K.D.K. COLLEGE OF ENGINEERING, NAGPUR
DEPARTMENT OF ELECTRICAL ENGINEERING
"PREVENTION OF TRANSFORMER OVERLOADING USING PROGRAMMABLE LOGIC CONTROLLER"

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Abstract: This project is based on open loop distribution system for industries which means that the load are connected to two feeders and any section of the feeder can be isolated without interruption. Thus average outage time is reduce to the time required to locate the fault and do necessary switching to restore the service. In this project, the switching is perform automatically with the help of PLC ladder logic diagram. Power control operation with PLC system is mandatory to run smooth control industries and other area. Control algorithm measure critical parameter and adjust variable output to optimize power by turning ON/OFF load with improve performs PLC is used to model and realize the complete system and perform the experiment for result analysis.

Introduction:

Supply disruptions are cause by factors like overloading that causes fuses to blow, lightning, poor workmanship of materials and equipment incorrect operations, relay failures and inadequate maintenance without distribution automatic system, these problems always cause failures anywhere within the service substations and would leads to power failure for an complete area. Power failures can last for extended periods, causing much inconvenience and financial losses to customers similarly as utilities. Some minor fault might jeopardize continuous electricity supply to customers. Power control operation with PLC system is mandatory to run smooth control in industries and other area. Control algorithm measures critical parameters and adjust variable output to optimize power by turning ON/OFF loads with improved performance. PLC is employed for automation and realize the whole system and perform the experiment for result analysis.

Implementation/Simulated Designs:

Block Diagram

View of Module

PLC ladder logic :

Fig-1: PLC Ladder logic

Implementation results:

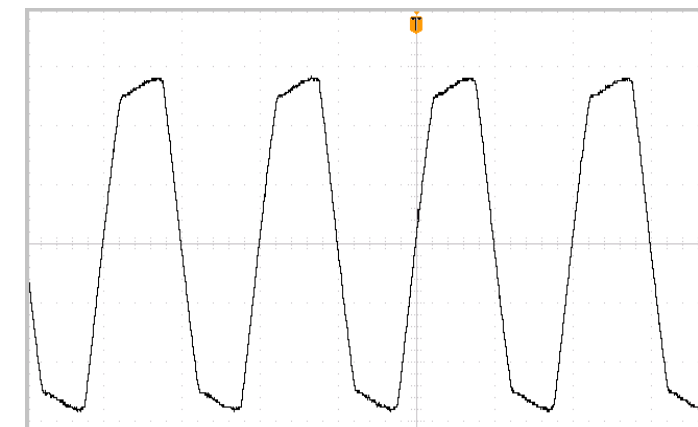

Fig-2: Transformer working in normal condition

Fig-3: Output waveform during switching

➢ It is observed that in normal condition the output voltage is very much stable and in the range as per input voltage of transformer. Transformer performs efficiently

➢ In the above fig.2, the X-axis and Y-axis are denoted by time and voltage respectively. This waveform shows transformer is working in normal condition. So the waveform is sinusoidal and normally the voltage is 1.5 to 1.8 volts.

➢ In fig.3, the waveform shown is during switching. This denotes the voltage rise to 2-3 times more i.e. 3V and drops to normal voltage after transformer 1 is switched to standby transformer.

Conclusion and Future scope:

Conclusion:
This system is based on the over-voltage protection of transformer. PLC ladder logic is used for the switching of transformer, when there is overvoltage's in working transformer and analyzed the fault. When the PLC identifies over-voltage the supply gets automatically switch to the another stand by transformer. The overall system not only designed for switching but also for making unnecessary loads shut down. Because of this system industries or other large consumers working on high voltages will get more reliable, highly efficient and continuous supply

Future scope:
The consumer can get and interrupted power supply and distribution system could be done automatically by implementing this project in substation. thats why in future man would be quickly justify the problem in substation and shift the load in stand by transformer automatically till the repair faulty substation.

References:

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Program Outcome (PO's)

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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