HAZARDOUS AREA MONITORING FOR INDUSTRIAL PLANT POWERED BY IOT

INTRODUCTION :

In some industrial plants,there are some areas which are to be monitored from time to time.sometimes the condition become critical which may leads to loss of property and also human loss.To monitor the condition we can integrate the smart devices in the areas which are needed to be monitored.Every device will be acting as a beacon and it is connected to temperature sensors.we can broadcast the temperature data along with the location of that particular area through beacons.

LITERATURE REVIEW :

1.POTENTIAL AND LIMITS OF IOT FOR HAZARDOUS JOBS IN PROCESS INDUSTRIES

The SmartBench framework is based on the cooperation of three fundamental actors: the operator, a mobile Application, and environmental smart sensors (ESS) deployed in the surrounding area.

It is possible to define objects and humans in perfect accord to the IoT paradigm. The operator is equipped with a mobile device and a human smart sensor (HSS) able to field.

ADVANTAGES:

Future works will be devoted to the integration of the proposed architecture with the plant network (if available) in order to retrieve other useful data (e.g.: wi-fi camera).

DISADVANTAGES:

Another future enhancement will be focused to the Introduction of an indoor positioning system in order to provide to the operators an estimation of their positions In their fields.

2.AIR POLLUTION MONITORING AND ALARMING SYSTEM VIA INTERNET OF THINGS

According to a severe situation of air quality in Thailand, air pollution emerges from an internal combustion engine, construction, different transportation, forest fires, industrial production and so on. These lead to a health's problem, especially coronary heart disease and severe acute respiratory syndrome. For this reason, researchers have a notion to apply information technology to monitor and alarm state of air quality in a hazardous area.

ADVANTAGES:

1. The smart box has been developed as a prototype to measure the levelof air quality, dust, temperature, and humidity.
2. it is suitable to implement and apply in a smart city for the near future.

DISADVANTAGES:

Blynk application is selected as a real-time notification system to the user provided that air pollution is greater than the standard level.

3.ANDROID BASED REAL TIME INDUSTRIAL EMISSION MONITORING SYSTEM USING IOT TECHNOLOGY

The need to industrialize to compete with global standards is a complete requisite to realize a booming economy.However, there is no question that it has wreaked havoc on the environment caused industrial emissions of dangerous chemicals. This study aimed to create a system that will allow Industrial plants and factories to monitor the emission of the smoke stacks

held in a manufacturing company anytime, anywhere using IoT or Internet of Things

ADVANTAGES: This will help companies in maintaining the machine Technology.and provide them emission data of gaseous elements such as carbon monoxide, particulate matter, sulfur and nitrogen dioxide that will help them in complying with the environmental standards of industrial emission.

DISADVANTAGES:

Security and privacy. Keeping the data gathered and transmitted by IoT devices safe is challenging, as they evolve and expand in use.

4.MODULAR AUTOMATION CABINET FOR PROACTIVE MONITORING IN ATEX ZONE 2

A versatile modular monitoring equipment for the proactive diagnosis and monitoring of a wide range of industrial equipment [2, 3] is becoming more and more useful. Automation systems have started to be modularized in order to be able monitor a wide range of equipment (such as compressors, electric motors, gas turbines, blowers etc.) A properly designed automation cabinet [4, 5] can increase productivity, lowers costs, and ensure processes reliability.

ADVANTAGES:

The proposed cabinet is also portable, easy to install and then switch to another plant.This can easily compensate the downside of wireless equipment costs.wireless instrumentation helps reduce human work and material costs, by eliminating expensive cables and most related wire infrastructure and work.

DISADVANTAGES:

Previous experience has proven the unquestionable benefits of portable diagnosis cabinets. Increasing need for multiple such systems.

5.IOT-BASED RISK MONITORING SYSTEM FOR SAFETY MANAGEMENT IN WAREHOUSES

The smart product concept can be used as a generic term figuring out many other naming such as intelligent product, connected object, smart object, smart thing… The multiple definitions of the smart object were analysed by (Gutiérrez et al., 2013), in order to provide a consensus definition satisfying all the software and system engineering domains. Kiritsis, 2011; Niskanen, 2011; Zouinkhi et al., 2011) have provided various context-application dependent definitions that can be seized to design and model smart object in multiple research areas such as the IoT, ambient intelligence, robotics and process automation.

ADVANTAGES:

1. For secure storage of hazardous substances, some areas should bedesigned or adapted to ensure suitable storage conditions.

