Electric Power and Power Electronics Institute

WEEKLY SEMINAR SERIES – SPRING 2018

Monday, February 19th, 2018, 3:00 p.m. – 4:00 p.m., ETB 1035

HIGH SPEED MEGAWATT CLASS MOTOR AND HIGH FREQUENCY VARIABLE SPEED DRIVE SYSTEM

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Abstract

TECO-Westinghouse has partnered with Clemson University to develop a megawatt-class electrical drive for gas compression and other high speed applications. The project is funded through DoE's office of Energy Efficiency and Renewable Energy's (EERE). The project objective is to design and build a 1 MW, 4,160 V, 15,000 rpm motor and a 1 MW, 4,160 V, 500 Hz drive with a combined efficiency of 93% or higher, and meet other challenging performance requirements. Extensive multi-physics simulation work was used in the design of the motor and drive supported by comprehensive tests aiming at qualifying WBG devices for use in medium voltage high power applications, and validating critical motor components. Customized gate drives were developed to meet stringent switching and performance requirements, and motor topology was optimized to minimize losses and cooling efficiency. The complete system is now under construction and will be fully tested at Clemson's eGrid Lab in the fall of 2018.

Biography

Paulo Guedes-Pinto joined TECO-Westinghouse Motor Company (TWMC) in April 2014. At TWMC he directs a team of 55 engineers and designers responsible for the design of large AC and DC machines, medium voltage drives, and research and development of electric machines and power converters.

Paulo Guedes-Pinto has over 25 years of experience in the design and manufacture of large AC and DC motors, high speed DC traction motors, motors and generators for locomotives, axial flux permanent magnet machines, high speed permanent magnet motors for subsea and land applications, as well as medium voltage drives. He holds eight patents related to permanent magnet machines and carbon composite structures applied to those machines. In 2011 he was the recipient of FMC's Peter Kenear Technology Award for the development of a 3.2 MW, 6.6 kV high speed PM motor for subsea pumping.

Before joining TWMC, Paulo Guedes-Pinto held engineering leadership positions at Boulder Wind Power (BWP), FMC Technologies, GE Canada, JDS Uniphase, and Indústrias Villares (now Gevisa, a GE company).

Paulo Guedes-Pinto graduated from the University of São Paulo in 1979 with a BSEE, majoring in electric machines. He also pursued post-graduate studies in power systems and quality engineering. Mr. Guedes-Pinto is a registered professional engineer in Ontario, Canada.