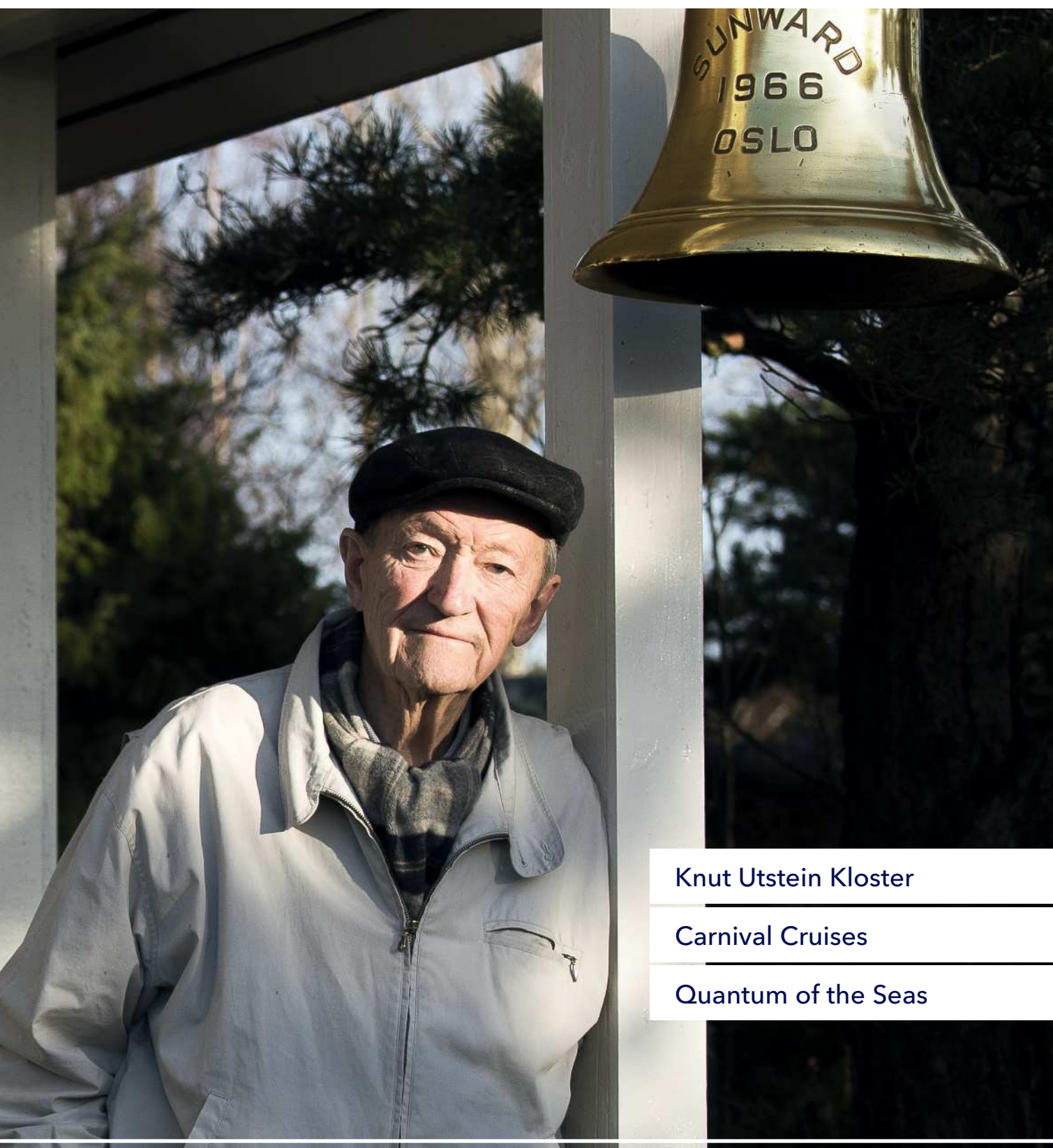


# CRUISE UPDATE

MARCH  
01 2015



Knut Utstein Kloster

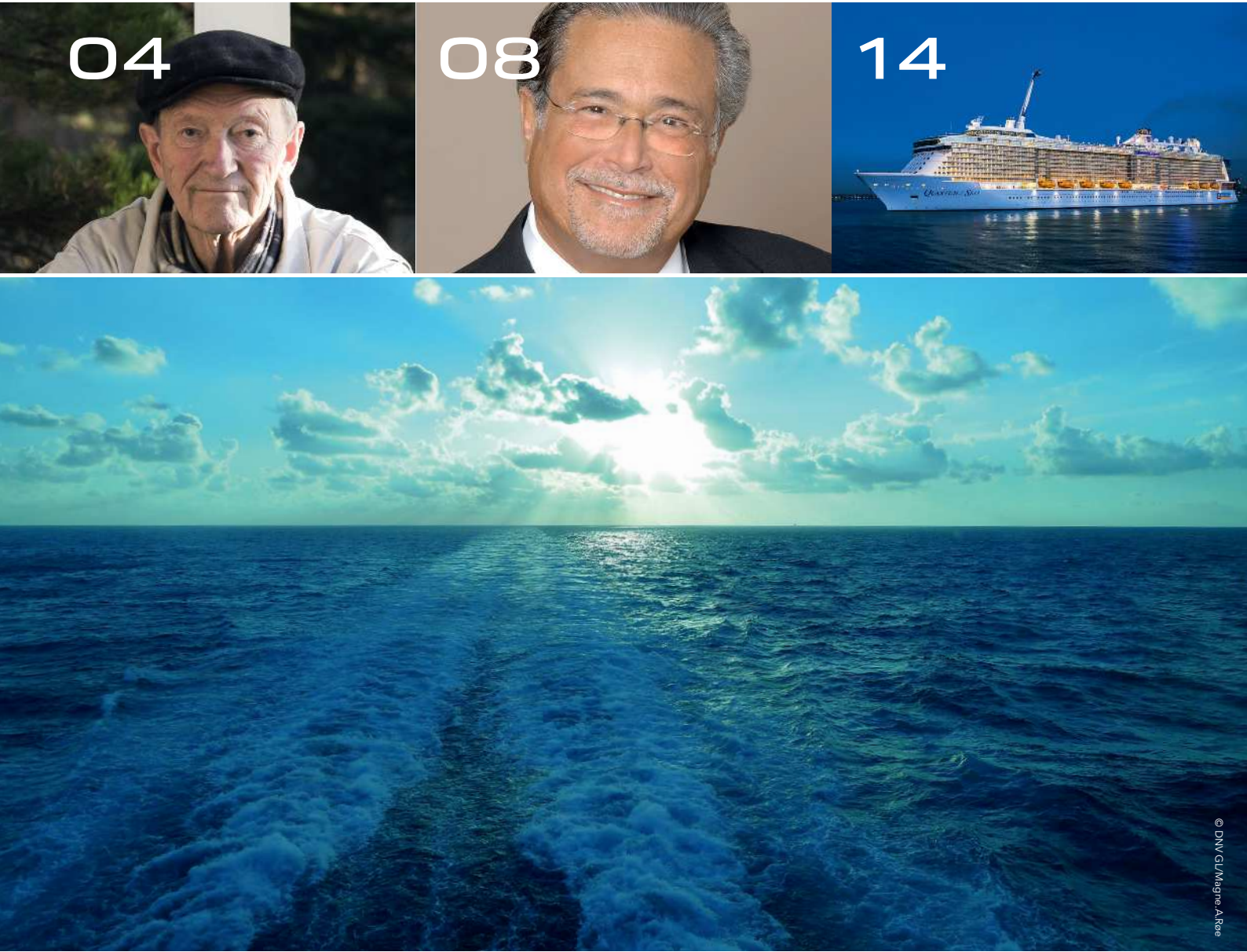
Carnival Cruises

Quantum of the Seas

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Front cover photo: © Knut Utstein Kloster. Knut Utstein Kloster pictured beneath ships bell from his first ship, M/S Sunward



© DNV GL/Magne A. Røe



## EDITORIAL



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## CRUISE UPDATE

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Welcome to DNV GL Cruise Update 2015. I hope this edition can provide some reflections and inspiration that can help to create a safer, smarter and greener cruise industry.

There is no industry like the cruise industry. Later this year, we celebrate the 50th anniversary of the keel-laying of the Sunward, the vessel that started the era of the modern cruise industry in 1966. Over the years, we have seen an incredible improvement in what cruise ships can offer passengers. The vessels are becoming more and more advanced as regards both maritime technology and passenger experience. The cruise industry is often seen as leading when it comes to implementing new technology and to be constantly striving to find better solutions.

Last year, I decided to dig a bit deeper into the history of this industry and I soon realized that I had to try to meet one of the founding fathers. This magnificent industry was started by two gentlemen – Ted Arison and Knut Utstein Kloster. I quickly learned that Mr Kloster was in his mid-80s and wrote him a letter asking if we could meet. I soon got an e-mail back with his positive response.

We agreed to meet for a 1.5 hour lunch and we spent 3.5 hours. I learned one special item at this meeting that I want to share with you. When he planned the *M/S Sunward*, which was built to trade between the UK and Gibraltar, he had identified a risk of low bookings for the winter season. To mitigate this risk, he invested more, designing the air conditioning to handle the Caribbean weather and putting bathrooms in all the guest cabins.

It was not the low bookings during the winter that stopped this trade but General Franco, who closed the border between Gibraltar and Spain. At the same time, Ted Arison's shipping partner had to discontinue his operations. Ted Arison had the customers and Knut Utstein Kloster had the ship – a perfect match. From a modest start, the industry now carries more than 21 million passengers (2014) and has a multi-billion-dollar turnover.

The Sunward was built to legacy DNV class in Bergen, Norway. At DNV GL, we have been a part of the cruise industry since its infancy. We have witnessed how ships have changed and how safety has improved and will continue to do so. The future will bring more ships and more passengers and we are here to ensure safe travels and environmentally sustainable operations.



