

Non Super Conducting Fault Current Limiter for Energy Management of AC-DC Microgrids

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Abstract - The fault current limiter is used limit the current during overloading and under short-circuited condition .It is not only controls the magnitude of fault current and it is also enable the power management in normal and fault condition of utility .The proposed FCL ,which ensures a high protection level of the system and it has no impact on utility voltage and load. In this system the main aim is to connect both AC and DC systems .For controlling the magnitude during the fault time the DC reactor is used. It is also used for the energy management and also for the control of the power flow from AC to DC systems. A boost converter is utilized to provide an almost sinusoidal input current.

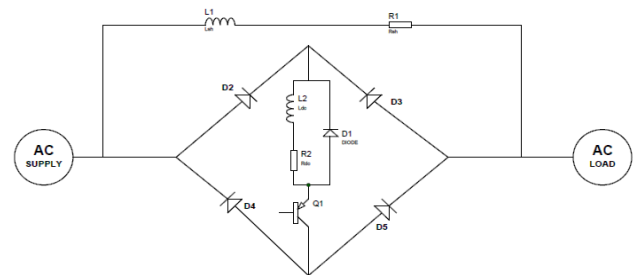
Index term- NSFCL , grid , energy management , PWM technique , Converter and Inverter

INTRODUCTION

The AC-DC micro-grid are the more rapidly using type of grids which produce supply to the more number of areas, due to the exchange of AC-DC process, it occur fault in most of the time while transferring the supply .Thus the fault current limiter is introduced to limit the fault condition and also make easy the work of the micro-grid. In this paper we introduce the non superconducting fault current limiter to limit the fault condition in the grids. One of the most problems of the FCL is the stored energy in such circuits in during the fault condition, which is not taken into account in recent studies.

EXISTING SYSTEM

In this system the limiter is used for the only for the ac source and the ac load And it only limits the fault in the ac grids so that the limited energy is wasted in the limiter itself so there is no use energy and is wasted.



