

## A Review on Fault Detection Using Different Technique

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**ABSTRACT:** The Electrical power transmission and distribution power lines plays vital roles in Power System techniques it has to achieve the essential continuity of service of power source to the end users. The power transmission lines connect the generating stations and load centers. The probability of fault occurrences in transmission lines is very high. Since a faults can destabilize the power system it must be isolated immediately for restoration of power source. It is fault analysis is very important issue in power technique engineering in order that to clear faults quickly and restore power supply as soon as possible with minimum interruption. In this paper presents a literature review of power transmission line faults detection.

**KEYWORDS:** Fault Detection, System Protection, Neural Networks, Transmission Line, etc.

### I. INTRODUCTION:

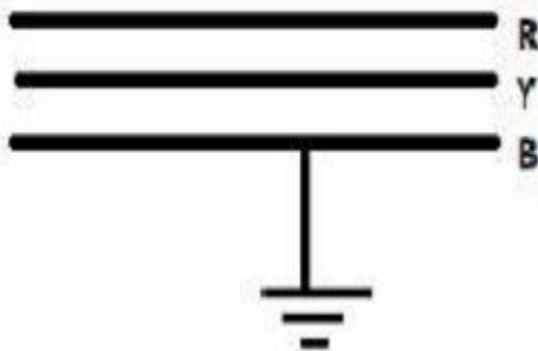
The electric transmission system faults are the greatest threat to the continuity of electricity transmission. The faults on electric power are an unavoidable problem. A well-coordinated protection scheme must be provided to detect and isolate faults rapidly so that the damage and disruption caused to the power system is minimized. It is therefore an everyday fact of life that various types of faults on electrical power systems, though infrequently, and at random locations. The power system is faults can be broadly classified into two main areas which

have been designated as active and passive. The electrical power systems control centers contain a large number of alarms received as a result of various types of faults. To protect these systems, the faults must be detected and isolated accurately. Majority of short-circuit faults tend to occur on overhead lines. The operators in the control centers have to deal with a large amount of data to get the required information about the faults. The faults occur when various conductors contacted with ground or each other condition. In fault detection and isolating the faulted line quickly is important since faulted lines may cause accidents which may harm human, and damage the equipment's or decrease the economical life of devices because of short circuit current. The faults may lead to new faults in other power transmission lines or substations. Furthermore, the interrupts will decrease the quality electricity supplied. Therefore, many approaches were introduced to solve this issue.

### II. Fault Detection

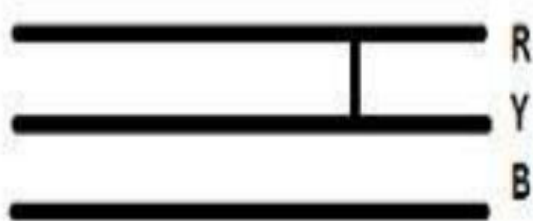
In general two kinds of faults occur in any transmission line network which is unbalanced and balanced faults also known as symmetric and asymmetric faults resp. We see that maximum no. of faults which is encountered is of unbalanced type in any power distribution system. Adding up, faults can also be viewed as series and shun. The series fault are those type of faults which occurs in impedance of the line and it doesn't engage any ground and neutral nor any interconnection between the phases.

Here, we find an increased level of frequency and voltage and drop off of current in the distorted phases, such as if there occurs any one or two opening of lines by the circuit breaker. And, the shunt one is the unbalanced between any phases or any phase and ground. This type of fault occurs when one conductor falls to the ground or gets into contacts with the neutral wire. It could also be the result of falling trees in a rainy storm. This type could be represented as shown in Fig 1. below.



**Fig. 1. Single Line to ground fault**

The second most occurring type of shunt faults is the Line-to-Line fault. This is said to occur when two transmission lines are short-circuited. As in the case of a large bird standing on one transmission line and touching the other, or if a tree branch happens to fall on top of two power transmission lines. This type could be represented as shown in the Fig. 2 below.



**Fig.2. Two line to line faults**

### III. RELATED WORK

The many researchers have been done in field of economic dispatch problem some of the work is described in this paper.

**EisaBashier et.al**, study in this paper, the fault detection in power system using neural network. The Electrical power systems suffer from unexpected failures due to various random causes. The functions of the protective systems are to detect, then classify and finally determine the location of the faulty line of voltage and/or current line magnitudes. Then at last, for isolation of the faulty line the protective relay have to send a signal to the circuit breaker. It aims to implement complete system for distance protection that subdivided into several neural networks zones. The single phase to ground, double phase and double phase to ground faults are considered. When real values are then used as an input to trained neural network fast evaluation of errors obtained. The results obtained for transmission line fault detection, classification and locations finding all were highly satisfactory using BPN network architecture [1].

**D.Thukaram et al.** this paper used the artificial neural network and support vector machine (SVM) approach for fault location in radial distribution systems by using the data available from the substation. The approach provided the distance range of the occurrence of fault, but failed to give the exact fault location [2].

**SmritiKesharwani et.al**, in this paper investigation, the power transmission line among the other electrical power system component suffer from unexpected failure due to different random causes. A fault occurs on transmission line when two or more conductors come in contact with each

other or ground. The system is used to train an artificial neural network to detect the transmission line faults. Back propagation network are very efficient when a sufficient large no. of data set is available. The results show that the method is suitable for design a protective scheme for transmission line base on artificial neural network [3].

**Mayuresh et.al**, In this paper, fault detection using wavelet transform and neural network. The present a discrete wavelet transform and neural network method approach to transmission line fault detection. The analysis of the details coefficients energy of the phase signals, and as an input to neural network to classify the faults on power transmission lines. The features are extracted from the current signals by using wavelet transform. The feature vector is then given as input to the neural network. This paper fault classification can be extended to other power system protection problems such as finding fault location [4].

**Zahri Mustapha et al.** suggested the algorithm for fault location using ANN by taking into account the fault resistance and fault impedance as the inputs. The technique presented was only to determine the single line to ground faults and could not detect the other faults that occur in the power system [5].

**IshaAwasthi and Aziz Ahmed et.al**, proposed a nodal system for the detection of faults where several nodes are considered and distance between each node is calculated for fault location on occurrence of any fault. The Rosenblatt's algorithm was used in ANN, carried out on MATLAB and energy saving principle for power utilities was emphasized [6].

**Desai et.al**, shows right different scheme for

detection and classification of faults on transmission line. The scheme is to use neural network and wavelet transform together, to choose a proper way for solving the problem. Wavelet transform has strong mathematical, very fast and accurate tools for transient signal in the transmission lines which was used in artificial neural network that can make a different between measured signal and associated signal that has different pattern. It can be done by using specific algorithm [7].

#### **IV. CONCLUSION**

The various papers and literature has been studied for fault detection. Most of the prose worked on detection of fault related to the power system. For the improvement of power quality meaning that to make power purer, the compensated circuit is considered to be attached. While to enhance the power system with reliability respected time. Thus more important is to detect of fault as well as locating them as soon as possible.

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