FAKT ANALYSIS OF TRANSMISSION LINE
APPROACH TO MATLAB SIMULATION

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ABSTRACT
As we know that today very much power or electricity are consumption and this condition are increasing transmitted by transmission line, from one place to other. But some time in which transmission line various type fault may occur and these fault affect the all system which is connected to it. The main purpose of present this paper are in which we will study or analysis the various fault and also show the effect of fault in transmission line and bus system which is connected to transmission line. This paper and project is approach to MATLAB software. In these projects we design a transmission line and various faults will be happen due to fault tool box which has faults discuss above. After the fault, we will showing, what kind of effect on bus system like, voltage, current, power, positive, negative, and zero sequence component of voltage and current output in wave form.

Keywords— LL-Line to line fault ,LG-Single line to ground fault, DLL-Double line to ground fault.

1. INTRODUCTION:-
In the process of transmission line fault analysis, determination of bus voltage and the rms line current are possible when different type of fault occurs in the power system. The terms bus voltage and rms current of line are very important in power system. There are two fault occurs on the power system of 3-phase balanced fault and unbalanced fault occurs on transmission line of power system are line to ground fault, double line to ground fault, double line fault. Transmission line fault analysis helps to choose and develop a better device for protection. As we know that for protection of transmission line to mount the circuit breaker and its rating depends on triple line fault because of the triple line fault current is very high as compare to other fault current. By using MATLAB simulation in computer, analysis of transmission line fault can be easily carried out.

The main objective of this paper is to study the common fault types which are balance and unbalance fault of the transmission line in the power system. Secondly is to perform the analysis and obtain the results of various parameters from simulation on those types of fault using MATLAB.

A novel modeling framework for analysis and simulation of unbalanced faults in power systems is procedure incorporates the frequency information in dynamical models, and produces approximate nonlinear models that are well suited for analysis and simulation[2]. The transformer model includes saturation and the parameters have been obtained from experimental measurements. The study shows that sags can produce transformer saturation when voltage recovers. This saturation produces an inrush current that is similar to the inrush current produced during the transformer energizing. The study takes into account that the voltage recovery instant can take only discrete values, since the fault-clearing is produced in the natural current zeroes[5]. The instant of voltage recovery corresponds to the instant of fault clearing. For single-phase and phase-to-phase faults, a single point-on-wave of voltage recovery can be defined. For two-phase-to-ground and three-phase faults, the recovery takes place in two or three steps[4]. System grounding and ground fault protection are important in the petrochemical industry. First, it is important to have the proper system grounding for the particular system application. Then, it is equally important to have the proper ground-fault protection[3].

1.1 FAULT IN TRANSMISSION LINE:-
In the 3-phase transmission line of power system mainly 2 types of fault occurs symmetrical or balanced fault and unsymmetrical fault, but in this paper we study and analyze about unsymmetrical fault which mainly occur between two or three conductor of 3-phase system or conductor to ground. Unsymmetrical fault include mainly 3 types of faults are:-

- Single line to ground.
- Double line fault.
- Double line to ground.

The most common types of faults by far is the single line to ground fault followed in frequency of occurrence by the LL fault, DLG fault and three phase fault. Most of these
occurs as a result of insulator flashover during electrical storms[2].

In order to study and analyze the un-symmetrical fault in MATLAB there is a requirement of developing a network of positive, negative and zero sequence. In this paper we analyze positive, negative and zero sequence current and voltage of buses at different fault condition.

Simultaneously we analyze the active and reactive power and rms bus current and voltage of the system at various fault condition.

MATHEDOLOGY:-

MATLAB gives an attractive environment with hundreds of reliable and accurate built-in functions. These functions help in providing solution to a variety of mathematical problems including matrix algebra, linear systems, differential equations, nonlinear systems & many other types of technical solutions related to electrical machines. SimPower Systems software & other products of the Physical Modeling product family work together with Simulink software to model electrical, mechanical and control systems.[5]

To study and analyse the transmission line fault following circuit arrangement may be used which is shown in figure-1 in which two three phase source of rating 100 MVA, 13.8 KV, 50 Hz is connected to two transformer of rating 1000 MVA, 13.8/500 KV and 1000 MVA, 500/13.8 KV respectively. The bus system are connected between these two transformer. Between bus 2 and bus 3 a resistive load is connected and near bus2 fault is created for the instant of 0.1 to 0.4 second. In system three transmission lines are used in which one is of 100 Km long and another two transmission lines having distance 15 km.

When LG fault is created near bus 2 then voltage of phase A across bus 2 becomes zero as shown in figure-2 and positive sequence voltages of bus 2 becomes low at 10KV and negative sequence component of voltage becomes high to 5x10^4volt as shown in figure-3 and active power and reactive power across bus 2 becomes varies between 0.7 - 1.7 MW and -1.3 to 1.3 VAR as shown in figure-4. When LLG fault is created near bus 2 then phase A and phase B voltage across bus-2 becomes zero as shown in figure-5 and positive and negative sequence component of voltage across this bus becomes decrease and increase to 5KV respectively. Active and reactive power of bus-2 becomes varies from 0 to 1 MW and from -1.5 to 1 VAR respectively as shown in figure-6. If LL fault is created then two phase namely A and B voltages varies near zero and positive sequence component of voltage across bus 2 becomes constant at 1.5 MV as shown in figure-7 and power across bus2 is lies at 17 MW as shown in figure-8.
Simulation and analysis of three phase fault using MATLAB is a very convenient way to achieve results of the transmission line fault parameter. In this paper, the simulation of three phase transmission line fault analysis system is proposed. This simulation presents the various fault in transmission line of the power system such as single line to ground fault, double line to ground fault, double line fault etc. This system helps to redesign the bus system of the power system according to its results.

**CONCLUSION:**
REFERENCES:


