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MULTIMEGAWATT INVERTER BY PHOTOVOLTAIC SYSTEM

#1Mr. Mahesh M. Bochare, #2Mr. Vishal D. Suryawanshi, #3Mr. Animish C. Machutre, #4Mr. Suraj S. Ibitwar, #5Prof. Kadhane N.L

2vishalsurya59@gmail.com

#1234Student, Electrical Engineering Department
#5Assistant Professor., Electrical Engineering Department
Universal College Engg & Research, Pune-412205, India

ABSTRACT

In this paper studied that, this system is suitable to meet the demands of IEEE & IEC standards, utilities regulations by using Non-conventional Energy Sources. Because, advantage of this technique is simplicity and flexibility. The Multi-Megawatt Inverter is modified inverter used for various purposes. This Inverter converts D.C voltage given from PV farms to the high amount of A.C voltage in MW compared to normal Inverter. The available inverters only converts DC form into AC form which is not suitable for multiple applications in different platforms and not connected to grid because of synchronized condition is not fulfilled. So in this all problems related to synchronization are eliminated by using the PIC 16 F 877A. Hence, according to need, this Multi-Megawatt Inverter is interface to grid system to meet the utility demands. In this technique, we use the PV farms considering to future scope. Because, misuse or high use of conventional energy sources. In future, these sources are not available or rarely available. Hence according to future scope, in this technique PV farms means non-conventional energy source use. These are easily available and unlimited in nature.

Keywords: Multimegawatt Inverter, PV farms, Grid syste

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I. INTRODUCTION

Now a day we are use conventional energy sources like a fossil fuel. Hence the various environmental problems create like pollution, green house gases, global warming, temperature increment and depletion of ozone layer. Maximum pollution occurs due to the conventional energy sources and all problems arrive from the pollution. Now a days the energy demand increasing but the energy generation from the conventional sources is difficult because of price of fuel increasing rapidly. To overcome this problem by using the non-conventional energy sources. Hence solar system (photovoltaic system) is more popular than other renewable energy sources.

The development of non-conventional energy sources are latest researcher's area. Because the non-conventional energy sources having lots of advantages and the conventional sources having lots of disadvantages. To improve power quality requires new inventions or new strategies and management of electricity grid. PV cells generate electric energy from the solar but the generated energy in the dc form and this electrical energy need to store and use it whenever load requirement. Also due to high cost of the PV cells, investment on solar energy also high.

II. EVOLUTION OF PHOTOVOLTAIC SYSTEM

Evolution of photovoltaic system has past technologies and present technologies. The past technology is based on centralised inverters and these inverters connected to various modules. And these modules connected in series as well as parallel manner. This past technology contains various limitations like requirement of high voltage cables between modules and inverter, mismatch between modules and diodes, power losses. In present technology the non-conventional energy source applications used in PV system provides many benefits to the DG (distributed generation) power systems.

III. EXISTING SYSTEM

The proposed system provides the use of voltage source inverter without using step up transformer. Fig (1) shows the block arrangement of Multi-megawatt Inverter. This system contains solar panels (PV farms), battery,

current and voltage sensor, dc to ac inverter, LC filter, Isolation transformer (grid synchronisation), power grid. Solar panels give energy from sun rays and convert it into the electrical energy. To store this electrical energy the battery is used. This electrical energy is in the DC form but for greed having electrical energy in AC form, hence the dc to ac inverter uses. The main function of dc to ac inverter is to convert dc voltage to the ac voltage of required frequency and voltage. Then the LC filter is used for generating signals for particular frequency or removing complex signals. For synchronisation to the grid means to match inverter voltage and grid voltages, in synchronisation isolation transformer is used. In this system there are two approaches, one is connect PV farms in series to generate high voltage dc and then use high voltage dc to high voltage ac inverter and the second approach is connect PV farms in parallel then generate low voltage dc, then for high voltage use step up transformer.

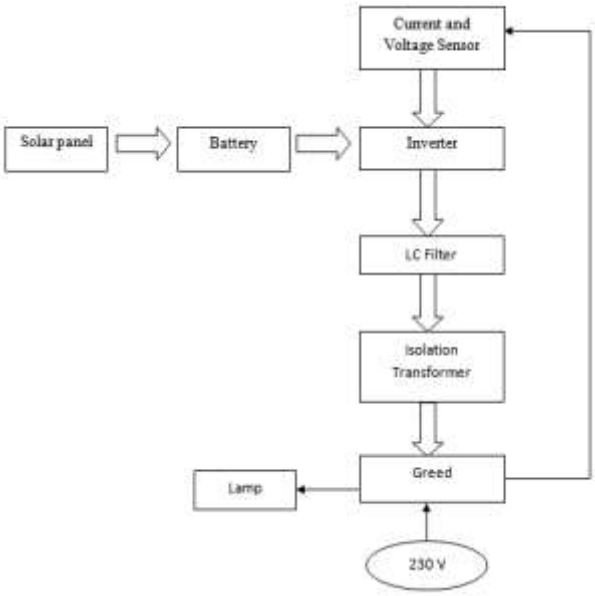

Fig. 1 Block arrangement of Multi-megawatt Inverter by using PV cells

Design of the Photovoltaic Inverter

The design of a power-electronic inverter depends on many issues, such as silicon devices; magnetic; capacitors; gate drives; grid performance; current-, voltage- and temperature-sensing and -protection; control strategies; and implementation, etc., which all must be covered.

Fig. 2 : Hardware prototype model for single phase Multi-megawatt inverter

IV. CONCLUSION

This Grid-connected photovoltaic i.e. PV systems can provide a number of benefits to electric utilities, such as power loss reduction, improvement in the voltage profile, and reduction in the maintenance and operational costs of the electric network. This project presents review on the latest development of control of grid connected photovoltaic energy conversion system.

REFERENCES

[1] J. Shuai, C. Dong, L. Yuan, and P. Fang Zheng, “Grid-connected boost half-bridge photovoltaic micro inverter system using repetitive current control and maximum power point tracking,” IEEE Trans. Power Electron, vol. 27, no. 11, pp. 4711–4722, Nov. 2012.

[2] K. Feel-Soon, P. Sung-Jun, C. Su Eog, U. K. Cheul, and T. Ise, “Multilevel PWM inverters suitable for the use of stand-alone photovoltaic power systems,” IEEE Trans. Energy Convers., vol. 20, no. 4, pp. 906–915, Dec.2005.

[3] E. Koutroulis and F. Blaabjerg, “Design optimization of grid-connected PV inverters,” in Proc. 26th Annu. IEEE Appl. Power Electron. Conf. Expo., Mar. 2011, pp. 691–698.SS

