MODELISATION OF AN HIPOSSINCRONE CASCADE WITH TWO THYRISTOR BRIDGES AND NO DC COIL

ABSTRACT

Hipossincrone cascade is one of the must used speed variables in the industry, particularly applied to mean and high power electric machines. Although it's apparent simplicity, its numerical modelization is an enormous challenge.

This dissertation presents the modelization and simulation of a system composed by an hipossincrone cascade with two bridges of thyristors and no DC coil. The modelization of the system was very difficult although very flexibility due to the methodology of blocks, possible through the libraries of the MatLab/Simulink software and the Power System Blockset. The system model was validated through experimental tests carried out in a cement plant.

The developed work contributes for a better understanding of the system and simultaneously provides the answers to some of the common problems associated with it. Therefore, the effect of the disturbances produced by the system on the motor and on the mains was investigated. Particularly, the harmonics produced by the hipossincrone cascade presented in the waveforms current and the torque harmonics presented in the spectrum of mechanical vibrations was analysed. Finally, some solutions are presented in order to take advantage of the full capabilities of this system.