

April 2019

Turner ECS Case Study

Drilling Rig Control Upgrade





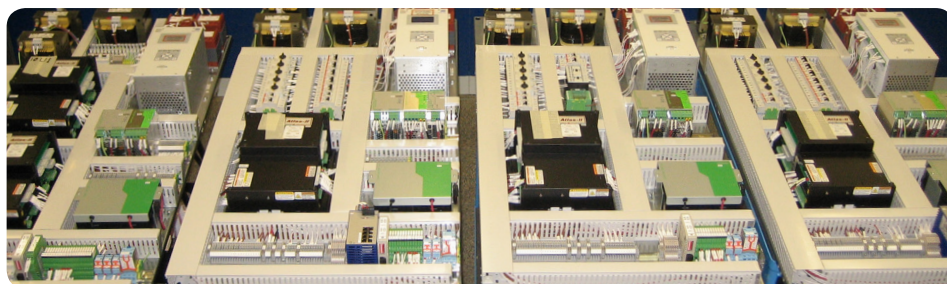
Introduction

The Scarabeo platform is a semi-submergible drilling rig, held in position by anchors. The platform “stands” on six legs connected by two pontoon feet. The platform is used for oil drilling in the Mediterranean Sea offshore Alexandria, Egypt.

The power plant consists of four EMD engines, two 16 cylinder- and two 12 cylinder engines. The four engines distribute their power through four generator circuit breakers onto the bus. No split options in place. From the main bus the power is transformed for its user-groups and also converter via for main power equipment.

Parts obsolescence and engine instabilities were the reason why Turner ECS received the turn-key order in 2012 to replace the existing generator control system for each engine. The generator control system consists of a Hill Graham AC40 master/slave module, automatic voltage regulator.

The spinning reserve power was calculated by an obsolete power limit module which had an interface signal through the SCR's to reduce power. The functionality provided by the module has been replaced as well.



TURN KEY PROJECT

UPGRADE OF:

- Generator Control System
- Power Limitation Module to the SCR

SPEED CONTROL

- Isochronous load sharing
- Droop mode
- Bumpless switch over droop/isochronous mode

SYNCHRONISATION

- Auto/manual
- +/- 3Vdc voltage interface
- Raise/lower speed

REDUNDANT LOAD SHARING SYSTEM

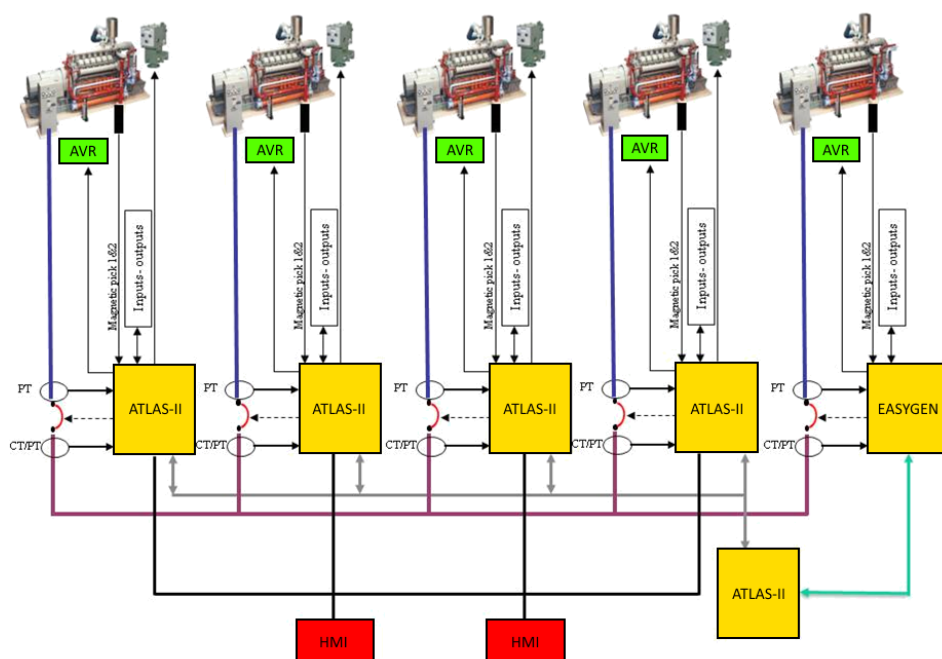
- LON load sharing lines
- kW load sharing
- kVar load sharing
- kW load error check

DIESEL PROTECTION & SEQUENCING

- Soft loading/unloading
- Start/stop sequence
- Alarm/shutdown handling

System Description

The Woodward Atlas-II controls are used to replace the old generator controls, kW module and interfaces with the existing Woodward EGB governor and four new supplied, installed and commissioned automatic voltage regulators.



All Atlas-II controls are communicating with each other via a LON network to share real, reactive loads and other information. As a backup in case the LON network fails, there is a redundant Ethernet network which can perform the same tasks as the LON network. For the newly installed engine an Atlas II will be used for the load share interface to the easYgen control. Furthermore, this control will contain the majority of the kW limit box functionality.

The following functionality is provided by the ATLAS-II control:

- Speed control
- Droop – Isochronous control
- Back up droop control
- kW and kVar load sharing control
- kW limiter
- Start & maximum fuel limiter
- Synchronisation and dead bus closure
- Soft loading and unloading
- Generator protection
- Alarms & Shutdowns
- Generator winding temperature monitoring
- Parameter interface display

HARDWARE SUPPLIED

WOODWARD ATLAS II

- Smart core board
- Power sense board
- Power supply board

Human Machine Interface

- Touch panel
- Citect software

Voltage regulator

- Basler DECS-200

Prefabricated:

- Mounting plates
- Doors



Turner Range of Services

LSTK Projects, Retrofits & Upgrades
Turner ECS delivers reliable retrofit solutions for a wide range of prime movers and other applications. This includes lump sum turnkey projects on turbines and compressors.

Genuine Parts & Service Exchange
Turner ECS has the largest stock of parts, service exchange governors and electronics in Europe and can provide a fast turnaround service.

Product Training
Turner ECS can provide official Woodward product training covering both theoretical and practical training on a wide range of Woodward products.

Electronic Repair & Mechanical Governor Overhaul Service
Turner ECS provides a comprehensive overhaul and repair service for electronic, mechanical and hydraulic governors.

World Wide Field Service
Turner ECS field service engineers and technicians provide comprehensive solutions for commissioning and on-site repair.

Service Contracts
Turner ECS provides long term service contracts to support users with Woodward governors and/or control products and electronic control systems.

ROTATING EQUIPMENT CONTROL SOLUTIONS DELIVERED ACROSS EUROPE & THE MIDDLE EAST

Turner ECS is an official Woodward Channel Partner with offices located in:

- The Netherlands
- England
- Germany
- Italy
- Abu Dhabi
- Qatar
- Saudi Arabia

Turner ECS also operates and manages an extensive network of official agents throughout Europe & the Middle East

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