

SEAVIEW



RINA MAGAZINE - CRUISE EDITION



MAJOR CRUISE
players explain the latest trends

SMART DATA
and asset management with Cube

HOW PASSENGER
demand is steering the industry

Welcome to Sea View, RINA's annual magazine exploring the opportunities and challenges for the cruise market.

The desire to embrace technology and innovate is a striking theme in this issue, whether it's cleaner energy like LNG and fuel cells, or digital tools to improve efficiency such as RINA's new Cube platform.

Leading industry figures give insights into key areas, including developing China's cruise market, designing the cruise ships of the future and tailoring the cruise experience to the demands of today's passengers. Their visions of how to successfully enter new markets and increase demand sustainably are crucial as the industry continues to grow and expand.

Many thanks to Carnival Maritime, CLIA, Fincantieri China, MSC Cruises, Royal Caribbean International, Silversea Cruises and Studio de Jorio for their contributions.

- 1 Cruise market growth and evolution
- 2 Innovate or sink: shipping tech GIAMPIERO SONCINI, RINA
- 4 Making waves in LNG and Asia LARS LJOEN, CARNIVAL MARITIME
- 6 Travel deeper: expeditions & experience ROBERTO MARTINOLI, SILVERSEA CRUISES
- 8 Developing China's cruise market FABRIZIO FERRI, FINCANTIERI CHINA
- 10 Designing for the future MARCO DE JORIO, DE JORIO DESIGN INTERNATIONAL
- 12 Fast growth: a good challenge to have GIANNI ONORATO, MSC CRUISES
- 14 Unique experiences at sea and ashore ANA KARINA SANTINI, ROYAL CARIBBEAN CRUISES
- 16 Sustaining the golden age of cruising ARNOLD DONALD, CARNIVAL CORPORATION
- 18 Hydrogen and fuel cells for a decarbonised future
- 19 Ultra-luxury yachts sail into the market
- 20 RINA's new digital platform, CUBE
- 21 Silver Cloud passes the Polar Code

Cruise market growth and evolution

Overall, the cruise sector saw 5% growth in 2017 with approximately 25.8 million passengers travelling. Similarly positive, the orderbook once again indicates confidence in a rising market, with over 100 ships to be delivered between 2018 and 2025 for a total value of US\$55 billion (€44.3 billion).

Of the 31 ships to be delivered in 2018, the AIDAnova stands out as the first ever LNG-fuelled cruise ship. Built by Meyer Werft for AIDA Cruises and classed by RINA, it is the first of seven LNG-fuelled ships on order for the various brands of Carnival Group. At over 183,000 GT, the AIDAnova is the second largest ship to be delivered in 2018 after Royal Caribbean's Symphony of the Seas, at an impressive 230,000 GT.

This year's deliveries will increase the fleet by 5% and passenger capacity by 6%, representing an investment of over US\$9 billion (€7.24 billion). Of the current cruise ship orderbook, 19 ships representing 2.7 million GT are being built to RINA class.

In terms of gross tonnage, 80% of the orderbook is destined for the contemporary cruise segment and bigger groups like Carnival, Royal Caribbean and MSC. Delivered in November 2017, the MSC Seaside illustrates the continued demand for large, high-tech cruise ships. The RINA-classed vessel is the first of four cutting-edge ships for MSC and the biggest cruise ship ever built by Fincantieri. The other 20% of the orderbook is divided, in descending order, among premium, luxury and expedition cruises. The craving for exclusivity aboard an ultra-luxury cruise ship and the passion for exploration are boosting the last two segments.

The emissions regulations that will enter in force in 2020 are slowly shifting the orderbook towards environmental sustainability. As many as 15 vessels will be LNG-fuelled, and Viking Cruises plans to make the world's first hydrogen-powered cruise ship.

Cruiser demographics are also evolving: millennials are increasingly attracted to river cruises, while on seagoing trips children often now travel with grandparents instead of parents. Colder destinations are becoming more popular, along with Cuba and the transoceanic trip crossing the Panama Canal.

The industry faced some difficulties in the Caribbean market after the hurricane season. However, operators adjusted routes, offered new itineraries and showed clear support through financial backing, evacuation and housing onboard the vessels. This spirit of commitment is what the industry needs to continue to grow and evolve sustainably in the coming years.

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Innovate or sink: shipping tech

Interview with Giampiero Soncini,
Senior Advisor Marine Innovation, RINA



Ever since I joined the Italian Navy 46 years ago, I've been helping to make ships better and smarter using technology. In the Navy, I worked on the first automated system using an Intel 8080 processor for engine rooms. Later, for the NATO Undersea Research Centre, I was involved in the construction of the first vessel with a fully computerised, GPS-based navigation system. It's a sign of how times have changed: we had to get special permission from the US government to install the GPS device, which cost \$700,000 and was the size of a large cupboard. These experiences helped me as CEO of SpecTec, which created the first comprehensive asset management system for ships, AMOS.

Now RINA has asked me to join them as a consultant in marine innovation, supporting the company's drive towards better digitalisation. In the midst of phenomenal growth and transformation, I don't think RINA even notices how innovative it already is. For example, I'm thrilled to get an insight into their state-of-the-art fleet performance monitoring software, InfoSHIP EGO Energy Governance. Other technologies currently under development are ones that I've been

wishing for over the last three years. It's good that RINA is already following the path of innovation. Because as history reveals, organisations that are complacent and resistant to change are the first ones to sink.

Although usually quick to adapt to changing conditions, the shipping industry has been slow to react to developments in technology. Given the long lifetimes of ships and the logistical complications of retrofitting a large fleet, it's easy to understand why. But when you compare shipping with, say, the aviation industry, you see that some changes make a lot of sense. Unlike airlines, as yet almost no ship owners have a system of condition-based maintenance. They just sit back and wait for a component to fail before fixing it. Technical documentation for aeroplanes is in the form of IETPs – Interactive Electronic Technical Publications – and takes up the space of a USB stick. Ships instead have to carry around massive piles of paper books that can't be consulted by anyone who's not on board the ship or in the owner's office. Every year I fly hundreds of thousands of kilometres, but if an airline were managed like the average shipping company, I would never get on a plane.





Innovation can help shipping companies stop doing crazy things that waste time and money, like carrying tonnes of documents around in paper form, trying to monitor a ship's enormously complex engines manually, and flying surveyors across the world at huge expense to carry out inspections that could be done efficiently by drone.

