

THE WINNING EQUATION

EXPLORER OF THE SEAS AND ROYAL CARIBBEAN'S MEGACRUISE SHIPS

BY RICHARD H. WAGNER

(Originally published in *The Log*, Navy League of the United States, New York Council, Spring 2007)

EXPLORER OF THE SEAS is Royal Caribbean International's primary entry into the New York cruise market. In 2007, the ship will begin sailing from the Liberty Cruise Ship Terminal in Bayonne, New Jersey on a year-round basis to destinations such as Bermuda, the Caribbean and Canada. This follows a successful season in 2006 during which EXPLORER sailed from Bayonne for part of the year.

By deploying this one ship to New York, the world's second largest cruise line has become a major player in this market. This is because EXPLORER is one of the world's largest cruise ships - a megacruise ship at 137,308 gross registered tons, capable of accommodating 3,835 passengers. In fact, she is larger in terms of gross tonnage than any passenger ship in service except Cunard's QUEEN MARY 2 (See *The Log*, Winter 2006 at p. 17) and fleet-mate FREEDOM OF THE SEAS (See *The Log*, Summer 2006 at p.9). (FREEDOM's sister ship, LIBERTY OF THE SEAS, will also be larger when she goes into service in May).

Royal Caribbean is well-known for its large cruise ships but it does not build such ships merely to awe the public. As we shall see, they are key to

Royal Caribbean's business strategy. "These have been a huge success. We wouldn't continue to march down the path toward large vessels if it wasn't something that we weren't more than 100% convinced was the right thing to do from a business perspective," commented Captain William Wright, Royal Caribbean's Senior Vice President, Marine Operations, when *The Log* spoke with him onboard EXPLORER.



EXPLORER OF THE SEAS at the Liberty Cruise Ship Terminal in Bayonne, New Jersey. (Image: R.H. Wagner).

The Line

In order to put Royal Caribbean's strategy in perspective, it is necessary to look briefly at the growth of the line. Royal Caribbean was born in the late 1960s when an American, Ed Stephens, flew to Oslo, Norway, with the hope of interesting

Norwegian businessmen in investing in a company that would offer Caribbean cruises out of Miami on ships that were expressly built for that purpose. At that time, there were a few pioneers offering cruises out of Miami but they were using ships that had been designed for other roles. For the most part, these were ships that had once competed in the transatlantic passenger market, which had been all but wiped out with the advent of commercial jet service to Europe. Stephens recognized that the calm waters of the Caribbean did not require ships with the strength needed to handle the rigors of a transatlantic crossing. A Caribbean cruise ship could be lighter, which would create fuel savings and shallower draft, which would allow it to enter more island ports than the former ocean liners. Furthermore, the ships could be less streamlined, more box-like, and thus able to carry more passengers and have more revenue producing amenities in the same physical space.

Stephens also saw the jet airliner, not as an enemy, but as a key to the future success of the cruise business. Instead of marketing the cruises just to Florida residents as the other lines were doing, the new company would sell its services nationwide, offering cruise packages that included air travel to Miami.

Norway was a good venue for seeking potential investors because a number of Norwegian businesses had done very well in the oil tanker and cargo ship businesses and were looking for ways to expand. Also, with the discovery of North Sea oil, the country was poised for growth. Stephens convinced three large investors, I.M. Skaugen, S/A, Anders Wilhelmson and

Company, and Gotas Larsen Shipping Corporation, to form a partnership. The resulting company was called Royal Caribbean Cruise Line and was incorporated in 1968.

By 1972, Royal Caribbean had three purpose built cruise ships in operation, each of approximately 18,000 gross tons and carrying about 750 passengers. The concept proved a success and these ships are viewed as the prototype for all subsequent cruise ships.

Other companies and businessmen saw the potential of the cruise ship business and adapting some of Royal Caribbean's ideas as well as developing their own, they too began to flourish. As the industry grew, Royal Caribbean was placed in the position of having to expand to meet the competition.

The traditional way a passenger ship company expands is by acquiring more ships. However, the more hulls a line operates, the greater its cost of operation. For each ship in the fleet, there is the cost of a crew, fueling the ship, docking fees, etc. From an operating cost perspective, it thus would be more efficient to somehow grow the line's capacity by increasing the passenger capacity of its existing ships rather than purchasing more ships, provided that the cost of increasing the capacity of the existing ships was less than or equal to purchasing more ships.

