

# **Control of a Grid-Connected Synchronous Generator WECS and Harmonic Current Filtering**

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**ABSTRACT**\_ Nonlinear devices, such as power electronics converters inject harmonic currents in the AC system and increase overall reactive power demanded by the equivalent load. Also, the number of sensitive loads that require ideal sinusoidal supply voltages for their proper operation has increased. In order to keep power quality under limits proposed by standards, it is necessary to include some sort of compensation. Different types of power quality compensators of higher or lower complexity have been reported. It is now well known that an active filter can easily compensate for harmonic current contents in the load current by inserting negative harmonics into the power network. The aim of this paper is to present the efficiency of the electrical part of a wind generation system with a synchronous generator. In attempt to minimize the commutation frequency harmonics in the current and voltage in the stator and to avoid the overlap phenomenon in the diode bridge, an LC filter is inserted between the excited circuit and the DC-DC converter. Simulation results are carried out to validate the proposed solution.