ENVIRONMENTAL CHALLENGE: Technology to the rescue

- Brittany Ferries
- Spotlight on Malta
- Real-Time Alarms
- Weather Routing
- Fuel Quality Debate
- People and Places
- News and Events
Bunkerspot is an integrated news and intelligence service for the international bunker industry. The bi-monthly magazine and 24/7 electronic news service, www.bunkerspot.com, both provide highly-specific information on all aspects of the marine fuels industry.

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12 month rolling price charts

380 CST Fuel Oil

Marine Diesel Oil

Could the decline of fuel oil be on the horizon?

The market has seen both a surge and a decline in crude oil prices in recent weeks, with record highs again set in the first half of July when North Sea Brent crude oil prices for August delivery topped $147 a barrel on the New York Mercantile Exchange (NYMEX). Continuing global uncertainty, compounded by strikes in Brazil, militant activity in Nigeria, and tension over Iran’s nuclear intentions, has been keeping oil markets volatile.

Looking at average bunker prices from Bunkerspot's brokers’ panel of 16 key ports, all marine fuel products dipped at the beginning of June, before rising steadily through the second week of July, when marine diesel oil (MDO) prices reached a peak of $1,315 a tonne before starting to fall back again. Fuel oil prices began to decline a week later into mid-July, at which point an average of prices of 380 centistokes (cst) fuel oil among the 16 key ports had reached $751 a tonne. All petroleum product prices have since continued to decline, although so far not as markedly as the slide in crude oil prices. By early August, North Sea Brent prices had dropped to around $120 a barrel.

The decline in spot oil prices has been attributed variously to factors such as “falling demand” in Europe and the United States, due to economic pressures, and to increased production in Saudi Arabia. However, it is worth bearing in mind that factors such as terrorist or militant attacks on oil facilities in Nigeria are still likely to cause sudden price spikes.

Oil markets are always susceptible to the chaos that can often be caused by natural events such as major storms and hurricanes, and in early August production at some refineries along the US Gulf Coast was reportedly halted in anticipation of the arrival of Tropical Storm Edouard which had begun to cut a swathe across the Gulf of Mexico and along the coast of Texas and Louisiana. So far there is no sign that the region will be hit with the ferocity of hurricanes that have passed through in recent history, but the hurricane season still has some way to go.

While the most recent trend has been a decline in prices, marine fuel product prices were still higher by early August than they had been in early June. But while 380 cst fuel oil prices saw a 20% rise during that two-month period, MDO prices rose by less than 2.5%. Some sources suggest that this may be due to a declining availability of fuel oil in the market, compared with distillates.

Longer-term, there are some signs that...
French cross-Channel ferry operator Brittany Ferries is having to cope with the same difficulties of soaring oil prices, an economic downturn, uncertain currency movements as all other shipping companies, but so far appears to be weathering the storm by making small but effective operational adjustments which are having little noticeable impact among its customers.

Brittany Ferries has withdrawn one fast ferry service from its non-peak schedule, reduced the sailing speed of most of its regular fleet and, on 1 August, introduced a fuel surcharge on freight shipments in response to soaring fuel prices. The company has also started to address the price of the fuel it is buying by gradually changing the grades of fuel it is burning.

So far, although concerned about the impact of a strengthening Euro on its largely British customer base, the company claims it has not yet been badly affected by the global credit crunch. The vast majority of its customers are British tourists who will this summer be driving in France and Spain and finding both Eurozone countries significantly more expensive than last year.

High oil prices present a major challenge to Brittany Ferries, as they do for all shipping and transport operators, but for this ferry company at least, they also present an opportunity as truckers and motorists elect to sail the company’s longer routes (UK-France, UK-Spain, Ireland-France) rather than drive and consume expensive fuel. According to Brittany Ferries, over 3.8 million cars crossed the Channel in 2007, with 27% of those choosing the Western Channel, of which the company enjoys a 75% share, including a 54% share of the UK-Spain market and 30% of the Ireland-France market. In 2007, the company carried 2.7 million passengers, almost 800,000 cars and around 240,000 freight vehicles. This year, the figures still appear to be stacking up, with no noticeable drop in freight

### Commercial Issues

**Brittany Ferries weather**

Llewellyn Bankes-Hughes sails with Brittany Ferries to see how the French cross-channel ferry company is coping with soaring oil prices, living inside a SECA and shifting exchange rates.

Brittany Ferries is the leading maritime carrier on the Western and Central Channel. Formed in 1972 by local farming co-operatives and the North Finistere Chamber of Commerce, the French ferry firm was created to ship fresh produce to the UK and bring British tourists to France.

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**Brittany Ferries**

[Image of a ferry]
Road freight contributes a significant proportion of Brittany Ferries’ income, with the bulk of freight volume moving northwards into the UK from France, Spain and beyond. High diesel prices have created an opportunity for Brittany Ferries this year, as the company has set up a new freight-only service from Santander to Poole, potentially saving trucking firms significant amounts of money by not having to drive the length of France to cross the channel at France’s northern ports.

On 1 August, the company introduced a fuel surcharge for freight operators, linked to the spot price of Brent crude oil. At $130 a barrel for Brent, the surcharge is set at £9.50 or €7.60 ($15) for UK-France crossings. If the Brent price rises to $150 a barrel, the surcharge rises to €12.21 or £9.77 ($19) per crossing. The surcharges for Ireland-France and UK-Spain crossings respectively are approximately double and triple the UK-France surcharges to reflect the longer routes.

Brittany Ferries operates five routes from the UK to France (Portsmouth to Caen, Cherbourg and St Malo, Poole to Cherbourg and Plymouth to Roscoff); three routes from the UK to Spain (Portsmouth to Santander, Plymouth to Santander and the freight-only service from Poole to Santander on the new 19,909 gross tonne (GT) Cotentin); and one route from Ireland to Roscoff.

The company operates one chartered and seven owned ferries and is the market leader on the Western Channel, with the most modern fleet. It is also one of the largest French merchant fleets. It controls a fast ferry service operated between Poole and Cherbourg by Condor Ferries. The company added the Cotentin in November 2007 and will introduce another new launch, the 32,500 tonne Amorique, in April 2009, to ply the Plymouth-Roscoff route.

The company currently consumes around 130,000 metric tonnes (mt) of maximum 1.5% sulphur fuel oil and some 10,000 mt of marine gasoil (MGO) a year, and calculates that fuel costs currently represent around 15% of its daily operating costs. Brittany Ferries typically hedges around 30% of the fuel it buys to help protect against volatile bunker prices.

The French operator has removed one of its two high speed crossings from Poole to Cherbourg from its rota to save costs. This ferry runs on MGO. Its high-speed ferries, the 5,000 tonne Normandie Vitesse and 6,581 tonne Normandie Express, are currently being operated at 38 knots and 35 knots respectively, but both are capable of higher speeds. The lower speeds are being used to conserve fuel.

