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A PATH FOR HORIZING YOUR INNOVATIVE WORK

FAULT DETECTION AND LOCATION IN TRANSMISSION LINE BY USING GSM

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Abstract: Designing and implementing commercial as well as industrial systems based on Wireless. Robust communication has always been a prominent field of interest among many researchers and developers. This paper presents design and implementation methodology of a real time fault analysis and loss reduction on transmission line using GSM Technology. GSM as the medium for fault analysis provides a cost-effective, wireless, always-connected and bi-directional communication as a message or data.

Keywords: Transmission, GSM

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INTRODUCTION

Generally when a fault occurs in transmission line, unless it is severe it is unseen. But gradually these minor faults can lead to damage of transformer and can turn harmful to human life. It may also initiate fire.

Present day in India, we do not have a system in hand that would let us know in real time once a fault occurs. Matter of concern is that since we do not have a real time system, this leads to damage of the underlying equipment's connected and turns out to be a threat to human around.

In order to avoid such incidents to the maximum extent, maintenance or checking of the transmission lines are generally carried out on a frequent basis. This leads to increased manpower requirement. The fact remains that the real intention of this is not met as many a times line failure may be due to rain, toppling of trees which cannot be predicted. Like in Western Ghats where the transmission lines are usually drawn amidst the forest and places like *Chirapunjee* where massive rainfall almost sets everything standstill.

To overcome these, we are proposing a GSM based transmission line fault detection System. Whenever the preset threshold is crossed, the microcontroller instantly initiates a message to be sent to the area lineman and the Control Station stating the exact pole to pole location. This helps us to realize a almost real time system.

In an electric power system, a fault is any abnormal flow of electric current. For example a short circuit is a fault in which current flow by passes the normal load. An open circuit fault occurs if a circuit is interrupted by some failure. In three phase systems, a fault may involve one or more phases and ground, or may occur only between phases. In a "ground fault" or "earth fault", current flows into the earth. The prospective short circuit current of a fault can be calculated for power systems. In power systems, protective devices detect fault conditions and operate circuit breakers and other devices to limit the loss of service due to a failure.

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for power systems. In power systems, protective devices detect fault conditions and operate circuit breakers and other devices to limit the loss of service due to a failure. In a poly phase system, a fault may affect all phases equally which is a “symmetrical fault”. If only some phases are affected, the “asymmetrical fault” requires use of methods such as symmetrical components for analysis, since the simplifying assumption of equal current magnitude in all phases is no longer applicable. There are various types of fault occurs in transmission line.

A. TRANSIENT FAULTS

A transient fault is a fault that is no longer present if power is disconnected for a short time. Many faults in overhead power lines are transient in nature. At the occurrence of a fault power system protection operates to isolate area of the fault. A transient fault will then clear and the power line can be returned to service. Typical examples of transient faults include:

1) Momentary tree contact 2) Bird or other animal contact 3) Lightning strike 4) Conductor clash

B. PERSISTENT FAULT

A persistent fault does not disappear when power is disconnected. Faults in underground power cables are often persistent. Underground power lines are not affected by trees or lightning, so faults, when they occur, are probably due to damage. In such cases, if the line is reconnected, it is likely to be only damaged further.

C. SYMMETRIC FAULT

A symmetric, symmetrical or balanced fault which affects each of the three-phases equally. In transmission line faults, roughly 5% are symmetry. This is in contrast to an asymmetric fault, where the three phases are not affected equally. In practice, most faults in power systems are unbalanced. With this in mind, symmetric faults can be viewed as somewhat of an abstraction; however, as asymmetric faults are difficult to analyze, analysis of asymmetric faults is built up from a thorough understanding of symmetric faults.

D. ASYMMETRIC FAULTS

An asymmetrical or unbalanced fault does not affect each of the three phases equally. Common types of asymmetric faults, and their causes:

1). Line-to-line – a short circuit between lines, caused by ionization of air, or when lines come into physical contact, for example due to a broken insulator.

- 2). Line-to-ground – a short circuit between one line and ground, very often caused by physical contact, for example due to lightning or other storm damage.
- 3). Doubleline-to-ground– two lines come into contact with the ground (and each other), also commonly due to storm damage.

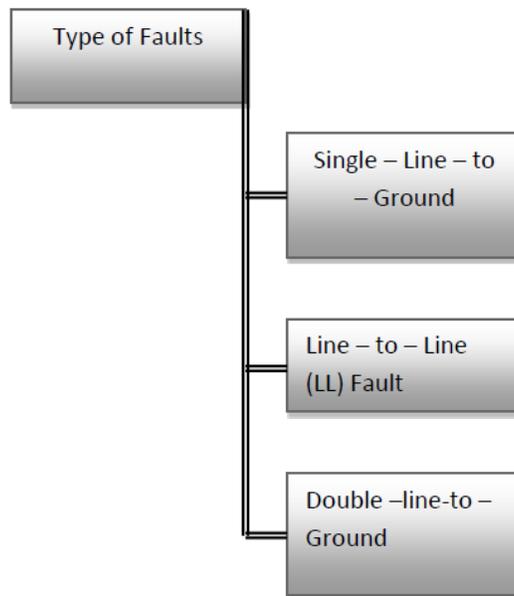
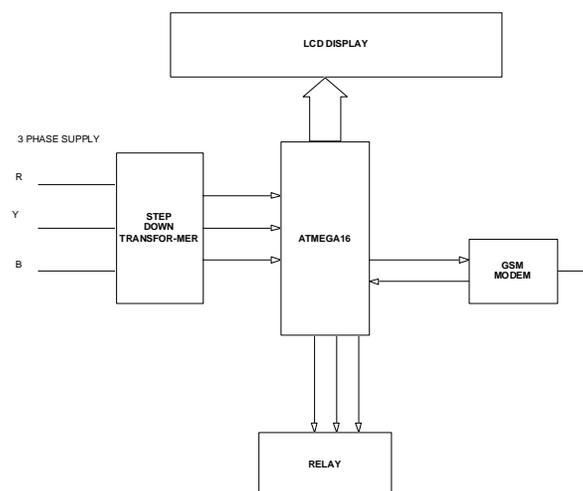


Fig. 1: Asymmetric Faults.

BLOCK DIAGRAM



Block dia.ofTransmission line fault analysis with location detection'

FUTURE SCOPE

The project is designed to send in an alert message as soon as there is a fault. In this model, we predict the place of fault using the distance from pole to pole. In future we can have a GPS attached to it that would exactly send the location in terms of longitude and latitude.

CONCLUSION:

The real-time hardware, software, GSM network is designed for robust environment and implemented in the electrical environment. The fault information at each place of transmission line could be display on the LCD and this information can be transmitted through GSM transmitter to the distribution network for effective distribution management and to save electrical power.

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