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Coordinated power quality improvement in multiunit diesel power plants

C.A. Platero Gaona; F. Blázquez García; P. Frías Marín; A.J. Casado Alias

Abstract-

Power quality is a main concern in power systems with generators driven by internal combustion engines, especially by low- and medium-speed diesel engines. The torque in internal combustion engines, which is the superposition of the torques from each cylinder, has periodic oscillations. These torque oscillations, once the generator is connected to the grid, result in power fluctuations and voltage flicker problems, which clearly reduce power quality. This paper presents a new control strategy to improve power quality in multiunit diesel power plants, based on the compensation of the electrical fluctuations between individual generators. This compensation is performed by properly controlling the mechanical rotor phase angle between the different generators during the synchronization process. The proposed control strategy is verified using a case study.

Index Terms- Diesel-driven generators, diesel engines, power quality

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