It has also taken steps to reduce its overall consumption by slowing down its conventional ferries. In reality, the ferries that are affected are adding only an hour or less to their crossing times. Because many of the cross-channel transits are overnight when the passengers are asleep, this money-saving measure has largely passed unnoticed. However, according to the company, its various schemes to cut fuel consumption are already saving it some 5% of fuel costs.

So far, Brittany Ferries claims it has not yet run into any problems with fuel reliability or availability after having been obliged to switch from high sulphur to low sulphur fuels following last year’s introduction of the Sulphur Emissions Control Area (SECA) in the English Channel.
The Bretagne

In July, Bunkerspot's publisher, Llewelyn Bankes-Hughes, sailed on the Bretagne to meet its French captain and crew, visit the bridge and engine room, and discuss the impact that higher bunker prices is having on the ship's day-to-day operations.

Launched in 1989, the 24,534 GT Bretagne currently runs the Portsmouth-St Malo route, switching in winter months to the longer Plymouth-Santander route. However, with capacity for 39 trucks, 580 cars and 2,056 passengers, the ship is now considered too small for the French route and will switch permanently to the longer Plymouth-Santander route from next spring.

The Bretagne – which is considered by many to be one of the most stable cross-channel ships and therefore a firm favourite with passengers – has a maximum cruising speed of 20 knots and consumes around 50 metric tonnes (mt) of bunker fuel a day. Its annual consumption is some 15,000-18,000 mt, which is loaded in batches of 150-170 mt twice a week in Portsmouth. Deliveries are made by the Whitaker barges Jaynee W, Whitchallenger and Whitonia, as with the rest of the Brittany Ferries fleet, the bunker fuel is supplied by ExxonMobil from its nearby Fawley refinery.

According to its Chief Engineer, Mathieu Massé, fuel quality testing is normally limited to onboard viscosity testing. One reason for this is that the advent of high bunker prices has encouraged the company to begin the switch from 180 centistoke (cst) fuel oil to heavier grades. Rather than make an instant switch to 380 cst fuel oil, the Bretagne, over the past four months, has been cautiously using and testing the heavier fuels in stages, increasing from 180 cst to 220 cst, then 240 cst before most recently running on 320 cst fuel oil. Ultimately, the plan is to run all four main Wärtsilä engines and all three Wärtsilä generators on 380 cst material, should the testing go according to plan. So far, according to Massé, no problems have been encountered with the higher viscosity fuel, while at the same time, the ship has not encountered any difficulty running 1.5% sulphur fuels following the switch last summer from 3.5% sulphur material as a result of operating within the English Channel Sulphur Emissions Control Area (SECA).

Unlike a few other ships in the Brittany Ferries fleet, the Bretagne has not yet been obliged to slow down to conserve fuel. According to its captain, Jacques Brichet, this is mainly because its schedule is already very tight, with turnarounds in Portsmouth and St Malo normally limited to less than two hours. Other ships have, however, been instructed to save fuel by shaving one knot off their speeds, adding between 15 minutes and an hour to their crossing times.

The Bretagne’s four main engines, given the names Sandra, Pandora, Vera and Gwen, work in pairs, driving two propellers. Normally all four work at the same time during night crossings and depending on the currents – particularly around the headland near Cherbourg which separates the French mainland from the Channel Islands – the ship will use one pair rather than both.

The Bretagne is unique among the Brittany Ferries fleet in that its First Mate (and maybe a possible future Captain), Kristell Kerouredan, is female. She is also the highest-ranking female officer at Brittany Ferries.

Channel. However, the company is well aware of some of the problems that have beset other shipping companies switching to low sulphur fuels.

Brittany Ferries buys all its fuel from ExxonMobil under a term contract, and lifts it all from the three UK ports from which it operates. John H. Whitaker (Tankers) Ltd delivers bunker fuel to ships in Portsmouth and Poole, and to storage facilities in Millbay Docks in Plymouth, using its three-vessel local fleet comprising the Jaynee W, Whitchallenger and Whitonita. Bunker supplies are collected by Whitaker’s tankers from ExxonMobil’s Fawley refinery, near Southampton.

Brittany Ferries is a privately-owned, French company that was created in 1972, about the time that the UK joined the Common Market, by local Breton farming co-operatives who together with the North

Finstère Chamber of Commerce, recognised the huge potential market in the UK for their produce. The idea was to transport fresh fruit and vegetables from Roscoff in Finistère to the south coast of England and to bring British tourists south to France on the return trips. With its headquarters still in Roscoff, it has since become the leading maritime carrier on the Western and Central Channel. The French farming co-operatives remain majority shareholders in the company and the French State has no financial stake.

The company began sailing from the UK to Spain in 1978. Next April it will introduce a new luxury cruise service between Portsmouth and Santander, using the 41,000 GT Pont Aven, which at a service speed of 27 knots, is the fastest of its conventional ships. The Pont Aven, launched in 2004, has capacity for 80 trucks, 650 cars and 2,400 passengers.

Captain Jacques Brichet keeps a sharp look-out

First Mate Kristell Kerouredan is the highest ranking female officer at Brittany Ferries

Chief Engineer Mathieu Massé says that fuel quality testing is normally limited to onboard viscosity testing
Malta is ideally situated as a bunkering hub, with approximately 80% of the shipping that crosses the Mediterranean passing the island. Currently, Malta's biggest bunkering competitors are Piraeus, Augusta and Gibraltar, all of which also lie on major Mediterranean shipping lanes. Malta Freeport in Marsaxlokk is an expanding container terminal, enjoying network connections to over 125 ports worldwide through the services offered by Hanjin Shipping, CMA CGM, IRISL, UASC, China Shipping Container Lines, Maruba Lines, Evergreen, Delmas, Hamburg Sud, Deutsche-Afrika Linien, ANL and APL.

There has been some confusion in recent years with regard to Malta’s bunker market. After its entry into the European Union (EU) in 2004, Malta was required to control a minimum of three months’ strategic oil stocks. Although there had been plans to privatise the state-owned Mediterranean Offshore Bunkering Company (MOBC), Malta kept it under the ownership of the larger state-owned Enemalta in order to meet these requirements. The same year, MOBC withdrew from the market as a physical supplier and now acts solely as a terminal operator. The confusion lies in the fact that, as a condition of its entry into the EU, the European Commission (EC) had been putting pressure on Malta to open up its petroleum markets and bring an end to Enemalta’s monopoly of the country’s importation, storage and wholesale markets. Although Enemalta is still the only company with a licence to import petroleum products for the inland markets, this is no longer the case with respect to the bunker market. Provided the right applications are made, any company can obtain licences to store and import marine fuel, and to operate as a bunker supplier.

As well as MOBC’s oil terminals (and others) in Valletta, Enemalta also owns a storage facility in Marsaxlokk with a capacity of 120,000 metric tonnes (mt). There is a whole range of secondary companies that rent storage space in Enemalta’s terminals and import fuel to be sold on to bunker suppliers. These include Nordic Oil, Total, Glencore and Trafigura, to name just a few. Also in Marsaxlokk, there is a 350,000 mt facility wholly-owned by Oiltanking Malta Ltd, and a 50,000 mt government-owned facility which is leased to San Lucian Oil Company Ltd.

