Industrial Power Solutions

Oil and Gas – Pressure Control

UPS Delivers Rugged Power Solution in Support of Oil Drilling Equipment

**Challenge**  A global leader in design, manufacture and sales of drilling equipment needed a new power solution to support its blowout preventer (BOP) control system. Their uninterruptible power supply (UPS) had several issues. For battery backup and conditioning, the prior power solution had a large, cumbersome footprint composed of two separate cabinets. It utilized Ferro resonant transformers; this inefficient technology was prone to overheating and known to feed low frequency noise back to the mains. Output power was available only at 240 Volts.

**Solution**  A single pad or pole mountable outdoor NEMA3R cabinet solution that would withstand harsh climates such as rain, sleet and snow as well as high and low temperatures as well as double-conversion online topology, power conditioning, power factor correction and temperature compensated battery charging.

**Result**  A rugged, self-contained cabinet solution that included batteries, charger and UPS, providing clean power and backup with superior functionality in half the footprint.

The uninterruptible power supply (UPS) our customer was using had several issues. For battery backup and conditioning, their power solution had a large, cumbersome footprint composed of two separate cabinets. It utilized Ferro resonant transformers; this inefficient technology was prone to overheating and known to feed low frequency noise back to the mains. Output power was available only at 240 Volts. IntelliPower’s solution resolved these issues in one self-contained enclosure, at half the footprint.

Advanced terrestrial and offshore drilling operations depend on blow out preventer (BOP) control systems to manage wellbore pressures. Equipment that make up an installation include – roughly – cables, sensors, pumps, chokes, pipes, storage tanks, communication networks, skid mounted hydraulic pumping units, diverter skids, driller’s panels, tool pusher’s panels, control cabinets, UPS and the BOP stack. These components work in concert, primarily to manage kicks. An ‘out of control’ kick is a blowout. Tremendous pressures are exerted on fluids present in subterranean formations. Deep wellbores form an escape route for pressurized formation fluids. A kick begins when down-hole pressure is less than formation fluid pressure.
UPS provide clean power and backup to control cabinets. Programmable logic controllers (PLC) assist in managing a BOP control system by facilitating some process control automation, sensor feedback, and alarm reporting. PLCs interface between control panel operators and system components. When power to a PLC fails, response to dynamic pressure conditions remain fixed or cease. In such circumstances drilling progress can suffer. Equipment can wear out, and drilling operations can shut down. In a worst-case scenario, uncontrolled kicks lead to a blowout. Blowouts can turn down-hole tools into airborne projectiles. Outpouring oil and gas can ignite. Major incidents can pollute the environment, initiate heavy capital losses, and seriously injure or kill rig personnel.

Their power solution was composed of two cabinets. One cabinet housed the UPS and connectors; the other housed batteries. In maritime field operations, space is limited. In power applications, Ferro resonant transformers are considered inefficient, large, heavy and prone to overheating. They are known to inject low frequency noise back into the power distribution system. Downtime due to frequent failures was compounded by poor maintenance support. Though marketed internationally, the prior UPS offered only 240 Volts output. Global voltage capabilities were needed to suit global field operations.

IntelliPower provided a solution with superior functionality in half the footprint. Each self-contained system includes batteries, a charger, and a UPS. All components are mounted inside one rugged, self-cooling cabinet. This cabinet is easily portable via top mounted lifting eyes. The American Petroleum Institute (API) requires BOP control systems have at least two hours of power back up. IntelliPower’s solution included long runtime, temperature compensated charging, and online double conversion technology. Its battery backup provides over 2.75 hours of battery runtime at 2500 Watts. Temperature compensated charging saves batteries from damage in extreme temperatures. Double Conversion On-line UPS include the latest in robust power conditioning – insulated-gate bipolar transistors and pulse width modulation is used rather than Ferro resonant transformers. IntelliPower UPS are designed and manufactured in the USA; maintenance support cases are closed utilizing the assistance of engineers who designed the systems, and production personnel who built them. IntelliPower offers base off-the-shelf solutions with modifications: global input, DC input, 120 or 240 Volt output, DC output, a wide range of power levels, variable enclosure sizes and shapes, and a multitude of connectors such as NEMA, IEC, Schuko, Terminal Block and Circular Mil. IntelliPower UPS can support a BOP control system anywhere in the world.

UPS are readily available in the marketplace; UPS supplier willingness to assist in intelligent integration is not. IntelliPower prescribes solutions that meet 100% of customer requirements; whether it is communications protocol, software features, enclosure sizes, connector types, battery runtime, or power levels. IntelliPower products integrate with the latest and greatest technology – enabling successful implementation in contemporary systems. IntelliPower products and services boast over 25 years of product testing, product development, and field operations experience in concert with major international Military, Industrial, and Commercial partners.