Norwegian Epic cruise ship

A high performance propulsion to increase availability, efficiency and passenger comfort

Amongst the largest cruise ships in the world
Norwegian Epic, amongst the largest cruise ships in the world, was built at STX Europe in Saint-Nazaire (France). With 155,873 gross register tonnage, 329.5m in length and 8.7m draft, it carries up to 6,400 people onboard including crew. The ship, launched in June 2010, has excellent performance in terms of power, propulsion efficiency, speed and low noise & vibration level.

A first worldwide
Biggest propulsion powered by Power Conversion with one 24MW slow-speed induction motor per shaftline: a first worldwide. Induction motors are fed by press-pack IGBT PWM MV7000 converters. Power Conversion has also delivered six generators with a total power of 90MVA and six electric motors for thrusters totaling 15MW.
Electric propulsion for smooth cruises
Being a pioneer in the development of electric propulsion systems with no less than 400 references, Power Conversion had the expertise to address NCL’s requirements. Indeed, for many years, electric propulsion has been adopted by shipyards and ship-owners for cruise ships as it significantly enhances all of their needs – ship efficiency, operating flexibility and passenger comfort.

Scope of supply
Power Conversion has supplied Norwegian Epic’s electric propulsion systems. The ship, built by STX Europe, is the first cruise ship fitted with Power Conversion’s new electric propulsion solution with 2x24MW propulsion induction motors fed by PWM MV7000 converters. Power Conversion’s scope also includes the generators and the thruster motors.

Why induction motors?
The induction motor rotor (squirrel cage type) has no components such as insulated windings, exciter, rotating diodes or permanent magnets. It only has copper bars and laminated magnetic core.

Thus, the reliability and the availability of induction motors are naturally increased. Furthermore, the induction motor fed by advanced PWM drive has a reduced acoustic noise and vibration level and its simplicity reduces maintenance time and cost. Power Conversion has designed a dedicated marine HTD (High Torque Density) induction motor with an optimized cooling, a large air gap, a low resistive rotor cage to decrease rotor losses and a low frequency machine with dedicated number of poles.

Global high efficiency
The main benefit of using PWM MV7000 converters is the low level of current harmonics, resulting in the following advantages: reduced motor losses, filterless solution and a network power factor optimization, close to 1 over the whole speed range.

High availability and easy maintenance
The arrangement based on induction machines driven by press-pack IGBT PWM converters has the very important advantage to present a very high level of reliability and a low maintenance cost. The simplicity of the motor and the converter design make the system simple and easy to maintain and offer a high level of availability.

Increased passenger comfort
The HTD induction motor is designed at a special level of flux with large air gaps to reduce noise levels. As for the MV7000 converter, one of its main advantages is the low level of harmonic currents, which also results in reducing motor noise, vibrations and AC supply harmonic levels.

Eco-friendliness
As an increasing number of ports are imposing strict limits on the emission levels for visiting ships, an environment friendly vessel has become a necessity. Power Conversion’s electric propulsion solution helps ship-owners meet these stringent requirements.
**Fleet optimization**
Power Conversion works in close cooperation with its customers to ensure the most appropriate upgrades and equipment availability. We offer whole lifecycle support, after-sales and services through our network of Regional Business Centers.

**High quality training**
Power Conversion is committed to providing high-quality training. We provide standard scheduled courses and courses tailored to your specific needs. Training sessions are either conducted on site or in our dedicated training centers.

**Technical assistance**
Power Conversion’s technical support is available through a 24/7 call center, to assist operators in any situation. Power Conversion supplies remote diagnostics facilities that allow efficient data transfer from the ship to Power Conversion’s main office for remote troubleshooting by our skilled engineers.

**Contact information**

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PWM MV7000 converter