PROPOSED SYSTEM

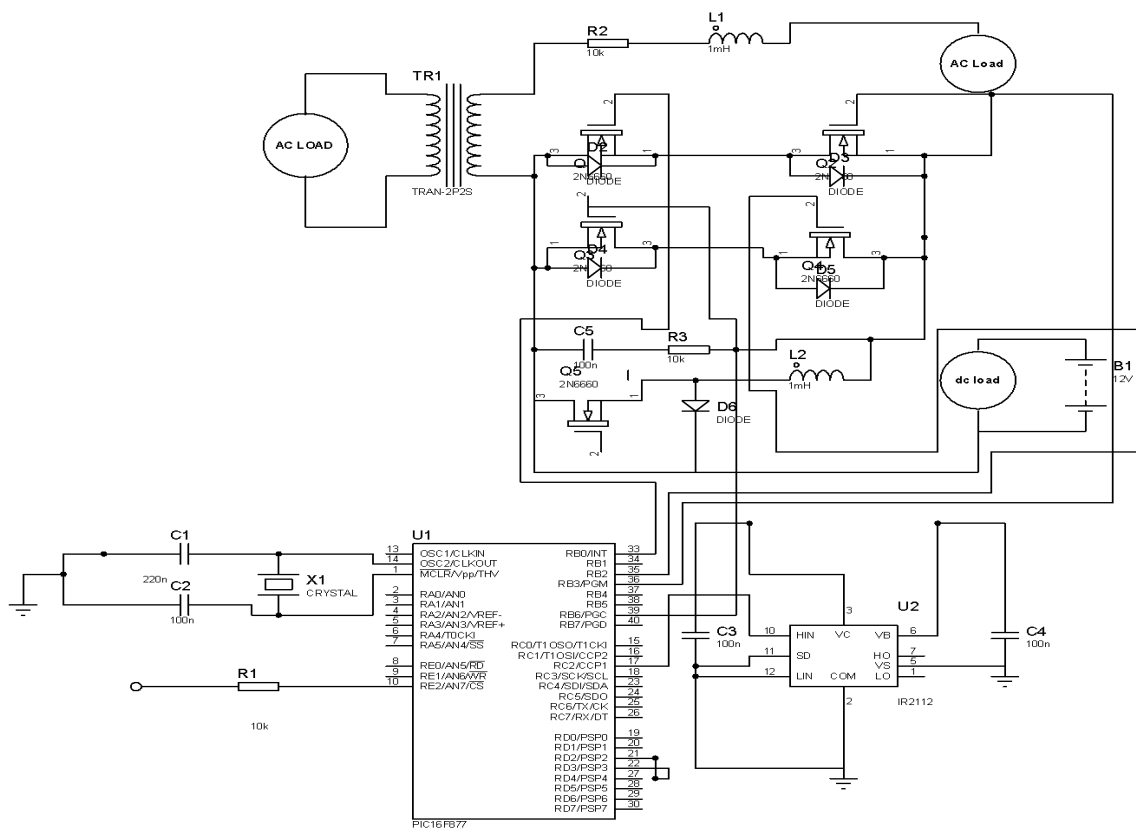
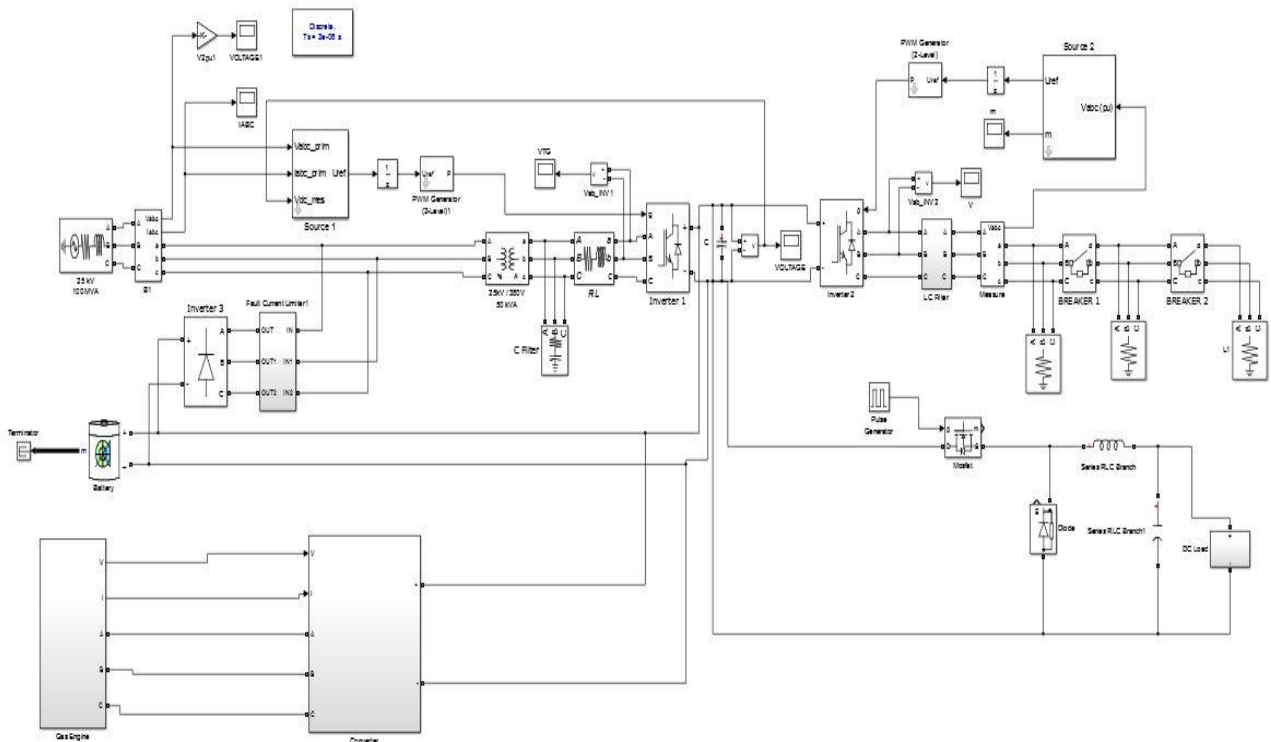
In this system the bridge type fault current limiter is used which is under the non superconducting type limiter .This type is used to limit the fault condition and the energy is saved in the limiter is utilised to another load that is the dc grid is run by this energy. The stored energy is utilised in the system so that power is generated more usefully.

