

While the Costa Concordia was grounded...

As social networks crucify the captain of the Costa Concordia, questions must be asked about the management of navigational safety on board large ships. It may be assumed that systems tend to migrate towards states of higher risk, especially under the effect of the crew's complacency induced by the illusion of mastering the unexpected, thus leading to a situation of unrecognised high risk. Should we then have to look at something like the "bridge team workplace" on large ships? Artelia's answer is quite definitely YES.

... Port Revel was building the "VOYAGER"



This new model of a large podded cruise ship over 1000 feet (300 m) long transporting over 5000 people will enable masters and officers to train in shiphandling under various emergency conditions that are unlikely but always possible. In an emergency, the first decisions taken are usually crucial because subsequent actions are conditioned by them. Shiphandling training is similar to that of a high-level sportsman, who must keep in top form at all times. This training is required in order to provide a "déjà vu" effect, so that "Truly superior pilots are those who use their superior judgement to avoid those situations where they might have to use their superior skills" (from: Great Aviation Quotes).

The new model at Port Revel is equipped with a propulsion system consisting of two "pods". A pod is a sort of gondola that can pivot 360°, fixed at the stern of the ship and containing an electric motor that drives the propeller. It thus replaces both the propeller and rudder and makes a ship particularly easy to handle, provided you know how to use it...



Large ships currently fitted with pods generally have two, though anything between one and four can be found on large cruise ships. About one third of existing cruise ships are fitted with pods. To make these ships even easier to handle, they are equipped with extremely powerful "bow thrusters" that are practically equivalent to the rear pods in terms of power (a bow thruster is a pump fitted transversally in the bow of the ship; it exerts a thrust that can deviate the bow to port or starboard). With these systems, a modern cruise ship can turn around in a circle that hardly exceeds its own length... in less than 10 minutes, which is truly amazing. These propulsion systems have gradually been getting more popular over the past 20 years, representing a genuine revolution in the navigation field. They also need to be operated in a completely different way from traditional propulsion systems comprising a propeller and rudder, and call for serious training.

A further complication in using such propulsion systems is the windage of large modern ships, which can range from 10,000 to 20,000 m² (1 to 2 hectares!) and generate transverse forces of several hundred tonnes that cause the ship to move sideways. This problem affects not only cruise ships but also container carriers. A large ship can thus drift over the water just as a car drifts on ice. There is no room for improvisation...

It may be recalled that in 2009, Sogreah (now Artelia) launched the "Otello", a 1:25 scale model of a 335-metre, 8500 TEU container carrier. This event was part of the celebrations to mark the extension of its shiphandling training centre: Port Revel. To open the 2010 season, Sogreah launched the latest addition to its fleet, the "Q-Max", a faithful reproduction of a 345-metre LNG (Liquefied Natural Gas) carrier with a capacity of 266,000 m³. Thanks to this latest model, the result of an innovative and pragmatic approach, sailors can now train on a ship that represents the new giants now sailing the seas.

The Port Revel development programme was launched in October 2007 and represents an investment of over one million euros, consolidating the centre's worldwide leadership in training pilots in shiphandling operations. By extending the lake to cover a total of 5 hectares, of which 50% is shallow water, doubling the number of quays and installing additional current-generating equipment, Port Revel can now offer an extremely varied range of situations and host 10 trainees each week as opposed to 8 previously.

Since Port Revel first opened more than 40 years ago, numerous American, Canadian and European pilots have appreciated its facilities. Between 150 and 200 are expected in the coming months, for conventional courses or tailor-made training designed by the centre's highly motivated and experienced instructors to suit their specific needs.

As maritime safety becomes an increasing concern, Port Revel is even more relevant than ever in training ships' captains and pilots to handle emergency situations.

The European and North American maritime pilots who make up 80% of the Centre's students are well aware of this and we hope we will soon have the pleasure of welcoming new captains and pilots...

To meet these needs, the Port Revel Centre proposes a range of different shiphandling training courses using scale model ships with on-board pilots:

Shiphandling course for pilots & masters
Advanced course
Escort tug course
Emergency shiphandling course
Pod course



The Port Revel Centre was the first of its kind to be created in the world, and it offers significant advantages:

- over 6500 experienced pilots and captains have been trained there since 1967 (mainly from the USA, Canada and Europe, but also from Brazil, Turkey, etc.), and many of them are now coming for the second (and even third) time in their career,
- instructors are highly experienced and motivated maritime pilots,
- the fleet of 11 models at 1:25 scale reproduces 20 different vessels,
- 4 escort tugs are operated by a real tug master at the pilot's orders,
- Port Revel has inherited Sogreah's century of experience with scale models, numerical simulation, port planning, design & construction,
- the 5 ha lake is highly versatile with very little interference from wind; it also features extensive shallow water areas, a long canal, the new Panama locks, an SBM and numerous quays; it is also equipped with wind, wave and current generators and a DGPS for accurate debriefing of the exercises performed on the lake.



A few technical details ...

The ships are precisely reproduced to a 1:25 scale and are equipped with indicators giving rudder angle, engine speed, ship speed and heading, wind speed and direction, etc. Most of the ships are equipped with bow and stern thrusters and with perfectly operational anchors. They behave like real ships.

Two of the four tugs are fitted with Voith Schneider propulsion and one is fitted with a Z-peller system. The tugs are controlled by the pilot via a remote-control system.

Over 40 years' experience has shown that trainees quickly learn how to control the models just as they do the real ships that they are used to manoeuvring.

A few words of background history ...

After three years spent with Esso captains at the end of the 1960s, the Centre was taken over by Sogreah in 1970.

During the 1970s, most trainees were captains, while the first pilots came to discover the centre.

During the 80s, the ratio of 9 captains to 1 pilot was reversed.

In the 90s, the first refresher courses were organised for pilots, who returned every 5 years. These courses are less directive and leave more room for customisation, which is a way of optimising port operations to increase port accessibility.

Since the year 2000, we have seen a change in our relations with seafarers. We are now moving towards a closer partnership in which students use our installations at their convenience. Courses and equipment are specially designed in close collaboration with them, such as the courses on operations using escort tugs.

About ARTELIA

Created in March 2010 through a merger between Coteba and Sogreah, the Artelia group, which is fully owned by its managers and employees, boasts annual turnover of €350m (2013). With a workforce of 3200, it is one of the foremost French engineering and project management companies working in the construction, infrastructure, water and environment sectors.

The Artelia group operates internationally via a network of 40 offices spread throughout Europe, Africa, the Middle East, Asia and South America.

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