REDUCES THE HORMONIC DISTORATION OF WIND SOLAR HYBRID SYSTEM IN GRID CONNECTED

Mr.M.K.Anand kumar

Assistant professor in Excel College of Engineering and Technology (Namakkal District)

S.Shanmugapriya

Currently pursuing ME (2 nd year) from EXCEL College of ENGG & TECH, Pallakapalayam

(Namakkal District)

P.Munees @ kaniskar

Currently pursuing ME (2 nd year) from EXCEL College of ENGG & TECH, Pallakapalayam

(Namakkal District)

ABSTRACT

The modeling and intelligent control of a stand-alone hybrid energy system based on solar-wind-diesel with battery. In the proposed system operate in a standalone mode the power quality is expected to decrease by the fluctuations from each of the voltage and frequency with varying loads and each of the two renewable sources which have depended on the wind speed, and solar radiation and temperature. An method is given based on the improved fuzzy intelligent control techniques. The detailed design and realization of the intelligent control of a stand-alone pv-wind-diesel-battery controller are discussed in this paper this can be solved, by controlling the Pulse Width Modulation (PWM) of Voltage Source Converter (VSC) as modeled with Battery Energy Storage System (BESS). In the method Photovoltaic is a combination of more than one solar panel array of solar cells, connected in series and parallel with large voltage and current output of one solar cell, Because of the battery output voltage depends on current and state of charge, which is a non-linear function of the current and time and Wind turbine generator is the other renewable source used widely in the
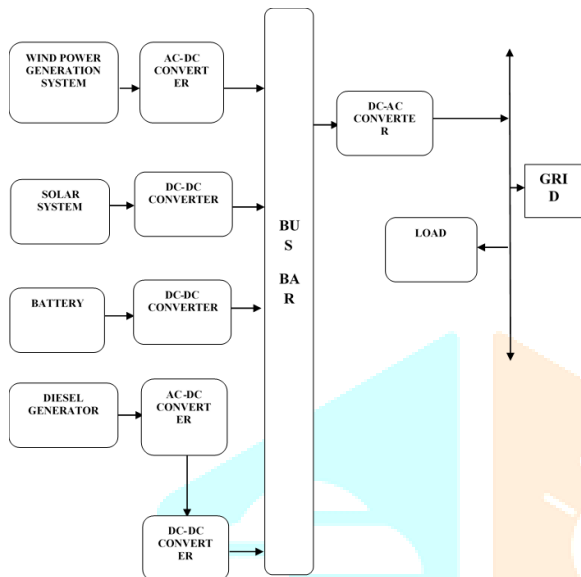places that have the wind at all reason, which is flexible to capture kinetic wind energy and convert to Mechanical energy into electrical energy. Consequently, it is of great interest the operation and intelligent control of the mentioned systems for certain normal, and abnormal operating conditions, moreover, to express and verify a much more capable, precise and robustness between these two types of controllers to quickly repair and stabilize the micro-grid during events such as the islanding.

INTRODUCTION

In this meting curve is achieved by controlling diesel generator. The DC hybrid generation system is composed of renewable energy sources (wind and solar), conventional energy source (diesel generator), power electronic converters, energy storage devices (lead-acid battery) and loads. This method provides simple control the Multi Evolutionary Optimization (MEO), minimizes the number of sensors as the load and inverter currents are not measured, and provides ease of practical implementation. A boost

converter (step-up converter) is a DC-to-DC power converter that steps up voltage from its input supply to its output load.

Here cascaded dc-dc converter is used for improving high efficiency of the circuit.This method proposed a low cost charging scheme for small scale isolated with DC bus voltage

BLOCK DIAGRAM EXPLANATION:

The operation results of PV-diesel-battery hybrid power system verify the effectiveness of the microgrid architecture, and the optimal operation of energy system and improved control method of micro-grid should be paid more attention. Based on the topology structure, for the goal of coordinate power allocation among variety renewable energy effectively, the dispatch control and energy management are analyzed and designed. The hybrid system was designed to overcome the problem of climate change, to ensure a reliable supply without interruption, and to improve the overall system efficiency by the integration of the battery bank. The system design philosophy was to maximize simplicity; hence, the system was sized using conventional simulation tool and representative in isolation data. This system will replace an existing diesel powered electric generator and was sized to meet the residence's known lighting and plug loads, refrigeration, cooking, and heating needs.

