

ANALYTICAL STUDY OF THE SERIES CONNECTED DGFFACTS FOR IMPROVING THE QUALITY OF SUPPLY OF THE ELECTRICITY NETWORK

Francisco J. Santiago, Eugenio Perea, Eduardo Zabala, Asier Gil de Muro
Energy Unit
Labein - Tecnalia
Parque Tecnológico de Bizkaia, Ed. 700, 48160 Derio, Spain
Phone (34) 94 607 33 00, Fax (34) 94 607 33 49
E-mail: fsantiago@labein.es

Keywords: Minimum active power injection; power decoupling; rotatory vector; series compensation; voltage compensation.

ABSTRACT

Electronic power devices connected in series have been used to control the active and reactive power flows in the transmission network, by means of the line impedance variation [1]. UPS (Uninterruptible Power Supply) devices, based on power electronics, have been broadly used to control the load voltage [2]. Nowadays, Distributed Generation is expected to cause voltage fluctuations on the distribution network, due to the oscillatory nature of some of the sources, such as wind or solar energy, and also because of the uncontrollability of such resources, which could affect the operation of the whole network. The sDGFFACTS (series connected DGFFACTS) can isolate a group of distributed resources, or even a branch of the distribution network itself, making them ideally operate decoupled. The sDGFFACTS can correct the short term voltage variations downstream from its connection point. This paper proposes the control algorithms to be implemented in the sDGFFACTS in order to improve the Quality of Supply of the electricity network.