Fear slows down innovation. The fear that new technologies will lead to mass unemployment is widespread but not true, any more than it was true for the printing press and the steam engine. Of course, some types of job will be lost. Ten years ago, I started to predict that half of ships would soon operate with no or a very small crew. People thought it was a crazy idea, even a dangerous idea. But it's totally feasible and – if Western shipping companies want to compete with China, which has unlimited numbers of seafarers and very low crew costs – absolutely necessary. Stepping bravely into this future is the only way to compete in an industry with ever-fiercer competition and ever-tighter margins.

In essence, innovation is the only way to keep our companies alive and provide employees with jobs. They will be different jobs, perhaps being part of an onshore maintenance team, producing and piloting drones, selling and installing devices. But they will be interesting jobs, and staff should be involved in choosing and shaping the technologies that really do help them. I would never advocate adopting a new technology just because it's new and high-tech. It has to make real business sense and be embraced by employees on the ground.

Some fears, though, are justified. Cyber security is one. It's my top priority to ensure that neither RINA nor a customer is ever left unprotected or dependent upon a technology that could be attacked. But failing to innovate and keep pace with digitalisation makes a company more, not less, at risk of cyber crime.

Following RINA's technology priorities will be a challenging job. But it's also exciting to be supporting

a company at the leading edge of this digital transformation. Digitalisation doesn't change the nature of shipping, just like music streaming services have not changed the nature of good music. We're doing what we did 30 years ago, but with better software and innovative ideas we can do it a lot better.

GIAMPIERO SONCINI

Born in Bologna, Italy, Giampiero Soncini served in the Italian Navy from 1971 to 1985. During this time, he completed an MSc in Electrical Engineering at the University of Pisa. After joining NATO in 1986, he worked on the engineering team supervising the construction of the NATO-owned Research Vessel Alliance, one of the most sophisticated research vessels in the world. From 1988 to 1998 he served as Technical Manager for RV Alliance and RV Manning at NATO's Saclant Centre, now the Centre for Maritime Research and Experimentation (CMRE).

Giampiero then joined Norwegian-owned IT company, SpecTec Srl, as Managing Director. After becoming CEO in 2005, he led the company successfully for another 11 years, doubling revenue, expanding into emerging markets and securing major contracts that have helped SpecTec's AMOS software dominate the shipping market. In 2011, Giampiero was awarded a doctorate in Public Administration (Honoris Causa) by Massachusetts Maritime University for his "significant contribution to the maritime industry".

Passionate about music, Giampiero plays the guitar and manages rock band Minus One, which represented Cyprus in the 2016 Eurovision Song Contest.

Making waves in LNG and Asia

Interview with Lars Ljoen, Managing Director, Carnival Maritime



Some challenges are unpredictable - hurricanes, geopolitics - and some are easier to foresee. It is clear that building the world's first LNG-powered cruise ships is no simple task. But LNG offers a huge opportunity to all of us involved in cruising, and helping to lead the industry's transition to LNG is a milestone not only for Carnival Maritime and Costa Group but the whole Carnival Corporation.

Why are we focused on LNG? Ultimately, for us this is about protecting the environment and biodiversity we are operating in, because the health and vitality of the oceans and areas through which we travel are absolutely essential to our business. On top of that, LNG is an economic, clean and safe marine fuel with increasing global availability. It complies with existing and scheduled emissions requirements while providing the opportunity to significantly reduce particulate matter and greenhouse gas emissions. By building new ships that will be powered by LNG while in port and at sea, we believe we are setting ourselves up to take advantage of these benefits.

There are technical challenges, of course. Natural gas requires a larger tank volume than conventional fuel, so

we are working with Meyer Werft to optimise the design of the ships to best utilise space in engine rooms. Safety is of course always a prime focus. The fuel will be stored in three type C tanks at a working pressure from 0.5 to 1 bar. These tanks will be located in their own hold spaces, with double-wall pipes used for gas lines and gas control valves in their own safe spaces.

Some technical challenges are bigger than the ship itself, the biggest being infrastructure. Port infrastructure is improving all the time, and we are actively working with ports around the world to ensure reliable supply. LNG bunkering facilities and terminals are currently being developed in Europe, for example our partner Shell Oil's new LNG bunker vessel in Rotterdam. We hope that by helping to establish LNG as a trusted power source and to develop the infrastructure needed to use it, we will make it more of a viable option for everybody.

Training is another area we are focusing on, to ensure that the crew that will operate these new LNG-powered vessels are well prepared and have all the necessary experience. We are installing an LNG simulator in our



AIDAprima and Costa Diadema - Courtesy of Carnival Maritime



AIDAnova - Courtesy of AIDA Cruises

CSMART training facility in Almere in the Netherlands, where we can run our officers through all types of scenarios in a safe and controlled environment. RINA also regularly supports us in providing training to our employees.

In all these matters - technical challenges, infrastructure, training - we cannot work alone. For us it is vital to work together with the whole cruise industry to develop industry-wide standards. Only then can we move forward with a unified approach to make the use of LNG as a marine fuel a global reality. For the cruise industry, the first cruise ships to be powered at sea by LNG represent a major environmental and technical breakthrough.

Another global reality we are all facing, and in which Carnival Maritime is excited to participate, is the booming Asian cruise industry. China is the world's fastest growing and now second largest cruise market. Our two new builds, Costa Venezia (2019) and her sister ship (2020), are specifically designed to offer the best possible experience to Chinese passengers. Our Marine Operations team in Shanghai supports the Costa Asia fleet, and we will work with our partners across the region to build a robust ecosystem for the sustained development of China's cruise industry.

We couldn't make such progress in challenging new areas like LNG and the Asian market without the support of classification societies. They review, assess and approve all the ship's plans and drawings and are involved in the alternative design process for all existing and new building vessels. Our relationship with RINA has been strong for decades, and RINA will classify all our upcoming new builds - AIDAnova, Costa Smeralda and Costa Venezia - including LNG equipment and certification.

The type of diversity I describe above, and the opportunity to really make an impact, is what I enjoy most about my role in Carnival Maritime. When we talk about the tough stuff - fuel prices, smarter strategies for repair and maintenance - that's when I get excited.

All the teams must work together, all the cogs must be carefully balanced and interlocked. To create something as beautiful as our cruise ships and help keep them in shape is a great feeling.

LARS LJOEN

Lars Ljoen took over the position of Executive VP and Managing Director at Carnival Maritime in April 2016. He reports to Michael Thamm, CEO of the Costa Group and Carnival Asia.

Ljoen joined Carnival Maritime in 2015, leading the Cruise Preparation & Projects department as Senior Vice President.