Accordingly, Royal Caribbean took a bold and innovative step in 1977 when it sent SONG OF NORWAY back to the builder. The Wärtsilä shipyard in Helsinki, Finland cut the ship in two and spliced a new 85-foot section in the middle, adding more passenger cabins. In 1980, NORDIC PRINCE was

similarly "stretched." While this had often been done with cargo ships, it had never been done with a passenger ship before. But, the experiment worked and Royal Caribbean was able to meet the competition with larger ships.

Of course, a line cannot expand indefinitely by chopping up and stretching its existing fleet. However, the same economics that led to the stretching of the two existing ships made it attractive to build bigger ships rather than purchase more ships of similar size to the existing fleet. Due to economies of scale, it is less expensive, for example, to operate one ship with a 2,000-passenger capacity than two 1,000 passenger capacity ships. As a result, in 1982, Royal Caribbean introduced SONG OF AMERICA, a 31,000 gross ton ship with a 1,400 passenger capacity - - one-third larger than the company's stretched ships.

The competition also began to build larger ships but Royal Caribbean was planning yet another revolutionary move. In 1987, it took delivery of SOVEREIGN OF THE SEAS - - the first megacruise ship. Her 73,129 gross tons were more than that of any prior passenger ship save only the superliners QUEEN MARY, QUEEN ELIZABETH, and NORMANDIE. It is important to recall that gross tonnage is a measure of revenue producing area, not physical weight. Thus, while SOVEREIGN OF THE SEAS was smaller in size than the largest passenger ships then in service, QUEEN ELIZABETH 2 and NORWAY, her more box-like structure enabled her to accommodate more passengers and have more revenue-producing amenities.

During the remainder of the 1980s and the early 1990s, Royal

Caribbean added to its fleet three sisters for SOVEREIGN as well as six slightly smaller megacruise ships. It also acquired Celebrity Cruises, which it operates as a separate premium brand. This acquisition resulted in a change in the company's corporate structure. A holding company, Royal Caribbean Cruises, Ltd., was set up to own Celebrity and a newly-formed subsidiary, Royal Caribbean International ("RCI"), which would operate the Royal Caribbean line.

Reflecting its new owner's business strategy, over the next few years, Celebrity would also be equipped its own with megacruise ships including the 90,000 gross ton Millennium-class. Four similarly-sized ships would also be built for RCI.

The competition was not idle and they too were building megacruise ships. In 1998, rival Princess Cruises unveiled the first cruise ship of over 100,000 gross tons, GRAND PRINCESS. However, Princess did not hold the record for long. In 1999, RCI eclipsed all ships then in service by a wide margin when it put the 137,000-ton VOYAGER OF THE SEAS into service. Four sisters would follow.

In 2003, Cunard's QUEEN MARY 2 became the world's largest passenger ship. Although QM2 also does cruises, she was designed to do transatlantic crossings and as such, Captain Wright sees her as being in a different category than the RCI ships. "There is a whole different look and feel about it. She has a much comparatively narrower beam, she is long, long and slender, and that is what gives her that extra speed that they need for the transatlantic routes. And, I think the ships just have a whole different feel to

them. Clearly, the Royal Promenade which we have here on the Voyager-class sets her in her own class by herself."

Nonetheless, in 2006, RCI introduced an even larger ship, FREEDOM OF THE SEAS. At 154,407 gross tons and serving up to 4,400 passengers, she is now the world's largest passenger ship. "FREEDOM for all intents and purposes is a stretched Voyager. It was purpose-built at that length."

The net result of this is that in terms of number of ships in service, Royal Caribbean with 34 ships in its two brands is approximately 40 per cent of the size of industry leader Carnival Corporation with its eleven brands. However, when looked at from the perspective of how many passengers each company is capable of serving, Royal Caribbean is approximately half the size of Carnival.



Captain William Wright is in charge of Royal Caribbean's Maritime Operations. (Photo: R.H. Wagner).

