INTELLIGENT GRID CONTROL SYSTEM

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ABSTRACT

Power is the soul of world which is related to the electricity and "electricity" is the word which now rules the world. So, proper utilization of this commodity is of immense important to us. Normally, large scale industries consist of various departments like production, storage, package , Administration, transportation situated away from each other. For such industries, it is necessary to maintain Load When the grid is breakdown than the whole area which is depend on that grid remains electricity less it takes so much time to repair that so we had designed the system which will automatically shift the load of that grid to another.This project can be used for home to protect the device when the supply is damaged we can shift it to other supply This system can be useful in industries where the continues power supply is required.

Keywords: SG(Smartgrid), ADC ,Microcontroller, Power Distribution System, Intelligent.

I .INTRODUCTION

Today is the world of automation. When we are talking about automation, we must think about microcontroller. Microcontroller finds its application in each and every automation control like Remote controllers, Hand-held communication devices, automatic and semi-automatic washing machines, security system, telephone printing machines, automobiles, indicating and measuring instruments. The project described here being also a microcontroller based project, used for automatic phase detector. The use of microcontroller in this project is to store the data, process data and change data according to the user requirement. This is possible because microcontroller has CPU, memory, I/O ports, timers/counters, ADC/DAC, serial ports, interrupt logic, oscillator circuitry, and many more functional blocks on single chip. Hence it reduces the cost of hardware. Also there is no need to connect external RAM for memory storage. This is the most important feature of microcontroller. There are various types of microcontrollers available in market. The examples are Intel MCS-51, PIC family by microchip, ATMEL 89CXX, 89CXX51. The microcontroller used for this project is ATMEL-89C52. Now days, many times out of three phase one of the phase cut-out and the circuit breaker trips at that time the MSEB operator has to operate it manually by turning on the contacts of circuit breaker contact and if a MSEB operator sleeps at the time of duty at that time the hooter shouts and gives us alert.

II. GENERAL CONCEPT OF THE SYSTEM

The existing power grid faces many limitations and challenges in a world that increasingly dependent on electricity. As a result, some government agencies, utility companies, researchers and engineers in the electric power industry have envisioned of transforming the existing grid into Smart Grid.
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III. EXISTING SYSTEM

Comparing the features of the smart power grid with the existing grid, smart grid uses sensors, communications, and computational ability and control in some form to enhance the overall functionality of the electric power delivery system. In other words, a dumb system becomes smart by sensing, communicating, applying intelligence, exercising control and feedback, continually adjusting.The following table gives the comparison of the features of the intelligent grid system with existing grid system.

The present electricity grid is the result of fast urbanization and infrastructure development. However, the growth of the electric power system has been influenced by economic, political, and geographic factors that are utility specific.

Table No.1

Intelligent Smart Grid	Existing grid system
Digital	Electromechanical
Two way communication	One way communication
Distributed generation	Centralized generation
Network	Hierarchical
Sensors throughout	Few sensors
Self monitoring	Blind
Self healing	Manual restoration
Adaptive and islanding	Failures and blackouts
Intelligent coustomer metering	Old fashioned coustomer metering
Remote checking/testing	Manual checking /testing
Pervasive control	Limited control
Many coustomer choices	Few coustomer choices

IV.PROPOSED SYSTEM

A SG is an electricity network that can intelligently integrate the behavior and actions of all users connected to it - generators, consumers and those that do both – in order to efficiently deliver sustainable, economic and secure electricity supplies. Smart Grid incorporates monitoring, analysis, control and communication capabilities into the electric power grid in order to improve reliability, optimize asset utilization, improve security, increase energy efficiency and allow diverse generation and storage options. Smart Grid also allows homeowners and businesses to utilize electricity as efficiently and economically as possible hence, reduces cost and increases reliability and transparency.

