Carnival Dream: GE is first choice for propulsion

Fincantieri chose GE for high performance propulsion systems on Carnival Cruise Lines’ three latest flagships.

The challenge
High profile cruise ships Carnival Dream, Carnival Magic and Carnival Breeze are the three largest cruise ships ever built in Italy. Offering accommodation for 4,633 guests and 1,367 crew members each, they are also the three largest cruise ships ever built by Fincantieri’s shipyards. Each has a 130,000 gross register tonnage, is 306 meters in length, has a 62 meter air draft and a maximum speed of 22.5 knots. The ships were launched in 2009, 2011 and 2012 respectively.

The latest class of cruise ships operated by Carnival Cruise Line is based on the earlier, slightly smaller, Conquest class. These luxury liners need to offer their passengers a high level of comfort, while running efficiently and providing great operational efficiency and flexibility.

Cruise ship owners are choosing electric propulsion as a means of maintaining or improving the comfort level for their passengers (through such features as low noise and vibration), while offering advantages in performance and reliability.
As operational costs rise and new environmental legislation is implemented, there is a growing demand for technology that offers improved cost efficiency. In addition, the need to reduce fuel consumption and emissions is driving ship owners and operators to specify propulsion systems that can deliver significant operational savings.

**The solution**

Shipyards and ship owners have been choosing electric solutions from GE for their cruise ships for many years. They significantly enhance ship efficiency, operating flexibility and passenger comfort. GE’s power solutions and propulsion systems enable ship builders to produce lighter designs with more usable space and improved hull efficiency, lower vibration and noise, as well as reduced service costs and down time. GE is a pioneer in the development of electric propulsion systems, with over 400 references, providing it with the expertise to address Carnival’s requirements.

Propulsion technology from GE’s Power Conversion business has already been implemented on numerous high-profile vessels.
Cunard’s Queen Mary 2 is for example fitted with four GE propulsion systems that provide a total power of 86MW. Within the Carnival group, such ships as the Carnival Freedom, Carnival Splendor and Carnival Liberty, as well as many other Carnival group brand ships, rely on GE propulsion technology. So when Fincantieri chose GE for the latest generation of Carnival ships, it was selecting an already proven solution, choosing well-established reliability, and enhancing an already long-term relationship with the company. Each of the three ships features an electric propulsion system based on two synchronous motors, each providing 22MW at 135rpm, taking electricity from synchroconverters.

The results
Holiday makers benefit from smooth cruises, and ship owners gain the satisfaction that comes from a fully proven propulsion solution designed with highly efficient components.

Electric propulsion benefits in brief
Operating flexibility
Reduced noise & vibrations
Reduced maintenance
Increased maneuverability
Lower emissions (NOx, SOx, CO₂...
Main advantages of electric propulsion
- Optimization of the size and number of prime movers results in easier ship design, greater flexibility in layout, improved use of space, and reduced investment and installations costs.
- Prime movers work at optimum load at all ship speeds, so fuel consumption is reduced, diesel engine maintenance is reduced, and exhaust emissions are limited.
- Variable-speed main propulsion systems enable fixed-pitch propellers to operate right up to their maximum limit. Maximum torque is always available, irrespective of the rotational speed. This allows high acceleration at low speeds and offers high flexibility when maneuvering.
- With variable speed electric transmission systems, the electronically smoothed torque control significantly reduces noise and vibration levels, onboard and underwater.

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