Enemalta is now in the process of privatising all of its oil storage terminals, for both the marine and inland markets. In May, a bidding process was finalised which will see just one private company take all of these assets. Rather than liberalising the market and introducing competition, it seems a monopoly is simply being passed from one entity to another. The leasing of storage space to third parties will be subject to the company with the winning bid, with no guarantees on the storage space currently being used by local suppliers. But Ray Ferris, Chief Project Officer for Business Development & Commercialisation at Enemalta, insists that ‘if you take the ham, you have to take the bone’. Ferris declined to reveal which companies have entered their bids, but did say that foreign companies were included. Some local players have said that the whole process lacks transparency, and that certain parties are likely to benefit more than others from the new storage arrangements. Whoever wins, written into the sale is a clause that guarantees Malta her strategic stocks in order to meet the EU requirement.

For the time being, all physical bunker suppliers happen to be local Maltese companies, but in the opinion of Frank Sammut, former Chief Executive Officer of MOBC, there is certainly room for a good international player to enter the frame. Sammut, having detached himself from the industry for the last four years, now runs an independent consultancy firm, Technical Services Bureau Ltd. According to Sammut, bunker suppliers Falzon Service
Station and Island Bunker Oils have benefited from the local market scenario of late.

Bunker deliveries are carried out either inside the ports of Valletta or Marsaxlokk, or in one of the offshore areas designated by the Malta Maritime Authority (see map). Being a small island, most Maltese bunker suppliers can deliver fuel to all of these locations.

Falzon Service Station is one of the oldest suppliers on the island. The company obtained its bunker licence in 1992, and the company’s director, Joseph Falzon, has worked in the industry since Shell dominated the scene in the 1950s. The San Lucian Oil Company has recently been acquired by the Falzon Group of companies, providing the supplier with its own storage needs. On top of this Falzon Service Station rents storage space from MOBC in Valletta. The company plans to build new tanks at the San Lucian facility to take its capacity up to 100,000 mt, and upgrade the terminal to make it capable

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of receiving tankers of up to 50,000 mt. An in-house laboratory for blending and testing is also planned.

The company owns five barges: the 350 mt MT Oilfield, the 340 mt MT Oilstone, the 1,050 mt MT Spiro F, the 3,500 mt MT Santa Tereza, and the latest addition, the 2,800 mt MT Santa Elena, with an impressive pumping rate of 700–800 mt an hour. The Falzon Group also owns a fleet of 32 road tank wagons (RTW). Barges and RTWs are also leased to third parties. The company is currently looking for two new barges of 6,000 tonnes, and plans to replace its entire fleet within the next five years.

Falzon Service Station supplies 380 centistoke (cst) RMG fuel oil – making up 60% of its sales – as well as marine diesel oil (MDO) DMA, and marine gasoil (MGO) DMB ranging from 0.5% to 0.1% sulphur. The company works with a variety of traders but most sales are made directly with the customer.

Falzon Service Station also offers a tank cleaning service, making use of the waste oil terminal in Valletta. The company is currently working on a €13 million ($20.5 million) regeneration project with a French partner which will allow collected fuel to be reprocessed. The Maltese government is soon to privatise the marinas, and Falzon Service Station is also working on a special bunkering scheme for yachts in Valletta harbour. This will incorporate a pipe system running 1.5 kilometres from shore, supplying distillates to, and removing waste oils from, recreational vessels. The company is open to joint ventures with foreign companies looking to enter the Maltese bunker market.

Island Bunker Oils has been in the Maltese market since 2002, and supplies all grades of fuel oil – including low sulphur – from 380 cst right down to 30 cst, and all grades of MGO – 0.1% sulphur and above. The company supplies at all locations, including offshore, using its six barges: the 2,547 deadweight tonne (dwt) Anchor Bay; the 3,027 dwt Balluta Bay; the 3,027 dwt Salina Bay; the 6,585 dwt Xlendi Bay; the 3,290 dwt Mistra Bay; and the recently-purchased 10,628 dwt Paradise Bay, which boasts pumping rates of up to 1,200 cubic metres an hour (m³/hr), and is intended to strengthen Island Bunker Oils’ position in the very large crude carrier (VLCC) market.

Fuel can also be delivered via the company’s six RTWs.

Island Bunker Oils also delivers fuel from two government-owned ex-pipe terminals in Valletta – Flagstone Wharf and Deepwater Quay – both of which have berthing specifications of 200 m length and 11.5 m in draft. The company leases storage capacity in Valletta comprising some 32,000 m³.

Maltese trader Palm Shipping Agency is linked in with Island Bunker Oils, having a vested interest in the physical supplier through a subsidiary company.

Both Island Bunker Oils and Falzon Service Station have been awarded contracts to provide standby oil spill recovery vessels on behalf of the European Maritime Safety Agency (EMSA). Mistra Bay is pictured above during a drill. Malta is also home to the Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC).

Salvu Zammit & Sons Ltd supplies everywhere in Malta except at the offshore locations. It sells low sulphur fuel oil up to 180 cst, and MGO DMA 0.1% sulphur and above. The company owns four barges, three of which – the 100 mt Salvator, the 120 mt Sibert II, and the 425 mt Bawa I – supply MGO only. The Mgarr has a capacity of 1,600 mt of fuel oil and 450 mt of MGO. Zammit & Sons stores its products

<table>
<thead>
<tr>
<th>Port / Region</th>
<th>Physical suppliers</th>
<th>Grades of fuel available</th>
<th>Supply infrastructure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valletta</td>
<td>Falzon Service Station, Island Bunker Oils, Cassar Fuel Ltd, Salvu Zammit &amp; Sons, Cornflower Shipping Ltd</td>
<td>Fuel oil RMG 380 – RME 180, MDO DMG, MGO DMA 0.1 – 1.5% sulphur</td>
<td>Ex-pipe, barge, RTW</td>
</tr>
<tr>
<td>Marsaxlokk</td>
<td>Falzon Service Station, Island Bunker Oils, Cassar Fuel Ltd, Salvu Zammit &amp; Sons</td>
<td>Fuel oil RMG 380 – RME 180, MDO DMG, MGO DMA 0.1 – 1.5% sulphur</td>
<td>Barge, RTW</td>
</tr>
<tr>
<td>Offshore locations</td>
<td>Falzon Service Station, Island Bunker Oils, Cassar Fuel Ltd</td>
<td>Fuel oil RMG 380 – RME 180, MDO DMG, MGO DMA 0.1 – 1.5% sulphur</td>
<td>Barge</td>
</tr>
</tbody>
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Key: MGO = Marine Gasoil; MDO = Marine Diesel Oil; RTW = Road Tank Wagon

‘In May, a bidding process was finalised which will see just one private company take all of Enemalta’s storage assets. Rather than liberalising the market and introducing competition, it seems a monopoly is simply being passed from one entity to another’
in Enemalta’s facilities in Valletta. Trading for nearly 20 years, the company is Malta’s first licensed independent supplier.

