

Fault Monitoring and Protection of Industrial Load using GSM Technology

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Abstract— This paper focuses on fault monitoring and providing protection to industrial load using micro-controller and GSM technology. Large & medium scale industries suffer various problems such as overvoltage, under voltage, over temperature, single phasing, over current, earth fault etc. To protect the industrial loads from various faults mention above we are introducing a new system. The system which introducing is a micro-controller and GSM based hardware system which will keep a record of various parameters such as overvoltage, over current single phasing etc. A system is also interface with microcontroller, GSM modem and LCD. LCD will continuously display the values of all three phases and provide a value of temperature. The GSM modem takes the values which will be displayed on the LCD from micro-controller and send to the predefined mobile number by SMS. This system is capable to auto-restart when fault get cleared.

Key words: Fault, Industrial Load, GSM Technology

I. INTRODUCTION

The engineer and the researcher, who are working for the development of the industries, always have a power supply as priority area. They had came up with some condition monitoring method such as vibration monitoring, thermal monitoring, chemical monitoring, then all these type of monitoring method need special sensor which are quit costly. As compare to the traditional mechanical based system, the microcontroller based hardware system has more accuracy as well as safe and visual environment, which is shown by the experimental result. In this paper, we are introducing a new method for the protection of the industrial load using microcontroller and GSM technology. The microcontroller will constantly monitor the various parameters like under voltage, over voltage, over temperature, so that the load can be protected from the undesired values of the parameter. This system will also provide self evaluation which will keep informing us about the problem has occurred by which parameter. The system is also capable of auto restart itself, is default gate cleared and the parameter rescue it's predefined or specified value. Using this system, we are monitoring the various parameters of the devices and the values of this parameter will continuously send to the predefined number of servicemen or electricity board by the SMS using GSM technology. The system priority's is to protect the using microcontroller. Various electrical problems occur in tree phase supply like over voltage, under voltage, single phasing, earth fault etc. The load connected across these three phase supply cannot operate properly because of these faults. So to protect the device or load we are introducing the system which will

give the information about the fault occurs in which phase exactly. So that we can save men work and time also.

II. FAULT IN THREE PHASE DEVICES AND THEIR CAUSES

A. Over voltage:

When the systems voltage increases above the 110% of nominal voltage rating it is called as over voltage. Over voltages are less known than under voltage but they can also emerged because of the system fault. There are many reasons for the occurrence of over voltages like L-GND Fault, due to which the voltage of other two phases can rise. It can also cause due to the lightning strike, power supply surges and when the load of the system is suddenly reduced. The overvoltage can caused the failure of electrical equipment, due to the overheating which is caused by high voltage. It also caused insulation Failure and may destroyed electronic component.

B. Under voltage:

When the applied voltage is drop to the 90% of the rated nominal voltage, or less, it can be defined as under voltage. The main reason for causing the under voltage are short circuit, putting large load on the system suddenly, the failure in the equipment. Loose cable connection can also cause under voltage. If the voltage drop, the current will increase which means it will heat up the winding coil.

C. Earth fault:

An earth fault occurs when an active wire or the current carrying conductor comes into the contact with earth or ground. Due to this fault the system will draw heavy current which can caused the excessive heating and this overheating can turn into fire or explosion. It can also damage to the other equipment in the system.

D. Overheating:

When the temperature of the electrical system or its equipment increases above its rated value that situation it's called as overheating. It can be caused due to the short circuit line fault and when the equipment is overloaded above its rated value. It can cause the burning of the winding of the equipment and damage the electrical system.

E. Single phasing:

When any one phase of the three phase system is lost or broken, this is called as single phasing. It is caused because thermal overload, broken wire or mechanical failure. As the load is now shifted to the remaining two phases because of single phasing, they will get overheated and can damage the winding.