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INTELLIGENT LOAD SHEDDING MANAGEMENT

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ABSTRACT

The process plants are continuouslyoperating round the clock. Any power supplyinterruption will result in process stoppage leading to severe productivity loss and financialimplications. In the event of any failure ofTANGEDCO main supply, the standby powershould come in line without much time delay. Formeeting this requirement an Automatic Mains Failure (AMF) arrangement is required forautomatically changing over from utility supply toDG supply in the event of utility supply failure.In this project work,an AMF arrangement isfabricated, wired up, interfaced with laboratorythree -phase Alternator and was tested for different sequences. Also a real time AMF circuitwas studied for interlocks and various sequences of operation. The connected load details in the collegecampus were collected and sizing of cables was analyzed from the perspectives of generator operation. Based on the load details collected, the generator was adequately sized, neutral arrangement were all examined and proper sizing is arrived to ensure reliable operation of Diesel Generator for standby mode of operation. The present continuous mode of DG sets along with TANGEDCO supply is compared with the ongoing HT conversion mode of operation. The economics Diesel consumption/TANGEDCO tariff isestimated based on comparative analysis. The location of proposed DG set is also optimized for better flexibility of operation to feed the campus loads withoutany interruption and also to ensure efficient operationof DG set.Complete role of DG set is investigated by
Properly taking into consideration all the aspectsnamely AMF, economics, flexibility of operation .

Keywords: UFLS, UVLS, Frequency Distortion

I INTRODUCTION

The “Intelligent Load Shedding” is a means enabling to improve power system stability by providing real time adapted control and load shedding in situations where the power system otherwise would go unstable. The aim of our project is keeping the power system stability i.e. keep the bulk power or transmission system energized together with as much of the load as possible. In our case the of intelligent load shedding, the load sheds are assumed to be distributed among the feeders: chosen loads among the network are disconnected. Any part of the power system will detoriate if there is an excess of load over available generation. The prime movers and their associated generators begin to slow down as they attempt to carry excess load. Tie lines to other parts of the system or to other power

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systems across a power pool attempt to supply the excess load. This combination of events can cause the tie lines to open from overload. This results in one or more electrically isolated islands in which load may exceed the available generation**.**

II.BLOCK DIAGRAM

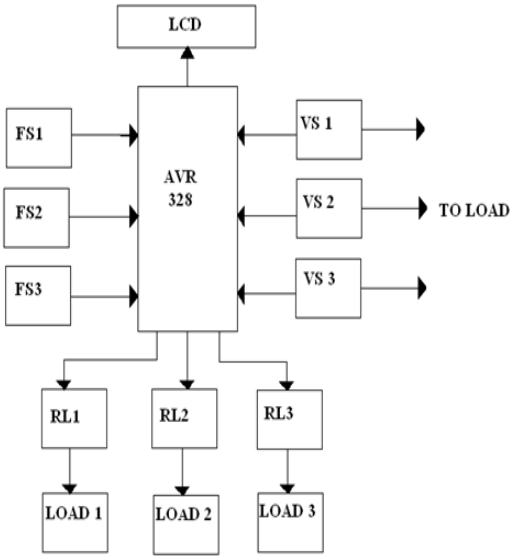

Fig.01.Block Diagram

2.1power Supply

A single phase input supply is given to circuit. But only a few voltage are prevent by project, And remaining supply are given by converter.

2.2 DC Regulator Power Supply Circuit

Every electronics circuit requires a DC supply for its operation. The singlephase supply is converted into 9 V DC supply with the help of transformers, diodes,
filters & regulator IC.

Component used:

1. Diode (1N 4007)
2. Capacitor (1000 micro farad 25v)
3. Regulator IC (7809 :- 9V) (7805 :-5v)

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2.3 Frequecny Changer Circuit

As we know that a two or more Alternator should be connected in parallel their frequency, voltage remain same at any condition the frequency of any alternator is not in standard frequency this FREQUECNY CHANGER circuit cut off the alternator supply.

