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"Analysis and Fault detection of 3 phase transmission line"

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ABSTRACT:-
The demand of power is increasing day by day for households, agricultural, commercial, trade sectors etc. This paper is developed so as to keep up that power needed by these sectors, as in associate electrical system, because of line to ground (L-G), line to line fault (L-L), 3 lines (LLL) varied fault happens. during this paper it's been mentioned a way to overcome this drawback and for this a system is made, that has associate automobile reclosing mechanism of disconnecting the availability to avoid massive scale harm to the management gears, load or hands within the grid sub-stations. During this manner a tripping mechanism is formed so as to curb temporary and permanent faults.

I. INTRODUCTION:-

Current flows through all parts of the wattage system throughout traditional operative conditions. There square measure numerous strategies through that one will analyse any installation by conniving the system voltages & currents below traditional & abnormal situations. Thanks to some unforeseen circumstances, faults may happen because of natural events or accidents like lightning strike, line to ground faults etc.

Three part fault analysis and its protection mechanism main operate is to confirm safety of equipment's and maintain facility stability at high speed.

In order to guard the equipment's of facility from faults, data regarding glitches, their detection, and safe isolation of the faulted space is required.

There square measure numerous varieties of fault. A number of them square measure Transient and Permanent Faults.

The incidence of transient faults accounts to 70-90%. In overhead power lines, most of the faults square measure transient in nature. in an exceedingly system comprising of varied elements like transformers, relays, short tree contact, bird or alternative animal contact, Lightning Strike, Conductor incompatible or stuff spark, Swinging wires and temporary contact are often the reason for transient faults. Thus, by de- energizing the road for brief time transient faults are often cleared. Service to the road are often recreated by instant automobile reclosing. The prevalence of Semi-Permanent or Permanent faults abides to 10-30%. A semi-permanent fault are often effectuated once little branch of tree falls on line. In such case of permanent fault, the fault can't be cleared by an on the spot de-energizing of the road and ulterior automobile reclosing. If there's a compeered time-delayed trip then system would let the branch to be burned away with none hurt to the present system. On AN overhead line, a broken wire or conductor creating a part open, or a broken pole creating the phases to short are the instance of common and most frequently occurring permanent fault. Faults on underground cables also are the instance of permanent fault. Most of the faults are often with success cleared by victimisation the acceptable tripping and automobile reclosing mechanism. Correct tripping will de- energize the road for enough period to pass the fault supply and to de-energise the fault arc, then the system mechanically recloses the road to keep up the ability offer. Thus, automobile reclosing mechanism will considerably decrease the outage time due to faults and provides a major level of service consistency to the buyer and dependableness of power grid

In the gift state of affairs of power systems, automatic reclosing system features a terribly wide space wherever it are often applied.

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Fig.1 Transmission Lines

Different type of fault in 3 phase is:

1. L-L fault (line to line fault)
2. L-G fault (line to ground fault)
3. 2L-G fault (double line to ground fault).

Is a fault that is cleared by the immediate tripping of 1 or a lot of circuit breakers to isolate the fault, and that will not recur once the line is re- energized.

Faults tend to be less transient (near the eightieth range) at lower, distribution voltages and a lot of transient (near the ninetieth range) at higher, sub transmission and transmission voltages.

Main Objectives of our project is:-

This project is aimed to style scale back the outage time due to faults and offer a higher level of service continuity to the client.

Moreover, no-hit high-speed reclosing motorcar reclosing. On transmission circuits will be a major issue once trying to maintain system stability. For those faults that square measure permanent, motorcar reclosing can reclose the circuit into a fault that has not been cleared, that might have adverse effects on system stability (particularly at transmission levels).

Methodology:-

The project is meant to develop an automatic tripping mechanism for the 3 section provide system. The project output resets mechanically when a short interruption within the event temporary fault
While it remains in tripped condition
Just in case of permanent fault.

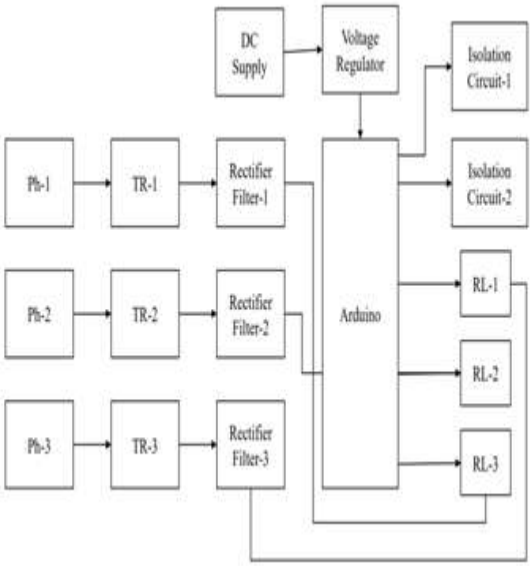

Fig. 2 Block Diagram

The electrical station that offer the ability to the consumer's i.e. industries or domestic will have failures thanks to some faults which might be temporary or permanent. These faults result in substantial injury to the ability system instrumentality. In India it's common to look at the failures in offer system thanks to the faults that occur throughout the transmission or distribution.

The faults may well be LG (Line to Ground), LL (Line to Line), 3L (Three lines) within the offer systems and these faults in 3 part offer system will have an effect on the ability system. To beat this drawback a system is constructed, which might sense these faults and mechanically disconnects the availability to avoid massive scale injury to the management gears within the grid sub stations.

