Self Design And Self Adjustment of Stabilizers And UPS During Runtime

V.Ravichandran[1], B.Boopathiraja[2], K.Gowerishankar[3], V.Kavin[4], R.Kirubanithi[5]
[1]Assistant Professor, Dept of EEE
[2, 3, 4, 5]Dept of EEE
[1, 2] Nandha Engineering College(Autonomous),Erode, Tamil Nadu, India.

Abstract- *UPS installed stabilizer is an innovative way of producing a device or a component which helps the circuit that helps in constant power transmission from start to the end. The component extends a compact and dischargable battery with its elements which supplies current in low voltage situation. It helps and works in all kinds of current situations that can be expected. The need of current processing in-between was also tend to neutralize with the battery connected with the equipment. All the other components installed works automatically calculating the input power and output power needed by the system.*

This paper presents a support device based on power electronics systematic design from top to the end which provides all the necessary functionalities required for the constant and un-interrupted power management of the regular and componential electronic systems. The way of monitoring and identification of voltage drop and current frequencies are variably caught and manipulated automatically by the system in its own phase and availability medium of components installed in the system. Most of the voltage variance occurring situations are easily reduced and the constant supply of current is produced.

Keywords- AC Supply, Transformer, Rectifier, Filter, DC Supply, Voltage Regulator, AC to DC converter, DC to DC converter, DC to AC converter, PWM(Pulse Width Modulation), PIC Micro Controller, Battery(Lead-Acid).

I. INTRODUCTION

Nowadays, there is no life without electricity. From the beginning of mankind, there always has been the necessity of power, which brought us to the inventions of fire, steam engines and most importantly, electricity. The power grid electric supplies are used for residential and commercial applications. In general, the resident and commercial consumers need alternating supply only because the generated power is alternating supply only, hence it may be preferable for further applications. At the same time the generated power is fully utilized by the resident and commercial consumers then for the industrial consumers the generated power is transmitted through overhead transmission lines with respect to step up and step-down operation.

Over all the electric supply played a vital role in our daily life means without considering the electric supply nothing will improve or satisfied. Hence, it's important to keep the electrical supply in our life.

Till now there are many inventions that are aroused to bring a constant current supply to the machine or to the system. There are systems that can save electricity and allows us to use it later and even there are some systems that limits the electricity that is being received for the system if the received electricity is exceeds the current needed.

The above systems are both having a separate capabilities and installed with a certain set of Components needed to carry the work given for them. We can't expect a single system to the both different work simultaneously. But it can be possible for a single equipment to carry the whole process mentioned above.

Among the various literature and research both the capabilities of energy storing and retrieving and energy reduction was achieved in the power electronics scheme of methodology .

II. PROPOSED METHEDOLOGY

A non-linear stabilizer combining an extended NDO technique and an adoptive backstepping algorithm is proposed for the N-level DC-DC MBC with CPLs in DC microgrid. This was carried out in various number of multiple sequential combinations until we get the desired result according to the system design and system input and output capabilities. To simplify the stabilizer model, a canonical form state-space model of the system, which consists of the converter total energy and the total input power is developed.

There is a usage of estimated value in the system, a back stepping controller is designed to guarantee the signal stability of DC bus voltage of the MBC fed DC microgrid with

fast responses and negligible steady state error. This error was commonly occurred in all of the possible occasions of the developing units of strategies that combines DC and AC operations in a legal way of power manufacturing, storing and receiving to the ends of the transformer that is being used in the system. MBC fed DC microgrid acts as a superior component in the manufacturing of normal voltage values that crashes and occurs during the equipment setup process.

In addition, the effectiveness and advantages of the proposed assorted stabilizer are verified during the instrument setup, the proposed control scheme can also be applied for the other converter topologies as well as current carrying situations of the transformer regarding the natural supply voltage that has been passed in the current topology that is found in between the microgrid which acts as a superior component in the system which contains normal voltage values comparing to high level Of voltage with the diminishing coupling coefficient, which will result in overcurrent under the critical case.

