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Detecting Power Grid Synchronization Failure System on Sensing Frequency or Voltage beyond the Acceptable Range

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Abstract: In this project we are going to implement the use of up-to-date technology in sensing the very low variations in frequency or voltage magnitude of a generator in a Power grid in which there may be many generators working in synchronism with the grid in terms of phase sequence, voltage magnitude and frequency. In today's practical Power grid as we all know many generators or power source are working together and to maintain stability between all, the detection and isolation of the sources falling out of synchronism, is of crucial significance as otherwise it would have caused the entire system to fail. Hence various techniques have been developed in industries and power plants (especially solar power plants) to keep all the generators and sources in synchronism with the Power Grid and in case of and failure detect and isolate the failed generator out of the grid and hence maintain a stable operation of the Power System.

Keywords: Grid Synchronization, voltage variation, frequency variation, Timer, Microcontroller.

I. INTRODUCTION

In a creator, hitching different energy sources to give uninterrupted power to a truck, a grid connection. Fault discovery that finds frequency or voltages beyond respectable is truly important. However, more current will flow through the electrical outfit or outlet, causing damage or destruction of electrical outfit or connections, if the connected electrical outfit does not meet these two limits. For this purpose, the mains voltage and mains frequency are constantly covered, and when they are the same, all electrical outfit is accompanied or connected simultaneously. When the synchronization fails, the system disconnects the affair weight and saves the affair weight. To ensure the stability and responsibility of these systems, the frequency and voltage of electricity must be accompanied in all corridor of the network. A synchronization error can do when the frequency and voltage of an element differs from the value of the rest of the network. Grid- connected hydroelectric, thermal, solar, etc. There are multitudinous types of electricity generation analogous as provides power to the weight. This generation process needs to be powered by the rules in the grid. These conditions include keeping voltage and frequency variations within limits. Still, the same confluent must be forced to leave the network, this is called Islanding. We have five public grids in India, West Grid, East Grid, North East Grid, South Grid, and North Grid. To attend all power shops with the country and public grid, we named three parameters voltage, frequency and voltage and current angle. It will be suitable to meet all three conditions for synchronization, so it will be accompanied with the network and called island state. Therefore, according to the IEEE1547 standard, the island state must be recognized and terminated within 2 seconds. There are multitudinous styles that can be used to identify the candidate. Synchronization is the reduction of the difference between the voltage, frequency and phase angle of the affair creator and the phase connection of the grid. Compared with technology, the system is more compact and reliable. This system is cheaper than other systems.

A. Objectives

- 1) The main objective of this project is aimed at development of such a system so as to avoid any over/under voltage and over/under frequency in Power System.
- 2) It also uses phase sequence indicator to show any phase sequence of the system (RYB or RBY)
- 3) The system reliability and security by avoiding failure of the entire system due to abnormalities in one or two of system units.
- 4) In case of any abnormal conditions pertaining to voltage or frequency the fault has to be detected and the system to be islanded or disconnected from main grid.
- 5) The faulty unit shall be replaced by a standby unit to meet the load requirement; this can be achieved by further implementation of electronics devices.
- 6) The project aims to detect voltage variations beyond (200-250) volts and frequency variation beyond (49-50) Hz.

- 7) Frequency sensor when the coetaneous line is detected, the frequency discovery doesn't work or the voltage is bad, the frequency sensor is used to descry the frequency of the power force, and the machine is used for this purpose.
- 8) Single- chip microcomputer snap 18F452 when the induction frequency or voltage of the power grid synchronization fault system is detected to be further than respectable, a single- chip microcomputer is used to control the intelligent system. It works with 5V DC and connects with TV display and voltage, frequency sensor.
- 9) Data coagulate in this system, 555 timekeeper integration is used as data backup. Frequency can be changed using this IC.
- 10) Relay motorist in this system, a motorist IC is used to operate the relay cargo and affiliate with the microcontroller.

III. SIMULATION RESULTS

After completing the hardware and software, we observed the following calculations: After using the system, we found weakness and instability in certain voltage range...

Voltage (V)	LCD Display	LAMP Indication
<240	Low Voltage	ON
240-250	Stable Voltage	OFF
>250	High Voltage	ON

After using this system, we have seen the light according to the frequency of the

Frequency (Hz)	LCD Display	LAMP Indication
<48	Display frequency	ON
48-52	Display frequency	OFF
>52	Display frequency	ON

IV. CONCLUSION

In this way, a system that knows the difference between frequency and voltage by detecting the coetaneous failure of electrical outfit outside the network has been established. Grid- connected hydrothermal, solar, etc. There are numerous power shops. Provides power to the cargo. Grid law deals with making the difference between frequency and frequency at the boundary. However, the same confluent must be disconnected, If there's a difference between the grid. This can descry abnormal voltage and frequency, precluding serious problems or power outages. This board is grounded on the single- chip 8051, which has numerous advantages by changing the programming. thus, the backup plan remains on hold to avoid full network failure

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