**Cassar Fuel Ltd** supplies at all locations. The company sells MGO DMA from 0.1% up to 1.5% sulphur to a variety of vessels, from recreational boats to large tankers. Although Cassar Fuel has been supplying for seven years, 2007 was its first year with its own barge – the 450 mt *Sacro Cuor I* – during which the company sold 50,000 mt of fuel. The supplier also owns 11 RTWs ranging from 11,000 litres up to 42,000 litres. Cassar Fuel leases storage space from Enemalta in Valletta and Oiltanking in Marsaxlokk, providing a combined storage capacity of 5,000 mt. Fuel is obtained from Total, which obtains its products from the countries within the EU, and AOT, which imports fuel from Russian ports.

**Cornflower Shipping Ltd** is a small-scale supplier specialising in the pleasure-craft sector. It supplies MGO DMA 0.1 and gasoline from its 100 mt barge, *Seagul I*, in Marsamxetto harbour near Valetta. The company’s barge is used as floating storage and is supplied by Cornflower’s three RTWs. The same company acts as a broker under the name *Attard Services Ltd*.

Other brokers operating in Malta include Allships Agency Ltd, Bunkering Brokers Ltd, Focal Maritime Services Ltd, Kirton & Co. Ltd, Marine Fuels Malta Ltd, Ronason Shipping Agency Ltd, Seatrans Shipping Ltd, Sorotto Ltd, J.B., and Sullivan Shipping Agencies Ltd.

The ending of MOBC’s bunkering activities in 2004, whether related or not, preceded a major drop in Malta’s bunker fuel sales. Based on traffic generated in Malta’s ports, sales figures seem to have increased from 760,000 mt in 2002, to 940,000 mt in 2003, to just over one million mt in 2004. In 2005 sales had dropped massively to 680,000 mt, and are now on the rise again, with a figure of 865,000 mt for 2007. According to Frank Sammut, there is potential for the market to reach 1.5 million tonnes, but new players would have to come in to make this possible. Whether the sale of Enemalta’s storage assets will help or hinder this potential growth remains to be seen.

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Current thinking

Richard Brown of Applied Weather Technology looks at how weather routing can help to optimise ships’ fuel consumption

With soaring fuel prices around the world, shipowners and operators are continually looking for ways to reduce the fuel consumption of their vessels. With the average weather routing fee equivalent to only one metric tonne (mt) of bunker fuel, it is a very small risk for one of the largest returns on investment available with regards to fuel savings.

For liner companies where each vessel has a fixed schedule, Applied Weather Technology (AWT) has developed its Fuel Optimization Service (FOS). For these vessels, the biggest impact on fuel consumption once they have left port is the route they select and their sailing speed. AWT uses the latest technologies in combination with an experienced team of weather routing experts and other variables such as the weather forecast, currents, vessel type, age, stability, cargo, speed, client requirements, etc., to determine the optimum route. Each vessel is continuously monitored and provided with updated information regarding its individual forecast, recommended route and optimum speed setting. The aim is to help ships make their scheduled arrival time, while minimising fuel consumption and keeping the crew, cargo and vessel safe.

The weather routing experts use the AWT Route Optimization System (AROS), which employs artificial intelligence to monitor the vessels continuously and alert the route analyst when action is needed. These alerts are prioritised so the analyst can quickly address those that are in the most need. These alarms cover all facets of the voyage from administrative details, data quality, vessel and voyage performance, route selection and safety. A few examples are the potential of encountering freak waves, icebergs, tropical cyclones, explosive deepening storms and sensitive cargo at risk. These types of alarms allow AWT to find the most efficient route while keeping the ship safe. The system also automatically notifies the route analyst when the recommended speed significantly changes from the speed provided in our last message to the captain. The route analyst can then quickly update the captain with the latest forecast and speed recommendation, thereby minimising fuel consumption.

Severe motion alerts

AWT is the only shore-based weather routing company to use vessel and voyage specific severe motion alerts based on the vessel size, draft, stability, speed, heading and wave conditions. These alerts provide both strategic and tactical guidance to our experienced route analysts when evaluating a vessel’s route. The alerts show where severe motions are most likely to occur at a specific time along the route and also indicate what headings and/or speeds could be used to avoid these areas, thereby minimising the potential of heavy weather damage.

New ship resistance technology

When they are unsure of what weather to expect on their voyage, ships’ captains will often choose a conservative route, adding needless miles to the journey. They will often start a sea passage at, or near, maximum speed, and then reduce their speed significantly during the second half of the voyage once they are confident they will make their required arrival time. This is not the most efficient way to manage the vessels’ speed and consumption, so AWT has created new proprietary technologies to assist the ship captains in this area. To minimise the uncertainty over the weather, AWT has create two types of ship resistance.

The first is Climatological Ship Resistance (CSR), which is the speed loss due to historical wind and wave data since 2000 for different ship types and weather patterns such as El Niño and La Niña. AWT has also created Forecast Ship Resistance (FSR), which can use the resistance based on the forecast from multiple global weather models or take the resistance for a specific area from the model that performs best in that region of the world. These technologies give AWT the capability to select the optimum route consistently, more accurately predict the weather impact, and give better advice on speed recommendations, thereby minimising fuel consumption.

The images on page 27 show the ship resistance for a vessel heading westbound across the North Pacific in mid-January. The first image is for El Niño weather pattern years, which shows the resistance being much stronger over the Central
Pacific when compared to La Niña years, indicated in the second image. The image for the El Niño years also shows significant resistance extending all the way to the Hawaiian Islands, while in the Bering Sea the resistance is significantly lighter. These resistance patterns indicate that during an El Niño year the optimum route from the west coast of North America to Asia is by far the best via the Bering Sea. While historically during the La Niña years the Bering Sea route will be more difficult; and the further south the departure port is, the more likely a southern route option becomes more viable.

**Optimisation for sail-assisted vessels**

As new technologies emerge such as the use of kite sails or aerofoils, AWT is working closely with its clients to develop new optimisation algorithms for minimum cost or least time that will take into account the impact on the vessel’s speed and consumption, based on the type, height and size of the sail, along with the wind speed and relative direction to the vessel.

**NCOM currents**

AWT also uses the latest technology in ocean currents: the Naval Coastal Ocean Model (NCOM). This data is available daily with a resolution of an eighth of a degree, which is far better than the monthly averages from the pilot charts. This data gives the ship’s captain and AWT the capability to fine tune the voyage to maximise the effects of the current. So significant savings in time and fuel are now even possible on shorter or coastal voyages.

**Fuel optimisation example voyage**

On a voyage from Bremerhaven to Veracruz, the ship’s captain intended to sail along a southern route via the English Channel, but followed the recommended northerly route. The northern route avoided significant delays that would have occurred while passing and exiting the English Channel due to a severe storm that moved over the southern UK. Throughout the voyage, AWT kept the captain advised of the optimum route and speed to maintain his schedule. Had the captain sailed his intended route, he would have needed a speed of 19.5 knots to maintain his schedule, requiring an additional consumption of nearly 10 metric tonnes (mt) a day. So on one voyage the captain was able to save 123 mt of bunker fuel, reduce greenhouse gases (GHG) by nearly 400 mt and save $73,800.