WE PUT OUR  
EXPERTISE TO  
WORK FOR YOU

# THE INVENTOR OF MODERN CRUISE

It is 1981 and I am standing on the dry dock at Aker Yard in Oslo where my father-in-law is working as an engineer, looking straight across the bay to the old Akershus fortress. Right beneath the fortress, a huge ship is about to dock and is being greeted by thousands of people, including the Norwegian royal family. This is the *SS Norway*, docking on her maiden voyage after being transformed from the 1957 - built *SS France* - a traditional ocean liner in the Europe to North America trade - into the *SS Norway*. The ship was for decades to be the largest cruise vessel in the world.

Then fast forward to the autumn of 2014 and I am back at Aker Brygge in Oslo, where the yard used to be and where there are now offices, restaurants, hotels and apartments, and we are talking to Knut Utstein Kloster - the inventor of the modern cruise industry and the man who bought the *SS France* for USD 18 million and spent another USD 100 million on refurbishing the ship. It takes vision and courage to make such a move and turn this into a great success. The story of the cruise industry starts with him back in the 1960s and this article will touch on his amazing career - a tip-of-the-iceberg story, unfortunately only in Cruise Update, about the unique history of a living legend now in his early 80s.

"It started in 1966 with the *M/S Sunward* - a passenger and car liner built in Bergen by Klosters Rederi A/S of Oslo and intended for weekly roundtrip cruises between England, Spain, Portugal and Gibraltar. It was designed like a yacht by renowned naval architect Tage Wandborg and could carry 400 passengers in 200 staterooms. Every room had private facilities, toilets and showers, and the whole ship was air conditioned for operation in tropical waters. A great success at first. But then a law was enacted in the UK restricting the currency its citizens could take out of the country, while General Franco practically closed the frontier between Spain and Gibraltar. The situation became very serious," says Kloster. "We took the ship back to Bergen for guarantee work and had to consider other operating alternatives."

**What happened after the market disappeared more or less overnight and you had a brand new ship?**

"Out of the blue, we got a call from Ted Arison in Miami, who later founded Carnival Cruise Lines. He needed a ship to replace an Israeli-owned vessel which had been sequestered by creditors when the owners went bankrupt. Ted had the passengers, knew about *M/S Sunward* and suggested a meeting. So I flew to Miami, met with Ted for a couple of days, went back to Oslo and recommended to the board that we should take *M/S Sunward* to Miami and do three- and four-day cruises to the Bahamas. Which we did. 'God bless you!' Ted responded. A few weeks later, with the

understanding of the Norwegian Seaman's Union, *M/S Sunward* came to Miami and literally determined the course for modern cruising. Luxury at economy price. Norwegian for the seamanship and Caribbean for the fun of it. Doing business as Norwegian Caribbean Line which was incorporated into Klosters Rederi A/S, and with Arison Shipping Company as the general agent, mainly responsible for marketing, sales and public affairs. Ted and I enjoyed working together."

**Going from one ship to a total of four in this trade can only be called a success?**

"Yes, it was. After a few months of successfully operating *M/S Sunward*, we ordered two bigger ships to be built in Bremerhaven and named *M/S Starward* and *M/S Skyward*. And subsequently two more ships to be built in Italy and named *M/S Southward* and *M/S Seaward*. As it turned out, we only got the *M/S Southward* in Italy. The state-owned shipyard cancelled our contract for *M/S Seaward* and sold this ship to another company for a higher price. As our operations were expanding and now covered several island countries in the Caribbean, we were concerned about the cultural gap between our passengers and the local communities ashore. A 'New Experiences Programme' was instituted, aimed at closing this gap. The basic idea was to help passengers learn more about local residents. This programme was acclaimed in a comprehensive New York Times article by the then travel editor Paul J.C. Friedlander published on 6 December 1970 and entitled "RX for Tourism's Cultural Disparity".

**Today, NCL's slogan is "Cruise like a Norwegian". You have no stake in NCL today, but you started and actively used the image of the Norwegian ship officers in the cruise industry. Back in the late 1960s, how did this work?**

"As I said, it was Norwegian for the seamanship and Caribbean for the fun of it. A very good combination. The Norwegian officers did extremely well in the dual role of safely operating the ships as highly skilled seafarers and mingling with the passengers in their





white uniforms as NCL's representatives. Never mind the charming Norwegian accent, which actually worked very well.

We helped with some dancing lessons in Miami and covered refreshments at the bar. All very shipshape. Coming from a job as a captain or officer on a tanker or bulk carrier, this was quite a readjustment.

For the captain, the welcoming speech in front of all the passengers was sometimes a nervy challenge. The story goes that the cruise director was asked by the captain, who had just been transferred from one of our tankers, to help him with what he was supposed to say. 'Relax', the cruise director said. 'Just start off by saying you are not a speech maker, just a captain, and the passengers will love it.' So shortly thereafter, down in the main lounge before dinner, the captain announced: 'Ladies and Gentlemen, I am not a captain, just a speech maker.' He got a lot of applause!"

In 1971, the cooperation with Ted Arison came to an end and NCL was on its own in the Caribbean, with Knut Utstein Kloster at the helm. At that time, he had moved to Miami with his family.

**Then you eventually set eyes on the SS *France*. Please explain this foresighted purchase of an old-fashioned liner ship.**

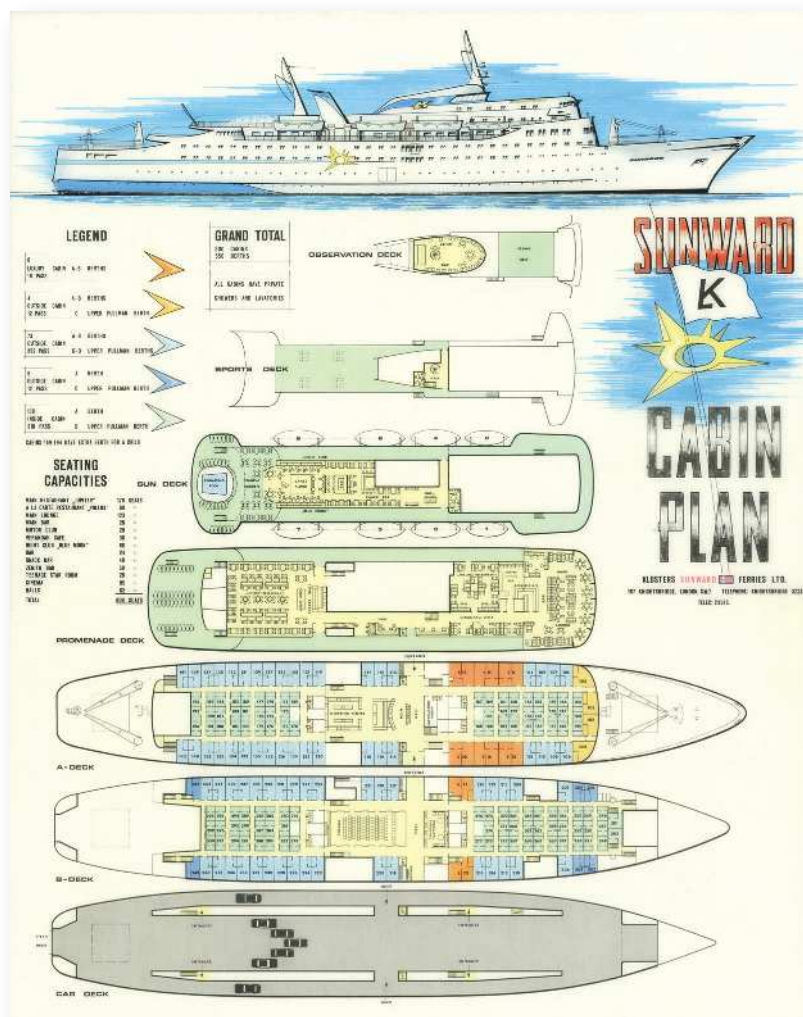
"Cruising had become so popular that we couldn't satisfy the demand. We needed more capacity urgently. Instead of building a new ship, which would have taken several years, we decided to look for one of the big transatlantic liners and convert it into a modern cruise ship. These vessels had been laid up because of the onslaught of air travel. The golden age of transatlantic crossings was over. The SS *France* was a masterpiece of design and marine engineering. No expense had been spared to make it the pride of France and President Charles de Gaulle. It was like a luxury sailing yacht, with no parallel midship body. The conversion in Germany was masterminded by naval architect Tage Wandborg, the designer of all our cruise ships. With the permission of King Olav V of Norway, the SS *France* was renamed SS *Norway*. The



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◀ Knut Utstein Kloster with a model of S/S Norway at the Norwegian Maritime Museum, Oslo

▷ Cabin plan at M/S Sunward. The ship also had a car deck



naming ceremony in Oslo on 3 May 1981 was attended by the King and his family. The UN flag was hoisted by Jamaican Wesley Samuels, NCL's senior steward. It was a tribute to all the officers, staff and crew from many nations, for whom the ship was not only their workplace, but also a home away from home. A reminder of the company's responsibility to take good care of a little United Nations at sea."

Knut Utstein Kloster wanted to move on from the SS Norway – with the *Phoenix World City*, a 250,000 grt ship capable of carrying 5,600 passengers. Designed by Tage Wandborg, this had three accommodation hotel towers, made possible by the ship's size and stability. In effect this liberated passengers from the traditional design involving cabins and long corridors in the hull. The project was seen by leading financial institutions as "a visionary response to the evolution of the cruise industry".

Knut is now in his 80s, sitting at Aker Brygge some 33 years after the SS Norway was proudly moored across the bay below the historic Akershus Fortress. For him, now, this is like going down

memory lane. Handing me a copy of the book about him, "True North – A Flickering Soul in No Man's Land", he says: "It's all in there." The book recalls the Viking ship GAIA's arrival in Washington on her way to Rio and the 1992 Earth Summit. The vessel sailed under a UNICEF banner: "Keep the Promise for a Better World for All Children" and was greeted by President George Bush, Iceland's president Vigdis Finnbogadóttir (the GAIA's god-mother), Norway's Queen Sonja and many others. There was also a children's choir singing Michael Jackson's "We are the World".

