**DETECTION OF POWER GRID SYNCHRONIZATION FAILURE ON SENSING FREQUENCY AND VOLTAGE BEYOND ACCEPTABLE RANGE AND LOAD PROTECTION**

This paper presents the design of a system to detect the synchronization failure of any external supply source to the power grid on sensing the abnormalities in frequency and voltage and thereby protecting the load. There are several power generation units connected to the grid such as hydra, thermal, solar etc., to supply power to the load. These generating units need to supply power according to the rules of the grid. These rules 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 from the grid which by effect is termed as islanding. This prevents in large scale brown out or black out of the grid power. So, it is preferable to have a system which can warn the grid in advance so that alternate arrangements are kept on standby to avoid complete grid failure. This system is based on Arduino Uno microcontroller. The microcontroller monitors the under/over voltage being derived from a set of comparators and a standard Arduino is used to vary the input voltage to test the functioning of the paper. A lamp load (indicating a predictable blackout, brownout) being driven from the microcontroller in case of voltage/frequency going out of acceptable range. GPS and GSM technologies are used to indicate the fault location.



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