the regulator to the burner. Gas leaks happen if the knob is accidentally turned on. .

[Department of Electrical Engineering] 14 The detection, monitoring, and control system for LPG leakage are the topics of this article. The stove knob is automatically controlled by a relay-driven DC motor. Using the example of passenger cars, the article examines the examination of potential hazards connected to the operation of vehicles with an electric drive. In the backdrop of recent fires, the writers discuss the issue of the safety of people and property in the event of a fire in an electric passenger automobile. The analysis of the state of knowledge regarding the heat release rate curve (HRR), total heat release (THR), heat of combustion, and factors influencing the fire advancement in an electric automobile received special attention. Everyone in the world nowadays is so preoccupied with their own lives that they seldom ever think about how to use resources efficiently. We are aware that gas has a purpose in the environment. Some gases do harm if released in excess, whereas others don't. LPG gas is utilized in households for culinary purposes. Not just for domestic use, but also in settings with human interaction like hotels, restaurants, and hospitals. Moreover, we may observe automobiles that run on CNG. The loss of life and property can be enormous if these types of gases leak in any amount. What if we find a way to lessen or eliminate the likelihood of this loss? Building fires have increased in frequency throughout the years. Modern buildings have complicated and enhanced structural designs, making it challenging for fire disaster victims to locate a secure exit. As a result, they panic, resulting in more accidents and fatalities. In this work, we suggest an intelligent fire evacuation system based on the Internet of Things that will successfully direct individuals along an evacuation path in the event of fire incidents. The primary module of the suggested model is controlled by the A* search algorithm. This will assist folks in finding the quickest and safest route out of danger. If the first ideal path is already occupied, it displays the secon best way he Internet of Things (IoT) links objects and people. It aids in changing the current system so that society can receive high-quality services. IoT is essential to the concept of a smart city since it allows for the addition of services for residents and the administration of the city using cutting-edge technology. The Internet of Things has the capacity to give current information to all the agencies handling situations like fire, crime, etc. IoT is also in charge of easing the difficulties emergency responders currently face, such as a weak communication network and information lag. An autonomous system based on IoT and ARC-GIS is suggested in this paper. The system picks up on fire. Many studies and researches have been conducted in the last few decades in order to enhance security systems and raise the level of protection they provide in many industries. One of the main issues that security must address is the possibility of a fire outbreak, which can occur anywhere, including homes, schools, factories, and many other locations. To prevent this from happening or to reduce the damage caused by a fire outbreak, IOT technology is used to manage this type of risk. During this pandemic, social isolation is crucial. The coronavirus is less likely to spread if people keep their distance from one another. Every public area has a police officer stationed there to monitor whether people are keeping their distance from one another, which increases the risk of infection for the policemen themselves. We can employ a social distance checking bot to ensure social distance in public areas. The robot is a Wi-Fi-enabled, fourwheeled vehicle. The robot moves through public spaces using an ultrasonic sensor to look for infractions. An ultrasonic sensor on the robot is used to find obstructions in the path of the vehicle. Gas leaks are the primary cause of industrial fires. These have terrible effects on the environment, the machinery, and people's health, resulting in injuries and deaths. The available leakage detectors use on-site alarms to alert nearby residents. Therefore, this idea suggests a leakage detector that issues an SMS warning to those who are concerned. This detector picks up on dangerous gases like LPG, methane, and benzene. Blasts are caused by the ease with which LPG and methane gases catch fire. Benzene is a carcinogen that can harm employees' health if they breathe it in at high doses. The identification of these gases is therefore crucial. This low-cost project uses an ESP-32 Wi-Fi module and the MQ6, MQ4, and MQ135 gas sensors to detect leaks of LPG, methane, and benzoene, respectively. It has been found in a survey that 80% losses caused due to fire would have been kept away from if the fire was identified promptly. Node Mcu based IoT empowered fire indicator and observing framework is the answer for this issue. In this task, we have assembled fire finder utilizing Node Mcu which is interfaced with a temperature sensor, a smoke sensor and signal. The temperature sensor detects the warmth and smoke senssor detects any smoke produced because of consuming or fire. buzzer associated with Arduino gives us an alert sign. At whatever point fire activated, it consumes protests adjacent and produces smoke. A fire caution can likewise be activated because of little smoke from candlelight or oil lights utilized as a part of a family. Likewise, at whatever point warm force is high then additionally the alert goes on. Bell or alert is killed at whatever point the temperature goes to ordinary room temperature and smoke level decreases. We have additionally interfaced LCD show to the Node Mcu board. With the assistance of IoT innovation. Node MCU fire checking serves for mechanical need and also for family unit reason. At whatever point it recognizes fire or smoke then it immediately alarms the client about the fire through the ethernet module. For this reason, we are utilizing ESP8266 which is from Arduino IDE. Likewise, the Node Mcu interfacing with LCD show is done to show the status of the framework whether the Smoke and Overheat is identified or not. What's more, Node Mcu interfacing with Ethernet module is done as such that client become more acquainted with about the predominant condition message. It insinuate the client about the fire identification. This framework is extremely helpful at whatever point the client isn't in the. Closeness of control focus. At whatever point a fire happens, the framework naturally faculties and alarms the client by sending an alarm to an application introduced on user's Android portable or page open through web. The use of different IoT devices for home automation has become very popular in recent years. Fire detection and avoidance of fire accidents is one of the necessary and important application of home automation using IoT. Traditional fire alarm system requires huge installation cost and labour. The proposed IOT based fire alarm system basically detects fire at an early stage, generates an automatic alarm and notify the remote user or fire control station about the fire outbreak. This also tries to +extinguish the fire. The use of Arduino is proposed to sense the surroundings for occurrence of fire with the help of fire and gas sensor. The development of home fire alert system is built based on Arduino board. The fire is detected at an early stage and the system generates an alarm and sends SMS or call alerts to mobile numbers stored inside the Arduino program, via the GSM module. Simultaneously, a water sprayer producing device is switched on for the control of fire. This prototype system can help users to improve their safety standards with immediate response by preventing accidents. This will eventually allow both the lives and the properties from the disaster.