In 2007, Knut Utstein Kloster was inducted as a pioneer in the cruise industry's Hall of Fame. We feel honoured that he took the time to come and talk to us about his life and career, and we must apologize that the format of a short article in DNV GL Cruise Update does not in any way do full justice to the history of this man who is greatly admired for his commitment to visions, ideas and mankind. It makes me wonder how his foresight and enthusiasm might have been welcomed today maybe he was some 20 years at least too early. ■



# BUILDING THE BIGGEST - EVER CRUISE LINE FROM SCRATCH

Carnival Place is at 3655 North West 87th Avenue in Miami, Florida and houses the global headquarters of the mighty Carnival Corporation. We are welcomed into the office of Micky Arison, the Chairman of the Board of Carnival Corporation. From his office, which is full of ship models, the port of Miami is visible at a distance just north of the Miami skyline. Airplanes on the final approach to the busy airport whizz by on either side of the office – actually some 40.5 million passengers fly in and out of Miami on an annual basis, quite a few heading for a cruise.

Today, Carnival is the world's leading cruise provider, with 100 ships, some 95,000 employees and an annual turnover of USD 15.9 billion. Carnival commenced operations in 1972 and its first ship was the *TSS Mardi Gras*, which ran aground on a sandbar on her maiden voyage. Not a good start for a new cruise line, but fortunately no one was injured and the ship was eventually refloated to continue the journey.

"Our position was that of being the underdog in the cruise market when we started our operations back in the early 1970s. This has stayed with our company and has been a great inspiration to expand. Our competitors were few at that time, but included NCL (Norwegian Caribbean Line) and Royal Caribbean. They had more modern ships with better amenities," reflects Micky Arison. "Eventually, we had a fleet of three rather old and worn ships all sailing with a very spirited atmosphere on board which was what our guests wanted. To have fun.

"It was the breakup between my father Ted Arison and Knut Utstein Kloster (please see separate story) that led to the establishment of Carnival. We had the sales organization and employees in Miami but needed ships, so this is why we started the cruise line. Our partner then became AITS, which was a tour operator that used the word 'Carnival' in the name of its tours, i.e. 'Rio Carnival' as an example. This is why we named our new company Carnival Cruise Lines. At the time, we did not set out with a huge visionary idea of becoming the world's leading cruise line.

Some of Arison's earliest days in the cruise industry were spent as a shipboard employee. "I worked on board the *M/S Skyward* in the freewheeling late 60s and 70s – you know, this was the flower-power generation – Sgt. Pepper's Lonely Hearts Club Band... A good time to grow up, but these were probably the craziest years of my life, before Ted more or less hauled me off the ships to pursue a shore-based job and an education. In hindsight, probably a wise decision," says a very frank and open Micky with a laugh. "Following the start with the *TSS Mardi Gras*, we were able to buy two additional ships, the *Empress of Britain*, purchased in 1975 and converted into the *TSS Carnivale*, followed by the *S.A. Vaal*, converted into the *Festivale*, which at the time in 1978 was the largest cruise vessel in the Caribbean. We saw the potential so eventually we started to design and build our own ships and the *Tropicale* was delivered in 1982. That was a 38,000-ton ship – small by today's standards but trendsetting at the time. This, in my view, was a marked turning point for the entire industry and turned into a multi-billion-dollar building spree.





Micky Arison,  
Chairman of the Board  
of Carnival Corporation



Carnival Breeze at the British Virgin Island Tortola

“Back in the 70s, RCCL also started off with Norwegian ship owners on the finance and ownership sides – Wilhelmsen and Skaugen – and its first ship was the *Song of Norway*. And Kloster went to France and bought the *SS France* and converted this into the *SS Norway*. The latter became by far the largest cruise ship in the Caribbean for two decades. For Carnival’s part, we’ve not looked back since then and have continued to grow by acquiring other cruise operators too. Our customers have different preferences so this is why we have so many brands with different profiles in our group. We introduced a multi-brand strategy and our first acquisition was Holland America Line.

“During the course of expanding the company, there were deals that succeeded and others that didn’t. Efforts to purchase Norwegian Cruise Line and Royal Caribbean, for example, did not come to fruition whereas other deals such as the acquisition of Cunard and P&O Princess were huge milestones for us,” says Arison.

“Would it be possible for the industry to expand again the way it has over the past 20 years?” he reflects. “The growth rate for Carnival Corporation has been nothing less than incredible during that period. Source market growth is still strong, especially in international markets such as Australia, the UK and many other European countries. Also, there are some new cruise operator entrants trying to come in, such as Virgin and Richard Branson. It takes quite a lot to establish a new cruise line and gain the necessary experience. For example, it took Disney a few years to establish and streamline its operations however they eventually

became quite successful. So it will be interesting to watch as new players enter the field.

Taking a look forward, Arison says, “The future holds even larger ships which provide economies of scale as does having a multi-brand company such as ours with a 100-ship fleet. In terms of developing new markets, we are increasing our capacity in the East, especially China where there is also a lot of government support for developing the industry. In the future, there will be better distribution and ports and this market may eventually become as big as or even bigger than Europe. There are many ports along the Chinese coastline.

With respect to the future, Arison cautions on the need for thoughtful itinerary planning and port development. “Larger ships carry more guests and many ports in both the Caribbean and Europe are already operating to capacity. The market for more ships is there, but the need for expansion of port facilities and the development of additional destinations is an important factor,” says Arison.

“When the cruise industry started, the shipboard experience in terms of dining, activities and entertainment was much more basic. Those days are gone. Now we have to offer all kinds of entertainment, food and destinations based on people’s desires, tastes and wants. Dining concepts, for example, now range hugely, from Italian and steakhouses to sushi, Asian fusion and celebrity chef partnerships. And from a technology standpoint





TSS *Mardi Gras* was the first Carnival Cruise ship

we need to ensure great connections for Internet service and smartphones while the ships are sailing too, not just when in port. Today's cruise passengers are the social media and smartphone generation - more or less across all age groups," says Arison who himself is quite active in social media, including Twitter.

In addition to running the world's largest cruise company, Arison is also the owner of the Miami Heat, a professional basketball club. "The interest in and support for this club was initiated by my father and eventually I became the owner," says Arison. Given his role with the Heat, Arison is a highly recognizable figure in South Florida. "If the Heat is doing well, then that's great, but if we're not

performing so well I get to hear that loud and clear too. Sports fans are extremely passionate and vocal."

With a passion for cruise, a life at the centre of the cruise industry and a personality you just have to be impressed by, I have no doubt that Arison will continue to grow the business and create fun for his millions of passengers. ■

Carnival Corporation & plc is a global cruise company and one of the largest vacation companies in the world. Its portfolio of cruise brands includes Carnival Cruise Lines, Holland America Line, Princess Cruises and Seabourn in North America; P&O Cruises and Cunard in the United Kingdom; AIDA Cruises in Germany, Costa Cruises in Southern Europe and P&O Cruises in Australia. The Carnival vacation companies attract some 10 million guests annually and the company's stock is listed on both the New York and London Stock Exchanges.

Headquartered in Miami, Florida, USA and in London, UK, Carnival Corporation & plc operates a fleet of 100 ships, with another seven ships due for delivery between now and March 2016. With approximately 200,000 guests and 77,000 shipboard employees, there are more than 277,000 people sailing aboard the Carnival fleet at any given time.

# EFFECTIVE AND EFFICIENT RISK MANAGEMENT IS MORE CRITICAL THAN EVER

We are facing more and more complex challenges, implementing new technology and aiming to achieve better results with less resources and within shorter and shorter timelines. For these reasons, effective and efficient risk management is becoming more and more critical for sustainable business.

I guess we have all been involved in some kinds of risk-assessment and management processes. In some cases, the process has been regulatory driven or due to a procedure-driven requirement and doing and documenting the process have made us compliant. In some cases, it has been done because we are in a challenging project where failure is not an option or would represent a major downside, or where the success of the initiative represents a great reward.

Good risk-management practices and methods consist of the following elements performed more or less in the following sequence.

- Identify threats
- Determine the risks (expected likelihood and consequence)
- Identify ways to reduce those risks
- Prioritize risk-reduction measures
- Follow-up the implementation of measures and the residual risk

The different steps are explained in numerous books and articles and there are also ISO standards for risk management. Numerous sources can provide insight into how these processes should be performed.

However, not all risk-management processes deliver the expected value. Here are a few tips on what is required in addition to the traditional process.

## **Focus on value creation**

Spend time initially on evaluating the value at risk and track the ways in which risk management can reduce exposure and increase the likelihood of success. As in all other areas, we are investing resources and would like to get a good return on our risk-management initiatives, so benefit tracking is essential. It may be very

advantageous to track the overall exposure and how this develops over time. This kind of data should be included in the reporting to senior management and/or steering committees for projects.

## **Be an integral part of processes, including decision-making processes**

Risk management is not a side activity, it should be part of the core of what we are doing - either our core processes or our core projects. For a project, the risk-mitigation measures should be part of the core project plan and should be followed up with the same importance as other activities in the project.

Risks and uncertainties are also critical information when decisions are being made. Way too many decisions are made based on a single KPI without paying attention to the risk involved or the potential uncertainties related to the different KPIs. If you are prioritizing two different initiatives with the same NPV, the result might be very different if risks and uncertainties are part of the process.

Since risk management should be part of the core of our activity, the responsibility for managing risk is an integral part of management. You can never delegate accountability for managing risk.

## **Be dynamic and iterative**

Risk assessment and management processes are not one cycle, they are a process characterized by iterations and several cycles. The process needs to be dynamic - when there are changes, we must assess them, reassess our exposure, track the benefits from the changes and update our project plan based on prioritized mitigation measures.





© Getty Images

#### **Base decisions on the best available information**

Managing risk is not a one-man exercise, it is a team effort where different individuals with expertise and experience are brought together to conduct assessments and analysis. The quality and results depend on the “completeness” and depth of the assessments. It is good advice not to save money by not bringing the best available resources into the risk assessments. Bring in the pessimists; don’t surround yourself with only “yes” people. We have also seen that some processes are performed on too high a level and within different silos. This is an area where the devil is in the details and the way in which the different areas are interlinked and correlated is extremely important.

#### **Be tailored and structured**

One size doesn’t fit all. Different projects, or processes, with different complexities will have different needs. The risk-management process needs to be tailored to the challenge. In addition, ensure a structured approach - the structure in itself ensures that the effort is as complete as possible.

#### **Be sceptical and assess assumptions**

Projects and initiatives are often based on some fundamental assumptions - review these assumptions and validate their

robustness. It is also good practice to review how changes in some of the frame conditions will affect the project.