ADVANTAGES:

- ❖ Lower emissions and better mileage
- ❖ Hybrid cars use no energy during idle state they turn off and use less than petrol engines at low speeds.
- ❖ Hybrid cars offer greater mileage than other cars.
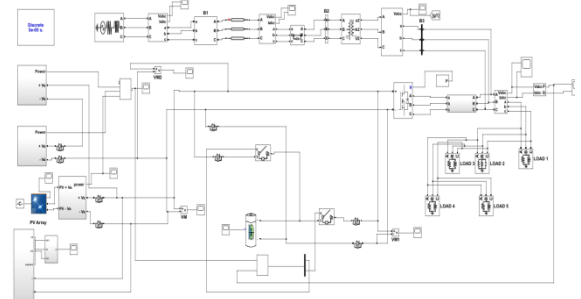- ❖ Hybrid are reliable and comfortable.

APPLICATIONS

Convert the DC battery voltage to the variable AC required to derive the AC motor.

Includes DC-DC boost converter and DC Three phase inverter.Control system can operate in all mode or in hybrid gas electric mode.

Partial power electronic.

RESULT AND DISCUSSION

SIMULATION OUTPUT:

A Mat lab/Simulink model of an integrated standalone PV-wind hybrid system using a battery for storage and backup protection is presented. The individual components of the system are discussed and modeled.

OUTPUT WAVEFORM:

The y-axis denotes the voltage value in the source side. The x-axis denote the time duration in the source side.The Distribution side waveform for the load voltage and current with the load respective the voltage present in the model waveform.
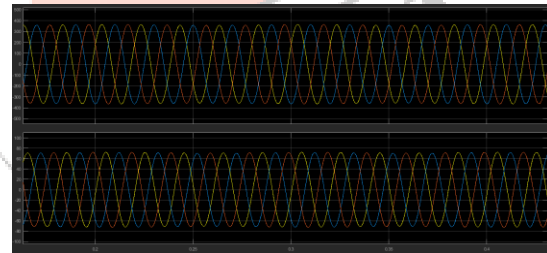

Figure: Output waveform of hybrid system.

HARDWARE OUTPUT TABULATION:

Hardware	Specification	Input Ranges	Output Ranges
Generating power	Input source	0-230V	230V
Solar panel	Input source	11.25v	13.5v
Microcontroller	PIC (16f877a)	5V DC	5V DC
Rectifier	Input power	230V AC	12V DC
Boost converter	Converting the input supply	12VDC	24VDC
Inverter	Output power	24V DC	24V AC
Transformer	Output power	24v AC	230V AC
AC lamp	Output load	230V DC	4A

CONCLUSION:

In the system four different generation system that consist of PV/Wind Diesel/Battery and operated together to support the load. Secondly, applied dqO-axis theory in a voltage source converter controller to controlling each of the frequency and voltage of standalone hybrid micro-grid system by supporting of a charging and discharging of the storage system with a capacitor in DC side. Finally, a comparison between the performance of PI and Fuzzy logic on voltage and frequency controller. The comparison examined hybrid power system, when occurred change on the three phases RL load and taking four cases, first, when the wind, solar irradiation, and temperature are constant. A second situation is only wind speed changes, while temperature and solar irradiation are constant, and the third situation, both temperature and solar irradiation change however wind speed is constant and final situation, wind speed, temperature, and solar radiation all change according to its characteristics, and show that the Fuzzy controllers are more robust and able to alleviate the frequency and voltage of the Micro-Grid as compared to the PI controllers. This work proposes aversion method to using a fuzzy logic for voltage and frequency controller in a standalone hybrid power system.

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Mr.M.K.Anand kumar

Currently working as an Assistant professor in Excel College of Engineering and Technology (Namakkal District) affiliated to Anna University,Chennai.completed his B.E from Sri Ramakrishna Engineering College (Anna university) and M.E in VLSI Design from Sasurie College of Engineering ,Vijayamangalam ,Tirupur.

Shanmugapriya

Currently pursuing ME (2 nd year) from EXCEL College of ENGG & TECH, Pallakapalayam (Namakkal District) , Affiliated to Anna University,Chennai.completed B.E from EXCEL College of ENGG & TECH, Pallakapalayam (Namakkal District) .