2.4 System Discription

This system is based on a AVR. The microcontroller monitors the under/over voltage being derived from a set of comparators. As the frequency of the mains supply cannot be changed, the project uses a variable frequency generator (555-timer) for changing the frequency, while a standard variac is used to vary the input voltage to test the functioning of the project. A lamp load (indicating a predictable blackout, brownout) being driven from the microcontroller in case of voltage/frequency going out of acceptable range. Further the project can be enhanced by using power electronic devices to isolate the grid from the erring supply source by sensing cycle by cycle deviation for more sophisticated means of detection.

2.5 Time Delay Circuit

In single phase supply, each phase touches o & remains negative for a specific cycle & specific time. The Circuitshould work whena surges in voltage time are required. Hence a time delay circuit of 10 sec. is designed**.**

2.6 Atmega Microcontroller (AVR)

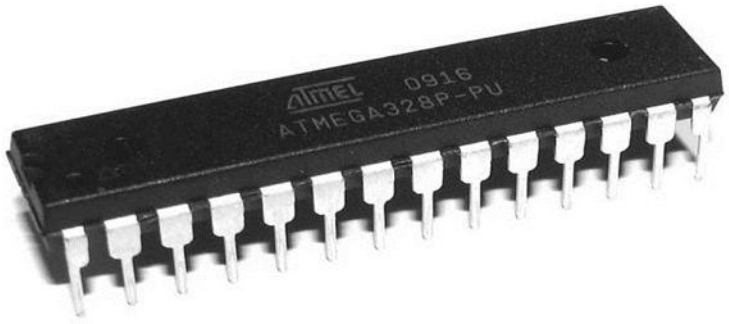

Fig.02.AVR

An Arduino board consists of an Atmel 8-bit AVR microcontroller with complementary components that facilitate programming and incorporation into other circuitsArduino have used the mega AVR series of chips, specifically the ATmega8, ATmega168, ATmega328, ATmega1280, and ATmega2560.An Arduino's microcontroller is also pre-programmed with a boot loader that simplifies uploading of programs to the on-chip flash memory

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2.7LCD Display

Fig.03.LCD Display

LCD stands for liquid crystal display. A type of display used in digital watches and many portable computers.Used to show the dynamic Passkey.Ability to display numbers, characters and graphics.

2.8 Relay

Fig.04.Relay

An electrically operated switch. Use an electromagnet to operate a switching mechanism mechanically Used where it is necessary to control a circuit by a low-power signal or where several circuits must be controlled by one signalcan handle the high power required to directly control an electric motor or other load.

2.9 Frequency Sensors

Fig.04.Frequency Sensor

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It is a 4 pin sensor. Basically it is devised for the Arduino platform. It is used to sense frequency.