2. A safety rules system was firstly proposed in (Zouinkhi et al., 2011) thatdefines the chemical substance state of each supervised container (i.e., a product).robotics and process.

DISADVANTAGES:

1. Overcoming the major issues of safety in WMS with the help of the smartproduct concept requires providing intelligence and decision-making capabilities dedicated to safety-control for each warehousing operation

2. These operations will be monitored by product-embedded safetymechanisms to detect environmental disturbances, risky and conflictual situations in order to harmoniously coordinate warehousing operations of hazardous and harmful products with respect to safety of goods, people and environment.

6.CHALLENGES AND RESEARCH ISSUES OF DATA MANAGEMENT IN IOT FOR LARGE SCALE

PETROCHEMICAL PLANTS

The Internet of Things (IoT), which seamlessly interconnects heterogeneous devices with diverse functionalities, is an attractive choice for the large-scale petrochemical industry to develop an integrated system. With the industrial revolution, efforts have mainly been focused on factory automation, transportation security,and surveillance.

ADVANTAGES:

Next-generation smart factories should be able to adopt the exchange of data information between different wireless devices.

DISADVANTAGES:

Due to the distinctive characteristics of 6LoWPAN (e.g., low energy availability, throughput, reliability, availability, and processing capabilities), it has specific routing requirements.

7.LEVERAGING IOT TO IMPROVE MACHINE SAFETY IN THE MINING INDUSTRIES:

Each year, hundreds of mine workers are involved in machinery-related accidents. To mitigate the occurrence of these accidents, new safety methods are needed to monitor access to hazardous areas around operating machinery, improve documentation/monitoring of maintenance that requires shutdown of the machinery, and prevent unexpected start-up or movement during machine maintenance activities.

ADVANTAGES:

The mining sector in particular will benefit enormously from the ability to remotely view safety-related data in real time and to receive alarms when safeguards are potential failing.

8.IOT BASED FIRE AND GAS MONITORING SYSTEM:

In infrastructure and industrial plants the rapid growth is creating environmental issues like pollution, climate change and malfunctioning. It has a great consequence for the requirement of an operationally adaptable, efficient, cheap and smart monitoring systems. For this purpose we come up with idea to use these kind of technology i.e the Internet of Things (IoT) inform of a solution. In this paper, we suggest wireless data gathering frameworks that enable each detector node to track the changes in the behavioural pattern of gases and to identify their role in gas leakage problem, whilst at the same time trying to minimize power consumption.

ADVANTAGES:

The DHT11 is a commonly used Temperature and humidity sensor. The sensor comes with a dedicated NTC to measure temperature and an 8-bit microcontroller to output the values of temperature and humidity as serial data.

DISADVANTAGES:

When there is no flame nearby there is no beeping of the buzzer and no flashing of lights.

9.ELECTRICAL HAZARDOUS AREA CLASSIFICATION DESIGN AS A BASIS FOR SAFER OPERATIONS:

The use of Electrical Hazardous Area Classification drawings as a basis for communicating the degree and extent of explosive hazards within industrial facilities is explored. Existing occupational health and safety regulations are referenced to determine a link between operational activities and the use of electrical hazardous area classification drawings as a tool for hazard assessment and management**.**

ADVANTAGES:

They are primarily used to Influence the selection and installation of electrical equipment.They can also be used as a means for communicating

the potential explosion hazards associated with electrical and non-electrical operational activities**.**

DISADVANTAGES:

Employees must be able to identify and assess the hazard in order to properly mitigate the hazard. This requires a standard means of communicating the nature of the hazard.

10.CONTINUOUS REMOTE MONITORING IN HAZARDOUS SITES USING SENSOR TECHNOLOGIES:

The deployment of a distributed point source monitoring system based on wireless sensor networks in an industrial site wheredangerous substances are produced, used, and stored is described. Seven essential features, fundamental prerequisites for our estimating emissions method, were identified. The system,consisting of a wireless sensor network (WSN) using photoionisation detectors (PIDs), continuously monitors the volatile organic compound (VOC) concentration at a petrochemical plant on an unprecedented time/space scale.

ADVANTAGES:

1.being inexpensive

2.being suitable for leak detection (all compounds, all locations)

3.being suitable for all of the site's equipment and their phases of operation

4.Allowing real time estimation.

5.Allowing easy inspection for enforcement.

DISADVANTAGES:

Volatile organic compounds (VOCs) are widely used in industries as solvents or chemical intermediates. Unfortunately, they include

components which, if present in the atmosphere, may represent a risk factor for human health.

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