



## Genset control system for automatic synchronizing, load sharing & protection.

### PRIME MOVERS

5 x Diesel Engines

### CONTROL TECHNOLOGIES

#### Woodward 2300E Load Sharing & Speed Control

The 2300E replaces the 2301A analog controls, providing load sharing and speed control. Using an external computer (PC) and built-in configuration software, application variations may be custom programmed to accommodate engine speed range, gear teeth, and select forward or reverse acting.

#### Woodward easyGen 3500 Generator Control

Synchronizer, load sensor, load controller, provides dead bus closing, has VAR/PF control capability, and generator protection functions.

#### Woodward LS-5 Breaker Controller

The LS-5 is a synchronizer, load sensor, and load control designed for tie-breaker applications in an EasyGen based system.

#### Basler DECS Digital Voltage Regulator

The DECS digital excitation control systems offer high performance, high flexibility, and extreme reliability for brushless excited AC synchronous generators.

### PROJECT OVERVIEW

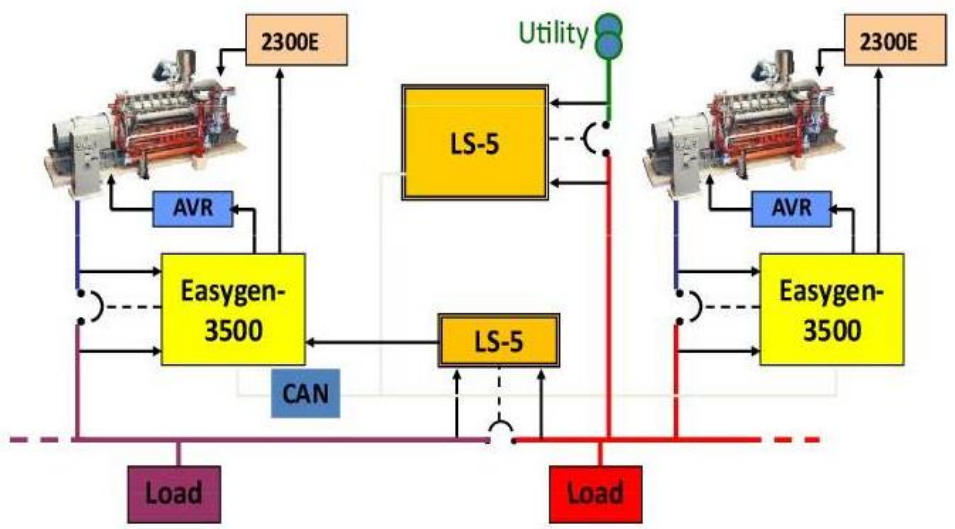
Mid-Atlantic dredge company had been considering updating their outdated controls on a dredge vessel and finally determined the time had come to go ahead with the upgrade. Unreliability of the obsolete Woodward analog 2301A speed controls and outdated voltage regulation system were the main factors of concern. GCS recommended the Woodward 2300E speed control and Basler DECS AVR on their five engine generator sets. A major goal was to add a generator control system for automatic synchronizing, load sharing, generator protection, and other features.

The upgrade was needed for the following reasons:

- The performance and reliability of the existing system was poor
- The installed controls and voltage regulators were obsolete
- Spares were no longer readily available for these controls
- The dredge was at risk with continued operation using the obsolete equipment
- Maintenance and product support was limited