2.10 IC 555 Frequency Generators

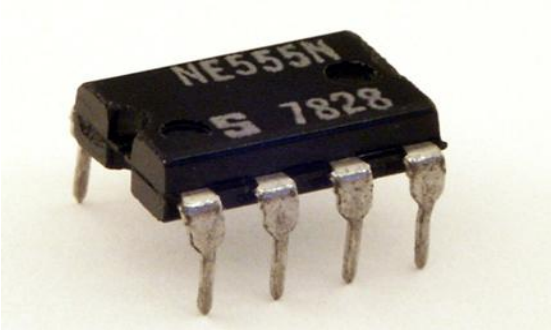
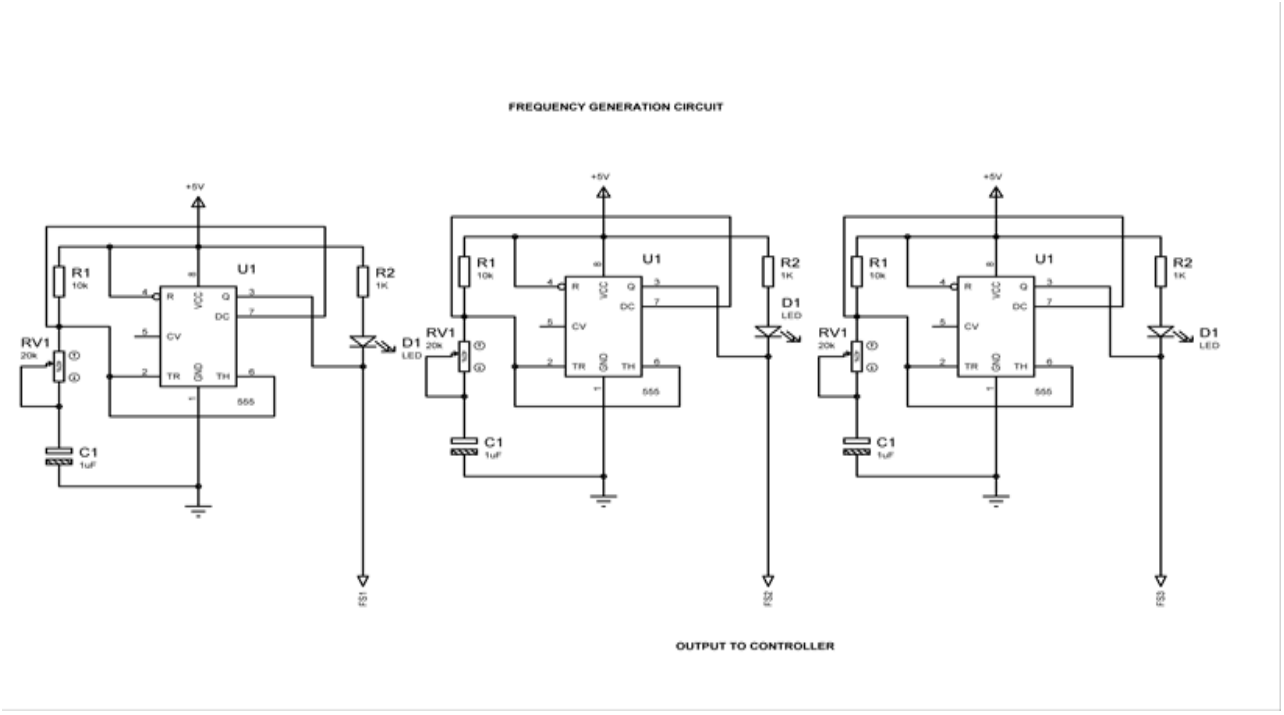


Fig.05.IC 555 Frequency Generator

The 555 timer IC is an integrated circuit (chip) used in a variety of timer, pulse generation, and oscillator applications. The 555 can be used to provide time delays, as an oscillator, and as a flip-flop element.

III. CIRCUIT DIAGRAM



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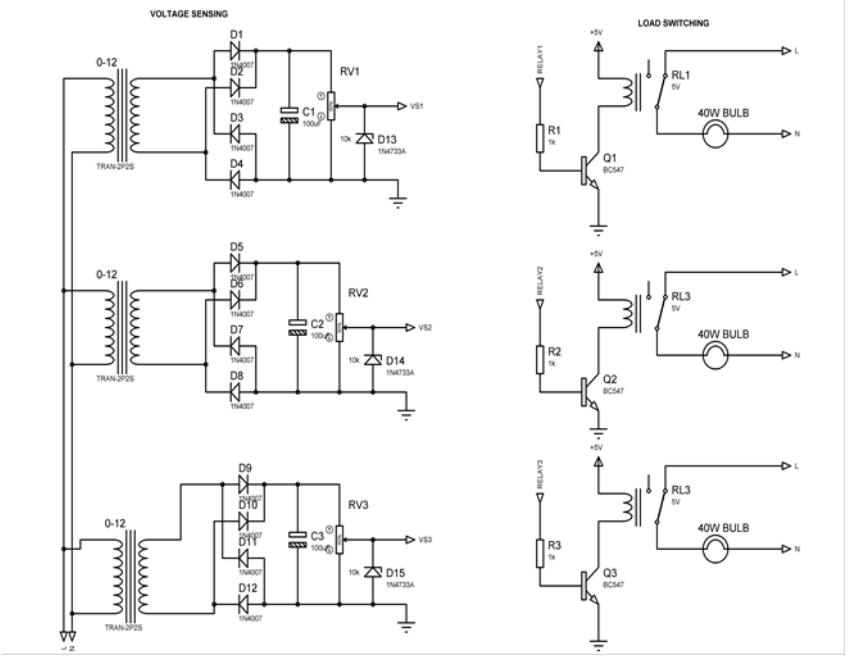