<table>
<thead>
<tr>
<th></th>
<th>Actual route</th>
<th>Intended route</th>
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</thead>
<tbody>
<tr>
<td>Required speed to meet ETA</td>
<td>18.65 Knots</td>
<td>19.50 knots</td>
</tr>
<tr>
<td>Daily fuel consumption rate</td>
<td>75.94 mt a day</td>
<td>85.00 mt a day</td>
</tr>
<tr>
<td>Overall voyage consumption</td>
<td>1,030.5 mt</td>
<td>1,153.5 mt</td>
</tr>
<tr>
<td>Voyage fuel costs (£$600 a tonne)</td>
<td>$618,300</td>
<td>$692,100</td>
</tr>
<tr>
<td>Voyage fuel savings</td>
<td>$73,800</td>
<td></td>
</tr>
</tbody>
</table>

With the daily operating costs of a vessel being so high, owners and vessel operators can realise significant savings from the FOS at a very low cost. They can also reduce their carbon footprint and improve the safety of the crew, cargo and vessel. With the improvements in the weather routing technologies and the overall reduction in seagoing experience due to manpower shortages, it is now imperative that the ships’ captains are provided with as many tools as possible to complete their voyages safely and efficiently.
Everyone knows that reducing CO₂ means reducing fuel consumption, but how? Nick Dearden of Greenwave – shipping’s new environmental charity – shows the way.

When Greenwave was formed two years ago, we kept a pretty low profile. We wanted to prove we could deliver results. We started with no preconceptions, just a mission to reduce greenhouse gas (GHG) emissions from ships.

Because we are a charity, all our work has to be funded by donations. We were fortunate that a handful of visionaries in the Greek shipping industry shared our belief that the impact of shipping’s GHG emissions had to be reduced.

We put together a very talented team of specialists that included naval architects, aero and hydro dynamicists, physicists, engineers, designers and software developers.

Greenwave has close co-operation with two leading universities: Auckland University in New Zealand and Solent University in Southampton. This gives us access to some pretty sophisticated twisted flow wind tunnel and towing tank facilities.

We recognised early on that the shipping industry is quite conservative and if we were going to provide it with ways to cut carbon dioxide (CO₂) they would need to be practical and affordable. So we imposed four key criteria on ourselves right at the start:

- be sustainable
- be capable of fitting to a large proportion of the existing global fleet
- not require additional crew
- repay the capital and fitting cost within three years from the fuel saved.

We also set ourselves a timetable: the first solutions must be deliverable within three years from the start in the summer of 2006.

Quick wins

One look at the design of a typical bulk carrier tells you that aerodynamic considerations were not a priority. When we scale-modelled the cranes and superstructure from an actual supramax vessel we immediately identified areas of turbulence that created most of the drag.

Specially designed foils and fairings, with unique profiles, were developed and applied at key points. Subsequent testing found a drag reduction of 20% was being achieved, amounting to a fuel saving of about 50 metric tonnes (mt) per ship per year.

Wind wins

Improved aerodynamics was a start, but the real breakthrough came from our investigations into wind power. There had already been a considerable amount of research and development on technologies like wing sails and kites.

We considered these but came to the conclusion, quite early on, that the surface area of sail needed to generate significant amounts of thrust on, say, a 60,000 tonne bulk carrier were of the order of 2,500 square metres (m²). That’s a very large amount of sail and, however we configured it, we felt it could not meet one of our own self-imposed criteria, namely operating our technologies with just the existing crew.

What we needed was a way of harnessing wind power using push-button sailing from the bridge.

Our research took us back to the 1920s, and the development, by a German engineer called Anton Flettner, of a rotor or wind engine. This technology uses the Magnus effect, where wind hitting a spinning surface (in this case a cylinder) creates thrust. The cylindrical configuration enables a significant surface area to be achieved from a relatively small footprint on deck.

Scale models were again designed, developed and tested. Initial results were indeed impressive. The wind engines proved to be 10 times more efficient than sail in harnessing the power of the wind... and capable of delivering a remarkable 13% of the total thrust needed to propel a laden bulk carrier.

Greenwave is a UK-registered charity focused on reducing carbon dioxide (CO₂) emissions by reducing fuel consumption. In just two years, its research and development team has already come up with practical, affordable ways to cut emissions by being able to use less engine power and thus less fuel.

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Thanks to the support of a Piraeus-based ship manager, the Greenwave team was able to obtain three years of ships’ log data from four vessels, which enabled us to benchmark our research findings against actual voyages, wind strengths, apparent
The team was eager to look for ways of reducing the main cause of drag, namely the hull’s contact with the water.

The wind engine was not new technology but old technology being brought up to date. Flettner’s rotor had been successfully sea trialled on an Atlantic crossing so we knew it worked. But in those days the relentless advance, first of steam and subsequently diesel engines, meant that power was all that mattered. Fuel cost and sustainability were not then issues that anyone considered.

Further development was carried out on Greenwave’s wind engine, and the more we tested it, the more impressed we became. Here was a proven technology to which state of the art design and materials could be applied. Wind engines were capable of delivering a remarkable 10% of the total thrust needed to propel a laden bulk carrier. This would enable the engines to be throttled back saving some 900 mt of fuel per ship per year while maintaining voyage speeds.

Stability and control
The team was eager to look for ways of reducing fuel by improved hydrodynamics, but the wind engine gives us the potential to monitor performance.

A scale model of the hull, of the same supramax vessel used for the aerodynamic tests, was created and subjected to heeling and yaw tests in the towing tank at Solent University. They were not the typical tests for this kind of vessel but the wind engine was not a typical method of propulsion. Our key area of concern was whether the use of wind power required some kind of keel but it soon became apparent that the rock-solid stability and scale of these vessels meant that effectively the whole side of the ship acted as a keel and provided more than enough side force.

Our tests enabled us to identify that performance could be enhanced still further with slight hull modifications. However, we have not yet pursued these additional improvements as the benefits need to be weighed against the cost of installation, including the length of time the ship would be out of commission.

The future priority for hydrodynamic research and development will focus on ways of reducing the main cause of drag, namely the hull’s contact with the water.

Forecasting and monitoring
Our ships’ log database gave us the opportunity to have real data against which to benchmark our testing but we felt this could be further developed as a forecasting tool for emission and fuel savings.

‘Drag reduction of 20% was being achieved, amounting to a fuel saving of about 50 tonnes per ship per year’

Ultimately, we would develop it into an onboard system that would monitor performance of the Greenwave technologies and give the ship’s master real-time information and the opportunity to optimise the technologies based on prevailing conditions.

Greenwave is actively seeking co-operation from other shipowners, on a strictly confidential basis, to make further ships’ log data available. Any shipping company supplying data would not be identifiable and the information would be merged to create average conditions on set routes.

Greenwave’s Performance Analysis Software System (PASS) was demonstrated at Posidonia in June 2008. It enabled a shipowner or manager to select specific criteria about the ship, voyage, fuel and which Greenwave technologies would be applied.