OPERATION

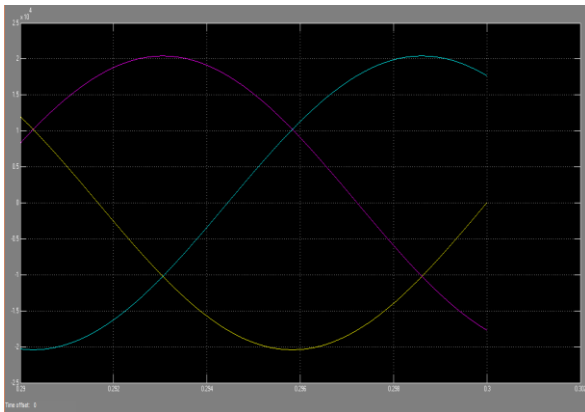
For power management in normal operation of the utility, dc reactor current should be controlled .so that the output voltage of diode- bridge is compared with a reference voltage .when the output voltage is less than the reference voltage the semiconductor switch is turn on.

During the fault condition the limiter is operated and it limits the fault that is any type of fault. Then the limited current is stored in the limiter itself, So that the stored energy is used to run the dc grid supply. This is known as the energy management of the system.

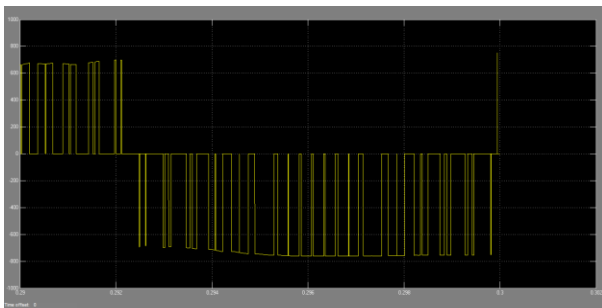
SIMULATION



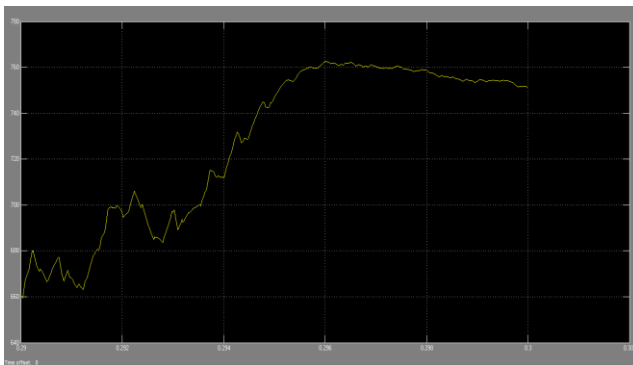
RESULT WAVEFORM



Fig(1) AC voltage waveform in normal operation



Fig(2) Pulse generated in the limiter



Fig(3) DC reactor current during fault condition

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CONCLUSION

Thus the new structure for FCL is proposed which is capable to manage power in normal and fault condition of utility, control the magnitude of fault current, and ensure a high protection level of the system. Moreover the energy stored in FCL during fault condition can be transmitted to the adjacent dc grid. It can manage the both ac and dc system.The theory and feasibility of the FCL is demonstrated by simulating and providing experimental results of the proposed structure.