EUR21_08 – A SUCCESS STORY OF STEAM TURBINE REPLACEMENT BY HIGH SPEED ELECTRIC SYSTEM

Authors: Lionel Durantay (General Electric), Damien Spannagel (General Electric), Daan Van Gemert (Shell), Jackie Lava (Shell)

Abstract - Thanks to the development of high-speed induction motors and voltage source inverters, standalone electric drivers are today an alternative to the traditional train driven by steam and gas turbines when regulating the operating speed of compressor, improving the system efficiency and reducing significantly the emission of greenhouse gases as requested by the new European regulations. This will be developed in the first introductory part of this paper. The second part of this paper describes the main expectations and challenges of the end-user in term of project time line, reliability, inter-changeability and site electrification based on an actual business case in Nederland operating at 5.7MW @ 6,400rpm. The third part overviews the selected architectures of electric systems delivered to the end-user, including the induction motors and Voltage Source Inverters technologies. The last part is dedicated to the key technical milestones, during the design phase, Factory Acceptance Tests, and commissioning with a focus on the mechanical integration when using oil lubricated bearings. The conclusion highlights the learnings and the win-win cooperation of this project.