

830 – VSD output voltage online compensation for proper adjustment of ESP at the best

Authors: Diogo Brum Candido (WEG Brazil), Guilherme Augusto Pangratz (WEG Brazil), Joable Andrade Alves (WEG Brazil), José Roberto Castro (Equinor Brazil)

Abstract: Tracking the Best Efficiency Point for Electrical Submersible Pumps (ESP) applied to Oil & Gas application is imperative for improving the productivity of the whole system. The Variable Speed Drive (VSD) has a fundamental role in this operation since it is the component that provides the online adjustment of the output voltage applied to the ESP through the long cables between them. The long cables between VSD and motor, for example, the umbilical cable could be a few up to dozens of kilometers and its electrical characteristics (mH/km, uF/km, and mΩ/km) are not neglectable, which could bring some operation concerns when adjusting the VSD output voltage.

Therefore, this paper analyses the impact on the stability of the system during the output VSD voltage adjustment taking into consideration the electrical characteristics of the cables, also simulation and experimental results, taken with a scaled prototype, of two different output VSD voltage adjustment methods are presented and analyzed.