The first of an order for 23 10,000 TEU containerships, *Hanjin Buddha* is based on a DNV GL design concept.

EFFICIENCY SURPRISES

Amid the financial crisis, Seaspan had ordered an entire fleet of large, next-generation container vessels. The first one is in operation – and surprising its owners.

To most observers in the industry, it seemed to be rather a risky decision when in 2011 – at a time of very depressed rates in the container market – the independent containership manager and owner Seaspan placed an order for 23 10,000 TEU container vessels featuring a next-generation design that, if successfully executed, would result in dramatic cost savings. The project was to be a concerted effort combining research and development resources and manpower from several industry leaders, including Seaspan, Yangzijiang Shipyard, MARIC and former DNV.

It is always challenging to roll out a new design, but adding to the challenge was the sheer volume of the newbuilding project: To this day, the 23-ship Seaspan order has been the largest in Chinese history. An order of that magnitude required two separate teams working at two different shipyards.

In March 2014, Yangzijiang Shipyard launched the *Hanjin Buddha* – the first of Seaspan's 23-vessel order. The owner refers to this ship as a "SAVER" vessel – short for "Seaspan Action on Vessel Energy Reduction" – because, as the name suggests, it features significantly reduced fuel consumption.

"Reputations were at stake for all of us," says Seaspan chief operating officer (COO) Peter Curtis. "But my compliments to the yard – and to DNV GL for managing the many challenges of a project like this. We obviously had to have a broad and deep approach to risk management, and DNV GL was at the centre of this."

Increased efficiency – reduced emissions

The new 10,000 TEU SAVER container vessels offer major improvements in terms of energy efficiency, cargo capacity, operational efficiency, and emission reduction. Compared to current 10,000 TEU container vessels, the SAVER vessels carry more cargo while consuming less fuel. The new hull design enables these ships to minimize ballast water while in operation. Furthermore, the ships emit 20 per cent less pollutants to air per TEU. The SAVER design was inspired by the DNV Quantum concept developed in 2010.

Curtis says there has been much discussion about the realism of the cost-saving estimates. Seaspan pursued ambitious goals and applied strict validation methods as the project progressed. "We asked for increased loadability and decreased fuel consumption per deadweight ton," he explains. "The validation showed us results that were far in excess of what we had asked the designer and yard >

In March 2014, 100 industry VIPs attended *Hanjin Buddha's* grand naming ceremony in Shanghai. Gerry Wang, CEO of Seaspan, and Ren Yuanlin, Chairman of Yangzijiang, both praised DNV GL's vigorous support of the project.

Photos: Seaspan

"I remember when former DNV developed the Quantum concept. We were very keen on it. Of course, it had its funky and futuristic aspects, but it also had gold nuggets. The biggest gold nugget was this: design your ship around its actual operational profile. Not around maximum speed and deadweight."

Peter Curtis, COO Seaspan

The "Quantum" design developed by DNV GL puts energy and cost efficiency first.

> to achieve. The combined result – in terms of number of loaded TEU per metric tonnes of fuel over a certain time – amounted double digits, which was twice what we had asked for."

Curtis notes that the final results exceeded his expectations to the point that, initially, he was somewhat sceptical. "At first we couldn't believe it. We thought it was too optimistic," he says. "But through careful review with separate sources we concluded the results were correct."

Myth buster

As it turns out, Curtis' critical approach to validating all data, assumptions and ideas also busted some widely held beliefs in the industry. One of these myths was that ballast is inherently bad for fuel consumption. "We have tested and validated data on this now through draught trim optimization, and can now bust that myth," says Curtis. "For example, we optimized ballast for the speed and loaded draught for the first voyage, which in fact called for increased draught through adding ballast, and saved several tonnes of fuel per day. So, ballast is not always bad."

Curtis and his team also examined the disproportionate effect of small changes in speed. "We have looked at typical scenarios of 'dash-and-loiter' with relatively small differences between fast and slow," he says. "What you spend when you hurry is never offset by the gain when you slow down. This means several tonnes of fuel a day wasted or translated into some thousands of dollars a day, which is close to five to 15 per cent of the charter rate, to no gain. You just increase the cost to the customer – and that is not a competitive advantage. Now we are measuring time, speed, distances and fuel consumption of our entire fleet, so that we can see the big picture, and make the necessary adjustments together with our ship crews."

A tough act to follow

If the new SAVER vessels offer reduced costs, lower emissions, and greater fuel efficiency, the obvious question is: why isn't everyone copying the Seaspan model, as recently suggested by *Lloyd's List*?

The reason, Curtis says, is that there simply is not enough capital for everyone to have these big ships. "We believe this is where many liner majors will move

in time – but for now, the cost and access to capital does eat into the efficiency gains," he says. "So there will be ships of all types around. Our panamax vessels are still needed, despite all the doom and gloom about that size of vessel. They serve a certain purpose, too."

For now, though, Curtis says that Seaspan has decided to remain at the forefront of industry technology and innovation. In addition to his 23-vessel SAVER order, the company has also ordered 15 additional SAVER ships above 10,000 TEU. For Seaspan, this makes good economic sense – particularly when it comes to how the company finances newbuilds.

"We have never done speculative tonnage; it's always against a back-to-back, long-term time charter," says Curtis. "Those are the fundamentals of our model. Additionally, our charters have been blue chips who have performed consistently well, even during times of financial crisis."

Curtis says that, in general, Seaspan prefers to keep things simple. The company takes a conservative approach when it comes to innovation. "We transfer what we like and trust from prior designs onto new designs and change what we don't like – including equipment and methods of operation," he says. "If you look at our newbuilding programme, you will see we have a huge capital expenditure over what is basically only three series of ships. We'd rather spend some time getting the recipe right, and then build a series of ships." ■ **JKL**

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ABOUT SEASPAN

Seaspan is a leading independent owner, operator and manager of containerships, providing high-quality, modern vessels with best-in-class operations and innovative ship design.

It employs more than 3,000 people at offices in Hong Kong, Canada, India, China and Korea, as well as on board their large fleet of vessels.

Photos: DNV GL, Seaspan