THREE PHASE AUTO-RECLOSER

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Abstract: **The project is designed to develop an automatic tripping mechanism for the three phase supply system. The project output resets automatically after a brief interruption in the event temporary fault while it remains in tripped condition in case of permanent fault. The system is developed for an intelligent recloser mechanism that is able to differentiate between a temporary and a persistent fault, and then take proper action. The intended use of this systemis to increase reliability and energy quality. The system is realized by using a non-invasive method to monitor the soundness of the line. Through signal processing, this information is converted into logic that a microprocessor can use to control the recloser.**

With the help of suitable software simulation of above system can be done which can be further understood by simulation details and these new settings and recommendations will improve the Autorecloser success rate thereby improving the reliability of the network. It will also minimize the risk of major failures resulted due to the definitive tripping of important transmission lines due to transient faults.

I. INTRODUCTION:

The electrical substation which supply the power to the consumers i.e. industries or domestic can have failures due to some faults which can be temporary or permanent. These faults lead to substantial damage to the power system equipment. In India it is common to observe the failures in supply system due to the faults that occur during the transmission or distribution. The faults might be LG (Line to Ground), LL (Line to Line), 3L (Three lines) in the supply systems and these faults in three phase supply system can affect the power system. To overcome this problem a system is built, which can sense these faults and automatically disconnects the supply to avoid large scale damage to the control gears in the grid sub-stations.And when the fault is cleared it will automatically reclose the line,if fault is not cleared then it will trip that line permenently .

II. PROJECT SCOPE:

We can use this concept of smart recloser for protection and fault detection of the transmission line as well as in machines for the same purpose.With this auto-reclosing

auto-recloser senses the faults when fault arises on the line or system.After sensing fault the auto-recloser starts working.It sends command to the relay and relay will trip the circuit breaker.The current transformer (CT) and potential

transformer (PT) are used to measure the current and voltage during fault.This CT and PT gives this current and voltage values to controller.It will activate its circuit and by using this controller will decides the type of fault,and by using timing circuitry it gives command to breaker either trip the circuit or reclose the line.

III.   SYSTEM IMPLEMENTATION:

The smart reclosing system uses current transformer (CT) and potential transformer (PT) for sensing the values of current and voltage during fault condition.This values of CT and PT are then fed to controller and the trip circuit to detect the type of fault i.e. Line to Line fault,Three Line to Ground fault,Double Line to Ground fault,ect.

Also trip circuit will give the necesary command to the breaker if the fault is cleared then to reclose line as normal or if the fault is not cleared then to trip the line permenently.

By using display we can observe the transient waveforms of the current and voltage before and after the fault and the respective type of fault.Suitable software is used for the simulaion of the circuit of this smart recloser.
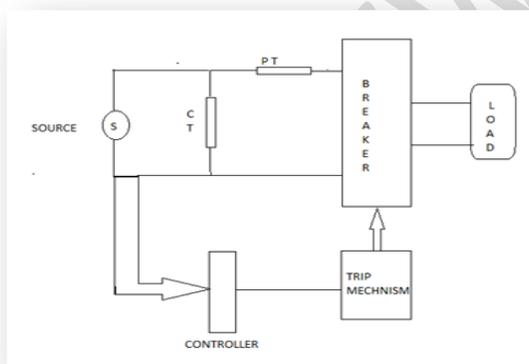
IV.   ARCHITECTURE:

Fig: Circuit Diagram

V.   PROTOTYPE

We developed a prototype to check the feasibility of this system. In prototype,the system will be equipped with a smart recloser and control mechanism.Controller will be controlling the opening and closings of breaker as per line parameters sensed by respective CT's and PT's in system.If the line parameters varies due to various faults on system controller will take respective action along with recloser openings to clear faults. If the fault is not cleared by recloser operation or it remains for long time indicating permanent fault it will disconnect the load permanently. The behavior of system and its various parameters along with graph will be checked on the Simulink model of the system

VI.   SIMULATION:

Simulation will be done by using suitable software. In which analysis of above mentioned system will be done to reduce the transients as less as possible.
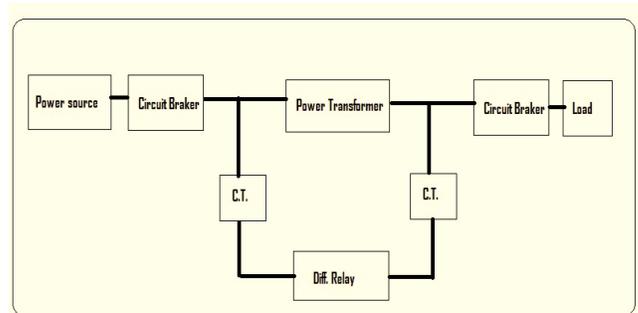

Fig:Simulation of smart recloser

VII.   RESULTS AND DISCUSSION

The result of our project is designed and optimized system. Smart recloser system have easy and friendly interface. There are no doubts about the reliability of redundant system due to automatic reclosing and changeover system for unforeseen situations.Also as the automatic reclosing or tripping is done the system operation is safer and will not consume time as local fault clearing.

VIII.   .ACKNOWLEDGEMENT:

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