The system then calculates emission and fuel savings for that particular voyage.

The PASS system will be web-hosted software which shipowners will be able to register to use. Registration with Greenwave will be free and a password will create access from anywhere in the world.

Programme status
The aerodynamic drag kit is about to be sea trialled this autumn and it is expected that the system will be made available by the end of 2008.

The wind engines are currently undergoing outdoor tests on 10 metre scale models using battery power to drive the rotors and to monitor their performance. Full scale sea trials will commence at the beginning of 2009.

Who benefits and who pays?
Greenwave was formed as a charity to enable the shipping industry to tackle the problem of greenhouse gas emissions. Its only remit is to improve the environment. All Greenwave technologies will be made available to the industry on a not-for-profit basis.

Greenwave’s work is undertaken on behalf of the entire maritime industry and for the benefit of the global environment and the generations who will follow…our children and grandchildren. It’s a big task but we are making real progress in practical affordable and sustainable ways.

Our funding to date has come from a few visionaries in the industry who could see that something had to be done. But a task on this scale should not be left to a handful of people so we urge everyone in the industry to play their part in making a contribution to the charity’s work.
Andy Osbourne argues that Krystallon’s scrubbing technology offers an antidote to rising fuel costs and emissions

It is often all too easy to get wrapped up in complicated projections for the future when scanning recent headlines in the maritime and energy media: ‘Crude prices at record high’, ‘What’s going to happen to freight rates?’, ‘Ship emissions continue to rise’, ‘Bunker Costs Prompt Rethink’. It is against this backdrop that a refreshingly uncomplicated technology that slashes fuel costs and emissions levels has emerged – seawater scrubbing.

But before we look at the antidote that scrubbing provides, it is important to establish the disease; deadly air pollutants from ship fuel dramatically higher than levels in other transport sectors, hikes in refining investment, costly cleaner fuels that do not reduce particulate matter (PM) – one of the most deadly air pollutants – and an overall rise in carbon dioxide (CO₂) output.

On the face of it, it doesn’t look good. Emissions of sulphur oxides (SOx), major air pollutants and precursors for secondary particle formation in coastal areas, are directly proportional to the sulphur content in marine fuel. There are around 750 million cars in the world today, producing approximately 88,500 metric tonnes (mt) of SOx per year, based on figures that have one car emitting 50 parts per million (ppm) for 15,000 kilometres (km) a year. The world’s 100,000-strong shipping fleet burns around 370 million mt of marine fuel per year, according to the International Maritime Organization (IMO), and therefore emits 20 million mt of SOx – a staggering 225 times the emissions levels from the world’s car fleet.

A study presented to the IMO working group by the non-governmental organisations (NGOs) showed that if no actions were taken to reduce sulphur content in shipping fuel, the pollution will be responsible for 83,700 premature deaths per year by 2012. While the proposed cuts will not reduce the mortality rate to zero, it will cut by almost a third, to 33,700 annually by 2012.

The IMO’s April ruling, anticipated to be made law in October 2008, leads the way for stringent Emission Control Areas (ECAs) in waters in Europe and North America with SOx caps of 1% by 2010 and 0.1% by 2015. While the 2010 ruling could see ship operators continue to use cheaper fuel oil, or bunker fuel, by 2015 fuelling in ECAs will mean competing with road transport and other sectors for diesel fuel that already trades at almost double bunker fuel prices.

**Scrubbing versus distillates**

While sulphur may be the current target in legislators’ sights, PM is also largely attributed as a major cause of cardiovascular and cancer-causing diseases. It could be argued that in focusing on SOx, the IMO neglected the real killer pollutant, which is found in marine diesel and other distillates at almost the same levels as it is in heavy fuel oil (HFO). Seawater scrubbing, on the other hand, reduces PM from heavy fuel oil bunker fuel by 80% and SOx by 100%. As the IMO turns to other pollutants, such as PM, it is worth shipowners considering whether a costly fuel switch now or over the next few years will only serve to preempt their fitting scrubber technology later rather than sooner.

As well as the environmental benefits of capping sulphur limits, the International Energy Agency (IEA), in its report, *Medium-Term Oil Market Report for 2008–2013,* said new demands from the maritime sector would come at a time when an increase in costs was already forcing refiners to cut plans for additional capacity. ‘Increasing cost pressures have added 50% to investment expenditures over the past two years,’ the IEA, said in its report published 7 July 2008.

The IEA noted that some refinery upgrade projects had already been postponed and that further project delays were likely. The report identified the move to tighten environmental standards for bunker fuel as one of the major challenges facing the refining industry as the sector demands more distillate, or ‘cleaner fuel’. That would require major investments from refiners to increase distillate output.

It is in light of projected tight demand and rising ‘cleaner fuel’ costs that shrewd shipowners have begun to project their fuel costs premiums to factor in future emissions’ cap dates of 2010 and 2015. For many shipowners, based on current

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**Andy Osbourne** is the Business Development Director for Krystallon. He joined Krystallon in May 2006, having spent four years in the USA setting up BP’s Financial Risk Management business in Chicago, and latterly running its Arco Commercial Fuels Business in Los Angeles.

Since April 2008, Osbourne has been working with Krystallon’s chosen partners (Caterpillar and WMS) to establish a sales pipeline and to gain signed contracts for new build and retrofit applications.

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Environmental Issues

Premiums in Europe for low sulphur fuel oil, fitting a scrubber and ‘future-proofing’ their vessel offers savings immediately. International bunker supplier Chemoil Energy estimated in April that a 1.0% low sulphur fuel oil (LSFO) stem would soon demand a $100 premium over the spot price of 3.5% sulphur fuel oil CIF Rotterdam. At current prices the premium stands at more than $55 per tonne. With a price differential of $55 a tonne, a vessel burning 100 mt a day for 50 days in a 1.0% ECA would save $275,000 per year in fuel costs by fitting a seawater scrubber.

Marine diesel oil (MDO) in European and North American ports, where ECAs will predominantly be found, is almost twice the cost of 380 centistoke (cst) fuel oil. If the same case study is applied to MDO (as will be required from 2015 in ECAs), today pegged at a $435 premium over 380 cst in Rotterdam, then the same a vessel burning 100 mt a day for 50 days in a 0.1% ECA would save $2.18 million a year in fuel costs by fitting a seawater scrubber.

In other words, a new vessel launched in 2010 with a lifespan of 20 years would save $280,000 per annum for five years and $2.18m per annum for 15 years under this scenario – a total fuel spend saving of $34.1 million. With the IEA predicting rising distillate fuel costs, the premium for ‘cleaner fuels’ is likely to mean this figure is an under-estimation.

**Inundated with inquiries**

Krystallon has been inundated with inquiries for scrubbing technology following the IMO’s ruling. While the majority of inquiries are for newbuild vessels, seawater scrubbers – which vary in price from $700,000 to $7 million, depending on vessel and engine size – can be retrofitted in only 10 days when a vessel is in routine drydock. While initial inquiries were predominantly from the cruise and ferry market, which operate in current or soon-to-be ECAs, recent higher premiums for LSFO have forced other sectors, such as coastal tankers, into immediate play.

