Don't Let It Vent: 100% VOC Recovery from Shuttle Tankers

Marine

SUCCESS STORY

At A Glance

Application:
Marine: Waste to Power

Output:
Electricity: 1.7MWel

Benefits:
25 % Total Efficiency
26,000 Tons $CO2_2$ Saved Per Year

Installation:
4 X OP16-3C
June 2019

Location:
Norway

Customer:
Teekay

The Challenge

Volatile Organic Compounds (VOCs), except methane, are called NMVOCs that evaporate from crude oil due to their volatile characteristics. Storage, loading and unloading of oil in offshore platforms, storage ships (FSOs and FPSOs), onshore storage tanks and terminals, and on shuttle tankers, contribute significant emissions of NMVOCs. These VOCs are a mix of heavy hydrocarbons too volatile to be burnt in reciprocating engines. Teekay, operating one of the world's largest conventional tanker fleets, were looking for an efficient solution for use of the VOCs their shuttle tankers generated.

The Results

OPRA gas turbines recover 100% VOCs emissions from shuttle tankers, combusting surplus methane gas from VOC plant of approx. 10 ton per loading. Emissions are reduced from 27,000 tons CO_2 to 1,000 tons CO_2 annually, while also producing electric power to the vessel grid. As OP16 Gas Turbines are fuel flexible they can operate on VOCs and natural gas simultaneously, ensuring continuous power in case of VOCs supply shortage.

The Solution

The OP16-3C Gas Turbine can run on VOCs or boiloff gases from LNG tanks that are generated during the transportation of crude oil in shuttle tankers. The radial design of the OPRA OP16 Gas Turbine along with the 3C combustion system is designed to run on unconventional and low energy content fuels like VOCs and boiloff gases, that are otherwise vented or flared. As VOC generation is not constant and rather intermittent, the power generated from OP16 Gas Turbine can be fed into the battery system of the shuttle tankers. This stored power can be made available to the main switchboard of the ship. The battery packs can also be used for black out prevention and peak shaving. This gas turbine based solution is a compact, lightweight, low maintenance and vibration free power system that can replace existing engines or boilers which are large, heavy with high vibration and frequent maintenance demanding. The OP16 Gas Turbine is an air cooled machine and can easily be installed in the superstructure of ships, isolated from the engine room, and eliminating the need for a cooling water system piping required in engines. This arrangement ensures emergency power supply in catastrophic event of water flooding of engine room.

100%	100%	87%	68%
Reduction of VOC Emissions	Reduction of SO_x Emissions	Reduction of NO_x Emissions	Reduction of CO_2 Emissions

OPRA TURBINES
An Energas Group Company

Get in Touch With Us

OPRA Turbines, Haaksbergerstraat 71,
7554 PA HENGELO, THE NETHERLANDS

+31 (0)74 245 2121
opraturbines.com
sales@opra.nl