Voltage Optimisation for DP World Shipping

CASE STUDY

OVERVIEW

DP World is one of the largest marine terminal operators in the World, operating in 49 terminals across 31 countries, and growing. The Tilbury Container Services (TCS) is located near London within the Port of Tilbury. The site is spread across 33 hectares and is widely renowned as the UK's leading handler of North-South trades to and from South Africa.

THE CHALLENGE

DP World's rapid on-going expansion plan needed to address the key issue of energy reduction. Each site is a major energy consumer with some sites occupying more than 300 hectares. Within each terminal there a number of multi-levelled gantries used to store and supply power to refrigerated containers. DP World's current environmental policy operates around three themes: Clean Ports, Habitat H_20 and Addressing Climate Change; targeting carbon emissions reduction by 27% within the next 5 years, starting in 2009.

THE SOLUTION

DP World chose PowerSines smart voltage optimisation system, ComEC, to reduce their energy consumption and carbon emissions. The professional pre-installation site survey performed by Shields found that TCS had an average supply of 242V across their low voltage infrastructure. As all electrical equipment is designed to work within the legal range of230V± 10%, reducing the voltage to 220V would safely provide energy savings, reduce losses and extend equipment lifetime. The customer selected to install PowerSines ComEC voltage optimisation units to the power distribution units supplying refrigerated and frozen containers.

THE TECHNOLOGY

The core of the ComEC system is based on propriety topology of magnetic core transformers controlled by a microprocessor. Voltage Optimisation units operate based on the patented technology including:

- Induced Negative Voltage (INV) Suppressing existing sine wave, thereby providing a Sinusoidal wave form.
- Voltage Vector Combination (VVC) Controlling the voltage utilising the voltage vector angles and magnitude of three phase electrical systems.

BENEFITS OF COMEC VOLTAGE OPTIMISATION:

- Greater savings by dramatically reducing voltage without causing under voltages
- Built in manual and automatic bypass controlled locally or remotely via the Remote EMS
- Remote EMS enables smart metering, reporting, SMS/email alerts and secure web based interface
- Propriety patented technology
- Pure Sinusoidal wave forms
- Thermal protection
- Over current protection
- Minimal harmonics, losses and dissipation

THE RESULT

After extensive data logging, ComEC provided energy savings of 11%.

	Annual Savings
Annual KWh consumed **without** ComEC	653,165 KWh
Annual KWh consumed **with** ComEC	581,320 KWh
% Total annual savings	**11 %**

APPLICATION

Refrigerated & Cooling Storages

BENEFITS

Up to 18% direct savings for all electric loads

ROI within 1.5-3 years

Quick and easy installation

No changes to existing electrical infrastructure

Voltage stabilisation and control

Internal & manual bypass & protections

Decreases reactive energy