SHORT GUIDE

UV vs EC investment cost

How ballast water treatment technology impacts what you pay

The choice between UV and electro-chlorination (EC) for ballast water treatment isn't trivial. It has big implications, especially when it comes to your investment cost. Even on vessels where EC is common, it pays to understand the whole picture.

Complexity costs you money

UV ballast water treatment is a straightforward physical process, without any additives or detours. The ballast water is filtered and exposed directly to UV light, which neutralizes the organisms it contains.

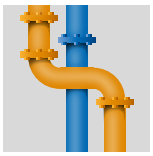
EC, on the other hand, is a chemical process – even if the chlorine is produced on board. The chlorine must be added to the ballast water, and any residuals or hazardous gases created have to be removed. Since generating chlorine requires warm saline water, salt and heat may also be needed. In total, there's a lot of piping and expense that isn't usually reflected in the system offer.

Read on to see the hidden costs of an EC installation.

Components that add to EC's price tag

Generating chlorine at sea might seem like a simple idea. But the system required for ballast water treatment is anything but simple. It's a complicated installation – with many costs that aren't included in the system price.

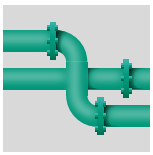
- **Costly and longer piping**



Unlike UV systems, where the ballast water simply flows through reactors that dose it with UV light, EC systems require hundreds or thousands of metres of pipes.
These extend through large sections of the vessel, especially when the aft peak tank (APT) is used to store saline water – which is nearly always the case. Pipes are needed for:
  - Transporting water from the APT to adjust salinity
  - Transporting water through heaters
  - Transporting water to total residual oxidant (TRO) sensors
  - Venting hazardous gases to deck
  - Chemical neutralization systems
  - Moving water to and from safe zones

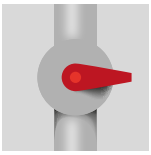
  NB! It's not just the piping that's longer with an EC system. There's far more cabling as well.

- **Costly exclusive materials**



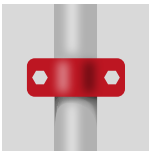
The length and complexity of the piping in EC ballast water treatment systems is just the first issue.
All those metres are multiplied by the material cost. Since the pipes have to withstand seawater and chemicals, many of them have to be lined with polyethene or constructed from stainless steel (SUS). Such materials can take longer for shipyards to acquire, which can make installation planning more difficult and add a risk of delay. In many places, they're also far more expensive than standard materials.

- **More costly valves**



Wherever there are pipes for multiple processes, valves are needed to steer the different flows. In an EC ballast water treatment system, there are flows for moving chemicals, heating the water, adding salinity and neutralizing total residual oxidants (TRO) – to name a few. The valves required are costly in themselves, but they're also additional points of complexity that need maintenance and could potentially fail.

- **More costly support components**



Due to the piping, valves and extensive layout, an EC ballast water treatment system can be much more complicated to engineer than a UV system, which is compact and localized. Additional structures must be built to support the different parts of an EC system, which may also comprise heaters, gas detectors and other components not reflected in the supplier's scope. If the APT is too small, it may also need rebuilding to hold more saline water.

How EC adds up at the shipyard

The more complicated a ballast water treatment system is, the more work it is for a shipyard to install it. Especially when retrofitting an EC system, you pay for the added complexity in two ways:

- **Installation time and labour**
  Every hour of work at the shipyard costs you money. If there are delays or unexpected complications, it's often you that pay the price.
- **Time out of service**
  Every day out of the water is a day that your vessel isn't making money. Depending on your operations, a few extra days of off-hire can come at a high cost.

Why choose UV and Alfa Laval PureBallast 3?

By choosing a UV system rather than an EC system, you can save on engineering, material costs, auxiliary components and many days of shipyard work. By choosing Alfa Laval PureBallast 3, you select both leading UV technology and an experienced team for project management and installation support.