#### **Knowledge management**

During a risk-management process, a lot of lessons learned are captured and systemized - such as threats, risks, the effectiveness of measures, etc. This is valuable knowledge that can be reused to accelerate similar types of projects later on. The recommendation is to capture this lesson learned and make it available for others to use in later projects or initiatives.

We in DNV GL believe that Risk Management will be more and more important going forward. This basic approach can add value to projects, operations and the assessment and qualification of technology. Over the past year, we have seen that good practices within this area have been one of the key enablers for successful projects and can safely state that the investments in structured risk management have produced a great return. The basics are applicable to all our activities, but one size doesn’t fit all and they need to be tailored to the challenge. There are differences between managing risks in operations and managing risks in a complex technology project. ■

# QUANTUM LEAP



To create a truly groundbreaking vessel, which has set a new standard for excellence in the cruise industry, Royal Caribbean turned to some old friends to get the job done.

At 168,666 GRT, 348 meters long and 41 meters abeam, Royal Caribbean's latest cruise ship, *Quantum of the Seas*, is a true giant, with a total capacity of 4,905 passengers and space for an additional 1,500 crewmembers. But Quantum's size is only part of what makes it a game-changer in the cruise industry. Take for example the North Star, a jewel-shaped capsule mounted on a crane on the ship's bow, designed to take up to 13 passengers over 300 feet above sea level.

#### The WOW factor

Still not impressed? *Quantum* also has a flowrider, which allows passengers to surf on board, a skydiving simulator, robotic bartenders, a climbing wall, dedicated, satellite-enabled high speed internet service, the music hall with seats for 559 guests and SeaPlex, a large, flexible space that can be used as a roller rink, basketball court, circus school, bumper car arena, or dancehall. Another space, known as Two70° features a three-story-high room

affording 270-degree panoramic ocean views, a café and an ice bar. Automatic window shades adjust to sunlight, and a 13-projector projection mapping system can project live views from outside the ship (or any other imagery) onto screens. At night, the space evolves into a highly dynamic entertainment venue that features six robotically controlled 100-inch LCD television screens, providing digital backdrops to complement live performances.

#### Passenger-first thinking

The technology and engineering behind many of these features represents "firsts" for the cruise industry. But according to Mika Heiskanen, Royal Caribbean's Director (Quantum Class), every aspect of the design and construction of *Quantum* revolves around the passenger. "We are proud of the many innovations found on *Quantum*, but our primary goal is to create a safe, memorable and truly unique passenger experience," he says. "Sometimes, we have to push boundaries of what is possible at





sea to get what we want, but if the response to this vessel is any indication, it has been worth it."

Heiskanen notes that while many features of the Quantum Class vessels may seem revolutionary, elements of the ship's design and construction can be traced back to previous Royal Caribbean ship-classes. "For example, Royal Caribbean's first cruise ship *Song of Norway*, built in 1970, featured a circular, glass enclosed lounge called the Viking Crown, which has been gradually transformed and upgraded over the years," he explains. "Echoes of this concept can be found on all Royal Caribbean vessels, including *Quantum's* Two70° space. Our design process is more evolution than revolution."

#### Cruising green

While many of *Quantum's* features are passenger-driven, Royal Caribbean also focused on reducing the vessel's environmental impact. Indeed, *Quantum* features a number of energy-efficient solutions including optimised hydrodynamics, a heat recovery system, energy-saving LED lighting, an air-lubrication system for reduction of hull friction in water and a state-of-the-art exhaust gas treatment plant (a hybrid scrubber). "By investing in these new technologies, we predict the we will not only reduce carbon

"DNV GL has proven to be a good partner through all phases of the build, especially for this project, which included so many innovations."

Peter Hackmann, Head of Communications,  
Meyer Werft

emissions, but be able to achieve significant energy savings compared to our Freedom Class cruise ships," says Heiskanen. "This not only makes good business sense, but with passengers increasingly sensitive to environmental issues, we strengthen our reputation as responsible company."

#### Partnering for success

Heiskanen says that while Royal Caribbean has always had strong, in-house technical expertise, the company relies on a network of partners and suppliers to achieve their vision. "Class and the yard play an important role, and we have come to view or relationship with DNV GL and the Meyer Werft shipyard as more of a partnership than a traditional owner-supplier relationship," he says. "We tend to work with companies that understand our business, think like we do and have the competence to think outside the box."

Jörg Langkabel, DNV GL says that Royal Caribbean, Meyer Werft and DNV GL have enjoyed a relationship that goes back for decades. "Our organisation has deep roots with Royal Caribbean while our relationship with Meyer Werft began in the mid-90s," he says. "For the Quantum project, we were involved at an early stage, providing advisory and verification services."

DNV GL's project approval manager, Siw Solstad, made sure that more than 3,800 drawings, some of which included special designs, were reviewed and discussed prior to approval with the yard and owner during several intensive workshops. Indeed, Langkabel notes that *Quantum* is such an innovative vessel, existing SOLAS rules on passenger safety at sea did not cover some features. "Part of our role to develop rules that ensured passenger safety for some *Quantum's* unique spaces and attractions," he says. "For example, the North Star capsule and the skydiving



"We are proud of the many innovations found on *Quantum*, but our primary goal is to create a safe, memorable and truly unique passenger experience. Sometimes, we have to push boundaries of what is possible at sea, but if the response to this vessel is any indication, it has been worth it."

Mika Heiskanen, Royal Caribbean's Director, Quantum Class

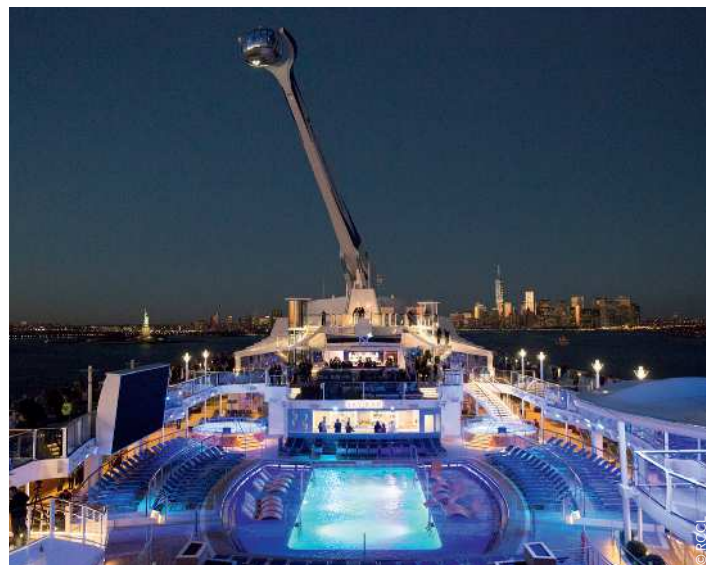
simulator were built for operation on land, not for use on a moving vessel. And Two70° is such a large and complex room, it required some new thinking with regard to fire safety."

For Langkabel, good cooperation between DNV GL's site team and yard personnel is critical. "Meyer Werft's production philosophy requires precise coordination between various suppliers, so we have to be efficient," he says. "By understanding what is important to the yard and the owner, and working closely with them to support their businesses, we can help them achieve their ambitions."

#### Flow-line production

Peter Hackmann, Meyer Werft's Head of Communications, explains that the yard has invested about EU 500 million to modernise production over the last decade. "We have built a laser welding centre, an automated pipe centre, computer-aided logistics, a material-flow control system, upgraded our dry docks and invested in a wide range of automated equipment and new organisation to speed production," he says. "We have also covered all our





“By understanding what is important to the yard and the owner, and working closely with them to support their businesses, we can help them achieve their ambitions.”

Jörg Langkabel, DNV GL

facilities so that the production process is not impacted by weather. We are building two huge cruise ships in one year – quite an achievement, given the complexity of these vessels.”

While Hackmann says the yard’s production philosophy can be compared to how cars are manufactured, he notes that cruise ships are far more complex. “Suppliers play a key role in keeping things moving on schedule,” he says. “We expect them to be reliable, flexible and responsive, especially when issues arise. DNV GL has proven to be a good partner through all phases of the build, especially for this project, which included so many innovations.”

#### Trust and open communication

Indeed, representatives from the yard, DNV GL and Royal Caribbean scheduled regular meetings every two weeks during the build, and more often as they reached critical milestones. DNV GL’s veteran site team manager Andreas Hosak notes that unlike building commercial tonnage, the construction of cruise ships requires a lot of specialised expertise and good communication. “In terms of complexity, cruise ships are challenging, and even more so for such an advanced vessel like *Quantum*,” he says. “Meeting the expectations of both the yard and the owner can be difficult, but we have been working with both for so long, there is a lot of trust.”

Hosak says that this close relationship between class, the yard and owner helped manage some challenging technical issues. “The sheer size of the hybrid scrubber created some headaches and we spent a lot of time working out fire safety with the Two70° space,” he says. “In total, about 400 km of piping and 2200 km of electric cables have been installed aboard *Quantum*. Also, because the air lubrication system to reduce hull friction was new, it took some time to get right.”

In addition to working closely with the yard and Royal Caribbean and other suppliers, Hosak got a lot of support from his colleagues at DNV GL from all over the world, including China, South Korea, Greece, Latvia and Germany and the regional approval centre at DNV GL’s headquarters in Høvik, Norway. “We leaned on the expertise of our noise and vibration team, headed by Eileen Mandt-Brun, and our scrubber expert Markus Osterkamp during critical phases of the project,” he says. “It was a real team effort.”

#### Collaboration of the Seas

For Hosak, now working on *Quantum*’s sister ship, *Anthem of the Seas* (due for delivery in the Spring of 2015), the project has been a genuine success. “When you consider how many people were involved at different stage of the build and the end result, it is hard not to be proud of to be part of the project,” he says. “It may be known as *Quantum of the Seas* to passengers, but for me, a better name might be “Collaboration of the Seas!” ■

# THE MEIN SCHIFF SERIES - MANUFACTURED IN FINLAND FOR A GERMAN-SPEAKING MARKET





Mein Schiff means my ship in English. This series of brand-new, truly modern, European-style cruise ships has been built and tailored for TUI Cruises, a joint venture cruise company owned by cruise line RCCL and German tour operator TUI. *Mein Schiff 1* and *2* were converted ships acquired from Celebrity, whereas *Mein Schiff 3* and onwards are newbuildings. *Mein Schiff 3* was delivered in 2014, *Mein Schiff 4* will be delivered this year, then followed by one a year until 2016 (*Mein Schiff 5* and *6*) with an option for an additional two (*Mein Schiff 7* and *8*). That TUI Cruises is eager to obtain new tonnage is clearly demonstrated by the fact that its available tonnage is booked with a load factor of 101% (2014) – these ships are popular in the German-speaking market. All Mein Schiff ships are built at Meyer Turku yard, which was acquired by German shipbuilder Meyer in Papenburg in 2014.

