



# Electrolytic treatment of black- and greywater

**SEWAGE HANDLING** US-based Severn Trent De Nora has developed what it calls a safe and effective sewage treatment that oxidises sewage in an electrolytic process. Among other places, it has been successfully installed on board floating houses for fishermen in South America.



Omnipure™ Series 55 marine sewage treatment system



Floating accommodations for fishermen in Chile

Offshore oil and gas operations and oceangoing vessels generate sewage that can contain contaminants having a detrimental effect on water quality and the overall marine environment. As a result, marine sewage treatment systems are required to lessen the environmental impact. The MEPC.159(55) effluent standards adopted by the International Maritime Organization's Marine Environment Protection Committee apply to all sewage treatment systems installed on board on or after January 1st 2010.

Severn Trent De Nora offers Omnipure™ Series 55 marine sewage treatment systems for effective electrolytic treatment of both black- and greywater while providing a safe and sanitary method of handling solids. The company says they are the only marine sewage treatment systems that oxidise sewage through an electrolytic process and also generate sodium hypochlorite for the disinfection of the sewage streams.

The Omnipure Series 55 systems incorporate an advanced electrolytic process that imposes certain physical and chemical changes on the wastewater stream as it passes through the treatment system, re-

sulting in wastewater effluent quality well within the MEPC.159(55) requirements. The process does not require handling of waste solids from raw, untreated influent. Instead, concentrated solids are automatically removed in situ to the treatment process. Furthermore, the Omnipure Series 55 systems accommodate the removal of the total suspended solids (TSS) after treatment via an electrocoagulation cell technology that causes the TSS particles to agglomerate and settle into concentration areas of the unit's process tanks. The solids are then automatically removed during the normal treatment process by an automated valve sequence that does not disrupt or stop the treatment process. There is no physical handling of the solids. Instead, they are disinfected by the sodium hypochlorite solution produced by the unit, making subsequent handling easily managed by any number of collection means.

Severn Trent de Nora offers two solids handling system options with the Omnipure process: a bagging unit and a centrifuge unit. Each option is said to offer a convenient, sanitary method of solids capturing, handling and disposal.

The solids bagging system allows the wet solids to mix with a small amount of polymer and then be deposited in filter bags that can hold up to 15 kg (33 lbs) of 8 to 10% solids. Dirty or spent bags are easily removed and disposed of or incinerated. If allowed to dewater to a 10% concentration or higher, the waste from this method can be considered Class B sludge, which is safe for landfill disposal.

The centrifuge system allows for automatic handling of wet solids and provides for dewatered solids that can be disposed of by traditional waste management methods. Also classified as Class B sludge, the dry solids are discharged into a container, drum or tote for easy disposal. The dewatered solids produced are normally of a concentration between 15-18%.

## Latest technology in the Chilean fish farming industry

The highly regulated Chilean fish farming industry is focused on promoting sustainable environmental practices and optimal sanitary levels throughout the region in an effort to protect the sensitive coastal waterways. Salmon farming practices are governed by these sustainable

environmental practices, contributing to the excellent oceanographic conditions found along Chile's coastline.

The Chilean authority Dirección General de Territorio Marítimo y Marina Mercante (DGTMM yMM), having subscribed to MARPOL and IMO treaties since 1994, requires that all discharges into local waterways meet the IMO MEPC.159(55) effluent standards.

The industrial salmon farming industry in Chile has boomed over the last 20 years, making Chile the second-largest global producer of salmon after Norway. The year 2011 was one of growth for the Chilean salmon industry, which experienced a 51% growth rate over the prior year and reached a high of USD 352 million in exports.

Floating houses, made of concrete, offer comfortable arrangements for fishermen based on site to manage and work the salmon fisheries. The houses include modern amenities along with water and wastewater systems to manage the potable water and grey/black wastewater treatment demands. A typical house has anywhere from 15 to 30 workers living on board at any given time.

In an effort to meet the Chilean government's regulatory requirements on sewage discharge from fisheries and their operational facilities, local fisheries selected the Mariner Omnipure® Series M55 from Severn Trent De Nora for use at more than ten Chilean salmon fisheries after evaluating a wide range of commercially

available marine sewage treatment systems.