V.WORKING PRINCIPLE

Our project is based on microcontroller. Microcontroller is the heart of this project.beacause all outputs as well as inputs are connected to the microcontroller.In this project we used three power supply which are one thermal, two hydro connected to ADC.ADC converts analog quantity into digital quantity. Then its voltage and current readings are displayed to the microcontroller. If the system is under voltage or over voltage the signals are given to buzzer through microcontroller, buzzer shouts and gives us the alert. Also using this system ;if any supply from hydro or thermal is cutoff then the grid automatically shifts the load on other supply hence we get continuous and reliable power supply. Because of which the devices and appliances are protected.

VI. SCOPE OF PROJECT

Fig.1

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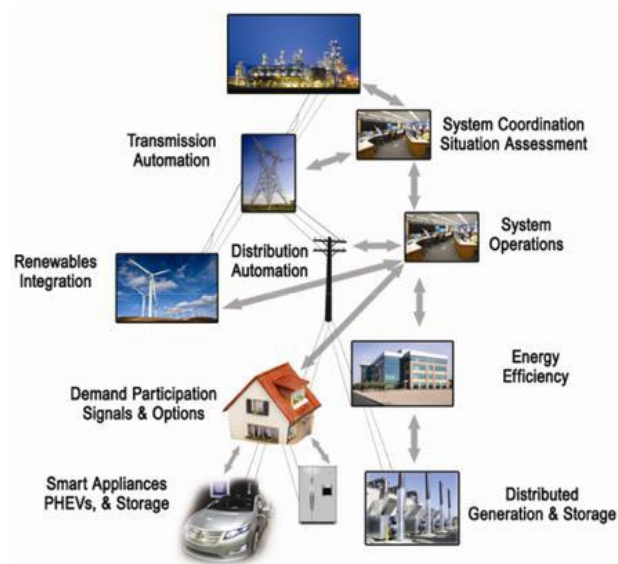25th February 2017, www.conferenceworld.in

(ICSTM-17)

ISBN: 978-93-86171-30-6

1. Area, regional and national coordination regimes: A series of interrelated, hierarchical coordination functions exists forthe economic and reliable operation of the electricity system. These include balancing areas (BAs), independent system operators (ISOs), regional transmission operators (RTOs), electricity market operations, and government emergency operation centers. Intelligent grid elements in this area include collecting measurements from across the system to determine system state and health, and coordinating actions to enhance economic efficiency, reliability, environmental compliance, or response to disturbances

2. Central generation: generation plants already contain sophisticated plant automation systems because the production cost savings provide clear signals for investment. While technological progress in automation continues, the change is expected to be incremental rather than transformational, and therefore, this area is not emphasized as part of this report

VII.APPLICATION

- The system can be used in MSEB.
- The system can be used in Industries
- The system can be used in Power Distribution System.
- It is used for grid changing.
- It is used for the load safety

VIII .ADVANTAGES

1.Auto switching of MSEB

2.Providing more reliable power supply

3. Extensive and effective communication overlay from generation to consumers.

4. The use of advanced sensors and high-speed control to make the grid more robust.

5. It will provide higher operating efficiency.

6. It will provide a greater resiliency against attacks and natural disasters.

7. It will provide effective automated metering and rapid service restoration after storms.

8. It will provide greater customer participation in generation and selling.

IX. DISADVANTAGES

1. The circuit is bulky.

2. The programming is complicated.

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3. The circuit is complicated.

4. High cost

5. Slow speed of switching.

X.CONCLUSION

In this project the concepts of smart grid have been studied and explained. The Microcontroller Based "**Intelligent Grid Control system** "we designed is safely used for grid changing for distribution sectors. It has been found that there are currently numerous studies, researches and projects with the emphasis of transforming the existing grids into more advanced smart grids. However, there is no global standard as to what exactly a smart grid is and what its constituents and features.

ACKNOWLEDGMENT

It is indeed a matter of great pleasure and proud privilege to be able to present this project on "**Intelligent Grid Control System**".We would like to take this opportunity to express our respect and deep gratitude to our guide We would like to tender our sincere thanks the staff members for their co-operation. We are highly obligated to our entire friends, whose contribution intellectually and materially in the words and deeds for preparation of this project.

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