## MEYER TURKU



Thomas Weigend, Director and Head of the Sales and Design Department at Meyer Werft



Tom Degermann, Head of Sales and Marketing at Meyer Turku

“As you know, the Turku yard has had many owners in recent years: Norwegian Kvaerner and later Aker before being sold to the Korean-based group STX. We’re now very satisfied to have the German Meyer group as a professional owner,” says Tom Degermann, Head of Sales and Marketing at Meyer Turku. “The yard here in Finland complements our profile as a builder of high-quality cruise ships and other special design tonnage,” says Thomas Weigend, Director and Head of the Sales and Design Department at Meyer Werft in Papenburg. “In addition,” he adds, “the Turku yard can build ships of any size, something we cannot do in Papenburg due to the limitations of the river running north into the German Bay.”

The hull of a Mein Schiff is the best there is in the world of hydrodynamics,” says Degermann. “There’s no point in being modest, we’ve done a great job in optimizing the hull and centre of gravity. Half of the fuel expenses depend on the hull and hydrodynamics the rest being electrical load of hotel operations and auxiliary systems. We’ve been able to fulfil and exceed the owners’ expectations, including regarding the total comfort for passengers in that the noise and vibration levels are also very low. The ships have traditional propulsion – meaning diesel generators, electrical propulsion motors and straight shafts.”

When discussing what the future holds for the Meyer Turku yard, Weigend adds that the yard is currently producing about one 100,000-ton-plus cruise ship a year and this can be doubled. “We can also build LNG fuelled ships and have already delivered car ferries, especially to Baltic operators like Viking Lines.” “It would help the industry if the EU could come up with common rules for operations and fuelling of LNG fuelled ships,” adds Degermann. The Mein Schiff series has very bright interiors. Even in the long passenger corridors, you have the feeling that there is sunlight. Ships designed for Europeans are generally brighter in colour than those specifically designed for American customers.



## ROYAL CARIBBEAN AT MEYER TURKU

The Mein Schiff series is owned by TUI Cruises and the construction work and other operations have been divided between the two owners of this company: TUI Cruises runs the hotel and passenger operations whereas RCCL via together it's brand Celebrity is responsible for ship operations including construction supervision. We were also kindly invited to speak to Rami Nurminen, RCCL Project Director for the Mein Schiff projects. "We now have the *Mein Schiff 3* operational statistics and they are very good in terms of energy efficiency. We have also installed a state-of-the-art exhaust gas cleaning systems on board to be able to utilise wider range of fuel oils when operating on emission regulation areas. As our ships will be operating mostly in EU waters, this is of course important to us. The scrubbers are hybrids with both an open and closed loop, and they may also be bypassed completely for the ship to run on only MGO," he says.

Nurminen pulls out a 3D view of the scrubber and selective catalytic reactor installation and says that the operations of *Mein Schiff 3* demonstrate that the emissions are vastly reduced and that the ship's fuel consumption is 40% lower than that of *Mein Schiff 1* and 2. He is confident that this can be even further slightly reduced on *Mein Schiff 4*.

We meet Nurminen at the 364-metre-long dry dock which is also equipped with a 600-ton construction crane. Just days before the dry dock will be flooded to float the ship for the first time, the enormous dimensions of the hull are visible, as are the bronze propellers shining in the low late-autumn sunshine in Turku. Quite a sight!

"When working with a yard, or for that matter other suppliers, there is a 'learning curve' for each individual ship. This curve





Rami Nurminen, RCCL Project Director for the Mein Schiff projects



involves learning to work together, optimizing the production and obtaining an end-result, i.e. getting the ship finished on time and to or beyond our expectations. This learning curve is good and of course benefits the next ships in a series. As a ship, *Mein Schiff 3* is a success, but of course the operational experience will also teach us a lot. One such item learned was to find even further means of preventing the formation of soot in the exhaust gas system. So this learning curve is good for all those involved," says Nurminen.

"When it comes to the design and operations, we have optimised the ship's hull for an average operating speed of 17-18 knots. That is normally sufficient to move from one location to the next during the night - typical cruise operations. We have also installed the ABB Emma system for maximum voyage planning, in which

elements such as engine use, trim, voyage waypoints, etc, are considered. Add to this an optimum hull design, the scrubber installation and our own operational experience, and we get some great ships into service," says Nurminen.

"However, it's not only the great performance of the ship itself that's important to us. We have worked on the acoustics in the theatre with variety of designers and consultants to make surroundings for orchestras like the Vienna Philharmonic Orchestra, we've created restaurants, interiors, coffee shops and the spa and relaxation areas especially for the German-speaking market and the ships have been very well received as upscale tailor-made ships. I would absolutely recommend a trip on one of the new ships in the Mein Schiff series," concludes Nurminen. ■

# STAR CRUISES GAMES UP WITH NEW SHIPS



Genting Hong Kong's Executive Vice President, Michael Hackmann, shares with DNV GL the current thinking and strategic focus on the iconic Asian cruise brand.

As Genting Hong Kong brings its Star Cruises fleet of seven vessels to the next level and adds two more next generation vessels, DNV GL continues to play a key role.

"Our corporate culture is one of service with no compromise on safety. What this looks like in action is Asian hospitality for Asian customers built on a foundation of operational excellence," said Michael Hackmann, Executive Vice President, Marine Operations and New Ship Building for Genting Hong Kong. Genting Hong Kong, listed on the Hong Kong and Singapore stock exchanges, is a part of the global Genting tourism group and is shareholder in two premier cruise ship brands, Star Cruises in Asia and Norwegian Cruise Lines based in Miami. Genting Hong Kong also is a joint venture partner in the Resorts World Manila and Resorts World Jeju land-based properties, with work also commencing on a second Philippine integrated resort, Resorts World Bayshore.

Tan Sri Lim Kok Thay is the Chairman and Chief Executive of the Genting group of companies, which is involved in leisure and hospitality, power generation, oil palm plantations, property development, biotechnology and oil and gas business activities.

"Our Chairman, simply will not compromise in his commitment to his customers and the company. This is part of the importance of upgrading the fleet at this time," said Mr Hackmann adding, "Our fabulous marine team looks after the ships very well and they are highly competent and very safety focused. Given the resources and capability at the corporate level, I see my role as supporting and enabling the teams for both newbuild and current ships in operation."

Star Cruises together with its associate company, Norwegian Cruise Line and two newly joined members, Oceania Cruises and Regent Seven Seas Cruises, represent the third largest cruise operator in





© Meyer Werft

the world, with a combined fleet of 28 ships cruising to over 450 destinations, offering approximately 47,400 lower berths.

"Most of our operational officers are graduates of Scandinavian maritime colleges. This training ingrains an operational culture of professionalism and rigor in all ship operational procedures. Any decision in favor of safety will be backed by top management," said Mr Hackmann.

A hands-on leader, Chairman Tan Sri Lim was present for the 9 February 2015 steel cutting at Meyer Werft shipyard in Papenburg, Germany, kicking off construction of *Genting World*, the first of two next-generation of mega cruise ships. The first ship, with hull number S.711, is scheduled to be delivered in the fall of 2016. Its sister ship, S.712, will be delivered in the fall of 2017. Each ship is 324 m long, 39.7 m wide and boasts a 23 knots service speed that is necessary to meet Asian customer base requirements for covering an ambitious itinerary during a several day cruise. Both ships are designed for the fast growing Asian cruise market and will both be homeported in Asia.

Speaking at the steel cutting ceremony, side by side with Bernard Meyer, Managing Partner of Meyer Werft, Tan Sri Lim noted "It is

a proud moment for all of us at Genting Hong Kong, especially for me, as today's steel cutting ceremony marks a new chapter for Genting Hong Kong, reaffirming our Star Cruises brand as the leader in Asian cruise travel. The delivery of these two newly commissioned mega cruise ships will enable us to continue to strengthen and further enhance our competitiveness across our key source markets."

The Meyer Werft relationship with Star Cruises goes back several decades. "We are glad to continue the long lasting relationship, which started 20 years ago with the building of *SuperStar Leo* and now we build these new ships for Star Cruises," echoed Bernard Meyer who leads the German shipyard that bears his family name.

Upon completion, the new mega cruise ships will be more than 151,000 gross tonnes with more than 1,600 cabins, accommodating approximately 4,500 passengers and 2,000 crew members. Double the size of the largest of the existing Star Cruises ships, the 21-deck luxury cruise ships will be the new flagships under the Star Cruises brand, offering a wide array of itineraries, leisure and entertainment options for all cruise travelers.

#### Genting grows cruise ambition in Asia-Pacific

A pioneer in its own right, Genting Hong Kong was incorporated in September 1993, operating its fleet under the Star Cruises brand, to take on a bold initiative to grow the Asia-Pacific region as an international cruise destination.

"Our Chairman is very hands-on with all of the ship design and development. Being based in Hong Kong, we know the Asian market. Meyer Werft and DNV GL are partners that we trust and share mutually aligned, long-term objectives," said Mr. Hackmann, explaining that "Only when the yard, the class and owner can work seamlessly, can the quality of the ship be secured."

When DNV GL Vice President and Regional Manager for Greater China Torgeir Sterri visited the Genting Hong Kong office it was like visiting old friends. "I did the approval for *SuperStar Leo* which was delivered in autumn of 1998 and the sister ship *SuperStar Virgo* delivered in summer of 1999," said Sterri, who is now Vice President and Regional Director for DNV GL Greater China. "It is a real privilege to see how Star Cruises and Meyer Werft are again partnering with another opportunity for DNV GL to contribute our expertise," he added.

