Review Paper On
PLC Based Smart Relay Coordination System For Smart Electricity Distribution

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Abstract- *The power distribution system is made up of different load lanes. Assume that each of the three load lanes in this distribution system is connected to the same distribution line. If load lane 1 is off due to an issue, but load lane 2 is also connected to the same line, then both load lanes will likewise become off if there isn't an issue with these loads.Therefore, "PLC Based Relay Co-ordination System for Smart Electricity Distribution using PL for stand by supply arrangement" is the primary goal of our project. In this project, a relay will turn on the other load lane that is connected to the same line automatically when one load lane is off. here, the PLC i.e. Programmable Logic Controller are use with the protective Relays and sensor to detects the various parameters like temperature by LM235, over voltage, under voltage and various faults conditions. All sensors send continues data toPLC which have in build programmed algorithm to perform action through send commant to relay to distribution transformer to cut off the supply and maintain the load scheduling automatically.*

Keywords- PLC, Relay, LM235,Over voltage, under voltage, Distribution Transformer.

I. INTRODUCTION

Now days power system protection is major concern to protect the system by dynamically changing load, Faults. the over current relay is mostly used protective device to prevent the power system by permanent loss. here, the PLC is developed with Protective relay to monitor, analyze and perform control action on the various power system equipments like Transformers temperature, load, current and voltages. Relay are used with PLC and sensors to detect the lane fault as under voltage, over voltage, overloading, phase to phase fault and temperature fault. The distribution transformer use at the end of line to step down the high voltage supply. if the load demand is increased then, it increase the current in secondary side of transformer and also cause of temperature increase. this may be cause of transformer damage and permanent fail in supply at customer end. the PLC based relay system is capable to monitor this situation and perform the control action to avoid the hazards and fault. this is one of application of Automation in where no need to manual control.

II. PROBLEM FORMULATION

Day by day the power system is going to more complex because of Industrial development and commercial use. that's why the load demand from the consumer side is also increasing. so, stable power system operation is necessary to provide the continuity. number of line and buses are inter connected with the main transmission line and continuously working. but if any abnormal fault occurs in the any single line at that time it may be cause of failure line and also affect the Norma working of other line and damage. so, to protect the power system operation against this problems various protective scheme are also developed. but by this overall power system get affected i.e. disconnected during fault. so, to over rite this and maintain the other buses continue in working we need some another technology which command to specific affected line to automatically.

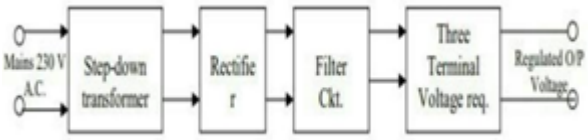
III. PROPOSE SYSTEM METHODOLOGY

In this paper, a PLC is used to control and protect a transformer. The approach is straightforward: we are creating a safety circuit to shield our power system distribution transformer from over current and overheating caused by load demands and dynamic load fluctuations. To do that, we employ a temperature sensor called the LM35, which is mounted on a transformer winding and continuously detects the winding's temperature before sending the data to a PLC. After that, if the temperature rises over the threshold, the PLC will activate the control circuit and relay, cutting off the supply. This kind of protection is also provided against over current, and current is measured using CT. Similarly, if voltage changes or occurrence of fault then control circuit will

operate and protect transformer from damage by considering the load scheduling scheme we have to develop the algorithm for programmable logic control and to manage visual representation and human machine interface between Engineers and developed system we have use WinCC.

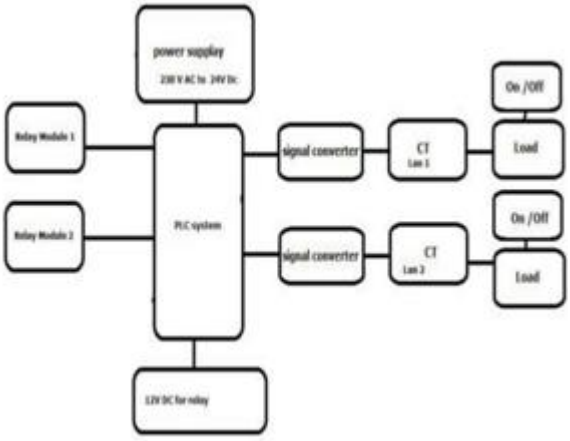
IV. POWER SUPPLY DESIGN

The required power supply circuit for the operation is build as per the following block diagram for the smooth operation.



Here, the 230 A.C. voltage transformer are use to step down the supply. full wave Rectifier circuit is use to convert the AC to DC voltage. Filter circuit are use to remove the AC pulsating particles present in supply after rectifier. the three terminal voltage regulator is a 7805 voltage regulator which convert the input DC voltage into 5 volt DC output.

WORKING



As stated in above block diagram. there are two module are connected with PLC. 230 to 240 supply connect to PLC for the PLC operation. 12 volt DC output supply is for Relay operation. signal converter are used to convert the signals from CT lane 1 and CT lane 2 to PLC input. after that on the basis of this signal ON and OFF are happen in distribution line if fault is on the particular line. alarm feature is also developed to indicate that which line is affected by fault and generator need to balance the line. if any fault, over voltage or under voltage comes into the line then sensor collect the data and dives to the PLC through signal converters. PLC are programmed and make decision to perform the cut off operation for the fault affected line as possible quickly.

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