Volume 4 || Special Issue 5 || ICCEME 2019-2020 || ISSN (Online) 2456-0774
INTERNATIONAL JOURNAL OF ADVANCE SCIENTIFIC RESEARCH
AND ENGINEERING TRENDS

TRANSMISSION LINE MONITORING BY USING IoT

Sarthak Sanjeev Koli[1], Iliyas S. Mulla[2] ,Vaibhav H. Kamble[3] ,Shreenivas D. Chougule[4], Dnyandev E. Patil[5], Prof. M.A. Mulla[6]

Electrical Engineering S.I.T, Ichalkaranji, Maharashtra, India[1,2,3,4,5,6]

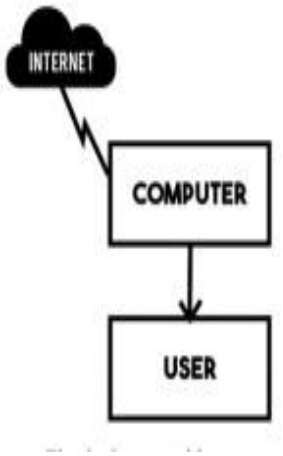
sarthakkoli777@gmail.com, iliyasmulla876@gmail.com, vaibhav229466@gmail.com, shreenivaschougule2015@gmail.com, patildnyandev19@gmail.com m.a.mullasitcoe.org.in@gmail.com

Abstract- The internet of things is a system which is mean by internet of things the system is attached with devices like analog , mechanical ,digital devices, objects and unique identifiers (UIDs) is provide to the people and sending the data without any human to human interference. By our literature review, we have found that cloud based real time monitoring and conditional control of diesel generator is the solution for future demand for solving the issue of on-site monitoring and control of diesel generators through remote monitoring to have actual observation of parameters of a DG that will give a better solution to society.

Keywords: UID, IoT

I INTRODUCTION

It is known that when a fault occurs in overhead transmission line system then instantaneous changes in voltage and current at the point of fault generate high frequency .The fault impedance being low. The fault current is relatively high, during the fault. The power flow is diverted towards the fault and supply to the neighbouring zone is affected Voltage become unbalanced



Because we have found that the Internet of Things (IoT) is a simple, yet a very powerful concept which evolved overtime. “Internet of Things” phrase which is well-known as IoT in short is created from the words “internet” and “Things” where “Things” refers to any internet connected device. IoT technology allows the physical objects to be connected to the internet and enabling the monitor and control of these objects from anywhere. The number of internet users is booming due to advancement in gadgets, computers and mobile phones therefore the IoT paradigm is proving to become a significant part of the modern era. It is estimated that 50 billion things would be connected to the internet by 2020, overshadowing the human generated data.

Power system reliability and security has the most important requirement. And to ensure good quality and also continuous power supply to consumers. Due to Lack of monitoring system the utility do not get timely data on the health of lines. Utility comes to only when there is serious fault/damage. . If there is a continuous monitoring of the lines and if the data is available on the internet, then the utility can take required actions in advance so as to avoid the serious damage. In our project, we demonstrated that the line parameters are monitored and the data is uploaded on the net through IoT.

Identify fault and location of fault.

The power system is protect to fault effects.

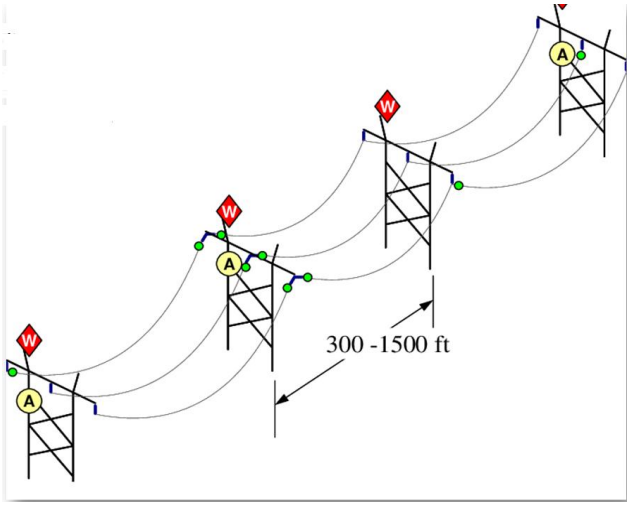
The need of project is in Transmission line fault clearing time increasing and Fault location is share to its worker.

We can control three parameters.