### Easygen-3400/3500 Series

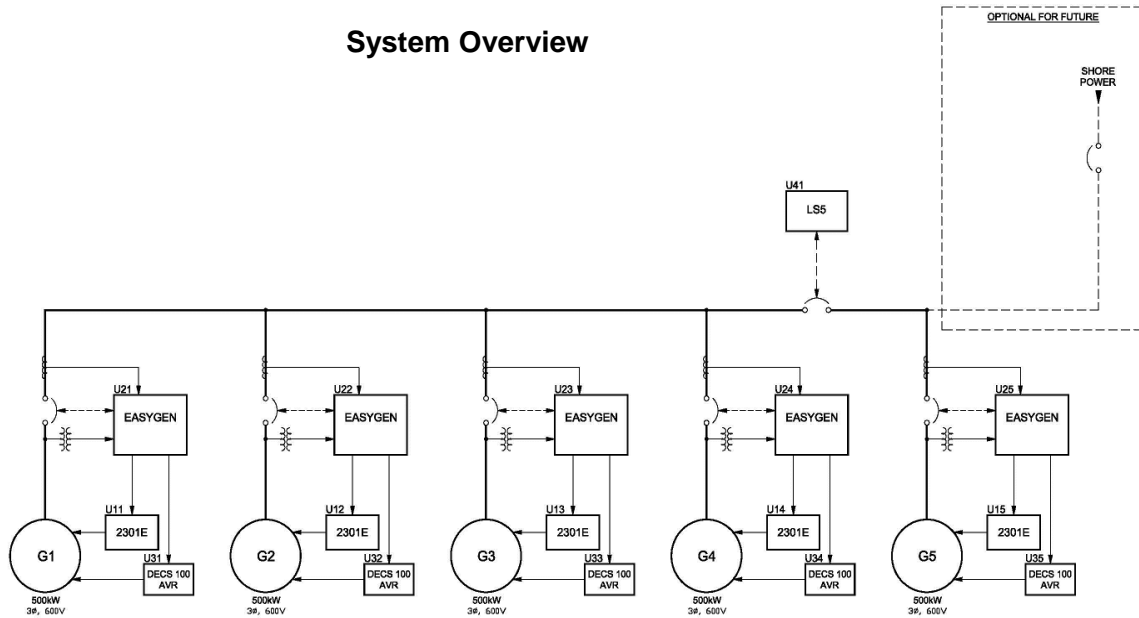
#### MULTIPLE – Mains Parallel, Multi-Segment



GCS utilized Woodward's new 2300E Speed Control with Basler's DECS AVR along with Woodward's EasyGen Generator Controller to address these issues. This proven strategy will greatly increase the reliability and overall performance of the generator system on the dredge. GCS was also asked to supply UPS backup power supply batteries for each of set of generator controls to ensure a backup supply is available in case of loss of power.

The Woodward 2300E, Basler DECS, and Woodward easyGen controls were mounted within the existing cabinets and the system was configured to accommodate future HMI and shore power conversion.

**System Overview**



**Woodward 2300E Engine Speed Control**

- Multiple dynamics
- Torque limiter
- Low speed sensing functionality
- Remote speed & load reference
- Engine speed control
- Soft load transfer
- Automatic idle to rated switching
- Load rejection/load pulse option
- Idle droop function
- PC configurable
- Modbus serial communication

**Basler DECS Digital Voltage Regulator**

- Automatic generator voltage regulation
- Voltage matching
- Full generator metering capabilities
- AVR/FCR/Power-Factor/VAR modes of operation
- Over/Under excitation Limiting
- Extensive generator protective features
- Excited diode monitoring
- Trending / Oscillography via service tool interface

**easyGen 3500 Generator Control**

- Automatic synchronizing
- Automatic generator loading and unloading for bump-less load transfer
- Isochronous load sharing
- Process import/export control
- VAR or power factor control
- Dead bus closing
- Digital communications network for information exchange between controls
- Programmable load switch or reverse power trip output
- Color, full function display

**Woodward LS-5 Circuit Breaker Control**

- Provides either phase matching or slip frequency automatic synchronizing across the bus-tie breaker
- Controls precisely power factor or VAR levels
- Automatic segment recognition
- Supports and communicates up to [16] bus segments
- Automatic loading and unloading for bump-less load transfer on each bus segment
- Easy CANbus interface to Easygen network of controls

GCS offers comprehensive control system support, from engine and turbine systems integration to turnkey project management for a broad range of marine, power generation and industrial projects. GCS is a member of the MSHS Group. [Learn more at www.govconsys.com.](http://www.govconsys.com)

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