Intelligent Tracing for Inherent Potential Leakage Observance and Control System

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***Abstract*- A newly formulated fault detection system for utility pole is designed. Designing and developing fault detection system is to provide an immediate and effective solution for those people who accidently touch the electric pole during rainy days to meet accident leading to death. To solve the problem addressed, proposed system is integrated with the fault detection system, wireless communication system and fault electric pole location can be transmitted via IOT to authorized persons. By integrating a smart microcontroller is explored which is able to identify the fault electric pole where it monitors the pole section continuously for the fault, here voltage is considered using voltage sensor and if it is identified then it will automatically gets trip down and will be intimated to the main station where it can be prevented from accident. In main station it will be useful to find out easily about the fault pole that where it is located and fault can be corrected easily.**

***Index terms*- fault detection system, fault electric pole, voltage sensor.**

I.INTRODUCTION

Power cables are widely used in urban power distribution system in recent years for their aesthetic and high reliability. With the rapid growth of power cables, the number of cable short circuit faults increased. Efforts are needed to localize short circuit fault in power cable system accurately and in a timely manner [1-3]. Where it leads to accidents in rainy days due the breakdown of the wires. Therefore, the rapid and accurate hybrid range positioning and fault location is very important to ensure the safety and stability of power system and economic operation [4]. Through the analysis of the accident records of the power cables and their attachments in various regions of India, such as the accident records of the electric cables and their attachments, the reason for the failure of the power cables in operation is divided into external force, cable assembly manufacturing quality, cable body. Manufacturing quality of the three major types, the respective share of these types is 58%, 39% and 3%.

From these statistical data, it is found that the failure of the attachment and the bulk of the fault is as high as 39%.In addition to the failure caused by external force failure. It can be seen that the cable accessories have become the typical parts of the weak link and the running fault of the power cable insulation. With the increase of the voltage level, the corresponding insulation requirements are improved, and the manufacturing process of the cable accessories becomes complicated. Therefore, the protection of cable accessories low failure rate is an important prerequisite to determine whether the power system is functioning properly. Due to its advantages, power cables are used widely, especially in the urban power grid. Rapid and accurate positioning for power distribution line fault is pretty important to ensure reliable power supply.

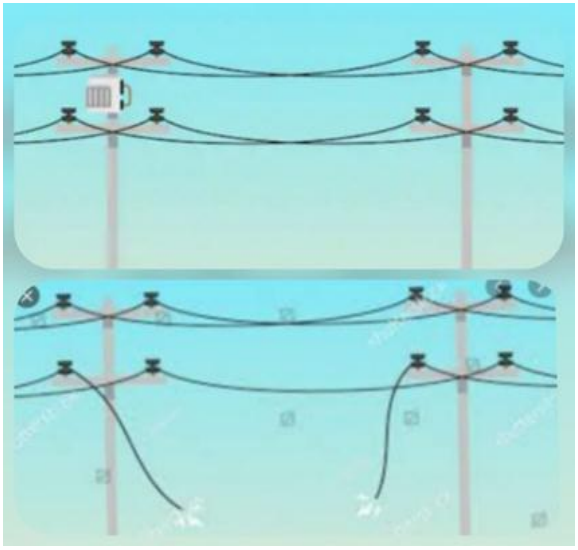

Fig 1 Fault detection

As shown in fig 1, once fault, we must find out the fault point and repair it. The first step is to monitor if there is a kind of fault and then detect which kind of fault. Methods of on-line monitoring are mainly through the monitoring of electric parameters and calculate insulation-related parameters to predict insulation damage. The aim of this study is to develop a new method for the monitoring of cable faults and providing intimation to electricity board as well as to protect the common people.

Aim of the proposed model is to enable an automated monitoring system to check potential leakage in electric poles during rainy season for saving human lives.

II. ARCHITECTURE AND IMPLIMENTATION

To monitor the pole, use voltage sensor connected to the microcontroller. Here PIC microcontroller is used. An 8 bit PIC18F877 microcontroller, the internal of microcontroller integrates an 8 channel 10 bit AD converter module, which can simplify hardware circuit and reduce module development costs. Amount of the data acquisition module is usually relatively large, so we need specialized memory chips for the module configuration. Ordinary E2PROM has low-cost, mature technology, but the higher power consumption requirements, the application in the portable systems becomes smaller and smaller; The non-volatile SRAM has fast read and write speeds, but less storage capacity, high cost and cost of poor ; Flash memory

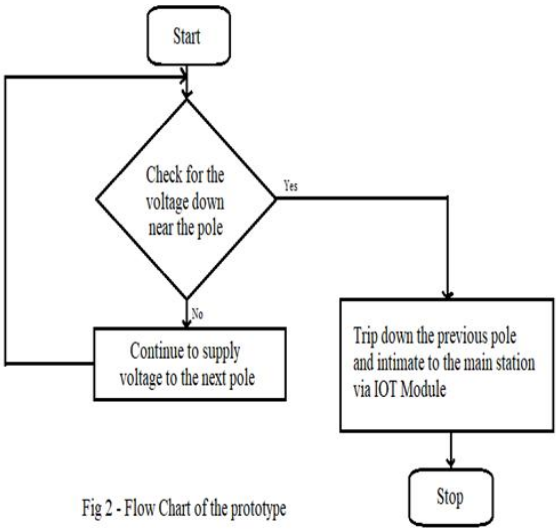

Fig 2 - Flow Chart of the prototype

has higher storage density, fast read and write speeds, having obvious advantages in storage capacity and costs. In the application of large amounts of data storage it is often the only option. Based on this, the multi-channel data acquisition module designed in this paper chooses the FLASH memory [5].