1.SAG

2.TEMPERATURE

3.WIND



II PROBLEM STATEMENT

Demand of power has been increasing extensively in region of industrial, agriculture, banking sector, medical and school and colleges. But now a days problems with transmission line are more and it is difficult to find exact location. So the losses during the exact fault location are more which is not good for transmission line. Time require to clear fault is more so the life of transmission line is reduce. Modern technology is highly sophisticated to reduce the problem in the transmission lines i.e. by IoT system.

III LITERATURE REVIEW

"Automatic Fault Detection and Location of Electric Transmission Lines with the help of internet of things" Sajal Menon. The method is provided us in low cost and very high reliable way to locate which is the faults in the electric transmission lines and also supports data storage. Hence this method can be implemented to detect the faults and retrieve the corresponding data anytime.

"Sag Calculation Difference Caused by Temperature Difference between the Steel Core and Outer Surface of Overhead Transmission Lines"- Gang Liu. In this paper, present an optimal formulation for a cost optimized wireless network which is capable of transmission of time sensitive sensor data through the electric transmission line network .

"EPRI-Sponsored Transmission Line Wind Loading Research & Development"- Phillip G. Landers. In this paper we have studied that how to calculate the wind calculation and also Wind how to effect on Transmission line."

"Electric Transmission Line and Fault Monitoring and also Identification System by Using Internet of Things"- S. Suresh. In this Paper we had studied that to IoT is How to Work and they are how to use in our Project."

IV OBJECTIVES

Main Objectives are Monitor entire transmission line.

For monitoring purpose we test the different parameter such as sag, temperature and wind speed.

Find out the fault in system by using IoT Techniques.

Send data along with exact location to the operator as well as to web page.

Improve transmission line efficiency.

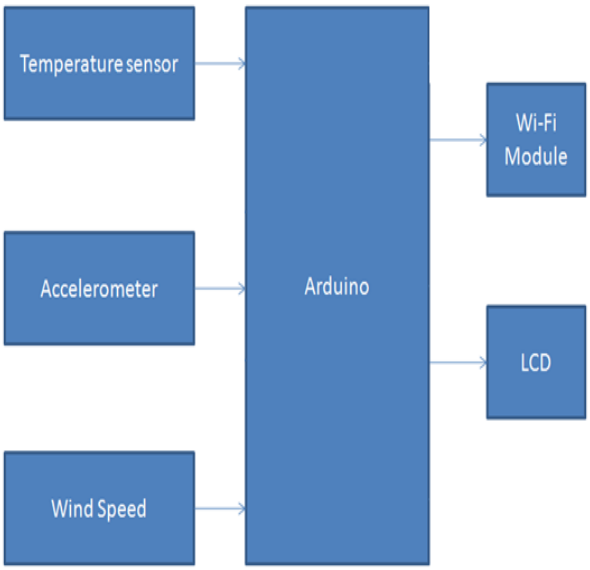
V METHODOLOGY

The proposed project work is concentrated on the monitoring of high transmission line on multiple towers.

For monitoring purpose we test the different parameter such as sag, temperature and wind speed. Based on the above parameters sensors are used and after sensing the physical information they are sending to Arduino .

Then Arduino send to the web page through Wi-Fi module. We can set the limit for each parameter. If any parameter crosses its limit then system sends the warning message to the authority mobile.

A overhead transmission line monitoring system for high voltage power grids is implemented on this 11KV line. This system consists of three-axis accelerometer, Wi-Fi module, temperature sensor, dc motor etc. With the known information of the observed span values obtained from three axis accelerometer, LM35, ADXL 335, dc motor are compared with IEEE standard. The overhead transmission line monitoring system is examined by comparing the calculated values using theoretical equation with the actual measured results. In addition, the proposed system could co-operate with IoT systems to improve its feasibility and practicality. The data of the various sensor are transmitted through the Wi-Fi module and stored in a database. These sag, wind and temperature information of a specific span could be provided to power companies to improve the safety of transmission lines or serve as reference in power dispatch centre. All data of overhead transmission line recorded in every hour on the hour.