III. SYSTEM ANALYSIS

The innovation of in order to deal with mismatched voltage levels between parallel connected low voltage and required high voltage of the grid a novel hybrid boost 3 level DC-DC converter is proposed based on the traditional single based diode clamped three-level inverter. Only one inductor two capacitors in the series and those power switches and diodes which are easy to be integrated are adopter to establish the topology with transformer less high voltage gain. The operation principle of the proposed topology is analyzed, and then the pulse width modulation(PWM) control method is obtained according to the switching functions about the output pulse voltages of both half-bridges. Therefore, the proposed converter cannot only operate with high voltage gain, but also make the duty cycle of power switches closer to 0.5.Moreover, voltage across the capacitors in series are well balanced in both steady and dynamic states.

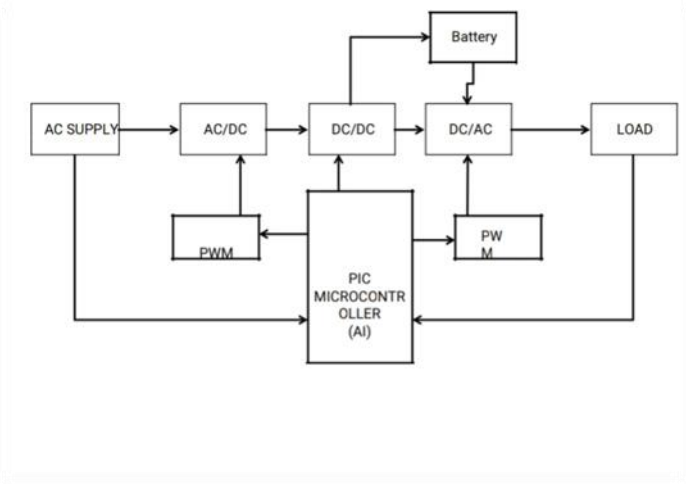


Figure 1. Block Diagram

IV. SYSTEM DESIGN

Transformer: 12-0-12 5 Amp transformer is used for stepping-up or stepping-down the AC supply voltage with corresponding decreases/ increases in the current.

The current can get the moved power from essential side. From that point onward, the power is changed over to the dc structure with the assistance of AC-DC converter and moved to the battery charging reason.

AC to DC converter: Electric power is transported on wires either as a direct current (DC) flowing in one direction at anon-oscillating constant voltage, or as an alternating current (AC) flowing backwards and forwards due to an oscillating voltage. AC is the dominant method of transporting power because it offers several advantages over DC, including lower distribution costs and simple way of converting between voltage levels thanks to the invention of the transformer. AC power that is sent at high voltage over long distances and then converted down to a lower voltage is a more efficient and safer source of power in homes. Depending on the location, high voltage can range from 4kV (kilo-volts) up to 765kV. AC mains in homes range from 110V to 250V, depending on which part of the world you live it.

DC to DC converter: For higher power applications, an electric motor was needed to drive a generator of suitable voltage. Such processes turned out to consume a lot of time for setup procedures, involved orbital costs, and were less efficient overall. With the rise of semiconductor devices and integrated circuits, the conversion circuits could be designed and implemented effectively as the components were compact, economically viable, and accessible. The biggest advantage was the ability to design energy-efficient processes using solid-state switch mode conversion as opposed to age-old methods that dissipated excess energy in the form of heat.

PWM : In its simplest form PWM output signals are constructed by comparing two control signals, a carrier signal and a modulation signal. This is known as carrier-based PWM. The carrier signal is a high frequency (switching frequency) triangular waveform. The modulation signal can be any shape. If the peak of the modulation is less than the peak of the carrier signal, the output will follow the shape of the modulation signal. If instantaneous magnitude of the modulation signal is greater than the carried signal at a point in time, the output voltage of the inverter leg should be connected to the positive side of the DC link.

PIC : This is a 4K*14 memory space. It is used to store 13-bit instructions or the program code. The program memory data is accessed by the program counter register that holds the address of the program memory. The address 0000H is used as reset memory space and 0004H is used as interrupt memory space. The general-purpose registers consist of registers that are used to store temporary data and processing results of the data. These general-purpose registers are each 8-bit registers.