The ship

EXPLORER is the second of the five Voyager-class ships, going into service in October 2000. "There are very small technical differences but the overall design, [the Voyager-class ships] are identical. The deck schemes are different but the basic ships are identical." She is 1,020 feet long, 157.5 feet wide and has a draft of 29 feet. Her 1,185-member crew is Norwegian and international.

Royal Caribbean recognized that the Voyager-class ships were not just an evolutionary step in the development of the cruise ship but a leap forward that required some new thinking about the way a ship is operated. To begin, there would be a more formal approach to training the officers to run the ships. "We felt that because of the unprecedented size of the ship that it was appropriate to also do simulator training just as the airlines have done for many years. So, at our STAR Center in Dania, Florida, we actually replicated the bridge of the Voyager-class ships. Our officers, when they go there, take the normal bridge resource management training, which is interpersonal relationships. But they then also train on exactly the same equipment that they use onboard the ships. It's a ship-specific simulator, which is unique in the maritime world. Airlines have been doing it for years but I believe we are the only company, passenger or otherwise, that has actually made that kind of investment."

This more sophisticated approach to training reflected the fact that the bridges on these ships are not the traditional type where the officers have

to walk from one console or instrument to another to collect and process data but rather more closely resemble an airplane cockpit. The officers sit in high-backed chairs in front of a U-shaped console. Computer displays and the controls for the ship are within arms reach. Moreover, the systems installed such as the Dynamic Position System, which links navigational data with the propulsion systems thus enabling very precise handling and positioning, are state-of-the art. This type of bridge has now been standardized across the Royal Caribbean/Celebrity fleet. "When an officer goes from one ship to another it would be the same, the same technologies."

Along the same lines, Royal Caribbean decided to abandon the traditional propeller and shaft method of propulsion and rely upon the pod propulsion in the Voyager-class. "There is one what we call a 'fixipod' - - it is a pod but it does not move, it does not rotate. [In addition, EXPLORER] has two azimuthal pods which can rotate 360 degrees. They are pulling whereas the fixipod is pushing. The fact that they are pulling is a great advantage because the water, the environment that the propeller is working in, is much purer. Since it is a more laminated water flow that is hitting the propeller it is operating at higher efficiency. If we had the propeller at the end of a shaft the water that eventually reaches the propeller is somewhat turbulent because of the rotation of the shaft and the struts that are supporting the shaft, and that takes away the efficiency. We get about ten percent better efficiency by having the pods pull rather than push."

This also allowed Royal Caribbean to dispense with rudders on

these ships. "We steer by rotating the pods themselves. They are really fantastic. These vessels would be extremely challenging to maneuver if you didn't have azipods. You'd be very much more dependent on tugs. Here, for all intents and purposes we operate tug free even under challenging conditions."

EXPLORER has six engines giving her a maximum speed of 22 and a half knots. "She is a diesel electric ship so all the engines are used for power generation." Service speed varies from leg to leg of a cruise. "One of the things that we are paying a lot of attention to right now with fuel prices as high as they are now is to make sure that we have reasonable legs. Sometimes we depart a little bit earlier than we might have five or six years ago so we keep the speed down to more economic levels. We spend a lot more time now really scrutinizing our itineraries for overall economy"

The increase in the cost of fuel has required Royal Caribbean to adapt in other ways. "We have eight ships in total [RCI and Celebrity] that are gas turbine ships. It is a fantastic technology, we love it, but it is expensive. It is so expensive, in fact, we are just getting started on a project where we retrofit a diesel generator on all these vessels. It is a hugely complex project. That will give the [captains] the opportunity to run the diesel when they are in port. [In addition,] the captains, in certain confined water, like to have two turbines running, not for speed but just so in case they lose one, they would have the other one. Now, they could get by having the diesel there. It would give them some steerage, some flexibility, even if they lost the one gas turbine. It's going to be about \$15 million a ship. We

found the room [for the equipment] but it is complicated. A lot of other systems have to be re-directed, the piping arrangements - - it is a huge project. In many ways, it is more complicated than stretching the ships."

