



ABC Maritime has been using XBEE on board the *M/V San Beato* starting in August 2012 to treat her Heavy Fuel Oil 380 when she eventually encountered some difficulties with fuel quality.

Following these first good results, the company decided to use XBEE on the long-term on board the *M/V AdFines Sea* in order to evaluate the capacity of the enzyme technology to clean up the whole fuel system.



In 2015, two vessels were monitored to compare the efficiency of a marine fuel additive to the XBEE Enzyme Fuel Technology.

The said sisterships have been the *M/V AdFines Sea* & *Star*. These chemical tankers are equipped with Mak 7M43C main engines of 6,300 kW at 500 RPM, powered on Heavy Fuel Oil 380.

The technical department has monitored several parameters, including the cleanliness of tanks, separators, filters, etc.

The table clearly shows that although the initial state of cleanliness of the *AdFines Sea* was worse than the *Star*, the former ended in far better conditions:

- sludge content has been remarkably reduced by -25% in the bunker tanks and -33% in the settling tank;
- separators got cleaner;
- automatic cleaning has been improved by a factor of 3.46 compared to the marine fuel additive;
- manual cleaning has been improved by a factor of 4.4 in comparison;
- turbo charger cleaning has been improved by a factor of 3.27!

Tanks	Marine Fuel Additive	XBEE Enzyme Fuel Technology
→ Sludge bunker tanks	N/A	-25.00%
→ Sludge settling tank	N/A	-33.00%
Fuel oil separator		
→ Disc stack condition	Unchanged (3)	Better (3 to 2)
→ Bowl condition	Better (4 to 3)	Better (3 to 2)
Automatic fine filter before main engine		
→ Manual back flush	Better (sometimes to no)	Better (sometimes to no)
→ Candle condition	Worse (2 to 4 to 3)	Better (3 to 1)
Lube oil separators		
→ Automatic cleaning frequency	Worse (150 to 90 minutes)	Better (50 to 90 minutes)
→ Manual cleaning	Worse (1,500 to 750 hours)	Better (300 to 720 hours)
→ Disc stack condition	Worse (3 to 4)	Better (3 to 2)
→ Bowl condition	Worse (2 to 4)	Better (3 to 2)
Turbo charger		
→ Turbine side wet cleaning frequency	Unchanged (250 hours)	Better (150 to 490 hours)
Waste heat boiler		
→ Type of deposits	Better (3 to 2)	Better (2 to 1)