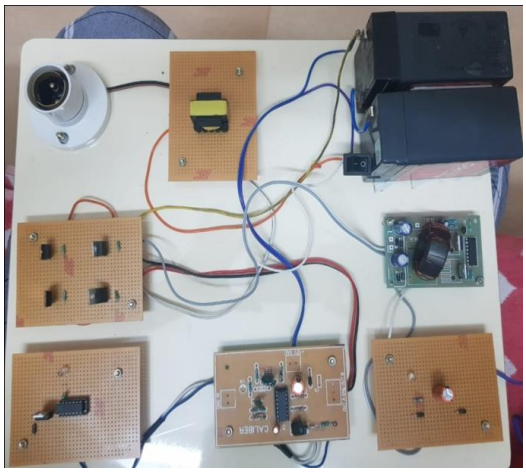
Battery: The electrical parameters of the lithium-ion battery 24V-150Ah are compatible in all respects with those of an AGM lead battery of 24V. In the vast majority of cases, the charging system can be kept the same and no additional accessories are required to perform the replacement. The battery can be 100% discharged, a lead acid or AGM battery can be replaced with half the capacity of lead acid battery if needed.

S.NO	PARAMETERS	XISTING SYSTEM	PROPOSED SYSTEM
1.	EFFICIENCY	80%	90%
2.	POWER SUPPLY NEEDED	12V	24V
3.	COST	HIGH	LOW
4.	CONTROLLER	ARDUINO	PIC

Table. 1 Comparison of proposed system with existing system.

V. RESULT AND DISCUSSION

The monitoring of the installed high voltage insulators is of great importance for the reliable operation of power networks. Until now the commercial monitoring devices face a lot of disadvantages related to high cost, lack of upgrades and limited number of motoring channels. The proposed insulator monitoring kit due to its low cost and its advantages can cover the advanced monitoring demands of power utilities. The easy installation, the open-source code software, the autonomous power supply and the easy modification of its operation according to the power utility needs are some of main advantages. The preliminary setup of the fundamental structure of the insulator monitoring kit project gives encouraging results in laboratory basis. Certainly, the laboratory system must be further advanced both in software and hardware in order to be installed in field conditions. In future it saves the electric power. It is more useful for the multinational companies for their bulk requirements. By implementing this project in main transformer, if there is any leakage in sub transformer the problem can be solved in the initial stage itself.



VI. CONCLUSION

There has been an increasing trend of power problems due to power transients, yet loads need to qualify supply of power. The power needs to be stabilized before supplied to the load. To overcome the above problem, Self adjusting power level equipment was designed, the design can be practically implemented in future based on the design achieved and is user friendly system and also the system was designed to be easily operated and can be supported by all the systems.

REFERENCES

[1] Yu Du, Xiaohu Zhou, Sanzhong Bai, Srdjan Lukic and Alex Huang, “Review of nonisolatedbi- directional DC/DC converters for plug-in hybrid electric vehicle charge station application at municipal parking decks”, Applied Power Electronics Conference and Exposition (APEC), 2018 Twenty-Fifth Annual IEEE.

[2] Kevork Haddad, “Three Level DC/DC Converters as Efficient Interface in Two Stage PVPower Systems”, Energytech, 2017 IEEE

[3] A. Lachichi, “DC/DC Converters for High Power Application: A Survey”, Electric P
Conversion Systems (EPECS), 2017 3rd International Conference

[4] M. Hirakawa, Y. Watanabe, M. Nagano, K. Andoh, S. Nakatomi, S. Hashino, Honda R&DCo., Ltd, “High Power DC/DC Converter using Extreme Close-Coupled Inductors aimed for Eletric Vehicles”, IPEC 2019

[5] Kansuke Fuji, Peter Koellensperger, Rik W. De Doncker, “Characterization and Comparisonof High Blocking Voltage IGBTs and IEGTs under Hard- and Soft-Switching Conditions”, Power Electronics Specialists Conference, 2018. PESC '06. 37th IEEE.

[6] Akira Nabae, Isao Takahashi, Hirofumi Akagi, “A New Neutral-Point-Clamped PWMInverter”, IEEE