Krystallon figures show that 50% of the current tanker fleet could find scrubbing more economical than a diesel switch, which equates to a potential tanker market opportunity of 5,893 ships by 2015 for scrubber manufacturers. For vessel owners looking to future-proof their vessels against future regulation at newbuild stage, the economics of fitting a scrubber are glaringly beneficial.

As many as 23,905 vessels from a global fleet target total of 71,758 could find scrubbing to be a more viable option than switching to diesel fuel by 2015 – equating to a potential market of over $7 billion based on average scrubber size and costs.

Based on current MDO prices, a 0.1% ECA, which could be in place on the North America west coast by as early as late 2010, would mean payback within in a year for a 5,500 twenty-foot equivalent unit (TEU) vessel – even if it spends just 12 days per year in an ECA.

A projected scenario for a 5,500 TEU vessel headed for Seattle would see it enter the west coast ECA at Neah Bay travelling at 25 knots – equating to as many as 15 days a year running its main engines on distillates within the ECA.

Even allowing for only 12 days per year on main engines within the ECA, the vessel burns 3,060 mt of fuel within the ECA and will run up an additional fuel bill of $1.96 million (based on a distillate differential of $640 per tonne in Seattle). Under such a scenario, a $3 million scrubber would take only 18 months to become cost-effective.

Huge savings on shipowners’ fuel bills are not the only advantage seawater scrubbing has over switching to distillates. Shipowners
facing the prospect of having to switch fuel tanks mid-voyage and alter their lubricant procurement to adjust to cleaner fuels will benefit from continuity in their fuel procurement operations.

How does it work?
While some scrubbing systems include the use of chemicals such as caustic soda in their cleansing process, seawater scrubbing benefits from removing additional costs beyond the initial installation fee. The system also benefits from its sheer simplicity; it requires neither additional chemicals nor fresh water for operation and can be retrofitted in as few as 10 days.

Krystallon’s seawater scrubber is manufactured from high nickel chrome alloy steels specifically developed for the application. It fits into the funnel space being both lightweight and self supporting. The scrubber is designed to run cool, operating on seawater, although, under emergency conditions, it can be operated at temperatures up to 450°C.

Currently, it provides for silencing of the exhaust noise, while removing 100% of sulphur dioxide (SO₂) and up to 90% of PM when operated on a 35,000 ppm, or 3.5%, bunker fuel.

A washwater treatment system will handle the full scrubber water flow and is designed to remove both the solid particulate and liquid hydrocarbon waste products. A very efficient design reduces contamination to levels measured in parts per billion (ppb). All materials are manufactured from corrosion proof glass reinforced epoxy. With regard to US coastal vessels, Krystallon is in the process of developing a light and cost-effective durable plastic scrubber suitable for vessels such as tug boats or small ferries.

Compliance with regulations is crucial and Krystallon uses a monitoring system design unique in the shipping industry.

‘As many as 23,905 vessels from a global fleet target total of 71,758 could find scrubbing to be a more viable option than switching to diesel fuel by 2015 – equating to a potential market of over $7 billion based on average scrubber size and costs’

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SO₂, nitrous oxide (NOx), PM and CO₂ are measured by quantum cascade laser-based detectors providing for many hundreds of measurements every second in a small and highly stable design, while washwater discharge is monitored for hydrocarbons, turbidity and pH.

Extensive studies have shown that washwater levels increase by only one ppm upon release into the sea – rising from the ocean’s natural SO₂ content of 928 ppm to 929 ppm before dissipation.

Despite the obvious benefits of scrubbing technology, continued dialogue between manufacturers, local authorities, regulators, and enforcement agencies is crucial in ensuring scrubbing is able to benefit all. Krystallon is regularly consulted by environmental bodies, NGOs, government representatives and the IMO on seawater scrubbing and remains open to dialogue.

With average SOx levels from ships currently 250 times the world’s car fleet, the need for an overhaul of ship fuelling becomes clear. Clearer still if the impact of shipping’s particulate levels is added to the equation. When 100% of SOx and 80% of PM can be eradicated by simply fitting a new technology to vessels – and in so doing save vessel owners, shippers and consumers billions of dollars of unnecessary fuel costs – there is an uncomplicated antidote.

Sales Interest Post MEPC Decision April 2008 - Delivery 2009-2012

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**Time to clean up!**

John D. McCown, CEO of Trailer Bridge, offers an operator’s perspective on the debate over ships’ emissions.

Up until just a few years ago, when the word ‘environment’ was used in a shipping industry context much of the time it related to oil spills. There is certainly no denying the terrible consequences of oil spills and by focusing on this issue, there have been great strides made in this area. But that’s not what I’m addressing today.

I’m addressing ships’ emissions, the ‘atmospheric spills’ of the shipping industry. This is a fairly new subject for me and one where I’ve learned much over the past few years. But even within the area of ships’ emissions, I think there is a lot of confusion in the industry.

A day doesn’t go by that we don’t all read more about greenhouse gases (GHG) and their effect on climate change. Ships’ emissions do contribute to GHGs, but, again, that’s not what I’m addressing today.

I’m focused on the particulate matter (PM) aspect of ships’ emissions as it relates to self-propelled vessels that burn residual fuel. In the marine sector, this is the proverbial 800-pound gorilla and the environmental issue of our time. The good news for the tug and barge sector is that this issue represents an extraordinary opportunity, and I believe this opportunity will present itself in a major way in 2010. I guess this article could be entitled: ‘How cleaner tugs and barges can clean up in 2010’.

In layman’s terms, GHG primarily refers to carbon dioxide (CO₂) and it is determined by the quantity of fuel used. Generally speaking, it doesn’t vary among fuel types and the prime way to reduce CO₂ is just to use less fuel. Using a gallon of gasoline results in about the same amount of CO₂ as using a gallon of residual fuel. PM, on the other hand, is determined by the quality of the fuel used and it varies considerably. It is really a measure of the dirtiness of fuel and takes into account a host of elements and foreign matter.

On that score, the residual fuel typically used in self-propelled vessels is pretty far down the totem pole. As the name implies, residual fuel is what is left over after all the refined product has been pulled out of crude oil. As a left-over product that is itself unrefined, it includes a concentrated amount of the original impurities in crude oil. Because of this, even crude oil itself has more energy content than residual fuel. The difference is made up by impurities and foreign matter and it is those impurities and foreign matter in residual fuel that result in extraordinarily high PM. One type of PM results from sulphur and it is such a key type that it is measured separately. Sulphur emissions are known to be hazardous to human health. Residual fuel also includes concentrations of heavy metal elements such as vanadium, mercury, lead and arsenic. I don’t know much about any of those, other than they aren’t good for you in any amount. It’s all these impurities that make the PM from self-propelled ships’ emissions the focus of everything you’ve been reading about the past couple of years related to ships’ emissions.

