

AHTS UT 722L BATTERY HYBRID CONVERSION

Main Switchboard Rebuild, Power Management System Replacement, Vessel Automation & Machinery Operating System (VAMOS) Replacement, Battery & Converter Integration



Delivered in 2004, **Mr Chafic** is a classic Ulstein (Rolls Royce) UT 722 Anchor Handling Tug Supply Vessel fitted with a conventional diesel mechanical propulsion system. In addition to its 2 main engine driven controllable pitch propellers, 2 x 2400 kW main engine driven shaft generators provide electrical power to the vessel and its 4 electrically driven thrusters for normal dynamic positioning operations. In order to reduce fuel consumption during standby operations, the vessel was converted to hybrid operation by installing 2 x 375kWh containerized battery systems with a peak power delivery capacity of 2 x 1.2MW.

This upgrade required the existing main switchboard to be re designed and rebuilt to be able to integrate the battery systems and their converters, and a replacement power and energy management system to control the new hybrid architecture, together with a replacement integrated automation & machinery control system.

MJR's scope of work was to provide the turnkey design, approval, build, supply, installation and commissioning package including: Main Switchboard rebuilding for hybrid conversion; replacement Integrated Automation & Machinery Control System & Power Management system; and upgrade from DNV DPS-1 to DPS-2/Battery (Safety) notation.

With the assistance of the Shipyard (**Navship**, Brazil), in late 2024 MJR and partner **ELSYS** carried out the installation and commissioning of the MJR supplied system including:

- 2 x 4000A Shaft Generator Isolation Air Circuit Breakers
- 2 x 2500A Battery Energy Storage Air Circuit Breakers
- Modification of 450VAC Main Switchboard Control Circuits & Instrumentation
- Hybrid Power Management System
- Integrated Automation & Machinery Control System
- New Extension Alarm System
- New Dead Man Alarm System
- New Tank Gauging & Valve Control Systems
- Interface to DP System & Stability/Loading Computer

At the heart of the system upgrade was the **ELSYS** VAMOS Vessel Automation & Machinery Operating System that was installed together with an advanced Power Management System to automate the Ship's new hybrid electrical power generation architecture. The photograph below shows the replacement Operator Station on the Bridge DP Console.



Bridge Console complete with replacement VAMOS 21" Colour LED Operator Stations

Throughout 2024 MJR carried out the basic and detailed design of the upgrade, with manufacturing of the electrical hardware carried out at MJR Teesside, UK facilities and manufacturing of the automation system at ELSYS facilities in Vigo, Spain.

Design & Engineering:

- Single Line Diagram
- General Arrangement Drawings & Layouts
- Main Switchboard Electrical Schematics
- Short Circuit Calculations
- Protection Study
- Load Balance
- Harmonic Compensation
- I/O List
- Alarm List
- IAS Mimic Screen Design
- PMS System Design
- DC Drives Replacement

Class Approval:

MJR were responsible for DNV approval of the full electrical power and automation design with FAT of the Integrated Automation & Machinery Control System and Power Management System carried out at our sister company ELSYS in Vigo.

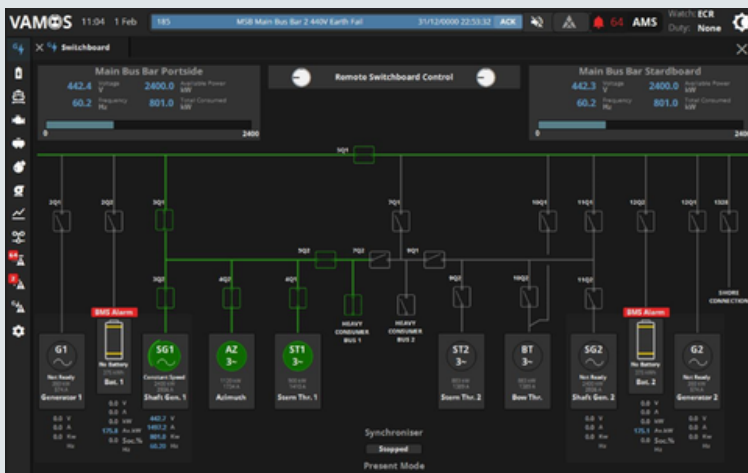


ECR Console complete with replacement VAMOS 21" Colour LED Operator Stations

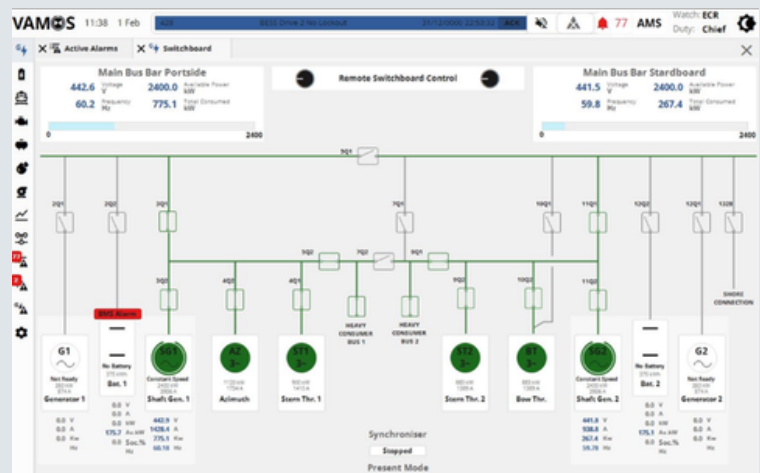
VAMOS

VESSEL AUTOMATION & MACHINERY OPERATING SYSTEM

At the heart of the upgrade is the ELSYS (an MJR partner company) proprietary Marine Automation Platform, VAMOS, developed over a number of years and already deployed successfully on a number of retrofit marine and offshore projects.



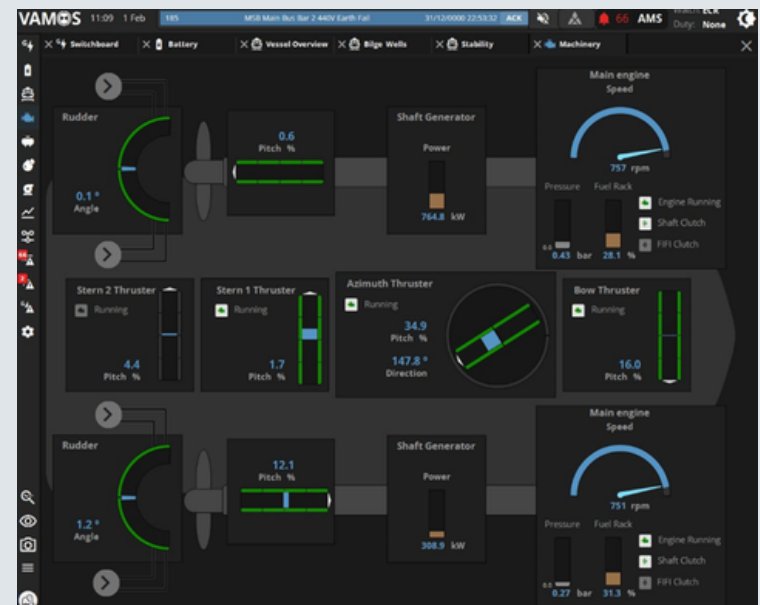
Power Management - Dark theme



Power Management - Light theme



Vessel Performance Overview



Overall Propulsion