This system is constructed victimization 3 single part transformers that square measure wired in star input and star output, and three transformers square measure connected in delta connections, having input 220 V and output at twelve volt. This idea low voltage testing of fault conditions is followed because it isn't suggested to form on mains line. 555 timers square measure used for handling short length and long length fault conditions.

A set of switches square measure won't to produce the LL, LG and 31. Fault in low voltage facet, for activating the tripping mechanism. Short length fault returns the availability to the load like a

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shot referred to as temporary trip whereas long length shall lead to permanent trip.

Components List:-

Components Required
Microcontroller
Optocupler
Transformer
Relay
Transistor
Display
Voltage regulator
Power supply
PCB
Resistor
Capacitor

Hardware Testing:-

1. Conductivity Test:-

In natural philosophy, a continuity take a look at is that the checking of an electrical circuit to ascertain if current flows (that it's in reality an entire circuit). A continuity take a look at is performed by inserting tiny low voltage (wired serial with an light-emitting diode or noise-producing element like a electricity speaker) across the chosen path. If lepton flow is reserved by broken conductors, broken elements, or excessive resistance, the circuit is "open".

Devices that may be accustomed perform continuity tests embrace multi meters that live current and specialized continuity testers that area unit cheaper, a lot of basic devices, usually with a

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straightforward light-weight bulb that lights up once current flows.

2. Power ON Test:-

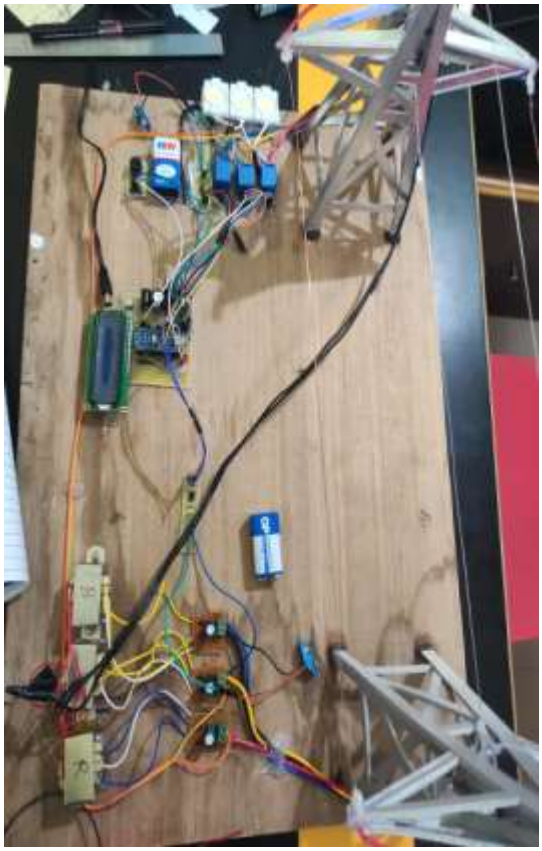
This check was performed to visualize whether or not the voltage at completely different terminals is in step with the necessity or not. We tend to take a multi meter and place it in voltage mode. Bear in mind that this check is performed while not ICs. Firstly, if we tend to area unit employing an electrical device we tend to check the output of the electrical device; whether or not we tend to get the desired 12V AC voltage (depends on the transformer utilized in for the circuit). If we tend to use a battery then we tend to check if the battery is totally charged or not in step with the required voltage of the battery by victimization multimeter.

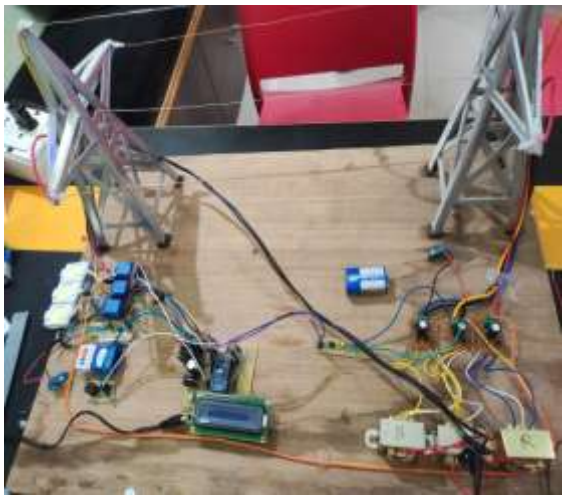
This explicit field, the fault analysis and detection techniques are often used area unit given in following:

1. Fault Detection victimization Composite Fiber optic
2. Fault Detection victimization Neural Network
3. The conception within the future are often extended to developing.

A mechanism to send message to the authorities via SMS by interfacing a GSM modem. By using Microcontroller Percentage error between the actual and obtained distances is calculated as

%Error = (Calculated Distance – Actual Distance)*100 4. Actual Distance





II. RESULT / CONCLUSION:-

This study shows regarding the world fault administrated for numerous locations on the overhead line for numerous sorts of the faults. during this overhead transmission square measure classified line four sorts of fault specifically L-G, 2L-G, 3L-G and 3 section faults are Distance taken at 250 klick into thought into this work and here four fault specifically as single line ground fault, Double line to ground faults, Triple line to ground faults and L-L-L faults

square measure comparison and detection has been show by this study with their planned work.

According, to the results, the present magnitude of the fault is enlarged and dip of existing buses at the instant of starting is attenuated in conversion of entire network. Therefore, once coming up with the ability transmission systems, electrical firms square measure expected to follow the set of normal specifications that square measure in short represented in chapter 2 of this analysis, keeping in mind that the any away transmission lines square measure from natural parts, like trees, the less faults occurrences are going to be and also the additional reliable the ability system are going to be.

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