The native Norwegian has a long track record in marine operations. He began his career on supply vessels and shuttle tankers in the North Sea offshore industry and worked at Royal Caribbean Cruises Ltd, where he was promoted to Director of Marine Operations during his eight-year employment.

In 2005, Ljoen joined Ceres Marine Terminals (NYK Ports) in Miami as Vice President of Business Development. Almost ten years later he headed up the development of business strategies for cruise services, roll-on/roll-off business and general cargo for the North American port activities of NYK Line.

Travel deeper: expeditions & experiences

Interview with Roberto Martinoli, CEO, Silversea Cruises



If we can believe the past, an increase in capacity drives higher demand in the cruise industry. The many new cruise ships planned for 2018 are therefore a positive indicator that good things are to come. I'm pleased to say that Silversea has a similarly optimistic outlook, with many important events in 2017 and more planned for 2018 and beyond.

We launched our ninth ship, Silver Muse, in April 2017 and announced the arrival of our tenth, Silver Moon, in 2020. To celebrate our growing business we have partnered with renowned photographer Steve McCurry. Over the coming months he will visually document our fleet and destinations, many of which are incredibly remote and little visited. The images will tell an inspiring story of adventure and travel by cruise ship.

Our recent initiatives don't all take place on the high seas. Following our successful launch of the Couture Collection – a high-end portfolio of immersive sea- and land-based adventures – we also plan new projects for our land-based programme. In the back office, we successfully issued a bond for \$550 million and

insourced our technical department from V.Ships.

It is commonly thought that growth in the cruise industry must mean growing the size of the ships. It is true that bigger ships pack more passengers on board and enjoy better economies of scale. At Silversea, however, our focus is not on packing in passengers but on making the voyage of each of our guests unforgettable. This means not only taking them to the most beautiful destinations on our planet, it means taking them there in supreme comfort and luxury. Size and comfort are closely related. Our ships, which range from 50 to 300 suites, offer the perfect balance between choice and intimacy.

Smaller ships permit a more authentic experience, which is what many in the baby boomer and millennial generations are demanding. In contrast, demand for durable goods is decreasing. Our guests are generally high net worth individuals interested in active lifestyles and cultural experiences. Avid travellers – not tourists – they seek authenticity and want to “travel deeper”.

They are happy to pay a little more for a more immersive



Courtesy of Silversea Cruises



experience, getting closer to destinations thanks to our smaller ships and bespoke services. The “travel deeper” concept is something Silversea will continue to invest in during 2018 and beyond.

Given this renewed interest in experiences, it’s no surprise that we see great strength coming from the expedition market. Within this sector, trends are becoming apparent. Galapagos typically attracts families and customers new to cruising, while travellers from emerging cruise markets such as China are more interested in the polar regions. We are excited that Silver Cloud, our first ship, was converted to an ice-class expedition ship in November 2017 and will spend the first part of 2018 in the Antarctic. The conversion was an exciting challenge in which I, as an engineer, was excited to play a part. I was also pleased to have RINA’s expertise in this.

Another interesting project Silversea will face in 2018 is the lengthening of the Silver Spirit. Starting in late February, she will be lengthened by inserting a prebuilt 49-foot-long midsection housing new luxury suites. This is extremely complex from a technical point of view, but it’s the third lengthening project of my career so I will enjoy rising to the challenge.

The Silver Spirit will also be overhauled in terms of interior design. Following positive feedback about the Silver Muse, with its soft colours and simple, modern luxury, we have decided to adopt the same design scheme for the rest of the fleet. We believe this comprehensive makeover will enrich the onboard experience. RINA will help us with the Silver Spirit lengthening and renovation works, as well as refurbishments planned for the Silver Whisper and Silver Wind.

Our business is growing fast because it allows our guests to travel deeper, to have a rich destination experience and to enjoy the true nature of some of the most remote places on earth – in perfect comfort. As the classification society for the majority of our fleet, RINA helps us to maintain the highest standards of quality and efficiency in our operations. With this

support, and given the positive outlook for our sector and our investments for the future, we look forward to many more adventures in the years ahead.

ROBERTO MARTINOLI

Roberto Martinoli is the CEO of Silversea Cruises, having been a member of the Board of Directors since 2013.

Before joining Silversea, Martinoli was the Chairman and CEO of Grandi Navi Veloci (GNV), a leading ferry company in the western Mediterranean. He currently retains his position of Chairman at Grandi Navi Veloci.

Prior to this he was President and COO of Norwegian Cruise Line (2009–2010) as well as Advisor to Apollo Management (2008–2009). He served as EVP Operations at Carnival Cruise Lines (2000–2008) and SVP at Costa Crociere (1997–2000). He also owned and operated Martinoli SAM (1976–1997), a ship management and consulting company.

Martinoli holds a master’s degree in naval architecture and marine engineering from the University of Genoa and attended an Executive Advanced Program at Kellogg Northwestern University, Illinois in 2006.

He currently sits on the Board of Directors and is a Member of the Executive Committee of Confitarma, the Italian Shipowners’ Association in Rome.

Developing China's cruise market

Interview with Fabrizio Ferri,
CEO, Fincantieri China



Given the huge potential of the Chinese cruise market, it may seem surprising that established industry players are slow to arrive. An underdeveloped market is challenging, of course. But those who come with open minds and the intention of supporting its sustainable development in the widest possible sense can expect many interesting opportunities. Our experience as first movers highlights some of the issues that we at Fincantieri China, and all others who wish to be involved in the Chinese cruise industry, have to look forward to.

2017 saw us make some major breakthroughs. In February 2017 in Beijing, in the presence of the President of China, Xi Jinping, the President of Italy, Sergio Mattarella and the CEO of Fincantieri, Giuseppe Bono, together with the CEO of Costa Group, Michael Thamm and the CEO of the CSSC, Wu Qiang, we signed a MOU for the construction of two ships in China dedicated to the Chinese market, with an option for an additional four. With the first delivery scheduled for 2023, the two Vista-class ships will be adapted to the Chinese market and built at the CSSC-owned SWS yard in Shanghai.

Building the first cruise ship ever in China is ambitious and requires a solid and reliable supply chain. That is why in May 2017 we signed a Letter of Intent with Su Ping, District Vice Director of Baoshan, and Chen Qi, Vice President of CSSC, for collaboration on the development of the cruise industry supply chain in Baoshan industrial park near Shanghai. The aim is to build a major hub for the cruise and other maritime sectors, attracting suppliers with preferential policies such as financial support, a fast visa process for workers or advantageous rates for land.

