



CIRCOR Commercial Marine Solutions Prepares Tankers to Meet Low-Sulfur Fuel Regulations

Challenge:

A major oil-tanker operator discovered its existing fuel oil pump system could not meet new environmental regulations for ships entering European ports designated in emission-controlled areas (ECAs).

Solution:

Colfax understood the regulations and responded with an Imo AB OptiLine pump solution that assured the operator's tankers could use low-viscosity, low-sulfur fuel to meet current and upcoming regulations.

Results:

In addition to helping meet the new fuel demands, the CIRCOR® pumps provide leak-free operation and extended intervals between necessary service requirements, a combination that means reduced costs for spare parts, as well as fewer man-hours and less expense required for cleaning.



Regulations Require Use of Low-Sulfur Fuel

Ship owners around the world today find themselves facing a unique new challenge: an array of current and upcoming environmental regulations. Among them is the MARPOL (marine pollution) Annex VI Regulations for the Prevention of Air Pollution from Ships, which stipulates that burning of high-sulfur fuel oils is not permitted within ECAs. Those regulations and the timetables for meeting them differ for ports around the world.

Since May 2005, specific MARPOL regulations requiring emissions from main and auxiliary machinery be kept within specific limits have been in force. They require, for instance, reduction of sulfur oxide (SOx) combinations, carbon dioxide (CO₂) and nitrogen oxide (NOx) combinations.

Additionally, European Union directives for 2010 require ships at berths for more than two hours to use marine fuel oil with 0.1 percent sulfur content. This means that the ships will have to switch fuel during port stay to a low-sulfur, low-viscosity fuel known as marine gas oil (MGO). This fuel, due to its low viscosity and poor lubricity, will have a great impact on the ships' machinery, especially the fuel oil pumps.

Low-Sulfur Fuel Presents Challenges

Prior to the regulations, ships could burn higher-sulfur fuel, which is more viscous. In some cases ships needed heaters to warm the fuel enough for it to become less viscous and easier to pump.

But the low-sulfur fuel is less viscous to begin with, and ambient temperature in a crude oil transport ship engine room easily reaches 40 degrees Celsius and higher – in some cases as much as 55 degrees Celsius. Adding excessive heat from pipes and engines will raise the temperature even further. As a consequence viscosity will fall, causing a significant change of operating conditions in the system. Ships therefore need cooling units to bring down the temperature of the fuel to make it thick enough to pump.

Under some of the regulations, ships can continue to burn the higher-sulfur fuel until they near a port, at which point they must burn the lower-sulfur diesel. To do that, they need a fluid-handling system flexible enough to handle both.

CIRCOR Applies Its Knowledge, Offers a Customized Solution

One of the world's largest tanker operators – which maintains 100 vessels and holds an International Organization for Standardization (ISO) 14001 certificate for reducing its environmental footprint – wanted to comply with the low-sulfur fuel requirements as soon as possible.

The CIRCOR team from subsidiary Imo AB examined the tanker operator's existing technology, evaluated its service environment and determined its current pumps could not handle the low-sulfur fuel. By contrast, the company's previous pump supplier had been unable to fully explain why the current engine-room pumps were not capable of handling future MGO demands.

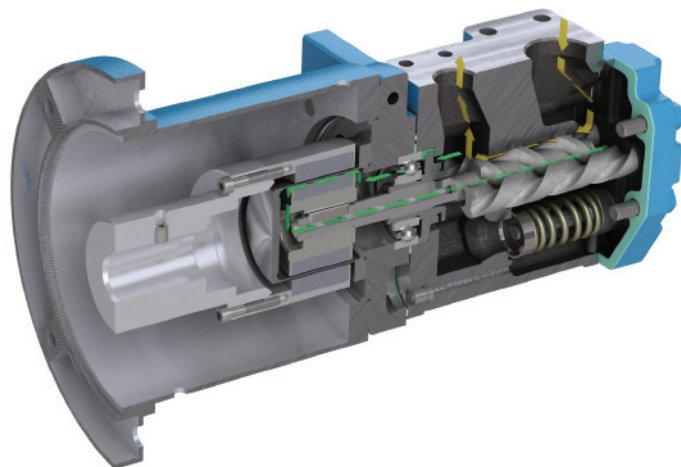




One of the world's largest tanker operators – which maintains 100 vessels and holds an International Organization for Standardization (ISO) 14001 certificate for reducing its environmental footprint – has installed 55 IMO® OptiLine pumps like this one for pumping fuel on 12 of its tankers.

That failure not only caused headaches and hassles for the tanker operator, but it also meant that if a suitable solution could not be found, its vessels might not be allowed to dock in certain ports in 2010. The CIRCOR team quickly confirmed that its solution would bring immediate benefits today and long-term advantages for years to come. Alfa Laval, the Imo AB distributor in the Middle East, played a key role in initiating the upgrade program.

The Imo AB OptiLine pump systems selected are a screw design that relies on the rotors' being lubricated by the pumped media. An oil film that builds up by the hydraulic



This cutaway view of the Imo OptiLine pump shows how screws create positive displacement to move fluid.

balance in the pump causes the rotors to "float" and be lubricated. The ship operator has installed 55 IMO® OptiLine pumps on 12 of the company's tankers, enabling them to use low-sulfur fuel, and will outfit an additional 38 ships in the near future.

Lowering Total Cost of Ownership (TCO)

The OptiLine pumps are designed without a mechanical seal, which makes them 100 percent leak free. That's a vitally important point, considering excess leakage can lead to actions from external parties – such as harbor authorities, class authorities and others – possibly resulting in denial of access to port, a delay in port or an extensive cleaning operation that can't be handled by an engine-room crew. Such cleanings entail the expense of hiring an external firm for the operation.

Leak-free operation and a long service interval (five years) have a significant impact on the cost of spare parts, man-hours and cleaning. The tanker operator can therefore rest assured its choice of pumping solution will function in the most efficient manner with the lowest TCO to keep it in compliance with low-sulfur regulations for years to come.



About CIRCOR International

CIRCOR International is a global leader in critical fluid-handling products and technologies. Through its global operating subsidiaries, CIRCOR manufactures positive displacement industrial pumps and valves used in oil & gas, power generation, commercial marine, defense and general industrial markets. CIRCOR's operating subsidiaries supply products under the well-known brands Allweiler, Fairmount Automation, Houttuin, Imo, LSC, Portland Valve, Tushaco, Warren and Zenith. Additional information about CIRCOR is available at www.circorpt.com.

About Imo AB

Imo AB is a CIRCOR business, focused on the development and manufacture of rotary positive displacement three-screw pumps for the marine, defense, pulp & paper, tooling machinery, power generation and offshore industries. Headquartered in Stockholm, Sweden, with 90 employees, Imo AB was founded in 1931, by Carl Montelius, inventor of the three-spindle pump, and Swedish entrepreneur Bengt Ingestrom.



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