At the pole the voltage is monitored by checking the electric leak and if occurs it will automatically trip down the particular pole. Here we are using solar panel and piezoelectric plate to produce dc supply and is stored in the battery for the microcontroller as shown in fig 2. Fig 2 represents the workflow diagram of the prototype that is used in the paper. Using heavy potential leak detector, the microcontroller will continuously monitor the pole.

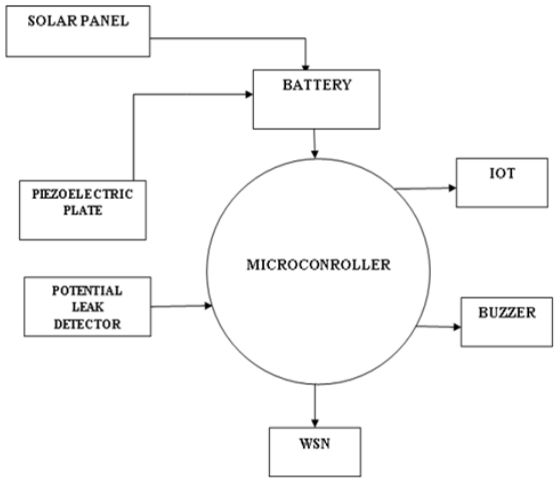

Fig 3 - Main Station Block Diagram

The electric leak will be detected by the sensor and the details will be sent to the microcontroller. The microcontroller will give the alarm with the help of buzzer and the location of the pole and alert message will be sent to the main station via IOT Module. And also the microcontroller will automatically trip down the utility pole.

The information of the utility pole is given to the main station via IOT Module and it will trip down the pole because it may harm living beings where if the wire gets break and falls on the ground which may cause death. So the pole is turned down and the message that there is a fault in that particular location. Utility pole section has driver circuit. The driver circuit ULN2003 is a monolithic high voltage and high current Darlington transistor arrays. Which is connected to the pole section (load).

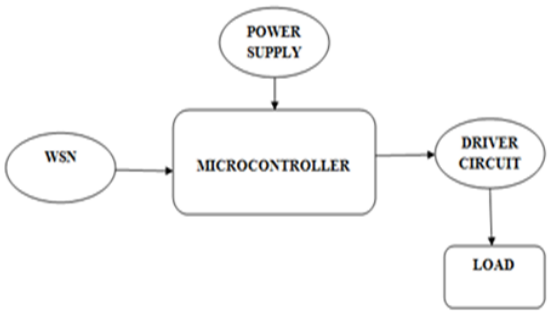

Fig 4 - Utility pole Block Diagram

High level language is used for the system development. Here Embedded C is used for developing the software code.

III. EXPERIMENTAL RESULT

The result of the prototype has a load which is trip down if the voltage goes down otherwise it will be in on state and transfer the power to the next pole.

Pole section

The current passing through the pole is measured continuously as electric leak in the pole and if any variation occurs in the circuit then it will automatically trip down the load where it will be intimated to the main station which may reduce the accidents such as electric shocks which is one of the cause of some deaths. This information is communicated through WSN system. The microcontroller using power supply will be used to monitored the pole.

Main Station section

When it gets information from WSN about the voltage down, it will be intimated to the main station. In main station alarm is set using buzzer and IOT(Here it is updated in the IOT App and iot.iotweb.in) which can identify the exact location of the tripped down pole section.

The output is seen in the IoT app where it shows the date and time of the electric leak occurred which can make effective localization of the pole that is effect from electric leak. It can also be seen in the website iot.iotweb.in. It also shows no. of sensors used location of the pole.

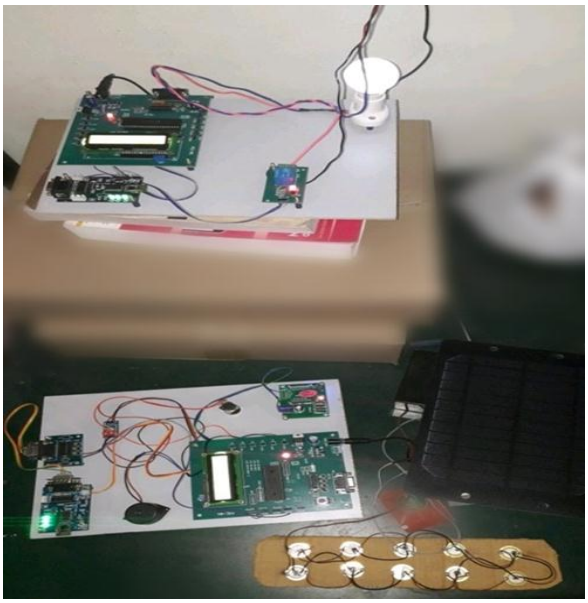

Fig 5 – Practical Experiment

IV. CONCLUSION AND FUTURE WORK

CONCLUSION

The system explores an automated system for continuous monitoring of electric poles and to trip down the electric supply to fault pole. Usage of sensor for measuring output voltage provides systematic monitoring technique which helps in detecting the voltage in the load. If the voltage goes down then if identifies that there is a fault and it will check for the fault in the system. After finding the fault it is intimated to the main station. The results talked about, and perceptions made in this exploration presumed that brilliant metering framework with IOT correspondence capacities will make the present power administration better and proficient from numerous points of view.

FUTURE WORK

All the poles should be connected to the main station and be monitored and this can be done using IOT. Here the poles voltage is monitored, if there is any voltage down near a pole then the pole should be trip down and is intimated to the main station which can prevent accidents.

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