Mr. Hackmann is now responsible for the marine operations and



new shipbuilding projects plus various support departments such as Port Operations and Crewing Operations. He is also Country Head for the Philippines where Star Cruises has substantial back office support facilities and its Star Cruises Training Academy.

A graduate of the Royal Australian Air Force Officer Training School, Mr. Hackmann was a pilot earlier in his career. "I was trained on the aviation side, but have a lot of experience onboard vessels also. There is quite a lot of cross-over between aviation and shipping. They are both transport industries and operate within rigorous operational and regulatory environments. As a community service, Mr. Hackmann also serves as a Director of the Royal Flying Doctor Service, Australia's largest and most well-known Not-For-Profit organization, and has been bestowed Life Membership for services to regional and remote Australia.

In keeping with its Asian customers, the new ships will have very large Chinese and Western spas, health and wellness centres, private karaoke lounges and a wide range of upmarket Asian and Western dining.

As usual with Star Cruises, the main itineraries will focus on shorter two, three and five night sailings, requiring ships with high service speeds to serve Asian clientele preference for multiple destinations/itinerary intensive programmes are preferred, he said.

#### **China market a focus of future with zero compromise on safety**

According to information released from the "Cruise Shipping Asia-Pacific 2014 Conference" held in Hong Kong in November 2014, cruise ship global deployment to Asia grew by almost 31% in 2014 and more deployment is on its way for 2015. In 2015, 26 lines and 981 cruises are touring in the region. China is to grow from the eighth biggest cruise source market to the second biggest within a few years. There is a prediction of as many as 4-6 million Chinese cruisers alone by 2020.

Genting Hong Kong has been leading the way to cater to Chinese customers who have been found to travel more often in June, July, December and the Chinese New Year when students are on holiday and parents take the opportunity to create new experiences for their children.

The new ship design will allow guests greater choice with a wide-range of onboard activities, amenities and stateroom options with the latest features, including villas, on the open seas. In addition, the mega cruise ships will offer over 30 food and beverage outlets such as gourmet restaurants, bars and cafes specializing in international and Asian cuisines. One of the highlights includes a special street night market with hawker stalls, serving famous Asian delicacies from various countries. In addition, there is a state-of-the-art modern theatre, world-class recreation, health and fitness and MICE facilities. For the families, there is an array of aqua slides and





Torgeir Sterri, Vice President and Regional Manager Maritime for DNV GL Greater China and Michael Hackman, Executive Vice President, Marine Operations and New Ship Building for Genting Hong Kong

a kids' waterpark. The newly built ship will also dedicate around 1,000 square meters of floor area for the ultimate retail experience at sea with a variety of international luxury brands.

There will be an observation lounge and exceptionally high styled VIP areas. To cater for the Asian customer, more deck space is allocated to gaming and restaurants will tend more toward Asian food and beverage. Allocation for retail space is larger for Chinese customers who always enjoy a good shopping spree. Genting Hong Kong is also seeking long-term partnership with duty free suppliers to meet the growing demands of the growing Chinese middle class.

There are also large medical centre facilities to offer new treatments, dental care, cosmetic touchup and executive health screening. For example, the ship will have MRI equipment that can offer full screening services that can be part of the packages available to the customers during their cruise.

"We intend to be the game changer in the market to keep our leading position among increasing competition. Wellbeing services are a large part of this," said Hackmann.

Currently Wusong in Shanghai, Tianjin, Xiamen and Sanya have four international cruise terminals in operation. Zhoushan, Qingdao, Dalian and Shenzhen are developing their terminals. There are six other cities including Haikou, Guangzhou, Ningbo, Nanjing, Yantai and Qinhuangdao with plans to develop cruise terminals.

"We understand China is facing challenges, including infrastructure and operational, in developing cruise business," said Mr. Hackmann. "We are passionate about contributing to this undertaking with our professionalism and zero compromise on safety."

"Nothing is so important if it cannot be done in a safe manner," said Mr. Hackmann, in conclusion. ■

#### PROFILE

Tan Sri Lim Kok Thay Lim has been expanding Genting's global presence in land-based tourism since he took over from his father in 2003. His initiatives included both developing leisure brands such as "Resorts World", "Maxims", "Crockfords" and "Awana", as well as setting up strategic partnerships with Universal Studios, Hard Rock Hotel, Premium Outlets, and others.

He expanded the Resorts World Genting in the Malaysian highlands and quickly expanded Group's presence to the United Kingdom, where Genting UK Plc is the largest casino operator in the country.

In 2006, Tan Sri Lim led his team to win the competitive bid to build and operate Singapore's first integrated resort on Sentosa Island, called Resorts World Sentosa. There are also integrated resort the Philippines, two leisure projects in the United States of America, namely Resorts World New York and Resorts World Miami.

#### GENTING HONG KONG COMPANY HISTORY

Genting Hong Kong was incorporated in September 1993, operating its fleet under Star Cruises, taking the initiative to grow the Asia-Pacific region as an international cruise destination. The company is a leading global leisure, entertainment and hospitality enterprise, with core competences in both land and sea-based businesses:

- Star Cruises - Asia-Pacific
- Norwegian Cruise Line (Norwegian) - an affiliate with Apollo and TPG
- Resorts World Manila (RWM) - Manila, Philippines; joint partnership with Alliance Global Group under Travellers International Hotel Group
- Resorts World Bayshore (WRB) - also in Manila and under the Travellers joint venture
- Resorts World Jeju (RWJ) - a joint venture at the Hyatt Regency hotel in Jeju, South Korea
- Present in more than 20 countries worldwide

Genting Hong Kong has a primary listing on the Main Board of the Stock Exchange of Hong Kong Limited under the stock code "678" and a secondary listing on the Main.

Board of the Singapore Exchange Securities Trading Limited under stock code "S21". Norwegian Cruise Line Holdings Ltd. is listed on the NASDAQ Global Select Market under the symbol "NCLH" and Travellers is listed on the Philippine Stock Exchange under the ticker "RWM".

Star Cruises in Kuala Lumpur is led by Gustaf Gronberg - Fleet Captain, Senior Vice President Marine Operation and Newbuilding. He is supported by a team of six senior managers in the area of Nautical Operations, Technical Operations, Quality Assurance and Marine Operations.

Star Cruises owns and technically manages seven passenger cruise vessels. All vessels are classed by DNV GL. DNV GL has ISM/ISPS/MLC for all seven vessels managed by Star Cruises.



# UPBEAT CHINESE CRUISE INDUSTRY

According to the China Cruise Industry Development Report 2014, the sixth cruise industry report on the Chinese market released by the China Cruise and Yacht Industry Association (CCYIA), the total number of cruises from China reached around 466 by the end of 2014; a year-on-year (YOY) growth of 14.8%.





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Of these, 366 were home port cruises, a YOY increase of 9.3%, and 100 were port of call cruises, a YOY increase of 40.8%. The 466 cruises catered to 860,000 tourists, a YOY growth of 43.4%. Of these tourists, about 740,000 were Chinese people who boarded their cruise from Chinese ports, 44.3% more than in the previous year, while 120,000 were foreign travellers who boarded a China-inclusive cruise that commenced from foreign ports, representing a YOY increase of 37.9%.

The CCYIA expects the Chinese cruise market to continue to develop rapidly in 2015. The volume of Chinese cruise passengers will exceed 1 million and the number of cruise liners calling at Chinese ports will reach 12 in 2015, compared with eight in 2014.

At the beginning of 2015, DNV GL was honoured to interview Mr Zheng Weihang, the Executive Vice President of the CCYIA. He talked about the emerging Chinese cruise industry, its trends and what it means for the industry players in both domestic and foreign markets.

#### **The Chinese cruise sector is moving up the industry value chain**

In 2014, the Chinese government issued clear instructions to encourage the building of cruise ships and a few Chinese shipyards have expressed an ambition to build such ships.

China has been the biggest shipbuilding nation for some years. According to the Ministry of Industry and Information Technology, the Chinese shipbuilding industry maintained its leading position in 2014, with its production completion, new orders received and order book accounting for 41.7%, 50.5% and 47.1% respectively of the world market. China has made breakthroughs in building complex ship types such as LNG vessels and offshore mobile units, but is still blank when it comes to cruise ships.

This situation might change in the near future. In late 2014, CSSC, the main arm of China's state-owned shipbuilding corporation, signed a three-party memorandum of understanding (MoU) with cruise operator Carnival Corporation and Italian shipbuilder



Mr Zheng Weihang, Executive Vice President of CCYIA

Fincantieri to explore the possibility of a joint venture in cruise design and shipbuilding for the Chinese market. Most recently, another MoU was signed between Carnival Corporation and China Merchants Group to explore the potential for two joint ventures aimed at accelerating the development and growth of the cruise industry in China.

In addition, Shanghai Huarun Dadong Dockyard was the first shipyard in China to provide dry dock and renovation services for Carnival's cruise ship the *Costa Atlantica*.

These cases show that China is stepping up its preparations for cruise ship construction. "In my opinion, we don't need to start from scratch in the construction of cruise liners. We're open to all options, including joint construction with foreign shipyards and cooperation with foreign designers," says Mr Zheng. He suggests that Chinese shipyards learn from their Korean counterparts and develop their shipbuilding competence by investing in foreign shipyards.

#### **The deployment of Chinese cruise ports is under way**

The fast development and growth potential of the Chinese cruise market is attracting both international and domestic players. According to Mr Zheng, the world's four biggest international cruise operators have all entered the Chinese market - Carnival Corporation, Royal Caribbean, Star Cruises and MSC. In addition,

some local players have also entered the cruise market. The current Chinese fleet includes two cruise ships; the *Han Na*, which is operated by Hannan Airlines, and the *China Taishan*, which is operated by Bohai Ferry. The joint venture Skysea Cruise Line, established in late 2014 by Ctrip and Royal Caribbean, will also start to operate one cruise in mid-2015.

"We only had five cruises originating from Chinese ports in 2013. But in 2014, we had eight vessels and we expect this to increase to 12 vessels in 2015 and 16 in 2016. The Chinese fleet will also be expanded continuously either by purchasing second-hand vessels or building new ones," says Mr Zheng, who forecasts that another company from Qingdao will participate in the cruise market this year.