When you look at the figures, it seems extraordinary that we are only now building the first cruise ship in China. The market reached 2.1 million passengers in 2016 and is now the second biggest after the US. If you compare the penetration rate of the US market (3%, or around 12 million people) to the one of the Chinese market (a country with 1.4 billion citizens), you can see there is still huge room for growth.

A project to boost the country's cruise industry - not just ships and passengers but the entire ecosystem,



Majestic Princess - Courtesy of Fincantieri



Costa Venezia - Courtesy of Costa Asia

from supply and logistics to ports - is massive and both requires and enjoys the support of the Chinese government. Supporting the cruise industry will help upgrade the country's shipbuilding capabilities in general, an aim outlined in the "Made in China 2025" plan. The government also sees cruising as a way to push up internal private consumption and create a more sustainable GDP structure. That's why it's important, firstly to become a preferred partner of the Chinese government, and secondly to widen our vision to encompass all aspects of cruising and not just building, converting and repairing the ships.

You might wonder why Chinese and other Asian shipbuilders don't yet have a strong foothold in the cruise shipbuilding sector. The answer is simple: experience. Since delivering its first modern cruise ship in 1990, Fincantieri has built 80 cruise ships and developed experience in design, engineering and supply chain management. It will take Asian shipbuilders time before they can close the gap with European ones, especially with regard to complex supply systems and flexibility during production. With our experience, we can help the Chinese cruise industry in this path.

The biggest players in the cruise market are involved in China, but business conditions should improve in order for the full potential of the market to be exploited. The start-up phase for a company in China is certainly challenging and can be a cultural shock for outsiders. Regulations can change rapidly, investment in infrastructure is needed, and sales distribution channels must be aligned with Western standards if we wish to see sustainable future growth.

As the industry is still in its infant stages, we don't yet have much information about the demands of Chinese and other Asian passengers. Some cruise operators have started to customise ships to local needs, for example more restaurants for regional cuisines, less exposure to the sun and bigger casino and retail spaces. Only time and experience can help us refine our designs. At the same time, we must adapt to global trends such as the fast-evolving expectations of millennials. Ships

must become "smart", with fast internet and digital services. This is a challenge that the shipbuilder and cruise operator will have to face together.

Facing challenges together is essential if we wish to support China in growing its cruise industry. Some principles of doing business are fundamental, such as trust, reliability and mutual support. Working together as partners with a wide vision and a long-term commitment will ensure that all players - and passengers - benefit from the massive potential of the Chinese cruise market.

FABRIZIO FERRI

Fabrizio Ferri is the CEO of Fincantieri China, a wholly owned foreign enterprise established in Shanghai in 2015 to better develop the Group's activities in the Chinese market. In this role, he was in charge of negotiating the 2016 Joint Venture Agreement between Fincantieri and CSSC for the construction of the first cruise ship in China dedicated to the Chinese market. This was followed in February 2017 by an MOU for the construction of two ships and in May 2017 by a Letter of Intent for collaboration on the development of the cruise industry supply chain in Baoshan industrial park.

Fabrizio joined Fincantieri in 2012 as Head of the Strategic Marketing department for the cruise business unit. Prior to Fincantieri, Fabrizio worked in China for three years in the industrial and marine crane sector for a company of Severstal Group, where he started up and managed its Chinese branch. Fabrizio has also worked in the automotive industry in the USA and Spain.

Fabrizio Ferri holds a degree in Mechanical Engineering from the Italian University of Bologna and an MBA from HULT International Business School in Boston, USA.

Designing for the future

Interview with Marco de Jorio, De Jorio Design International



Naval architects and designers have always played a strategic role in the cruise industry, but never more so than now. New markets, new technologies, new ship design concepts are appearing at a dizzying speed. Working alongside technicians, marketers, engineers and consultants of all kinds, we are called on to produce ever-more impressive visions of the ships of the future.

The real challenge is to interpret complex and diverse projects - like those of our main client, MSC Cruises - in a way that is both innovative and reliable. Efficiency, experience and professionalism have never been so important, because deadlines are tighter, standards are higher and passenger expectations are changing fast. Ships are larger and more complex, engines more efficient, onboard spaces more daring and spectacular. This inevitably poses greater technical challenges, but ones that are exciting to solve.

A recent trend is to blow up the traditional closed box shape that previously dominated cruise ship design. The idea is achieve a better relationship between indoor and outdoor spaces and help passengers rediscover the

pleasures of fresh air and the sea. New forms of ships have emerged, characterised by a kind of steel explosion in the ship volume. For engineers, this is a challenge in terms of structure and stability, but for interior designers and architects, the extra space offers endless possibilities for different configurations and more dynamic flows. Wider public spaces - because width is more important than length - help designers maximise comfort and offer better services and entertainment.

Achieving maximum comfort, which on ships equates to luxury, is a design mantra. However, the concept of comfort varies according to different people, nationalities and generations. Market analysts try their best to guess what future passengers will expect in terms of atmosphere and style. In truth, between the initial concept and the final delivery of the ship, preferences may change many times and in unpredictable ways.

We live in the "instant" age of images and social media, when a particular style element is "liked", spreads like wildfire over social networks and then quickly goes out of fashion. Our challenge is to focus on timeless design



MSC Seaside - Courtesy of MSC Cruises - Photo by Ivan Sarfatti



MSC Seaside - Courtesy of MSC Cruises - Photo by Ivan Sarfatti

that survives changing moods and keeps passengers engaged day after day, year after year.

Looking ahead, I expect to see more demand for themed ships dedicated to specific experiences. Right now, the largest cruise ships are packed with a huge variety of experiences: spas, casinos, water-based activities, gourmet restaurants, wine tasting, playgrounds for children, teenage areas, shopping centres and so on - all competing for attention on the same massive ship. But when you try to satisfy all possible desires of all types of passenger, you don't fully satisfy anyone or anything.

In the future, therefore, there may be demand for shorter and more specialised cruises. Perhaps a casino and retail ship in Asia, a Disney-style theme park ship for families, a gourmet ship offering itineraries around Italy and France, a floating spa... If this prediction comes true, it will be mostly appreciated by millennials and growing markets like China rather than the current generation of traditional cruise passengers or niche markets like expeditions. And if it comes true, it will lead to a revolution in ship design and great innovation in shipbuilding concepts.

We are lucky that, thanks to an increasingly strong culture of safety and a wide range of certified high-tech materials, we are never tempted to adopt an unsafe interior design solution. But we designers do love to push the boundaries. Not always physical boundaries and regulations, but perceptive boundaries and the limits of the imagination.

