ADVANCED SMOKE DETECTION SYSTEMS FOR RAILWAYS

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ABSTRACT

A smoke detector is a device that senses smoke, typically as an indicator of fire. Commercial security devices issue a signal to a fire alarm control panel as a part of a fire alarm system, while household detectors, known as smoke alarm, generally issue a local audible or visual alarm from the detector itself. In the railways fire accidents are occurred duo to electrical short circuits, wood materials, flammable materials, derailments, collision, conflicts.etc In this brief we proposed a new method advanced smoke detection system. In the smoke detection system ,we used microcontroller, GSM modem, smoke sensor. This system helps the passengers can know the fire accident in advance.

Keyword: - *Smoke detector, Commercial security devices.*

1. INTRODUCTION

Railway accidents, such as derailments, collisions, conflicts and fire accidents happen all over the world. According to the web report In india the godhra train burning accident was an incident that occurred on the 2002. The commission set up by the government of Gujarat to investigate the train burning spent 6 years going over the details of the case, and concluded that the fire was arson committed by a mob of 1000-2000 people [1]. The Nellore train fire accident occur in 2012 , when the Chennai- bound Tamil Nadu express train caught fire at 4:22 am near Nellore Andhra Pradesh , India .A railway emergency crew prevented the fire from spreading to the other coaches[2]

The CSP envisaged bringing down the number of accidents by 80 per cent from 2002 by 2013, number of accidents went up by 160 per cent during the above period .The loss of human lives in fire accident in passenger coaches steeply increased from 3 in 2002to 9 in 2012, 32 in 2013 and 35 in 2014. Fire prone activities like cooking by vendors at stations ,carriage of inflammable by unauthorized person cigarette smoking ,other waste material , accumulation of empty card board boxes and , went unchecked , aggravating the risk of fire. The automatic smoke/fire detection device in the running train will not successfully implemented .The five year arrange additionally upon the requirement for promoting automatic fire alarm system in trains for yearly recognition of fire and for presentation of automatic fire identification and suppression system for power cars which are more vulnerable to fire accidents .Recommendation were also made by the High Level Safety Review Committee for introduction of flame detection system interfaced with alarm chain pulling (ACP) equipment in coaches . However the exact date of trail and testing has not been mentioned.

The system is proficient for checking and giving alarm to the traveler during beginning phase of smoke, in this manner giving significant time for moving to safe region and clearing . The world's leading aspirating smoke detection system gives the earliest possible warning of a potential fire occasion by distinguishing smoke particles at the nascent stage [3]. The automatic smoke identification system as tried out is based on the very early cautioning smoke detection system strategy to identify smoke at incipient phase of smoke through continuous examination of mentor environment. Installing the detector within the microcontroller ensures a relatively stable operating environment, with constant temperature and humidity. Access to the detector is very easy. The smoke identification system is fully concealed and one less focus for vandals. Programmable affectability empowers the identifier to reliably distinguish between low level risks and real threats to service continuity, property or life. The expense of reacting to alerts is diminished without bargaining safety [4]. For case, suspected cigarette smoking or other threats

to traveler comfort, might be confirmed during a standard examination. High levels of smoke may initiate crisis methods.

Smoke identifier is housed house in plastic walled in areas, ordinarily molded like a plate around 150 mm in breadth 25mm in thick, yet shape and sizes differ. Smoke can be distinguished either optically or by physical procedure; identifiers might utilize either, or both, techniques. Touchy caution can be utilized to recognize and smoking in zones where it is banned .Smoke identifiers in huge business, modern, and private structures are typically controlled by a focal flame alert framework, which is fueled by the building power with a battery reinforcement. Local smoke indicators range from individual battery-fueled units, to a few interlinked mains –powered units with battery reinforcement, if any unit distinguishes smoke all trigger even without power.

In the late days event of residential risks because of the very inflammable LPG gas spills and the subsequent flame mischance have achieved disturbing rates. Such life debilitating local risks are found to happen much of the time. The real purpose behind this being absence of appropriate cautioning .Such issues have been the inspiration to plan a framework that gives former alarm on LPG gas spillage before it could break out into flame .The point is to outline a savvy and low power expending caution framework that gives complete security alarm to the general population in the occasion of gas hole or smoke alongside the sign of their fixation level it additionally examine the level peril and makes legitimate move to keep away from flame utilizing transfer system actuated by method for remote correspondence

With the portrayal of Chinese Train Control System Level 3 (CTCS-3) framework structure and work rule, the creator proposes an Intelligent Control Strategy (ICS) to enhance CTCS-3 wellbeing. Through the reconciliation with two diverse train-waysides specialized strategies that taking into account GSM for Railways (GSM-R) and track-circuit, CTCS-3 understands the cross line and debased operation in fast railroad. CTCS-3 with autonomous control unit of C3 and C2 that have been utilized to control 300~350km/h train and C2 200~250km/h prepare separately still conveys the entire capacity and hardware of CTCS-2. Through the trading of data in the middle of C2 and C3 control unit, the ICS delivers more dependable and exact center train control information after the insightful information combination of development power (MA), track information and brief pace limitation (TSR), and so on. After insight combination, the likelihood of regular cause mistakes has lessened and the extent of security order part has been constrained. The coordinated date permits us to compute allowed speed and create directing profile that guarantees the security of programmed train assurance (ATP) [5].