Along with the increasing number of cruises calling at or home porting in Chinese ports, more money is being invested in the construction of Chinese ports.

According to Mr Zheng, six cruise ports have been constructed and are in use - Tianjin, Shanghai (two terminals), Zhoushan, Xiamen and Sanya; three are being constructed - Dalian, Qingdao and Shenzhen; and another six cities have plans to build cruise ports - Yantai, Qinhuangdao, Ningbo, Wenzhou, Guangzhou and Haikou.



"The State Ministry of Transport is preparing a plan for the overall use of Chinese cruise ports," says Mr Zheng. "Currently, there's too much focus on building landmark terminals. I think it's more important to focus on cruise port functions and tourist comfort." Shanghai is currently ranked ninth in the world's home port list and is anticipated to become number eight in 2015, surpassing New York Port.

#### More opportunities for industry players

The development of the Chinese cruise industry has received both central and local government support. A series of policies have been issued since 2008 – for example the Ministry of Transport policy on permitting foreign cruise liners to call at several ports in China and on home porting in Chinese ports, regulating cruise liners operating between mainland China and Taiwan; the National Tourism Administration's promulgation of the service standard for cruise ports, to mention a few.

In addition, the Bureau of Exit and Entry Administration of the Ministry of Public Security has simplified the procedures applicable to cruise tourists several times, the General Administration of Quality Supervision, Inspection and Quarantine has issued a policy on handling immediate health and quarantine issues, the Customs Administration has simplified the customs-clearance procedures and the Maritime Safety Administration has issued policies to ensure the safety of cruise ships.

"These policies greatly advanced the development of the Chinese cruise industry. We encourage all the related industry players to help develop this industry," says Mr Zheng. "There are plenty of business opportunities for both domestic and foreign players to explore."

The international cruise operators are encouraged to call at and/or home port in Chinese ports and establish a joint cruise fleet with Chinese companies which will not only be able to enjoy the favourable Chinese policies but also ensure international operations.

In terms of cruise ship building, China welcomes more foreign shipyards, designers and suppliers to cooperate with Chinese companies and form joint ventures. There is a huge potential in the sourcing of cruise materials and facilities. China might become the Asian sourcing centre for cruise construction in the near future.

"These policies greatly advanced the development of the Chinese cruise industry. We encourage all the related industry players to help develop this industry," says Mr Zheng

Mr Zheng Weihang,  
Executive Vice President of CCYIA

From a logistics aspect, with the increasing number of Chinese cruise passengers, the international cruise operators will gradually increase their purchase volume in China. More Chinese suppliers will enter the international cruise supply chain. And vice versa, with the growth of the Chinese cruise fleet, foreign suppliers will have an opportunity to provide for the Chinese fleet and enter the Chinese cruise supply chain. Carnival Corporation has already appointed a senior purchasing officer in China and Royal Caribbean also has plans to establish a hotel operation centre in Shanghai in 2015.

On the tourism side, with the rapid increase in Chinese home port trips, there will be a lot of potential business for the Chinese travel agencies which can cooperate with foreign travel agencies to attract more foreign tourists to join the China-itinerary cruises.

"So there will be many business opportunities for industry players to explore in the emerging Chinese cruise sector," says Mr Zheng. Commenting on the outlook for the Chinese cruise industry, Mr Zheng is optimistic but practical about the sector's growth rate. He expects the number of Chinese cruise tourists to surpass one million in 2015 and to continue to increase to 2-2.5 million in 2020, 4 million in 2025 and 7 million in 2030. "While we value the increase in the number of Chinese cruise passengers, we should focus more on improving the quality and increasing the amounts spent by cruise tourists," he concludes. ■

# DNV GL ESTABLISHES GREATER CHINA CRUISE CENTER

AN INTERVIEW WITH TORGEIR STERRI,  
VICE PRESIDENT AND REGIONAL MANAGER  
DNV GL MARITIME GREATER CHINA





Torgeir Sterri has been Regional Manager Maritime Greater China since 2013. Before this assignment, he was Regional Manager Central Europe, Area Manager Benelux and France and Country Manager BeNeLux. Torgeir Sterri has a vast experience of cruise vessels and has been project manager for several new ships built to DNV GL class at the Aker and Meyer Werft shipyards.

#### Mr Sterri, what is your view on China as a future cruise market?

China has great potential to grow into a very large cruise market. It has huge source-market potential due to its vast population and very large and wealthy middle and upper classes, and it also aims to become at least the second-largest cruise market after the US. Cruise vessels have been part of the Chinese government's 12th 5-year plan. The Chinese government has established six new areas of consumption, and cruise tourism is one of them. Several brand-new cruise terminals have been built in the country over the last few years to develop the infrastructure and China is making great efforts to further develop its inland connectivity and cruise-related policies. A number of government-funded R&D projects related to luxury cruise vessels have been ongoing in recent years and the first steps into cruise vessel construction are under way. China became a luxury cruise vessel owner a few years ago via the purchase of second-hand vessels and several new Chinese owners and operators of cruise vessels have appeared in the last few years - and their number is growing. International cruise lines have been making very early moves into this new market. Royal Caribbean, Carnival and others have over the years strongly increased their activities relating to China due to the country's importance for future business. Besides deploying more modern vessels to China, they have entered into several strategic local partnerships to develop the Chinese market and have also allocated experienced leadership to their China operations. So all in all: the scene is set for success.

#### And how does DNV GL position itself to serve this market?

As a company with a global market share, major and with existing local cruise customers such as Star Cruises and international cruise customers operating in Greater China, for us China is a key strategic market, of course. We are well positioned in terms of setup and experience to provide excellent service here in Greater China. We believe the ability to provide a quick, coordinated response locally is crucial for success so we have been building up local competence in Greater China, especially in Shanghai and Hong Kong, to serve existing and future local and international customers. In Greater China, we have an experienced team with expertise in cruise ships in operation, plan approval and engineering, advisory and training services. We have decided to go to the next stage and are now establishing the Greater China Cruise Centre. This is an important step in order to provide all our customers with the support they need and add value to their operations. Our Global Cruise Centre in Miami has a long history of providing these services to our customers, and is one of the important reasons for our strong position in this segment. We are confident about achieving such success here in Greater China too, and are looking forward to further growth in this market. ■

Torgeir Sterri who now heads DNV GL in Greater China was involved in the approval work on Genting newbuilds previously constructed at Meyer Werft



# SCRUBBERS, LNG OR COMBINATIONS

## – SOME ADVICE FROM WÄRTSILÄ

The cruise industry is show business but here, too, you have to demonstrate that your operations are environmentally sustainable. This is to satisfy not only passenger expectations, but also increasingly the requirements of authorities worldwide. So ship owners have to consider the fundamental question: where will my ships trade and which fuel options are relevant for my ships given the trade they are intended for? Or is the trade just "global"?

We are at the Wärtsilä headquarters in Helsinki, Finland, having a most interesting discussion with Tomas Aminoff, Wärtsilä's Director of Technology Strategy, on the topics of scrubbers and LNG solutions in view of the environmental regulations and options for the cruise industry.

### From your point of view – what does the future hold?

"In my view, it's only a matter of time before we see more LNG. Of course it's important for ship owners to consider price and now, with cheaper oil, the need to move fast into other fuel sources such as LNG is not as pressing. In the longer-term perspective, however, LNG is going to be increasingly popular as this is a good answer to the ECA and other requirements. LNG will also be available in some US ports like Miami and Ft Lauderdale, as well as in Rotterdam, Gothenburg and other mostly North European locations. The biggest uncertainty here will be common rules on how to deal with LNG as fuel. For instance, can passengers be on board while fuelling – or not? If the answer is no, then the logistical challenge increases and probably becomes too big. There is now a fleet of more than 60 ships worldwide running on LNG and this means that bunkering solutions are becoming more readily available. To us, the entire LNG supply chain is the key to success – but as demand grows due to regulations, LNG will be a part of the future of shipping. DNV GL has classed many of the ships now trading and we have supplied engines and systems to run on LNG – there is a lot of competence available."

### What about the regulatory aspects?

"I know that the USCG has issued a statement that, in principle, it is ok to have bunkering in ports with crew and passengers on board. They have also been here in the Baltic to study the bunkering operations of the *Viking Grace* – an LNG-fuelled passenger and car ferry operating between Sweden and Finland. We are

discussing with authorities, based on risk analysis, what the issues that need to be resolved may be for ports and trade routes. But the key factor is to achieve a common rule set for how to store LNG on board and how to refuel in ports. LNG is becoming increasingly available so it is important to implement common

Wärtsilä 34DF, the midsize engine in the gas engine portfolio





rules. For bunkering, it's important for there to be a quick release if the bunkering process has to be terminated for some reason – a breakaway connection. Risk mitigation is the key field of analysis and we are currently pursuing this with several stakeholders."

#### **What do you believe a cruise operator will have to consider on the topic of LNG?**

"A challenge is the maximum size of any onboard LNG tank, but I believe that is more relevant for cargo ships trading globally. This has also much to do with a ship's balance, weight and centre of gravity, in addition to the space required by the tanks. All operators, and especially cruise ship operators for which space is at a premium, need to consider the ship's intended trade. Is it really necessary to have LNG capacity for maximum autonomy or is it enough to cover the typical trade pattern – for a cruise vessel this is typically a seven-day cruise. In this way, the LNG storage could be optimised from a cost and size viewpoint to cover all normal cruises, including harbour stays, and the seasonal relocation of the vessel – from, for example, North America to Europe – could then take place by at least partly using a low-sulphur liquid fuel like MGO. For the existing fleet to meet the sulphur limitations, scrubber installation is typically the best solution and the one chosen by most owners – we have more than 100 scrubber systems in our order book."

~ Pressurised C-type LNG storage tank and pump room  
 ~ Color Line SuperSpeed 2 after that she have been retrofitted with Wärtsilä in-line scrubbers



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#### **The ship engine is also part of the equation – what changes do you see here?**

"There are two aspects here. It is no surprise that we will continue to see the steady improvement of the hardware so that it has a better power/weight ratio, higher efficiency, lower emissions and longer service intervals. However, many other industries, and I believe that our industry will be no exception to this, are experiencing a software revolution. The engine control and optimisation flexibility will go well beyond of what we have today and the power management will be optimised on power plant level rather than on individual engine level. All power sources will become a team where each engine can have a dedicated task and in this way minimise the energy consumption not only at engine level but especially at vessel level. In a cruise vessel, we could have one engine on a stable 85% load, giving the base load the highest possible efficiency, another working at around 40% and adapting to load changes and a third idling ready to take load steps in case of a failure in the operating units.

