

Three phase fault analysis for temporary and permanent fault

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ABSTRACT

In India it is common, 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.

Keywords: Analysis of fault, permanent and temporary fault, Automatic tripping.

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I. INTRODUCTION

Various studies have shown that anywhere from 70%, to as high as 90%, of faults on most overhead lines are transient. A transient fault, such as an insulator flashover, is a fault which is cleared by the isolate the fault, and which does not recur when the line is re-energized. Faults tend to be less transient (near the 80% range) at lower, distribution voltages and more transient (near the 90% range) at higher, sub transmission and transmission immediate tripping of one or more circuit breakers to voltages.

Lightning is the most common cause of transient faults, partially resulting from insulator flashover from the high transient voltages induced by the lightning. Other possible causes are swinging wires and temporary contact with foreign objects. Thus, transient faults can be cleared by momentarily de-energizing the line, in order to allow the fault to clear. Auto reclosing can then restore service to the line.

The remaining 10 - 30% of faults are semipermanent or permanent in nature. A small branch falling onto the line can cause a semi-permanent fault. In this case, however, an immediate de-energizing of the line and subsequent auto reclosing does not clear the fault. Instead, a coordinated time-delayed trip would allow the branch to be burned away

without damage to the system. Semipermanent faults of this type are likely to be most prevalent in highly wooded areas and can be substantially controlled by aggressive line clearance programs.

Permanent faults are those that will not clear upon tripping and reclosing. An example of a permanent fault on an overhead line is a broken wire causing a phase to open, or a broken pole causing the phases to short together. Faults on underground cables should be considered permanent. Cable faults should be cleared without auto reclosing and the damaged cable repaired before service is restored. There may be exceptions to this, as in the case of circuits composed of both underground cables and overhead lines.

Although auto reclosing success rates vary from one company to another, it is clear that the majority of faults can be successfully cleared by the proper use of tripping and auto reclosing. This de-energizes the line long enough for the fault source to pass and the fault arc to deenergize, then automatically recloses the line to restore service. Thus, auto reclosing can significantly reduce the outage time due to faults and provide a higher level of service continuity to the customer. Furthermore, successful high-speed reclosing auto reclosing on transmission circuits can be a major factor when attempting to maintain system stability. For those faults that are permanent, auto reclosing will reclose the

circuit into a fault that has not been cleared, which may have adverse effects on system stability.

II. BLOCK DIAGRAM

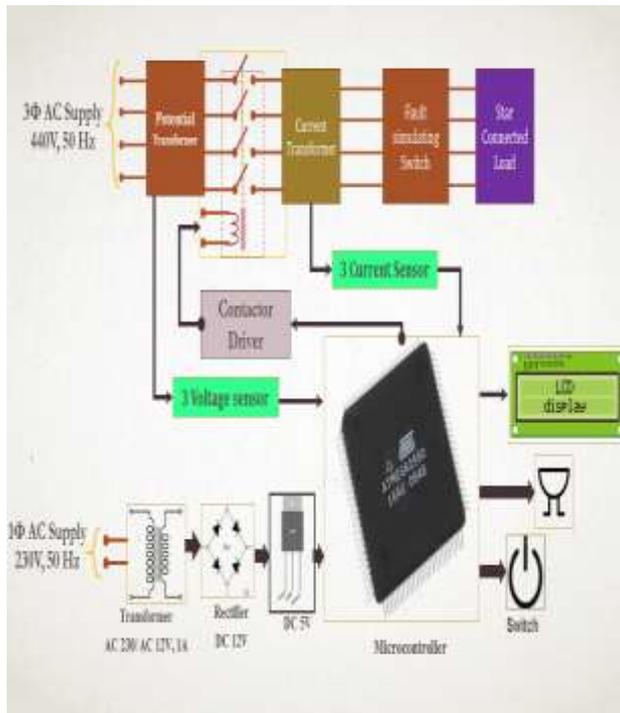


Fig 1. Block diagram

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- This is an advance auto reclosing system by using ATmega 2560
- Fault detection and analysis of fault is sub field of control engineering.
- Which concerns itself with monitoring system
- Auto reclosing does not clear the fault. Instead, a coordinated time-delayed trip would allow the branch to be burned away without damage to the system.

III. APPLICATIONS

- A Transmission line(AC)
- Distribution line(AC)

IV. CONCLUSION

This paper is designed successfully with automatic tripping mechanism using microcontroller for the three phase supply system while temporary fault and permanent fault occurs.

The concept of the future can be extended to developing a mechanism to send message to the authorities via SMS by interfacing a GSM modem.

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