In constructing a ship we collaborate with many experts, engineers and consultants, each with an important role to play. There are so many steps between conceiving and finalising the design - structural layout, technical aspects, management issues, elements like air conditioning, electricity, safety, catering, entertainment, retail spaces, and so on. The final vessel combines an infinity of aspects that may originally have seemed incompatible, but which you have worked together with other specialists to resolve.

In our recent projects regarding MSC Seaside and MSC Seaview, built by Fincantieri in Monfalcone, RINA offered invaluable support in matters ranging from layouts and fire escapes to enhancing cutouts. We have always found RINA experts to be capable of listening and imagining innovative ways to translate new design demands into reality. I'm looking forward to working with RINA on the next two Seaside EVO Class ships as well as the forthcoming new generation of cruise ships - and only time will tell exactly what they will look like.

MARCO DE JORIO

Marco de Jorio is President, CEO and Head of Interior Design of De Jorio Design International Srl, a leading company in top-end interior and exterior design for luxury cruise ships and mega yachts.

Born in Rome in 1962, Marco de Jorio studied at the University of Architecture in Genoa and Rome. In 1986 he joined Studio de Jorio, a company founded by his father, renowned architect Giuseppe de Jorio. He went on to found De Jorio Design International in 2000, along with his father Giuseppe and his brother Vittorio de Jorio.

Known for his innovative approach, creative designs and high level of technical expertise, Marco de Jorio has 30 years of experience in marine projects of all types, from ferries to cruise ships and yachts.

Fast growth: a good challenge to have

Interview with Gianni Onorato,
CEO, MSC Cruises



MSC Cruises has a similar challenge to the cruise industry as a whole, and it's a really good challenge to have. That is, how to expand rapidly yet sustainably, tapping the huge potential of new regions and markets while maintaining high standards and values.

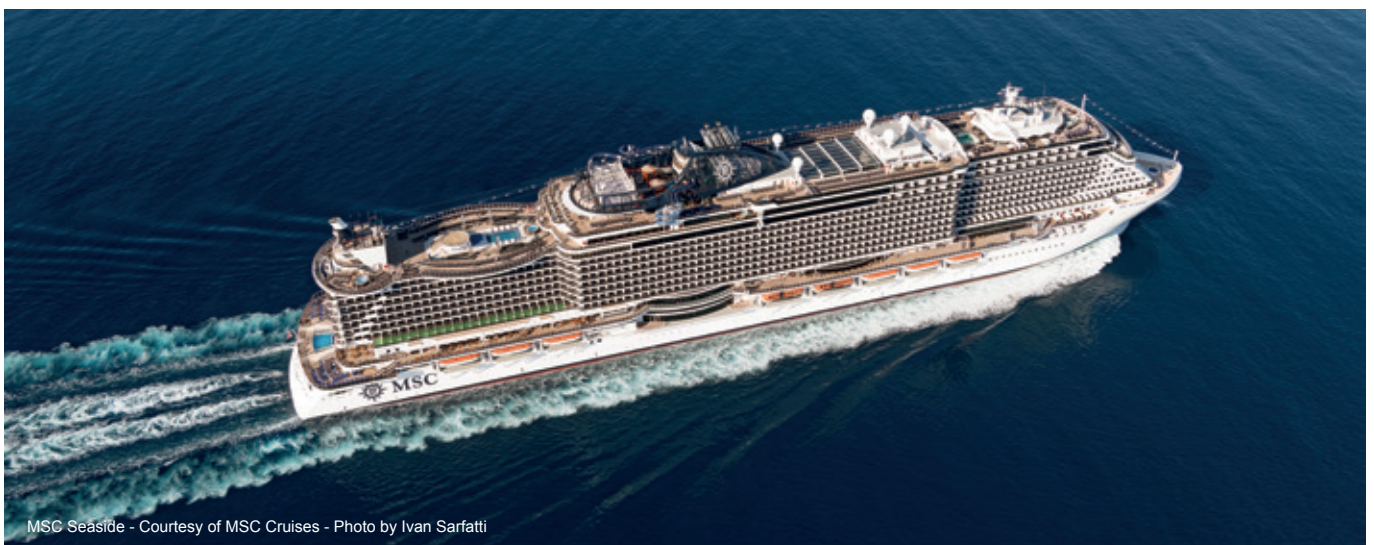
After four years of internal consolidation work, MSC Cruises has started growing once again, with two new cruise ships coming into service in 2017. Another 10 vessels will have followed by 2026, doubling the size of our fleet and tripling our passenger capacity. One of our key challenges is to absorb such an incredible expansion. To support this growth, we are engaging thousands of new employees, both onshore and on board our ships.

This is really a great challenge to have. Thanks to our newbuilding programme, we are now in a unique position to strengthen our presence around the world. In fact, with the entry into service of MSC Meraviglia and MSC Seaside, this is already happening, as it allows us to deploy some of our best tonnage in key markets including North America, the Caribbean and Asia.

This rapid expansion is not limited to MSC Cruises: the industry as a whole has huge growth potential. In the US, the world's most important cruise market, cruising barely accounts for 3% of holidays. In Europe it's 2%, and less than 1% in the rest of the world. If you couple this with the high competitiveness of our offering, the potential for the cruise industry to keep growing around the world is virtually limitless.

The increasingly mainstream, democratic nature of cruising will keep fuelling this growth. Long gone are the days when going on a cruise holiday was a rare luxury only accessible to very few people. Following decades of sustained and sustainable growth, cruising has become a highly competitive and affordable leisure product within everyone's reach.

Some geographical areas will see more growth than others, of course. At MSC Cruises we see potential in both mature and developing markets. For example, despite some talk of market saturation in North America and the Caribbean, we see our expansion in this region as a top global priority. To this effect, we



MSC Seaside - Courtesy of MSC Cruises - Photo by Ivan Sarfatti



MSC Seaside - Courtesy of MSC Cruises - Photo by Ivan Sarfatti

have permanently deployed MSC Seaside out of Miami following her entry into service in December 2017, joining MSC Divina. MSC Meraviglia will also be based in Miami as of 2019. We are also working to expand our presence in Asia, extending our presence from the Arabian/Persian Gulf to India and the South China Sea.

Given this worldwide potential, many cruise operators are now considering their strategies to enter new markets. I must say that we have had success in this area. Having only started operating purpose-built cruise ships in 2003, MSC Cruises was a latecomer to the cruise industry. And yet, we managed to become the number one cruise line in Europe and the Med in 10 years, while also developing operations across the world. Our approach when entering a new market is to innovate, go the extra mile in terms of offering the best possible service to our guests, and differentiate our product carefully.