3. METHODOLOGY
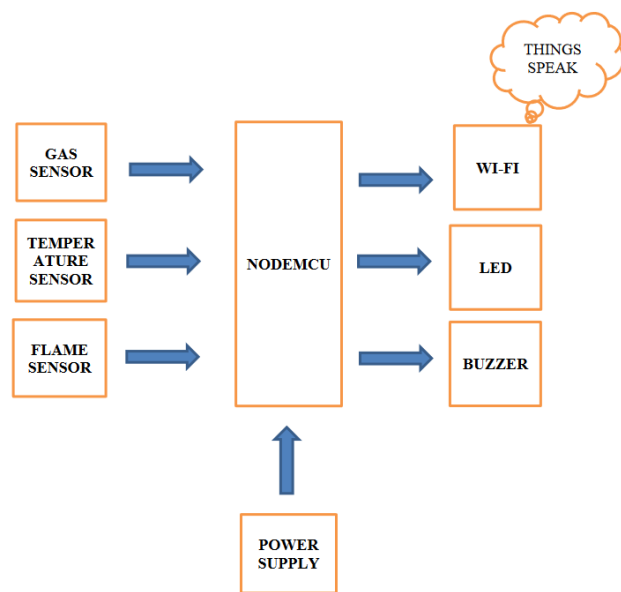
Fig -1: Block Diagram of CNG Car Fire Detection System.
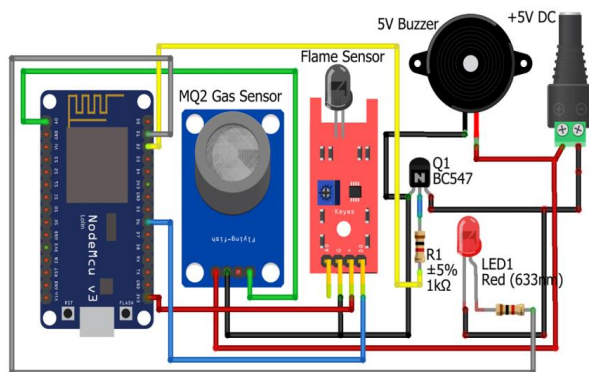
Fig 2: Circuit Diagram of CNG Car Fire Detection System.

4.RESULT

➢ Result implies that when fault is occur in a car then placed sensor operates and gives
signal to Node MCU that signal goes to buzzer and then buzzer gives alert to driver then
fault can be solved.

➢ The sensor quickly responds to the problem and sends the alert to the diver.

➢ By that process we can minimize fire accidents.

5. CONCLUSION

In order to reduce the damage caused by fire mishaps, users must be made aware by fire alarms. In order to reduce the loss brought on by fire mishaps, researchers are currently working to establish a system that warns local users and the firefighting authorities. This study described a straightforward and reasonably priced fire detection system that sends an instant notification to the owner's mobile phone and quickly notifies the driver in event of a large fire. The driver of the receives the push message and follows the developed application's

recommended. A buzzer and LED are used to inform nearby users. The firebase database is utilised in the proposed system The online version of the volume will be available in LNCS Online. Members of institutes subscribing to the Lecture Notes in Computer Science series have access to all the pdfs of all the online publications. Non-subscribers can only read as far as the abstracts. If they try to go beyond this point, they are automatically asked, whether they would like to order the pdf, and are given instructions as to how to do so.

6.ACKNOWLEDGEMENT

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