2. EXISTING METHOD

In the late days event of local risks because of the high inflammable LPG gas spills and the subsequent flame mishaps. The significant explanation behind this being absence of legitimate four cautioning such issues have been the inspiration to outline a framework that gives LPG gas spillage yet it doesn't give the alert. This strategy is best and the expense of sensor is high. It additionally investigation the level of threat the avoidance of framework is human physically. This framework does not exist programmed smoke recognition. This paper starting with a dialog of different procedure models intended for more straightforward application as it were. In the proposed strategy it is actualized for smoke recognition with programmed alert. The current strategy include that the smoke sensor is utilized to faculties the smoke that recognized in the train. In the current framework it doesn't having the programmed caution when it is recognized. The proposed framework utilizes moderately less costly sensors which decrease the expense of the sensor.

- Constant human intervention.
- More man power is required.

The effect of some disadvantageous elements on track circuit parameters in Qinghai Tibet railroad is broke down. Creators consider that the train running control framework in view of correspondence rather than on track circuit ought to be utilized as a part of Qinghai Tibet railroad. The essential structure and measures for enhancing the dependability of the framework are advanced. The unwavering quality and wellbeing of remote information correspondence used to transmit train control data are dissected by Markov model [6].

As the wise railroad is the pattern of current railroad advancement, the paper intends to demonstrate a review of the Railway Intelligent Transportation System (RTI'S) in China. Firstly, the present transportation circumstance in China is given and after that some fundamental ideas of RTI'S are discussed also. Besides, the need of RTI'S is broke down to demonstrate its vital position. At that point, the general engineering of RTI'S is acquainted here with make an unmistakable picture of RTI'S and how it functions. At long last, aside from key advancements in RTI'S, its manageable procedures are said to demonstrate the future improvement of RTI'S [7]

3. PROPOSED METHOD

This paper concentrates on building up an electronic framework that recognizes smoke giving visual level sign of caution. The framework is tried utilizing smoke sensors independently at the room temperature. If there should arise an occurrence of high focus smoke is identified the framework remotely actuates a noteworthy plausibility of mishap furthermore give the alert for the same. The framework is focal points contrasted with the current frameworks in the method for module that does not require human mediation. This technique is a solution for decrease the demise misfortune happening because of smoke in train is introduced. Smoke on the running train is more calamitous than on a stationary one, since fanning by winds spreads the smoke to different mentors. At the point when the mishaps are happening in remote territories or amid evening times the misfortune or harm being brought about is at high rates. The harm is heavier because of uncalled for span of administration at ideal time between when a mischance happens. This undertaking helps in informing the travelers and smoke sensors. Once the sensors connected to the compartments of the train detects the smoke identification. At the point when the smoke is identified in the train it can consequently give the alert. The block diagram of smoke detection as shown in fig.1 and fig.2 shows the flow chart of smoke detection.

3.1 Block diagram

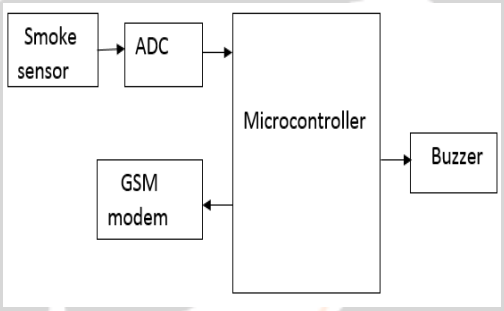


Fig.1 Block Diagram for smoke detection

3.2 Flow chart

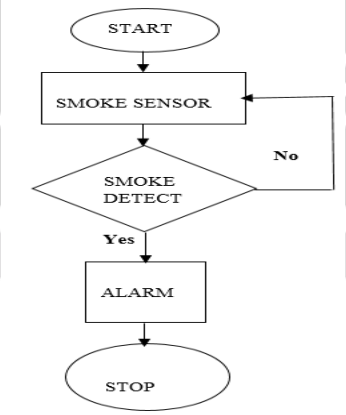
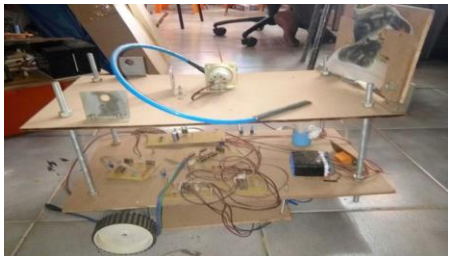


Fig.2 Flow Chart for smoke detection

4. RESULT & CONCLUSION



The smoke location framework utilizing optical smoke locator, so it is financially savvy, the framework is absolutely remote, consequently we don't need to face any wiring bothers. The framework is microcontroller based programming controlled and temperature sensor &smoke sensor; both are utilized, so the whole framework is significantly more viable. The smoke sensor needs to fast closeness to the hotspot for brisk identification while the smoke identifier needs to keep as high as could reasonably be expected. The arrangement is to put the framework at an ideal separation. However a superior option would be to utilize a profoundly touchy smoke sensor which would empower the area of the framework at any separation. The segments of the module, especially the sensors are delicate to temperature. So the module can be made more effective by including temperature pay

5. REFERENCES

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