Unlike other global players, MSC Cruises always operates under the same brand, no matter where. Ours is an international, inclusive product open to all nationalities and languages. Of course, we always adapt the offer to suit local tastes. This includes food, entertainment, itineraries and the languages spoken on board. With the Miami-based MSC Divina and MSC Seaside, for example, we have the essence of the Mediterranean adapted for North America. Among other things, we are now offering a richer entertainment product including American stand-up comedy and dining offerings to suit North American tastes.

Like the industry as a whole, as we expand we mustn't forget our obligation to continue minimising our ships' environmental footprint. To protect the sea and the marine environment, as well as our way of life, we are heavily investing to make every new generation of cruise ships greener than the previous one. We are also in the process of retrofitting our existing fleet with innovative environmental solutions, such as advanced exhaust cleaning systems and a range of energy efficiency measures.

I believe the trends of democratisation and expansion into new geographical areas will continue. As long as we continue to absorb this expansion steadily and sustainably, we can look forward to seeing more cruise ships sailing our seas, offering more exciting products and serving more destinations around the world.

GIANNI ONORATO

As CEO, Gianni Onorato oversees MSC Cruises' business from its Geneva-based headquarters and reports to the Company's Board of Directors and to its Executive Chairman.

With over 30 years' experience in the cruise industry, Mr Onorato has a finely developed understanding of the cruise business and extensive experience in senior executive leadership, having served as President of Costa Cruises from 2004 to 2013.

Born in Italy, Mr Onorato graduated from Naples' Istituto Orientale with a degree in Foreign Languages and Literature in 1983, and then specialised at SDA Bocconi School of Management in Milan and INSEAD in Fontainebleau.

Mr Onorato began his career in 1986 at Costa Cruises as Food and Beverage Manager before becoming Cruise Product Director. From 1997 he served as Vice President & Cruise Operations Director and was responsible for logistics and provisioning, as well as all activities relating to calls, excursions and hotel operations.

Unique experiences at sea and ashore

**Interview with Ana Karina Santini,
Director Commercial Development EMEA,
Royal Caribbean Cruises**



The word “cruising” evokes an image of a ship sailing on the open seas, naturally turning our focus to the passengers’ onboard experience. Equally if not more important, however, are the ports of call and what happens when the ship arrives at a destination. Our department has been working tirelessly since the late ‘90s to develop destinations and port facilities whenever there is the need to improve our guests’ shore-side experience or when our ships need infrastructure that is not in place.

The trend towards bigger ships makes it more essential than ever to help destinations make the necessary adjustments to their port infrastructure and facilities. There are many big ships on order, not least our Symphony of the Seas, which at 230,000 GT is the largest passenger ship ever built. She is the fourth in Royal Caribbean’s Oasis class of ships and will spend April running her first voyages between Barcelona and destinations in Italy and France.

Naturally, ports of call need to have the capability and necessary services to host this new generation of ultra-

large cruise ships. That is why we are always available to help strategic destinations improve their facilities. Developing port infrastructure is a long-term process and one that requires a stable system in terms of rules, bureaucracy and strategic vision. Thankfully, most local authorities and partners understand the benefits of cruise tourism and are generally keen to commit to a business model that can persist over time.

Inevitably, not everyone is so happy about cruise tourism. When big ships call at historical European cities, temporary overcrowding - or sometimes just the perception of it - can cause controversy. It is therefore in everyone’s interest, including the interest of passengers, the cruise line and local authorities, businesses and citizens, for us to work together with ports and destinations to identify mutually beneficial solutions.

A big part of this is providing accurate information to educate local authorities and citizens about the positive impact of cruising on destinations. We also need to highlight the fact that cruise visitors represent



The magic carpet of Celebrity Edge - Courtesy of Royal Caribbean Cruises



Harmony of the Seas - Courtesy of Royal Caribbean Cruises

a very small percentage of the total number of tourists, who mostly arrive by plane, train, bus or car. The Cruise Lines International Association (CLIA) is doing some incredible work in this area with key historical destinations in Europe.

No matter how fantastic the destinations and how well planned the itinerary, the onboard cruise experience also has to match guests' expectations. In this sense, we really listen to customers and stay one step ahead in terms of the variety of activities on board and technological innovation. Symphony of the Seas, for example, has a first-of-its-kind, two-deck family suite with a slide between floors. On the digital side, the Royal Caribbean app has been enhanced to allow passengers to order drinks wherever they are on the vessel, reserve shore excursions and make dinner reservations. Guests can also track their luggage on the app from the time it arrives at the pier until it is delivered to their rooms.

This type of digital facility is very attractive to young people, who are increasingly becoming an important market segment for us. Curious, eager and social, they often seek an active and fun holiday. We need to serve them with challenging destinations and experiences, as well as catering to totally different market segments such as high-spending guests who opt for premium holiday packages and longer itineraries. That is why we are happy to have a wide range of ships and brands that are able to satisfy the different types of markets. Our fleet keeps on growing to cater to these varied needs. As well as the Symphony of the Seas, we are also excited about the introduction of Azamara Pursuit in Europe in August this year and Celebrity Edge in Fort Lauderdale in November.

Each of the Royal Caribbean brands performed excellently during the past year, raising their guest satisfaction and employee engagement scores to new heights. Boosted by continued demand from North American and European guests, a positive outlook for our Asia Pacific products and consistently strong onboard spend, we are looking forward to our ninth consecutive year of growth.

It takes teamwork and creativity to solve the complex and evolving challenges faced by a growing cruise company in today's every-changing world. But I enjoy that immensely, as I enjoy the satisfaction when a new ship sails. The signs are positive that all of us at Royal Caribbean will be enjoying many more satisfying times in the years ahead.

ANA KARINA SANTINI

Born in Argentina, Ana Karina Santini is the Director Commercial Development EMEA for Royal Caribbean Cruises (RCL), assisting with strategic port developments and serving as RCL's representative on the Boards of Directors for operators in the EMEA region.

Her career started with several successful years as Secretary General of MedCruise and Commercial Representative for the Port of Buenos Aires in Genoa. In 2003 she opened her own firm, providing consultancy activities in the cruise sector for the Mediterranean and Latin America regions.

Before transitioning to her current role in 2017, Karina worked for RCL as an external consultant for Italian PR and Communications and later for the Commercial Development department, supporting RCL joint ventures in the Mediterranean.