Using the same electrolytic disinfection technology as the Omnipure™ Series 55, the Mariner Omnipure system is provided as a lightweight, self-contained configuration that is easily wall-mounted into confined spaces found on board the floating accommodations. Utilising the natural seawater of the fishery itself, the Mariner Omnipure electrolytic treatment process effectively destroys the fecal coliform and pathogens in the wastewater collected on board the houses.

Treated effluent is then discharged into the surrounding water without any environmental impact or stress on the salmon themselves.

## Platform for ship waste management

**SWANET®** | Ship Waste Agency, a French maritime e-service start-up founded in 2010, has launched what it calls a new and dynamic solution to ease and improve the ship waste management process directly from ship to shore.

It says its Internet-based platform Swanet® is a combination of two modules uniting the collaborative actions of all maritime actors, from the vessel that generates the waste to the centre that will treat it. This means that for the first time shipowners, agents, waste collectors and port authorities can be involved in a shared, secure connection having access to data that needs entering only once, in a declarative process providing full traceability of waste. They will also benefit from reports generated from data on the operations, saving time and money.

### Onboard application

Swaboard® is the onboard application that allows ship masters to generate electronic copies of waste flow data from the vessel: waste generated, treated, rejected at sea, incinerated, or to be discharged at the next port of call.

The 60MB application includes several databases such as "World Ports & Terminals", "MARPOL Annex and Categories", and more than 20,000 waste components in order to accelerate completion by the shoreside platform of documents required for the new declarative waste process.

Swaboard® has been designed to record all onboard waste operations via the onboard waste management tool (OBWM). The OBWM allows operators to quickly and accurately describe any onboard waste opera-

tion by recording all elements: date, time, coordinates, speed, waste tank, waste type, process used, output location of potential residual process treatment in accordance with MARPOL.

Data captured by Swaboard® will be sent to the shoreside platform, called Swashore®, through an Internet connection or SMTP. (via SMTP by enclosing the output data file to an e-mail). Files sent will not exceed 100KB to avoid excessive communication costs.

### Solution for onshore users

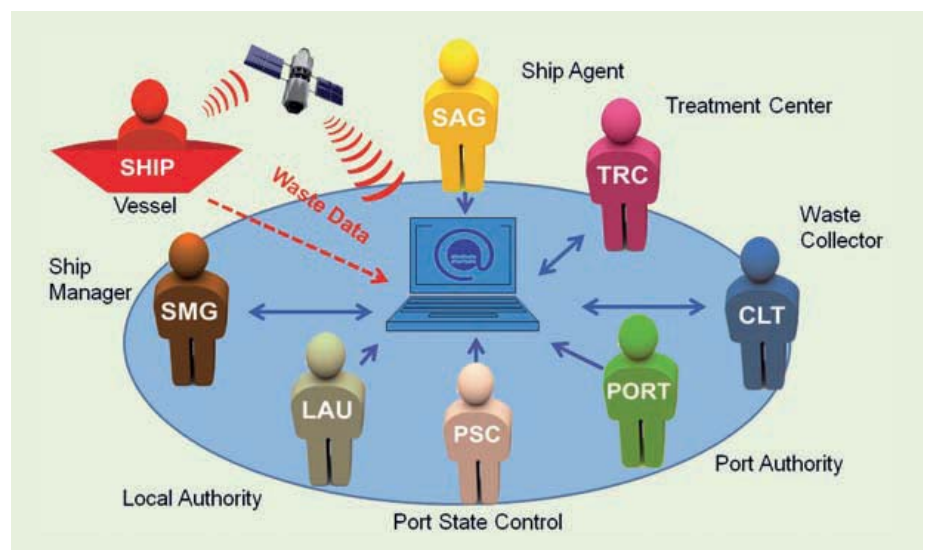
Waste data arriving at the Swashore® platform can be accessed by authorised ship agents. It can be obtained in advance and the following documents can be issued at any stage of the process:

- ▶ The electronic advance notification form for waste delivery (e-ANF), a complete description of onboard waste for faxing, e-mailing or transferring automatically into the port's IT system.

- ▶ The electronic waste unloading request (e-WUR): a detailed e-document used to inform the selected waste collector of waste specifications to be unloaded. Data on vessel specifications will be included to optimise the unloading process.

- ▶ The electronic waste delivery receipt (e-WDR) that will be finalised by the selected waste collector and validated by local authorities.

Swanet® can be obtained by an annual subscription.



Swanet® unites the collaborative actions of all maritime players