

PowerBlade Case Study

Use of otherwise lost energy lowers fuel consumption and emissions on semisubmersible offshore Norway

Case study facts

Location: Norwegian North Sea

Customer: Odfjell Drilling

Rig: Deepsea Atlantic

Time frame: July 2022



Description

Since 2021, Odfjell Drilling's Deepsea Atlantic semisubmersible rig has featured a flywheel and battery energy storage system that uses kinetic energy that otherwise would be lost. NOV's PowerBlade™ Hybrid energy recovery system reduces the number of diesel generators onboard, thereby lowering fuel consumption, maintenance requirements, and carbon emissions from drilling operations. PowerBlade stores otherwise unused drawworks braking energy in a flywheel and battery. This energy is then used to perform peak shaving during drawworks usage. Power from the flywheel and battery storage cuts the peak drawworks requirement for power from generators and reduces fuel consumption during drilling operations by 25 to 30%.

KPI

The PowerBlade Hybrid system can store up to 600 kWh of electrical energy generated from drawworks braking power and uses it to provide 6 MW (battery 3 MW, flywheel 3 MW) of peak shaving power to the drawworks. The generators do not need to work as hard because the short burst of peak power needed comes from the PowerBlade system rather than from the generators. Together with the DC/DC grid system, PowerBlade allows the rig to run tripping and drilling operations with as little as one generator.

The system is installed on the deck and interfaces with the main DC drilling bus. Our Maestro™ power management software constantly distributes the needed power vs. the stored power vs. the generated power and controls the energy flows so that the power demand on the generators is as low as possible.

The reduction of the number of required generators improves generator load utilization rates, thus lowering fuel consumption per kWh of electricity generated and emissions of the rig.

Value

PowerBlade Hybrid and the onboard DC/DC grid system allow the rig to be operated on just one generator for a significant period, even during drilling and tripping operations (under moored conditions), further reducing the rig's overall fuel consumption. With its 6-MW peak shaving capabilities, the power demand from the drilling equipment onto the generators is much more stable and generator sizing is more predictable, so running on fewer generators at a higher load level will lower the rig's fuel consumption.