“ A GRID SYNCHRONISATION FILAURE DETECTING BY SENSING FREQUENCY & VOLTAGE’’

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Abstract

this paper describes a simple way to detect an grid synchronisation failure using an basic the voltage & frequency while it go to abnormal condition or sudden change we must say islanding. In over grid there are an various generating units joint together to power grid ex. Hydro, solar, thermal so on etc say from source to load. As we know frequency or vtg must required for an generating units so, if error will be occurs then grid will automatically disconnected. this will prevent large number of brown out .to solve it their should be system which can warn the grid in advance . these system is based on our microcontroller and various component it also has IC555 for sensing the frequency not voltage . so farther under/over voltage drived from set of the comparator as frequency of the main supply not change so by variable frequency generator an frequency changed. the lamp load glow the system will disconnected.

Keywords: *frequency, voltage, grid, source, synchronisation.*

I. INTRODUTION

Power grids is an vast complicated units or junctions that create a large part of its infrastructure. lot of precautions be taken by operators for maintain reliability, hence three 4^th of power outages are caused by operator errors. These errors can be avoided by automatic adjustments based on models of the grid system. The set up explain an ensuring generator synchronization within the system. As grid will not have destructive interference a constructive interference will cause which increases the total power grid can produce which optimizes the grid. This is a demonstration devised to provide such kind of a system that could detect the failure in synchronous working of the power grid in case any external supply source that is supplying to the grid is encountering any kind of abnormal condition may be in frequency and voltage.

II. Power Grid Synchronization:

Synchronization means the minimization of difference in voltage, frequency and phase angle between the corresponding phases of the generator output and grid supply This system is more compact and reliable as compared to the manually operated system and less expensive. The necessity for synchronizing and parallel generator operation is often based on the following:

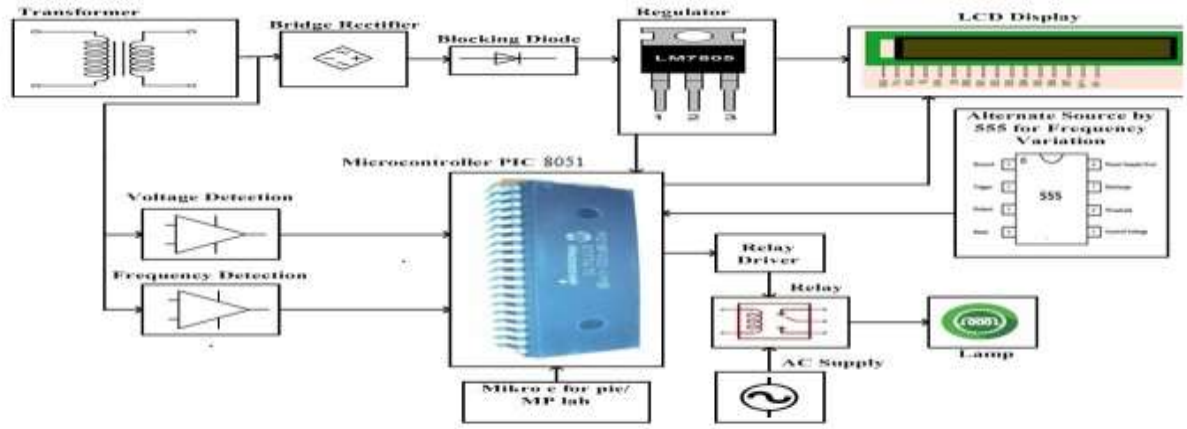
1. The rated generating capacity of an existing system has been exceeded by new load demands. 2. Enhanced reliability (multiple generating vs. single unit generating) is to be considered.
3. Operating efficiency of generator sets is a valid concern.

Difficulties which are due to synchronizing an electrical grid:

today we are more focused to the generation& distributing energy generation. If excess or large power is generated by these generation , it is to be transmitted to grid. Firstly connecting this system to the grid, it must be synchronized with parameters of the power system network or junction. The week synchronization can affected the strong power system and output in electrical and mechanical transients that can damage the prime mover, generator,

transformers and other power system components. The measurement of frequency is a tedious task. We have done it by converting the analog signal into digital signal and set the micro-controller accordingly such that whenever frequency and voltage goes beyond acceptable range , so it get disconnected from the system. It has been observed that the stability of synchronized states in power grids can be enhanced by tuning generator parameters rather than modifying the entire network.

III. Block Digram



Hardware Requirement

1) PIC *Microcontroller*s*:* Microcontroller is the Heart of the Circuit. In this circuit we are going to use the PIC MCU. Microcontrollers are used in automatically controlled products and devices, such as automobile engine control systems, implantable medical devices, remote controls, office machines, appliances, power tools, toys and other embedded systems.

2) LCD (Liquid Crystal Display)*:* The screen is an electronic display module and finds a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over even

segments and other multi segment LEDs. The reasons being: LCDs are Economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on.

3) Power Supply Unit: The power supply consists of step down transformer 230/12V, which steps down the voltage from 230V to 12V AC. This voltage is further converted into DC using Bridge Rectifier. The ripples are removed using a capacitor filter, this voltage is further regulated to 5V using a voltage regulator which is required for the operation of the microcontroller.

IV. ADVANTAGES

1) To provide the continuous supply for the betterment of NATION.
2) Safety against the natural disasters.
3) Easy to implement, reliable and flexible.
4) Cost effective and requires less maintenance and less time for performing the operation detection.
5) Grid is secured of power coming from different plants by detecting the abnormal conditions of frequency and voltages beyond acceptable ranges.
6) It prevents synchronization failures between grid and feeder.

DISADVANTAGES

1) This detection process is totally depends upon the microcontroller so that, if microcontroller gets failed then the whole process will stop.
2) The detection is possible by sensors and controllers are used if, they may get stop the need of replacement.

APPLICATIONS

A. This project is applicable for the solar power plants where frequency varies; frequency and voltage parameters should match with the power grid.
B. Microcontroller having various applications by changing the programming.

V. FUTURE SCOPE

We implement this project in order to provide continuous grid operation. Now a day there is a need of power with the proper utility. So, this paper gives the information about this system for the future use also. This is used to Detection any synchronization failure at
power grid then it will sense or detect by sensors .It is by sensing the abnormal conditions of voltage or frequency beyond the acceptable range. By using the simple Assembly language programming microcontroller will control all operation. So that it is also economical for the future use. We use this system for detection as well as protection purpose also this is the main benefit and future scope of this system.

VI. CONCLUSION

In this way, to develop a system to detect the synchronization failure of any external supply source to the power grid on sensing the abnormalities in frequency and voltage. There are several power generation units connected to the grid such as hydro thermal, solar etc. to supply power to the load. The rules of grid involve maintaining a voltage variation within limits and also the frequency. If any deviation from the acceptable limit of the grid it is mandatory that the same feeder should automatically get disconnected. This prevents in large scale brown out or black out of the grid power by sensing abnormalities of voltage and frequency. This seminar is based on the microcontroller 8051.that are having lot of advantages by changing programming. So that alternate arrangements are kept on standby to avoid complete Grid Failure.

ACKNOWLEDGEMENT

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