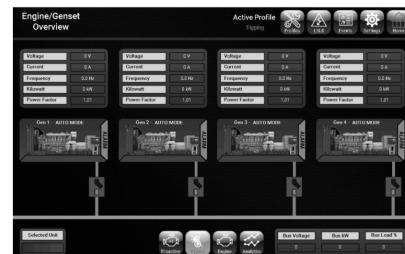


CONTROLS & AUTOMATION

Experience data-driven solutions right at your fingertips for your engine management needs with Cat controls & automation. Cat Smart Engine Management System (EMS) is the latest engine and generator controller system developed by Caterpillar. This new technology efficiently manages the number of engines required to be online to meet rig power demands - allowing you to take control of your operation's digital transformation.

SMART ENERGY MANAGEMENT SYSTEM ■



CAT SMART ENERGY MANAGEMENT SYSTEM

Cat Smart EMS is the latest engine and generator controller system developed by Caterpillar for land electric drilling rigs. This recently developed software package further utilizes Caterpillars EMCP4.4 controller to efficiently manage the number of engines required to be online to meet rig power demands.

Cat Smart EMS works by continuously monitoring rig power demand and comparing against available engine power. Depending on the power demand and availability, engines are started or stopped automatically for efficient operation. The logic behind this automation is adjustable by the end user and has multiple modes that can be selected for different drilling operations.

FUEL SAVINGS

- Reduce fuel consumption with increased engine load factor
- Up to 10% reduction in fuel consumption
- Improve gas substitution on Dynamic Gas Blending (DGB) engines

MAINTENANCE

- Reduce yearly maintenance cost with less engine run time
- Up to 25% reduction in engine runtime

SAFETY

- Human Machine Interface (HMI) provides remote access to engine controls
- Enhanced safety for rig crew working around engines with local lockouts, visual and audible alarm before engine start-up

SIMPLIFIED RIG CONTROLS

- Reduced CAPEX for new rig builds since Cat Smart EMS replaces third party engine controllers
- Simplified power house layout and space savings with removing the engine controller from the power house