She has a degree in Political Science & International Relations from the University of Córdoba, Argentina and a Masters in International Cooperation from the University of Bologna, Italy. She has studied at the European Commission's Directorate for International Cooperation and has a second degree in Political Science with an economics focus from the University of Genoa, Italy.

Sustaining the golden age of cruising

Interview with Arnold Donald,
Global Chairman, CLIA & CEO, Carnival Corporation



There's a magic to cruising – an emotional connection to the sea and an excitement about sailing on the open water and experiencing new people, places and cultures. This is an industry built on dreams of faraway places, new experiences, bringing a family closer together, getting away from the ordinary. And it's the job of all of us at CLIA, including our members, to make those dreams come true. During my first year as Global Chairman of CLIA, I've had the opportunity to work with the team to showcase that message and I'm proud of our achievements so far.

We are in a golden age of cruising. The industry is performing well and ships are sailing full. More than 27 million people are expected to take a cruise in 2018 and the number of cruisers has increased by more than 20 percent in five years. Brands are differentiated, offering a wide variety of experiences to different market segments, so everyone can find the right cruise for them. The keys to unlocking further growth are to better communicate the tremendous experience and value of cruising and to exceed the expectations of guests when they are onboard.

One trend we've seen is an even greater focus on sustainable tourism. Cruise travellers can now participate in sustainable practices from recycling to "voluntourism" initiatives. We've also seen the next evolution of experiential travel, such as indulging in local cuisine, taking guided tours through small villages and even visiting private homes. The cruise industry is responding to the trend for wellness vacations with onboard health seminars, custom fitness programs, stress management and spa services.

Travel agents continue to see steady demand, which is great for the cruise industry as they are key in helping travellers find the right brand, ship and itinerary. This will help ensure they have an extraordinary experience that will not only keep them coming back for future trips, but also turn them into advocates for cruising. The more we can help our travel agent partners make the process of choosing and booking a cruise easier, the more successful our industry will be.

In terms of technology, a big area of innovation involves transforming the total guest experience, from dining



Costa Smeralda - Courtesy of Carnival Corporation & plc



Ruby Princess - Courtesy of Carnival Corporation & plc

and entertainment to innovative ship designs and smart uses of space. Several cruise lines offer wearable technology that interacts with sensors and does everything from turning the lights on to acting as a security agent. As technology continues to transform the industry, industry members are making an effort to ensure its safe implementation. The International Association of Classification Societies has been key in working with industry groups to establish cyber security guidelines.

The industry continues to expand to emerging markets including China, which we expect will one day be the largest cruise market in the world. Looking at the broader picture, all markets are under-penetrated. We make up less than two percent of hotel rooms across the globe. So as we continue to generate awareness of cruising as an extraordinary vacation at an exceptional value, we have a tremendous potential for growth.

What role does CLIA play? By definition, CLIA is the unified global organisation helping the cruise industry succeed by advocating, educating and promoting the common interests of the cruise community. One of our key areas of focus is to help member cruise lines reach the “new to cruise” segment. CLIA and its members seek to educate policymakers in many cruise-related areas of public interest and work to facilitate legal and regulatory frameworks that will foster continued, sustainable growth in cruising.

The importance of sustainability to our industry is worth emphasising. While cruise ships comprise less than one percent of the global maritime community, cruise lines are at the forefront of responsible environmental practices and technologies. Among the industry’s advancements are exhaust gas cleaning systems and the first-ever LNG-fuelled passenger ships. Cruise lines will also implement Ship Energy Management Plans to further reduce fuel consumption and carbon emissions. CLIA members routinely post online sustainability reports and are among those participating in IMO working groups to develop global regulations to protect the environment.

Classification societies conduct inspections and set strict safety and environmental guidelines for design, construction and operation. They are therefore critical partners to CLIA in helping advance cruise ship safety in a coordinated and focused manner. Instead of each entity working on the same issues separately, we believe the strength lies in working together and anticipating the operational and technical issues that make these magnificent ships as safe and sustainable as possible.

ARNOLD DONALD

Arnold Donald has been President & CEO of Carnival Corporation & plc, the world’s largest leisure travel company, since July 2013. Prior to that, he served on the board for 12 years. In January 2017, he was appointed Chair of Cruise Lines Industry Association (CLIA). He currently serves on the board of Bank of America Corporation and Crown Holdings, Inc.

Mr Donald spent more than 20 years at Monsanto Company as Corporate Senior Vice-President, President of the consumer and nutrition sector, and President of the agricultural sector. Following Monsanto, Mr. Donald was Chairman of Merisant Company, which manufactures leading global sweetener brands Equal and Canderel.

Immediately prior to Carnival Corporation, Mr Donald was President and CEO of the Executive Leadership Council, a professional network and leadership forum for African-American executives of Fortune 500 companies, and President and CEO of Juvenile Diabetes Research Foundation International, the world’s largest charitable funder of diabetes research.

Hydrogen and fuel cells for a decarbonised future

In the last decades, and especially in recent years, reducing emissions of air pollutants from ships has been a major challenge for the marine industry. There are numerous pollutants to consider: ODS, NOx, SOx, PM, greenhouse gases such as VOC and CO2, LNG leakages and methane slips. In particular, reducing CO2 is on the agenda of current and near-future actions to be implemented.

The target of many studies is clear: zero carbon emissions. This is hard to achieve, because of course, burning fuel to operate ships produces CO2. Fuel cell technology may help in reaching this target. Fuel cells use air and hydrogen to produce electrical energy, heat and water.

From a technical point of view, fuel cells offer high levels of efficiency, including at partial load, plus low noise and vibrations. The cost of revision and maintenance is also low as there are no moving parts. Fuel cells operating with hydrogen produce no emissions, and they can operate with other fuels with either no or low emissions of pollutants.

Their modularity enables high-redundancy generation systems, decentralised electrical power generation and thermal energy management. These are very interesting aspects, particularly in passenger ships.

However, there are some challenges to overcome. The cost of the initial investment is still high. Issues around the availability and cost of fuel (hydrogen or methanol, etc.) need to be solved. Regulations for

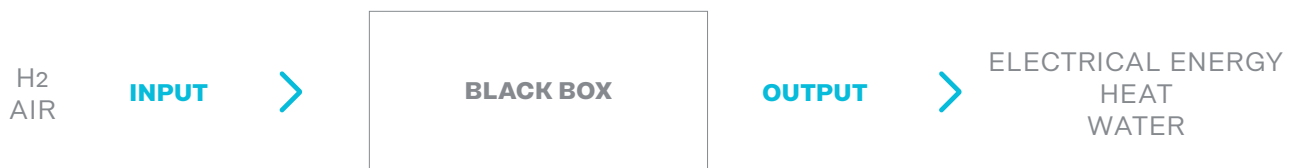
ship designs and systems need to be set in place. Procedures for fuel handling and bunkering also need to be developed and approved.