One of the most striking features of a megacruise ship is how high they are. Seemingly, if traditional construction materials were used, such ships would either become top heavy and thus unstable or else have to have a compensating weight at or below the waterline that would produce such a deep draft that they would not be able to enter or dock in many of the most attractive cruise ports. "We have a lot of aluminum on the upper decks. The yard has actually developed a technique where they can actually weld aluminum and steel. As the ships become higher then you try to reduce as much weight in the upper decks as possible."

Royal Caribbean envisions that it will be able to sail ships like EXPLORER for 25 years but it is not the technology or the condition of the hulls that limits their usefulness to the line. "What we find happens is as we evolve our vessels, which is very positive, there is also a negative side to it. We tend to offer new amenities which then date our earlier vessels because the guests now expect them to be part of the ship. For example, if a guest has had a balcony cabin, they typically want to have a balcony cabin again. Ships that don't have balcony cabins or a large percentage of them [become] a product that is more difficult to sell when you have these new ships that have [balconies as well as other new amenities]. Typically, the fleet maintenance is 25 years. There is an after market that would be for a lower-

type, more economy-type cruising. That's where they go to."

Life on board

The megacruise ships are not merely bigger cruise ships with more passenger cabins than traditional ships. Rather, ships such as EXPLORER are intended to be full-pledged resorts at sea. Not only is this reflected in the wide variety of amenities on board but in the structure of the ship itself.

According to a company statement: "Royal Caribbean typically appeals to couples and singles in their 30s to 50s as well as family vacationers. The median age is low-40s Our guests are active travelers looking for an affordable, cost-effective vacation that's fun, relaxing and refined." In keeping with this, EXPLORER has such amenities as a rock-climbing wall, three pools, a basketball court, a miniature golf course, six whirlpools, jogging and in-line skating tracks, a golf simulator, and a large fitness spa. In addition, there are bars, discos, a large casino, and for the romantically-inclined, a wedding chapel. Dining takes place in two seatings in a three-deck high elaborately decorated dining room. There are also alternative dining areas, ranging from the informality of a Ben & Jerry's ice cream shop to an extra-tariff Italian specialty restaurant.

While Royal Caribbean seeks to appeal to people who are physically active, in addition to a large library, EXPLORER does have a feature that is definitely cerebral. In the Ocean and Atmospheric Laboratory, scientists from the University of Miami's Rosenstiel School of Marine and Atmospheric Science perform experiments and record

data regarding sea and weather conditions. Since EXPLORER is constantly at sea and has a regular itinerary, the onboard laboratory affords scientists an unprecedented opportunity to observe changing conditions on a routine basis. More than 100 scientific papers have been published based upon work done on EXPLORER. The scientists also give lectures and the laboratory is open to the passengers. "Tens of thousands of our guests have actually gone through the labs and the interactive Eco-Learning Center that we have on board. They walk away with a very positive experience. For us, it was a win-win. We are contributing to doing real, cutting-edge science that is meaningful while at the same time providing something totally unique to our guests," notes Captain Wright.

Structurally, the tremendous size of the Voyager-class allowed Royal Caribbean to create an interior mall that is four decks high, 394 feet long and as wide as a street. The Royal Promenade links two 11-deck high atria and is lined with shops, cafes, and various eating establishments. Windows from interior cabins look down at the street performers, parades, and parties that go on in this space. It makes the ship truly seem like a city at sea. If this were not enough, the ship is also big enough to carry a 60 by 40 foot ice skating rink as well as a four deck-high, 1,350-seat theater.

The Way Forward

Royal Caribbean currently sails to some 180 destinations around the world. By the end of the decade, the plan is to sail to 200 destinations. Moreover, future

expansion is not just measured by where a cruise line sails to but where it sails from. While Miami remains the "Cruise Ship Capital," the lines are racing to bring their ships closer to different groups of customers, positioning ships in ports that rarely saw a cruise ship just a few years ago. In such ports, "you put an emphasis on the drive-in market but certainly there will be many guests that will fly in."



The Royal Promenade in EXPLORER is four decks high and longer than a football field. (Photo: R.H. Wagner).

