

# CASE CARNIVAL CRUISE LINE: NEW CONTROL SYSTEM IMPROVES OPERATIONAL REDUNDANCY AND GUEST COMFORT



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**Carnival Cruise Line took an active approach towards implementing a proper operational redundancy management system by hiring Wärtsilä to upgrade the control system in one of their cruise ships, Carnival Freedom.**

– Carnival Cruise Line operates its ships around the clock, every day of the year, which means that it is essential for us to provide continuous operation for the safety and comfort of our guests, says Csaba V. Benedek, Project Director, Redundancy Solutions at Carnival Cruise Line.

Carnival Corporation & plc is a global cruise company and one of the largest vacation companies in the world. The company has headquarters in Miami, Florida, U.S.A., and Southampton, England. Carnival Corporation & plc operates a fleet of more than 100 ships, of which 24 ships sail in North America and Australia for Carnival Cruise Line (CCL). Carnival's portfolio of cruise brands includes nine other notable cruise lines.

## **IMPROVING A VESSEL'S OPERATING REDUNDANCIES**

Equipped with six Wärtsilä 12V46 main engines, the cruise ship, Carnival Freedom, embarked on her maiden voyage in 2007.

She is 290 metres long with a beam of 35 metres and a tonnage of 110,000 GT. The vessel can carry 2,980 cruise guests, who are cared for by 1,150 on-board crew.

When Carnival Freedom first entered service, its engine-control system (WECS) was highly advanced.

– Although the system had been operating reliably over the years, in consultation with Wärtsilä, we decided to upgrade to the modern UNIC C2 system. Our decision was based on a recent Carnival initiative to improve the overall operational redundancy of our cruise vessels and the benefit gained from being able to operate the diesel engines in local mode, if required, says Benedek. ■ ■ ■



## “The success of this upgrade is the result of the good cooperation”

Challenges	Solution	Benefits
<ul style="list-style-type: none"> <li>– Performing part of the upgrade engine by engine while the vessel is in service</li> <li>– Ensuring a continuous and reliable operation</li> <li>– Ensuring availability of control system spare parts</li> </ul>	<ul style="list-style-type: none"> <li>– Installation of the durable, all-inclusive UNIC C2 automation system to improve engine redundancy and reliability.</li> </ul>	<ul style="list-style-type: none"> <li>– Increased operational reliability and safety</li> <li>– Single points of failure eliminated</li> <li>– Reliable, state-of-the-art engine management system</li> <li>– Improved system serviceability</li> <li>– Fully supported spare parts availability</li> </ul>

■ ■ ■ The purpose of the upgrade was to modify engine-related control and monitoring systems in order to make it less likely that the ship would lose propulsion or primary power after an incident. For example, an incident in one engine room compartment must not paralyze the ship's manoeuvrability.

– We had to ensure that we are operating at the highest degree of safety, reliability, efficiency and service delivery, Benedek points out.

### INSTALLATION OF A RELIABLE CONTROL SYSTEM

The UNIC C2 system is able to meet the highest reliability requirements demanded. Improved performance and reliability, for example, are the result of advanced mechanical and electrical design as well as distinctive features able to handle special measures for redundancy and fault tolerance. An upgrade of the control and monitoring system to UNIC C2 improves overall ship power generation redundancy and reliability, which means that each engine can be operated independently irrespective of a malfunction from any other engine on board.

Csaba V. Benedek says that the upgrade successfully performed in 2014 was especially noteworthy considering that, for the first time, some of the work was completed while the vessel was in service.

– The success of this upgrade is the result of the good cooperation between the ship's engine team, Wärtsilä and the Carnival Cruise Line implementation team, which developed a realistic schedule in order to accomplish the work and handle the complex logistics very well.

### A SYSTEM MADE FOR THE FUTURE

Csaba V. Benedek says that the biggest benefit of this upgrade is that the new UNIC C2 system is very compact and provides control of the engine from a single location. In addition — and Benedek emphasises the importance of this — the system can control any auxiliary system connected to the engine. Moreover, in the future the system can be expanded to gather and monitor additional data regarding engine performance.

In Benedek's opinion, Wärtsilä's products are reliable and the service provided has been particularly good.

– My personal experience with Wärtsilä during these past two years and during this upgrade project has been great. They had a very good support team in place and the on-board installation team was able to stay on schedule and meet our deadlines.

Carnival Cruise Line will continue its cooperation with Wärtsilä.

– I congratulate Wärtsilä on manufacturing a good product that will hopefully prove to be a solid solution for many years to come. Wärtsilä is our approved original equipment manufacturer (OEM) provider, which has delivered the engines to most of the ships in Carnival's fleet. The company also participates in the ongoing fleet wide operational redundancy project that I am involved with, so these upgrade projects will continue, concludes Csaba V. Benedek when recommending Wärtsilä.