Safe handling of very low flashpoint fuels like hydrogen and methanol means paying close attention to safety issues. Many ship systems and components are affected, from bunkering to fuel storage systems, from fuel transfer to ventilation, plus inerting and cooling systems and the electrical distribution system.

Spaces, systems and components related to these new technologies should be designed taking into consideration the general principles of existing rules (e.g. IGF Code). Where such rules are not specific or not applicable, Alternative Design techniques may be used following an alternative risk-based approach. In addition, we need to develop systems with higher energy density, which will help to reduce costs, and better bunkering infrastructure.

In 2010, RINA certified a prototype experimental vessel propelled by two electric motors supplied by hydrogen fuel cells. We are working on other three relevant projects. In addition to being active in the development of LNG as a marine fuel, RINA is ready to support any new project involving low flashpoint fuels (methanol, hydrogen etc.) and innovative systems (fuel cells, lithium batteries) for producing electrical energy on board a ship.

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Ultra-luxury yachts sail into the market

The world of luxury cruises is taking a new turn in the quest to reach ever-greater heights of opulence. Passengers demand pampering, with sumptuous accommodation and dining, a higher passenger/crew ratio, more personalised itineraries, more exotic destinations by ocean or river and more activities both onboard and ashore. Soon they will be able to do this aboard yachts that are designed to withstand transatlantic voyages and polar conditions, and can dock in quiet, untouched ports too small for cruise ships.

This new niche market segment of yachts that accommodate from 100 to 400 passengers is dedicated to high-end voyage seekers in search of wellness, fitness and personal healing, or an expedition getaway. Younger people, especially millennials, are also moving towards this type of vacation because of the exclusive experience it offers.

Sought-after destinations include smaller ports in the usual "retreat" regions, such as the Caribbean, the Americas, the Mediterranean, Africa and the Pacific Islands, as well as Antarctica, the Arctic, the Galapagos Islands, Asia and the Indian Ocean. Activities are carefully tailored to the passengers' wishes, whether that's relaxing or exploring. Prices can range from €2,000 to €35,000, and can last as little as four days or as long as a month.

Companies like Silversea Cruises, Crystal Cruises and Seabourn Cruise Line have already been exploring these waters, offering itineraries virtually anywhere

in the world. But new smaller players are entering the scene. Scenic's Eclipse, a "6-star" discovery yacht built by Uljanik Group in Croatia, will debut in August 2018. The yacht will have the Ice Class 1A Super rating that enables it to navigate through Arctic and Antarctic waters in summer, as well as the Polar Class 6 rating, the highest passenger ship ice-class rating, to navigate safely in challenging seas. The contract between manager and shipyard includes the option of a sister ship to be delivered in 2019.

Land-based luxury hotel groups are also starting to look out to sea. The Ritz-Carlton group has announced that reservations for its "The Ritz-Carlton Yacht Collection" will open in May 2018. This new venture combines the lifestyle of the resort with the casual freedom of yachting. Yachts will be available not only for cruising but also for private chartering. The group has partnered with Spanish shipyard Astillero Barreras for the delivery of the first yacht in 2019, potentially followed by two more in 2020 and 2021.

Exclusive destinations, tailored itineraries and ultimate pampering. The orderbook may still be small, with three confirmed yachts at a total investment of €450m, but the potential is large. The ultra-luxury yacht segment may soon start to make waves in the cruise industry.

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Scenic Eclipse - Courtesy of Scenic Luxury Cruises & Tours

RINA's new digital platform, CUBE

Launched in December 2017, RINA's Cube is a cloud-based platform for gathering and integrating data and digital assets from various sources, including shipyards, owners, manufacturers and port authorities. The user-friendly platform is designed to help anyone needing to manage their assets more efficiently, from the biggest cruise operators to the smallest niche companies.

Built to interact seamlessly with other technologies, Cube is simple to implement inside a company's existing digital ecosystem. The main aim is extract value from data and optimise processes from day one. This is particularly vital for the cruise industry, with its high-value assets and competitive market conditions.

Basically, Cube sharpens the process of gathering and analysing data in order to draw actionable insights. It helps to optimise any complex process involving many variables. As well as predictive maintenance, insights from Cube could relate to route optimisation, trim optimisation, multidimensional benchmarking, energy efficiency and many more depending on the services chosen from the Cube marketplace.

Cube works with large amounts of data from navigation, communication, maintenance and automation systems. In addition, Cube is capable of integrating and managing manually entered information and unstructured or external data such as engineering and design information, inspections, weather forecasts, security systems, maintenance histories, financial information and even social media.

The fact that ships collect vast amounts of data is not new, but in many cases, not much happens to this data. Cube offers a painless way to process the vast floods of information intelligently and produce useful insights to help its users gain a competitive advantage.

Cube's capabilities and features are based on an "as a service" approach: applications, tools, data and business intelligence reports are available through a cloud portal customised for each user. Users with the appropriate access rights can log into the portal at any time to check the data and insights that concern them. It goes without saying that these are safely stored and clearly presented – which will be music to the ears of busy cruise operators and engineers needing to make important decisions about their assets and operations.

Cube is part of an ambitious technology development programme at RINA, which recently rebranded its logo to reflect its long history of experience and its ability to innovate for the future. Digital innovations either already in use or close to being launched include digital twins, virtual immersive training courses and digitalised certification systems.

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Silver Cloud passes the Polar Code

RINA issued the first Polar Code certificate to the Silversea expedition cruise vessel, Silver Cloud, in October 2017. The Silver Cloud underwent structural strengthening works as well as refurbishments and upgrades required by the Code.

RINA reviewed the relevant documents, including the Polar Water Operational Manual (PWOM), a mandatory manual to be kept on board that contains the ship's characteristics and the procedures implemented by the crew in both normal and emergency operations. RINA experts then carried out extensive surveys and were able to ascertain full compliance with the Code.

Officially named the International Code for Ships Operating in Polar Waters, the IMO Polar Code entered into force on 1 January 2017. It is mandatory under SOLAS (new Chapter XIV) and MARPOL (Annexes I, II, IV and V) and is applicable to all ships operating in polar waters.

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Courtesy of Silversea Cruises

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RINA Corporate Image®

Cover photo: MSC Seaside - Courtesy of MSC Cruises - Photo by Ivan Sarfatti