As noted earlier, one of the advantages of the megacruise ships is that they allow Royal Caribbean to become a major player in any market with one move. For example, the third largest cruise line, Norwegian Cruise Lines, has been developing the winter cruise market in New York since 2003 with two ships that have a combined passenger capacity of 4,210, offering cruises from New York to the

Caribbean. (See The Log, Winter 2005 at p.7). In 2006, Carnival subsidiary, Holland America Line, entered the market with the 1,918-passenger NOORDAM (See The Log, Spring 2006 at 9) and she will be joined during the 2007-2008 season by QUEEN MARY 2 (2,620 capacity). With EXPLORER entering the fray next Winter with her 3,114 passenger capacity, Royal Caribbean will have the largest single ship in terms of passenger capacity in the market. Furthermore, although Royal Caribbean's total capacity will be less than that of Norwegian Cruise Line and of the two Carnival companies, its operation will be more economically efficient since the other companies must operate multiple hulls to surpass Royal Caribbean's capacity.

Along the same lines, "last year, we introduced the LEGEND OF THE SEASs [69,130 gross tons] sailing out of Southampton [England] to the Med. In her first season, she was elected as best large cruise ship in the UK. We are really excited about that. We are going to have the NAVIGATOR OF THE SEAS [EXPLORER's sister] next year also sailing out of Southampton."

Advances in ship design allow Royal Caribbean and the other cruise companies to enter these new markets. As noted above, the first modern cruise ships were designed to sail exclusively in the clam waters of the Caribbean and intentionally dispensed with some of the aspects of traditional passenger ship design that related to grey water sailing. However, Royal Caribbean is confident that its megacruise ships can handle the rough weather associated with operating out of ports like New York year round. "These are ocean-going vessels with stabilizers and the basic stability of such

ships. Even coming up [from Bermuda] last night, [EXPLORER met] extreme weather, they had over 90 knots wind at one point, and the guests were fine. We have two sets of stabilizers, four stabilizers, and when those are working they'll eliminate about 85% of the roll of the vessel."

One factor that places a limit on the size of megacruise ships is port facilities. If you build the ship too big, there will be no port facilities to serve it. Indeed, one of the reasons for the development of the new cruise ship terminals in Bayonne and in Brooklyn is that today's megacruise ships stretch the limits of the Manhattan Passenger Ship Terminal. When FREEDOM OF THE SEAS tied-up there during her maiden call in New York, "we had about 30 meters of overhang. Thirty meters from the end of the pier, the current isn't really that strong. It is once you get into the deeper waters of the Hudson that it really kicks in. I had my bow literally up by the parking lot. So, [a larger ship] would not work there. Bayonne is much preferable than up on the Hudson. These large ships are moving something like 6,000 guests in one turnaround day, maybe 7,000. That's a lot of people to get into Manhattan and off of Manhattan."

Royal Caribbean plans to introduce six more ships by the end of 2010, when it will have a total capacity of approximately 89,200 berths - - an increase of 21,300 or nearly one third over today's capacity. With Carnival planning to introduce another 20 ships in this same time frame, such growth is imperative for Royal Caribbean.

Two additional Freedom-class ships will join the fleet, one in 2007 and the other in 2008. However, a key part

of Royal Caribbean's growth strategy is Project Genesis, which calls for a 220,000 gross ton megacruise ship for delivery in Fall 2009. "Genesis is a clean piece of paper design. As remarkable as the VOYAGER was when she came on the market, the Genesis will be even more remarkable compared to what is out there today. There will be 8,000 people onboard." Not only will this tremendous size allow Royal Caribbean to serve more passengers, "you can do things that you would not otherwise be able to do . For example, the lifeboats on the Genesis will be 370 passengers. So, they literally are not boats anymore. In fact, we are not going to call them lifeboats, we are probably going to call them life vessels or life rescue vessels, signifying that these are not small boats. They are going to be catamaran hulled, twin engines, bow thrusters, radars, navigation equipment - - it takes the whole idea of a lifeboat into a completely different environment."

While Norwegian Cruise Lines has announced plans to build two 150,000 gross ton cruise ships, Royal Caribbean's chief rival, Carnival Corporation, has indicated that it has no intention of following suit. "I think their president, Bob Dickinson, said it at Sea Trade last year that when they crunch the numbers it does not work for them. They've made a pretty clear business decision. We have more experience than anybody and for us it is a winning equation."