

Active Harmonic Filter saves money and time on multi-well pads

Introduction

Oil field economics are changing rapidly. As a way to save money and reduce environmental impacts, many oil producers are using multi-well pad drilling as an alternative to single well sites. In 2014 over half of all new wells in unconventional fields were done using multi-pad drilling sites. Over the life of a well, different types of artificial lift equipment may be employed to maximize production. Unfortunately, with more wells there is an increase in harmonics, and more spikes in voltage distortion. This is presenting a problem for many multi-well pad drilling sites.

A field operator in the Bakken called upon TCI to find the best solution for reducing the costs of these harmonic issues over the lifetime of their site.

Assessing the Situation

Bakken's site was a multi-well pad with 18 wells each completed with a 50HP VFD pump panel, and a rod pump. Each time that a pump change was made to the site, new harmonic filters were required. This field operator was looking for a single solution that could handle all of their harmonic needs throughout the lifecycle of the site. The operator contacted TCI for assistance in solving their significant harmonic and high background voltage distortion problems.

In looking for an answer, it was seen that the traditional single well approach was not optimal for multi-well pads. The single well approach does not use the



Pre-ignition Chamber Combustion, it isn't flexible enough to support lifecycle changes, and it has high costs because there is little reuse of harmonic solutions.

TCI engineers found the best solution to the harmonic mitigation and voltage distortion problems were to install one HarmonicGuard Active Filter (HGA).

Over the lifetime of 4 well pads, a single HGA can replace 12 passive harmonic filters, multi-pulse drives, or active front end drives. Throughout the pads lifecycle, TCI's HarmonicGuard Active Filter can be accompanied with a simple, quick ship, six-pulse VFD. The HGA is a one-time installation with one disconnect per site. The HGA is I-EEE 519 Compliant at the Point of Common Coupling. It also will act as a shunt device, which means that a fault will not halt the VFD operation.

The active harmonic filters mitigating harmonics and the improvement in power factor provides an economic solution to the problem. The HGA provides a greater cost savings compared to an integrated VFD solution like an eighteen-pulse drive or an active front end drive.

Active Harmonic Filter saves money and time on multi-well pads *cont.*

Summary

Overall, voltage distortion can be effectively reduced to acceptable levels using harmonic filters. A basic understanding of how distortion is created and the effects of circuit impedances, helps in resolving the problems created by distortion.

Realizing the role of the distribution system impedance in any installation is necessary to accurately predict the level of distortion attainable through the use of filtering or other harmonic-reducing products. Just one of TCI's HarmonicGuard Active Filters can replace 12 passive harmonic filters, multi-pulse drives or active front end drives. The HarmonicGuard Active Filter can reduce harmonic mitigation costs over the lifetime of a site due to its savings from power factor utility charges and its immunity to background voltage distortion.



W132 N10611 Grant Drive, Germantown, WI 53022
P: 800-824-8282 | transcoil.com