"This combined with utilising remotely, in real time, the vast amount of engine-performance data we have access to as an engine manufacturer means that I believe there is still much to gain from engine optimization – actually we have only 'scratched' the surface a little here." ■

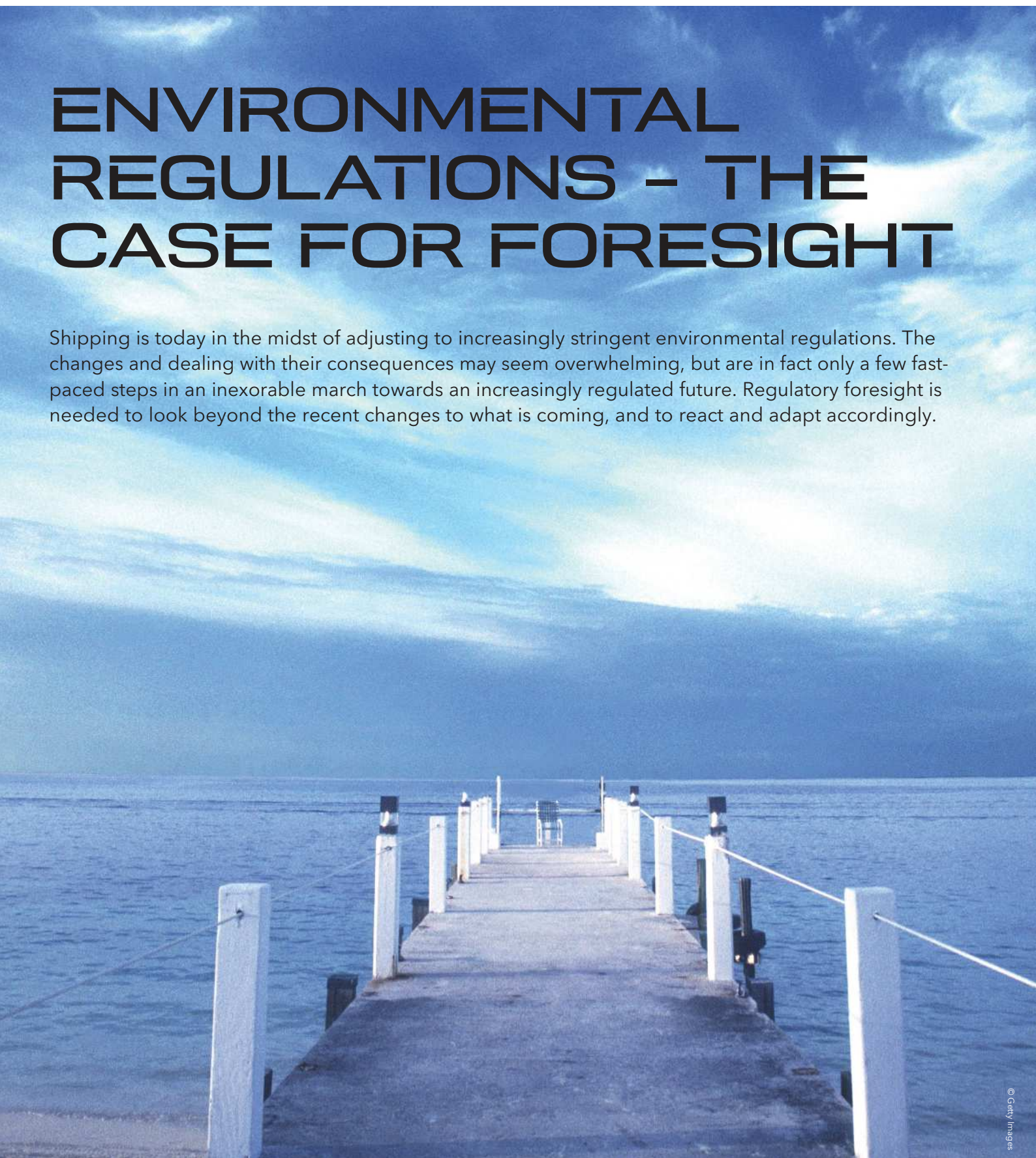
Tomas Aminoff, Wärtsilä's Director of Technology Strategy



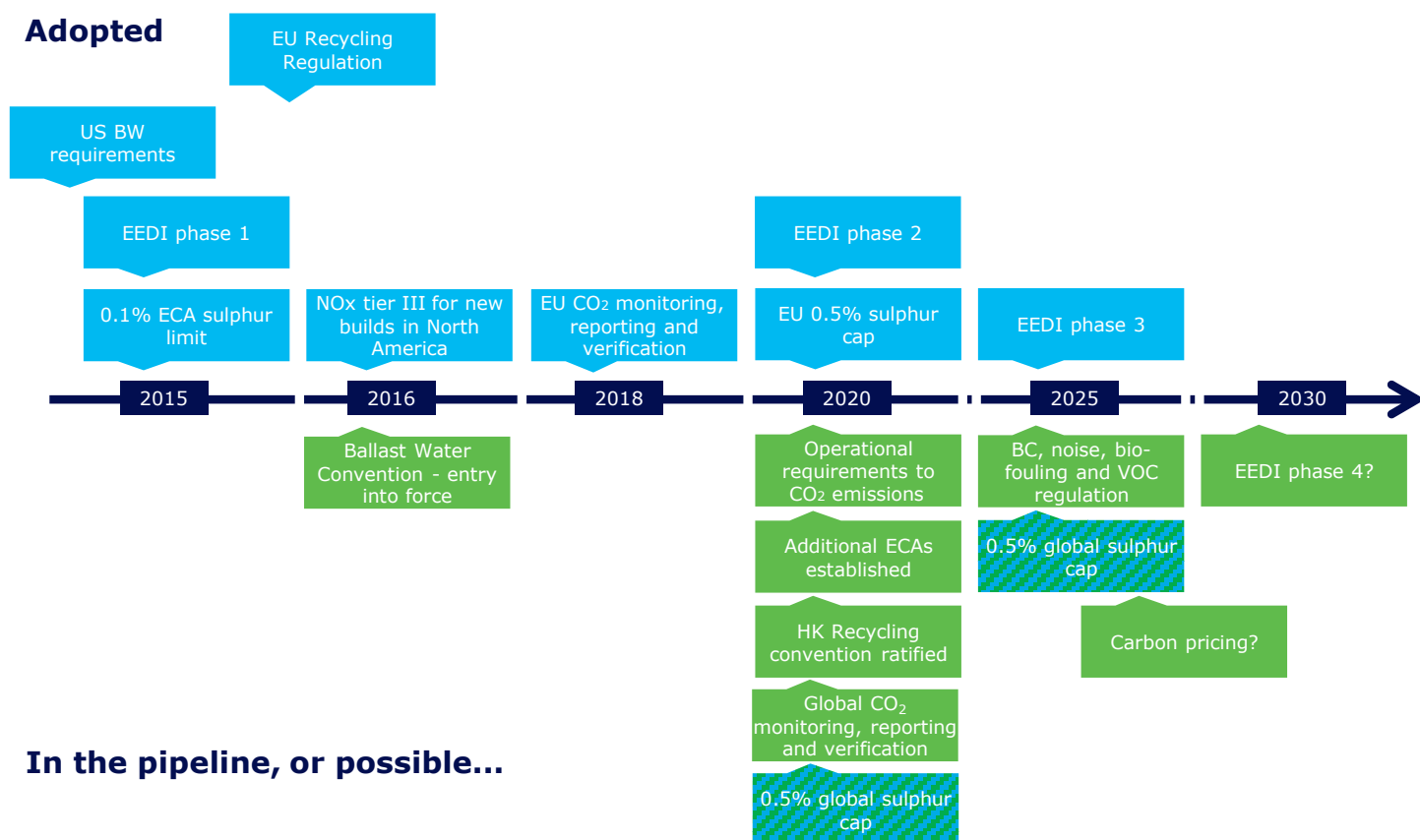
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# ENVIRONMENTAL REGULATIONS - THE CASE FOR FORESIGHT

Shipping is today in the midst of adjusting to increasingly stringent environmental regulations. The changes and dealing with their consequences may seem overwhelming, but are in fact only a few fast-paced steps in an inexorable march towards an increasingly regulated future. Regulatory foresight is needed to look beyond the recent changes to what is coming, and to react and adapt accordingly.







Note - dates below the timeline are estimates with inherent and greatly varying uncertainties.

The biggest recent change for shipping has been the tightening of the ECA fuel sulphur content requirements as of 1 January 2015. Choosing the right adaptation strategy has been – and remains – a challenge, particularly in light of the great fuel price volatility. However, as can be seen from the top half of the figure below, this is only one of a number of stricter regulations coming into force this decade.

#### Operational requirements as to CO<sub>2</sub> emissions Recycling Convention

NOx tier III requirements, the 0.5% cap on sulphur in all EU waters, the increasingly stringent energy efficiency design requirements (EEDI); these are all coming into force over the next few years and will make it more and more complicated to reach the right technical and business decisions when it comes to designing, retrofitting and operating ships. And given the long lifetime of ships, there is little certainty that what is the right decision today will remain so 10 or 15 years down the road. Future-proofing investments remains a challenging task.

An important insight when it comes to shipping regulations is that, in most cases, once a regulatory need is recognized to a sufficient degree by the body in question (whether it is the IMO, EU or others), some form of rule or regulation will develop. The timeline may be uncertain and in some cases extremely extended, but only very rarely does the process stop.

Regulatory foresight can thus be exercised by considering drivers for regulations in both society at large and the shipping community itself, combined with closely following the internal processes in the regulatory bodies. The lower half of the figure above is an example of this, where we apply our insights to provide best-guess timeframes for forthcoming regulations.

Considering the topics listed, it should be clear that a number of these regulations are likely to have a significant impact on ship design, retrofits and/or operations. Shipping companies would be well advised to take this into account when developing their long-term business strategies. ■