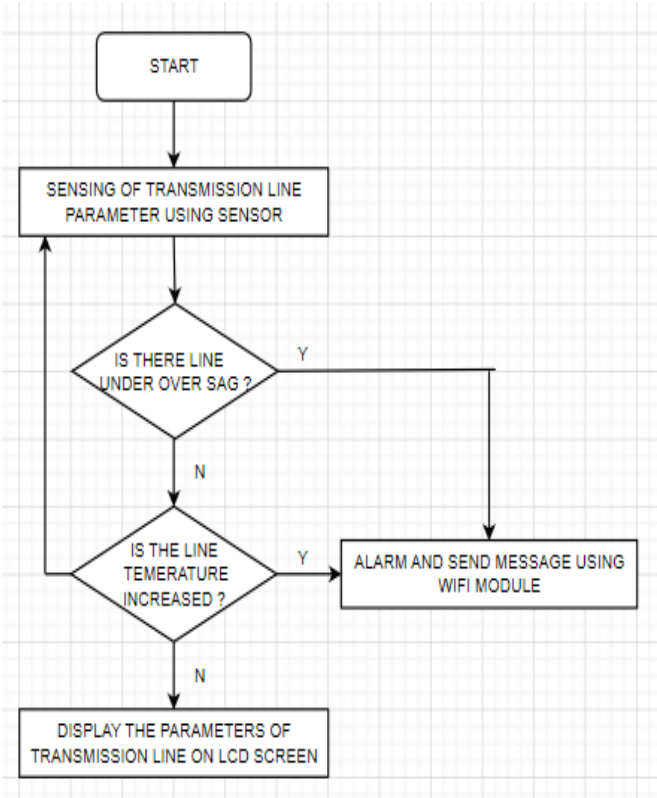
Algorithm

Step1: Initially sensors will sense the variations in transmission line parameters.

Step2: The sensed information is sent to Arduino Microcontroller.

Step3: Depending on the sensed information microcontroller will send respective signals to the Wi-Fi module for transmission.

Step4: The sensed parameters are sent to the operator by using Wi-Fi module.



VI HARDWARE RESULT

VII FUTURE SCOPE

More research work needs to be done in future.

Needs to be implement a wireless sensor network with mobile nodes.

The feasibility of using clustering techniques and aggregation need to be tested in same wireless sensor network.

Implementing a research project on concept where we focus on the fact of members getting all relevant details about the improvement in Transmission line monitoring. Information technology will offer solution to the rural areas. Cloud Computing and Information and Communication technologies should be used to make it.

VIII CONCLUSION

wind speed, ambient temperature, sag could be calculated. And observed sag and theoretical sag value could be compared.

By using this sensors it is not difficult to acquire these parameters with high accuracy in real time. Hence system is safe.

REFERENCES

1) H. E. House, P. D. Tuttle, ”Current carrying capacity of ACSR”, IEEE Transactions on Power Apparatus and Systems, pp. 1169-1178, Feb. 1958.

2) W. A. Lewis, P. D. Tuttle, ”The Resistance and Reactance of Aluminum Conductors, Steel Reinforced”, IEEE Transactions on Power Apparatus and Systems, pp. 1189-1215, Feb. 1958.

3) William D.Stevenson, Elements of the Power System Analysis, McGraw-Hill Book Company, 1962

4) F. Schweppe, J. Wildes, ”Power System Static-State Estimation, Part I: Exact Model”, Power Apparatus and Systems, IEEE Transactions on, Vol. PAS - 89, January 1970, Page(s):120 – 125.

5) K. Clements, R. Ringlee, ”Treatment of parameter uncertainty in power system state estimation”, Power Apparatus and Systems, IEEE Transactions on, July 1974.

6) IEEE standard for Calculation the Current-Temperature Relationship of Bare Overhead Conductors, IEEE Std 738-1993, 8 Nov 1993.

7)Tapani O.Seppa. “Factors influencing the accurate of high temperature sag calculations,” IEEE Transactions on Power Delivery, vol.9, no.2 pp. 1079-1090, 1994.

8)J. F. Minambres, J. J. Barandiaran, R. Alvarez-Isasi, M. A. Zorrozua,”Radial temperature distribution in ACSR conductors applying finite elements,” IEEE Transactions on Power Delivery, vol.14, no.2 pp. 472-478, April1999.

9) P. Zarco, A.G. Exposito, ”Power system parameter estimation: a survey”, Power Systems, IEEE Transactions on, Volume 15, Issue. 1, Feb. 2000, Page(s):216 – 222.

10) V. T. Morgan, ”Effects of alternating and direct current, power frequency, temperature, and tension on the electrical parameters of ACSR conductors”, Power Delivery, IEEE Transactions on, Volume 18, Issue 3, July 2003 Page(s):859 - 866.