

# Case Study 22

## Cargo Ship Discharge Water Compliance

### Background

As environmental regulations constantly evolve, companies around the world are looking for ways to reduce waste and clean-up emissions. Most cargo ships use heavy fuel oil (HFO) as the fuel source to their engines for propulsion that characteristically generate black smoke exhaust from their stacks. A shipping company on the Great Lakes spent millions of dollars outfitting its fleet with freshwater exhaust gas scrubber systems to reduce NO<sub>x</sub>, SO<sub>2</sub> and particulate matter from combustion emissions to exceed EPA clean air standards. Filtered freshwater is mixed with a NaOH based solution and sprayed into the exhaust stream as it passes through the stacks. Dirty spray water is processed with centrifugation and filtration before it can be safely discharged. This discharge water is monitored and must meet strict turbidity requirements to meet EPA compliance regulations. The fleet manager contacted Northeast Filter with frustration meeting this standard on a single pass through their current filters causing very high OPEX. He asked us to evaluate their system and provide better options if they are available.

### Solution

Once on-board a ship, VAS services evaluated the entire process and closely reviewed the compliance criteria for discharge water. Fluid analysis was performed on the inlet and outlet of the existing filter and an autopsy was performed on one of the spent elements. Test results indicated that 75% of the dirt particles were passing through the filter which was corroborated by indications of unloading found from the autopsy. Northeast Filter recommending changing the filter media to a hybrid with an offer to trial. The new hybrid filter element achieved compliance on the discharge water in a single pass with 50% greater on-stream life and lower OPEX. The fleet manager converted the rest of their fleet with these filters and they have been operating in full compliance for over 4 years without incident.



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