

ABSTRACT

MARTINS, Diogo. *Propulsion systems of ships under the All-electric Ship concept*: analysis of the application of dual multilevel converters in motor drive with open-end windings. 2018 137p. Dissertation (Master Degree in Electronic Engineering) – Faculty of Engineering, University of the State of Rio de Janeiro, Rio de Janeiro, 2018.

With the development of power electronics, interest in ships under the All-electric Ship concept has increased. From this perspective, all systems installed on board, even the most demanding as the propulsion systems are converted to electrical systems. In this context, the use of converters becomes essential. This dissertation analyzes the use of multilevel converters applied to large power engines, such as those found in propulsion systems. The topology presented consists of the use of dual multilevel converters connected to induction motors with their terminals open, that is, each end of the windings is connected to an inverter. The feasibility of this configuration is analyzed in this work. The converters used in the simulations are the three level diode clamped converter and the five level MLC² multilevel converter. S-PWM and SVM modulation strategies were adopted in the simulations. Also, a switching strategy where one converter is delayed relative to the other has been analyzed by applying modulating signals delayed by α degrees. To analyze the feasibility of using this configuration, emphasis was given to the results obtained from THD and current and voltage levels on the semiconductor devices.

Keywords: All-electric Ship; Multilevel converters; MLC²; Ship Propulsion; Open-end winding motors.