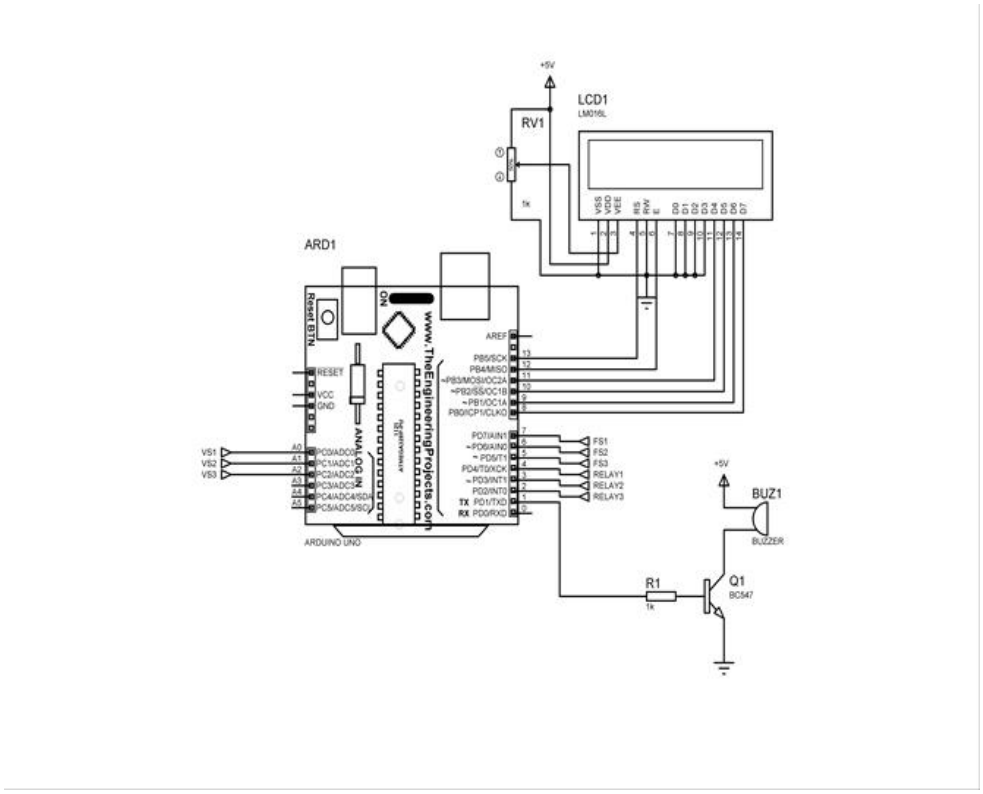

Fig.06.Circuit Diagram

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IV.ADVANTAGES

Better supply of power

1. No problems of variation in voltage and frequency.
2. Reduces the manual operation.
3. Automatic indication or switching operation.

V.APPLICATION

- Our designed system is suitable for all ratings of alternator or grid with just some minor adjustments.
- This system can be employed at every area which consistsof powersubstation.

VI. CONCLUSION

The need for a more efficient load shedding mechanismthat maintains the frequency in the desired levels and avoidscatastrophic under-frequency operation is essential.Especially after the emergence of the Smart Grid, theproposed mechanism can provide exceptional performanceexploiting the capability of selective distributed load

Shedding on the customer level. More specifically, this paperprovides the amount of load that should be shed in a Continuous manner in order to avoid system destabilization interms of frequency. The load shedding signal can be Frequently sampled and appropriate control actions should betaken in order to track this signal consistently

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