Powerpack And Windmill Automation

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Abstract :Motivated by the initial voltage requirement for windmill. Windmill requires initially voltage in few volts to generate that high amount of electricity in kilovolt. In industry they maintain a backup unit to provide a continuous power supply to windmill during power failure. The switching between main power supply and backup unit takes 1 minute. Due to this 1 minute discontinuity of power supply can cause great damage to the windmill or lead to the wastage of energy generated.to overcome this problem we have designed a unit named as POWERPACK. Powerpack acts as a standby power supply during power failure. Message will be send to the operator whether the windmill is operating on main power supply or powerpack through GSM . Also both fail message will be send to the operator based on which he/she will come to know there is damage to the battery.

IndexTerms **- Powerpack, Windmill automation, GSM**.

I. INTRODUCTION

The main objective of our project is to fulfill the requirement of industry. We are going to digitalise and automate the windmill operation.In industry power failure occurs mostly for 5 minutes. During this period to provide initial voltage to the windmill they maintain a backup unit. Switching between main supply and backup unit takes 1 minute. So to avoid damage to the system due to discontinuity of power supply we have designed a unit called as powerpack. This project is mainly consists of two parts- Powerpack and Windmill Automation. The Powerpack Unit used here act as stand by power supply during power failure, power fluctuation, etc.The powerpack unit consists of a battery charger, an inverter, output transformer, a set of batteries, control circuits and snubber circuit. The change-over from mains supply to the battery and back to the main supply is done automatically by the control circuits. If power failure occurs then 'AC fail' and if battery fails then 'DC fail' message is sent through GSM to the operator.

II. LITERATURE REVIEW

The generation of electricity from wind energy is less noisy and efficient and wind is a renewable energy source of electricity. India has fifth-largest power generation portfolio from wind worldwide and stands seventh energy consumer in the world. The electricity generation from wind is started in india in the 1986. The power is generated from wind by means of turbines [1].Large industries can use SCADA for automation purpose. System uses different sensors which are connected to raspberry pi to monitor and control the enterprise procedures with the help of internet. The limits are set on SCADA screen. When data sensed by any sensor cross the set limit then a signal is send to raspberry pi which in turn ON/OFF the process with the help WiFi configuration and IoT [2]

III. METHODOLOGY

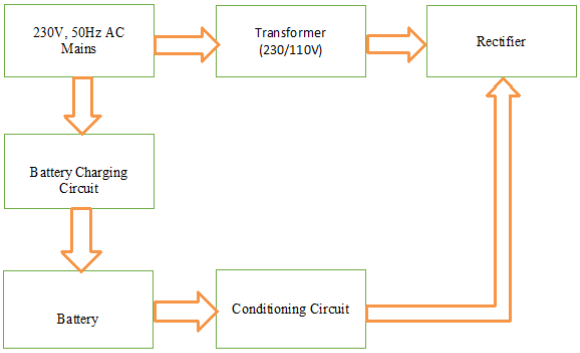

Fig 1. Block Diagram of Powerpack

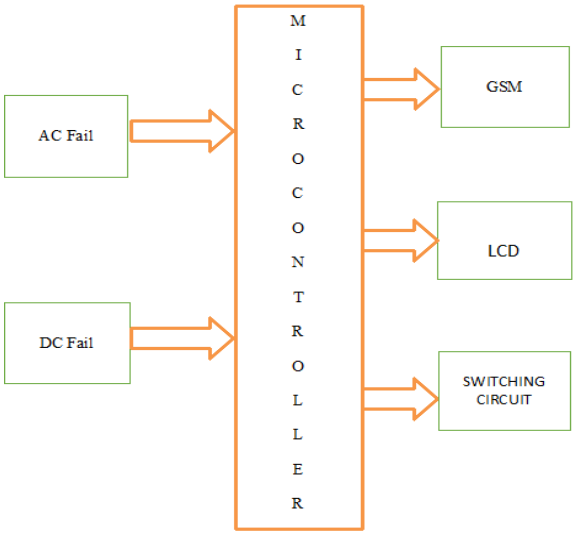

Fig 2. Block Diagram of Windmill Automation

The windmill initially requires 110v dc voltage for its operation. In the powerpack to obtain this 110v dc the 230V, 50Hz AC Mains supply from MSEB Grid is provided to the transformer to convert 230V to 110V ac which is then given to the rectifier to convert the 110V ac into 110V dc. At the same time this 230V, 50Hz AC Main supply is provided to the other tap of the transformer to convert 230V ac to 15V ac which is then provided to the rectifier to convert into 15V dc. The rectifier output is then given to the battery charging circuit to charge the battery of 12V. The 12v dc output of battery is provided to the PWM generator to generate PWM pulses to the MOSFET driver circuit. Then the MOSFETs applies this 12v ac signal to step up transformer which converts it into 110v ac and applied to rectifier to convert it into 110v dc. When battery voltage falls below 9V PWM generator stops generating PWM pulses and hence 110v dc input to the windmill cut off. In the Windmill Automation AC fail and DC fail signals are given to the microcontroller. If any of them fails i.e. AC or DC or if both fails then the message is displayed on the LCD as well as the same message is sent to the operator through GSM with the machine number including in the message. To input the machine number and operator mobile number keypad is used.

IV. ADVANTAGES

- Failure Acknowledgement
- Digital System
- Battery Charging with Autocutoff
- Low Battery Voltage Cutoff
- Over Voltage and Over Current Protection

V. FUTURE SCOPE

We can add relay discharge circuit for fast discharging. Also we can use ultra capacitor bank in battery charging circuit for fast charging since the proposed system takes 6 hours to charge fully.

VI. CONCLUSION

Implementation of this system can reduce the operator work to continuously checking the system. Using GSM makes the system more reliable since it is possible to check whether the system is operating on AC or DC and also possible to detect whether the battery is damaged. While implementing our system we came across some problems like battery takes 6 hours to charge completely but we can make the system more efficient by some modification in future.

VII. REFERENCES

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