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REVIEW PAPER ON TRANSMISSION LINE FAULT DETECTION SYSTEM

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ABSTRACT

Electrical power transmission system is very important part for transmitted the electrical power. In transmission system there are different type of fault occurred. The fault detection can helpful for power system to detect the faulted lines before any significant damage to the equipment. The accurate fault location can help to remove persistent of the faults and locate the areas where the faults regularly occur, thus reducing the occurrence of fault and minimize the time of power outages. For finding specific fault location on transmission system a smart GSM based fault location detection system will be used to indicate the exact fault spot where fault had occurred. This project consists of GSM module. Arduino Uno, sensors and LCD display for indicate the fault location and find fault occurred in system.

Keywords: Transmission Line, Arduino, GSM, Fault Etc.

I. INTRODUCTION

Nowadays the electricity is basic need of our daily life. Sometimes an unexpected issue arises due to trees, wind, construction, and corrosion caused by the wind Due to these unexpected conditions the fault occurs like (line to line, line to ground, line to line to line). Out of these line to line to line fault is more danger in the power system which could harm the electrical equipment. Because of these faults the current is changed from the original path. Fault detection can helpful for power system to detect the faulted lines before any significant damage to the equipment. The accurate fault detection can help to remove faults and locate the areas where the faults occur, thus reducing the occurrence of fault and minimize the time of power loss. This fault detection can helpful for power system to detect the faulted lines before any significant damage to the equipment. In power system the biggest task for Electrical Engineers is to find the exact location of the fault so that we can remove it quickly and provide continuous supply to the consumer. The design methodology includes the use of arduino and the GSM module and the combination of relay circuit with display on a LCD screen. A smart GSM based fault detection and location system used to quickly and accurately indicates and locate where fault had occurred in a transmission line. This fault will be identified by designing of the programmable software which would be installed in the Arduino UNO. It will show the exact location of the fault and types of fault. A desirable solution for wireless communication applications is the GSM module. A unique address (SIM card number) is provided to the remote control unit by the declining cost of GSM devices like mobile phones and the GSM SMS, allowing commands to be communicated across the wireless communication network. So in this way the fault is to be detected and sends the information to the remote control unit.

II. LITERATURE REVIEW

[1] Sharma, Ankit Nirwan, Ajay Singh Shekhawat proposed Fault Analysis on Three Phase Transmission Lines and its Detection Power system failure can cause instability loss and serious damage to either the defective or nearby healthy equipment. Additionally, the stability proposal is regarded as a crucial element in the management of energy and the planning of power systems Numerous studies have revealed that up to 90% of faults on most overhead lines are transient, ranging from 70% to 90%. When one or more circuit breakers are immediately tripped to isolate a problem, such as an insulator flashover, the fault is cleared and does not reoccur.

[2] Prof. Vikramsingh R. Parihar1, Shivani Jijankar, Anand Dhore, Arti Sanganwar, Kapil Chalkhure., proposed Automatic Fault Detection in Transmission Lines using GSM Technology There are numerous

distinct elements that make up the electric power system. When the insulation of the system fails at any point, a fault is simply described as a collection of unfavorable but unavoidable happenings that might momentarily upset the stable condition of the power system. The fault was accurate and perfectly indicated using a smart GSM based fault detection.

III. PROPOSED SYSTEM

Different approaches can be adopted for dealing with the transmission line failure. Here, we have used the GSM network to detect fault and send a SMS alert once the fault is detected. Here the Arduino microcontroller serves as a heart of system enables access to real time state of the system. The LCD display displays the monitored parameter in the system. Here we are using relay for tripping the circuit.

Arduino is an open-source hardware and software firm, project, and user community. It is act as a heart of the entire system that enables access to the real time state of the system. It receives the perceived parameter during the power transmission and detect the breach in short circuit limit set by comparing the current sensed with the pre-set short circuit limit. The Arduino microcontroller sends a signal for the relay to trip off the system, else the system remains connected. When the relay trips of the system, an SMS is automatically sent to the avail mobile phone via the GSM network.

The GSM module and liquid crystal display (LCD) module are also connected to the Arduino microcontroller. The LCD display displayed the parameters and monitored in the system.

IV. CONCLUSION

Nowadays there is the huge demand of the electricity because of all the industrialization. Due to this sometime overloading is happened which affect the conductor of transmission line and electrical equipment life. Because of this condition and natural calamity fault is occurred. It should be detected early and rectify earlier to provide electricity to the consumer without any longer period interruption of power supply. Using this programmable device fault location can be detected instantly so that fault can be removed in short time period and continue the power supply by removing fault in short time period. We have design the model in such way that it solves the problems faced by consumer. By using such way, we can easily find the fault and conclude it. It is highly trustworthy and locates the fault in three phase transmission line. In this project, we've created a GSM-based fault detection system transmission line, which provides information about the fault in system to the control Centre via SMS. Various system parameters are continuously monitored by the system. Additionally, it aids in timely defect detection, preventing unauthorized use of electricity. The project has a continuous monitoring system that combines microcontroller and GSM communication technology. Additionally, it depicts the software flow and hardware architecture. The system's implementation will save a significant quantity of electricity, making electricity available to more consumers in a country with a huge population, like India.

V. REFERENCES

[1] Ms. Devjani Banerjee, Prof Dr.Mrs.N.R.Kulkarni, Three Phase Parameter Data Logging and Fault Detection Using GSM Technology, International Journal of Scientific and Research Publications, Volume 3, Issue 2, February 2013 1 ISSN 2250-3153

[2] P.A. Gulbhile, J.R. Rana, B.T. Deshmukh, Review for overhead line fault detection using GSM technology, International Journal of Advanced Research in Electrical, Electronics and Intrumentation Engineering,Volume5, Issue12, December 2016 ISSN 2278-8875

[3] K. Saravanababu, P. Balakrishnan and K. Sathiyasekar, "Transmission line faults detection, classification, and location using Discrete Wavelet Transform," 2013 International Conference on Power, Energy and Control (ICPEC), Sri RangalatchumDindigul, 2013, pp. 233-238.

[4] M. Singh, B. K. Panigrahi and R. P. Maheshwari, "Transmission line fault detection and classification," 2011 International Conference on Emerging Trends in Electrical and Computer Technology, Tamil Nadu, 2011, pp. 15-22.

[5] Neeta S. Sonwane1, Dr. S. D. Pable2, Fault detection and autoline distribution system with Gsm module, International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395 -0056 Volume: 03 Issue: 05

[6] M. F. Othman and H. A. Amari, "Online fault detection for power system using wavelet and PNN," 2008 IEEE 2nd International Power and Energy Conference, Johor Bahru, 2008, pp. 1644-1648.

[7] A. Cozza and L. Pichon, "Echo Response of Faults in Transmission Lines: Models and Limitations to Fault Detection," in IEEE Transactions on Microwave Theory and Techniques, vol. 64, no. 12, pp. 4155-4164, Dec. 2016.

[8] C. Zhang and L. Zhou, "220kv Transmission Line Fault Diagnosis and Analysis," 2012 Second International Conference on Intelligent System Design and Engineering Application, Sanya, Hainan, 2012, pp. 1343- 1345.

[9] International Journal of Pure and Applied Mathematics Voulme 118 no.8 2018, 377-381; ISSN:1311-8080(printed version);(Fault Detection in Overhead Power Transmission) ISSN: 1314-3395