



Membrane Bioreactor



Customer: Croisières AML

Croisières AML is the most important cruise-expedition company in Canada. With a fleet of 18 boats located in 8 different ports in the province, near 650 employees welcome 500,000 passengers every year. In order to obtain from Transport Canada all the certifications and permits that are needed, each of their ships must meet very specific standards and regulations.

Facts

The *Regulations for the Prevention of Pollution from Ships and for Dangerous Chemicals* entered into force in May 2007 under the Canada Shipping Act. Under these regulations, ships have to comply by 2012 with much stricter discharge standards regarding cargo residues, food waste and gray water (drainage from dishwasher, shower, laundry, bath and washbasin drains, swimming pools and spas). As a leader in the cruise-expedition industry, Croisières AML opted to move ahead right away and seek the ideal wastewater treatment system for a gradual implementation within the fleet.

Challenges

Croisières AML investigated possible treatment solutions taking into account the following:

- A technology adapted to the ships' physical constraints, mainly in a retrofit scenario
- A technology meeting the performance criteria imposed by the new regulations

As it was not satisfied with existing products available on the market, Croisières AML entered into a partnership with Premier Tech Aqua (PTA) for the development and testing of a wastewater treatment solution specifically designed for ships



Solution

Croisières AML and PTA designed a membrane bioreactor system which was launched during Summer 2008 as a pilot project on the Cavalier Maxim, one of the Group's ships, docked at the Port of Montreal.

The solution that was designed is composed of a biological treatment process that uses the activated sludge principle. The process is combined with water filtration, achieved with a submerged ultrafiltration membrane device. As a comparison, the membrane apertures are 1,500 times smaller than the width of a human hair. The membrane system, being a very compact solution, allowed for reduced-size tanks. That was a major achievement: weight, space, ease of installation in an existing ship, and installation time (minimize dock time) are all important criteria in retrofit of a naval equipment

Results

With treatment performances that far exceed the new discharge standards, the system allows the Cavalier Maxim to sail without major ship modifications and excess weight, both in freshwater and salted water.

Overall, this new wastewater treatment system provides the following:

- Quick and easy installation and start-up
- Compact and space-saving design mainly in regards of retrofit scenario
- Simple and easy maintenance (only self-checking work required such as sight inspections, report of operation hours, etc.)

Benefits and future perspectives

The treatment quality achieved with the membrane technology meets regulations and allows AML to maintain his cruising activities in the St-Laurent navigation channel. It's proved to be easily achievable in a retrofit scenario and could allow wastewater from the ship to be reused in activities other than human consumption.

« Up to now, over 150,000 passengers have contributed to « try & test » our new wastewater treatment system. The treatment results are amazing! »

Yan Hamel
Croisières AML

« Carrying out such a project is part of one of the aspects of PTA's vision, which is to ensure a constant flow of innovative ideas in order to design the most adapted, ecological, and effective wastewater treatment solutions for various applications »

Henri Ouellet
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