

821 – ReX and Recommendations for Mechanical Integration of Large High-Speed Motors

Authors: Lionel Durantay (General Electric Power Conversion), Edouard Thibaut (TotalEnergies), Alain Gelin (TotalEnergies), Lionel Roth (General Electric Power Conversion)

Abstract: Synchronous and asynchronous motor technologies dedicated to high speed make it possible to offer high-power variable-speed compression services without using gearboxes. The mechanical integration of these motors requires special precautions because of the wide speed variation ranges required. The first part of this paper explains the mechanical integration rules described in the API 541 and 546 standards which are the most restrictive in the world. The second part describes a site return of experience from a vibratory instability of an 18MW 2-pole motor and explains the mechanism that led to this instability. The third part proposes the recommendations to be followed for synchronous or induction motor by manufacturer, OEM, EPC and User-End in terms of modelling, design and testing for successful mechanical integration and is illustrated by a business case of an 18MW starter-helper variable speed induction motor fed by Voltage Source Inverter.