This issue has quickly moved to the centre of the radar screen for a couple of reasons. The first is that while the fuel used in most internal combustion engines has become consistently cleaner over the years, the fuel typically used in ocean-going vessels remains unchanged. This has become increasingly recognised. To put this into perspective, consider there are roughly 35,000 self-propelled vessels that move 13 billion-tonne miles of cargo each year, comprising some 95% of world trade. To move that cargo, those self-propelled vessels account for less than 3% of worldwide fuel consumption. In general terms, it’s a similar percentage of total GHGs. Sounds pretty good so far, but when you take into account the fuel quality aspect, it deteriorates precipitously in terms of its PM contribution. Because residual fuel is so much dirtier than the more distilled fuel products in cars and almost all other internal combustion engines, while vessels are near and in port, they comprise a significantly larger portion of local PM emissions. Based on various studies, many coastal and port areas now point to vessels as being responsible for 30% to 40% or more of total PM emissions. When you take into account the further initiatives already underway to make vehicle and other mobile emissions sources even cleaner, and line that up with the projected growth in marine transport without any changes in fuel quality, it is not surprising that PM from vessels is expected to account for the...
majority of total PM in many coastal and port areas in 10 years – unless something is done now.

Those statistics are why you started to see this issue more actively discussed starting a couple of years ago. The data and its trends were alarming to the experts in the environmental area – and for good reason. The policymakers and the public at large have been equally concerned. The standard industry answer that it is a complex issue that has to be dealt with globally began to wear thin and just wasn’t being bought anymore. Californian regulators and various port authorities in the state began to take unilateral action to reduce vessel PM emissions that they knew were harming their citizens. The California Air Resources Board (CARB) estimated that vessel PM emissions could be tied to some 800 premature deaths per year in the state (see Bunkerpot, December/January, page 44). Various ways of addressing vessel PM emissions, from plugging into electric power at dock, to sulphur scrubbers, to using cleaner distillate fuel near and in port, began to emerge. In what I thought was one of the more insightful examples of analysis and leadership to come out of the industry in some time, the International Association of Independent Tanker Owners (INTERTANKO) came out with a provocative recommendation: let’s deal with the issue with a wholesale worldwide switch from the residual fuel self-propelled vessels use to the distillate fuel tugs typically use (see Bunkerpot August/September 2007, page 16). This directly addressed the root cause of the problem and would result in a 90% or so reduction in PM, the sort of dramatic decrease various parties were demanding. INTERTANKO reasoned that this approach, even though it would roughly double the cost of fuel for self-propelled vessels given the typical price relationship between residual and distillate fuels, would actually be less costly in the long run than a series of prophylactic measures that didn’t do as much and that would still likely be subject to an eventual mandate to still switch to distillate. INTERTANKO presumably also recognised that a wholesale change at the same time would generally maintain parity, leading the way to have these costs passed on to their customers.

‘The good news for the tug-barge sector is that this issue represents an extraordinary opportunity for our sector, and I believe that opportunity will present itself in a major way in 2010’

The California authorities and INTERTANKO were joined by various European authorities and the ball started rolling faster on this issue. Change would be coming and the question was whether it would be patchwork or more comprehensive. The activity by various states galvanised the US Environmental Protection Agency (EPA) into further action. Everybody came to see the International Maritime Organization (IMO) as the entity that could facilitate a global solution and the IMO’s Marine Environment Protection Committee (MEPC) began deliberations in earnest.

The second factor that I believe energised the vessel PM issue was a study that was published in November 2007. In this peer-reviewed study, leading academicians in the field linked PM emissions from vessel residual fuel to 60,000 deaths worldwide each year, primarily in coastal and port areas, increasing by 40% by 2012.

All this activity culminated in June when the IMO came out with a new single long-term global standard calling for no more than 0.5% sulphur content for all vessel fuel by 2020, a dramatic reduction from the current 4.5% IMO standard. In Emission Control Areas (ECAs), the IMO has called for no more than 1.0% sulphur content by 2010, reducing to 0.1% by 2015. The new IMO standards will be reached primarily through the switch to cleaner distillate fuel which results in geometrically less PM and sulphur oxide emissions. With the IMO framework now in place, individual countries are now expected to establish numerous ECAs which will typically be a protected zone extending out a defined distance from the shore. Because there are only two ECAs in the world today (in the Baltic Sea, and the North Sea and English Channel), the industry isn’t focusing on them as much as they should and is incorrectly focused on 2020. These ECAs will not only have the first impact, but as they are put in place I anticipate they may accelerate the transition to using cleaner distillate fuel all the time.

I believe the big opportunity for US-flagged tug-barges that already use distillate fuel will come with the enactment of US ECAs. The framework for recognising the new IMO standards was approved by the US Senate and signed into law by President George W. Bush in mid-July (see page 15). While there are no US ECAs yet, there are two bills working their way through the House and Senate, respectively H.R. 2548 and S. 1499, that if passed will have the effect of establishing a 200 mile protected zone around the US that would effectively be an ECA (see Bunkerpot, June-July, page 14). If this were to occur, the 0.1% sulphur restriction would go into effect in that area in less than two years. Some are speculating that these bills will run into obstacles with such a large zone as it relates to transits by international vessels. That may very well be and perhaps there will be some bifurcation between how international and domestic vessels are addressed. The case for, and the ability to, regulate domestic vessels whose emissions affect US citizens is a focus on both ends of their voyage is compelling. I believe that a broad ECA will be established, at least for domestic vessels, to go into effect in 2010 under the IMO framework. Recommendations have been made that these bills be amended to include 200 mile protective zones around Hawaii, Alaska and Puerto Rico so that the US citizens living there have the same protection as citizens on the mainland. If these 200 mile zones are enacted, all of the domestic coastal trade and much of the routes between the mainland and the offshore Jones Act trade would effectively require all vessels to use distillate fuel. The tug-barges that already use distillate fuel would not be affected cost-wise but the self-propelled vessels using residual would see their fuel costs double. This would be a paradigm shift that would greatly advantage the tug-barge sector, and it’s likely just around the corner.
Environmental Issues

‘Compared to the carriers serving Puerto Rico that presently use residual fuel, Trailer Bridge’s smaller vessels have up to 10 and 16 times less PM and SOx emissions, respectively’

Trailer Bridge experience

I’d like to highlight our actual experience and our own in-place environmental differences. Trailer Bridge’s tug-barge vessels use only cleaner distillate fuel. When coupled with tug-barge vessels’ lower fuel consumption per unit mile characteristics, it results in significantly less PM and other emissions compared to carriers which use residual fuel. For instance, compared to the carriers serving Puerto Rico that presently use residual fuel, Trailer Bridge’s smaller vessels have up to 10 and 16 times less PM and SOx emissions, respectively. We believe that we are the only marine company in the world whose entire fleet already meets the IMO’s new long-term global standard.

Trailer Bridge was the first marine carrier to join the Smartway Transport Partnership, an innovative voluntary collaboration between the EPA and the freight industry designed to increase energy efficiency while significantly reducing greenhouse gases and air pollution (see Bunkerspot, February/March, page 44). I recommend that all of you look into joining Smartway Transport if you haven’t already done so.

In the marine sector, choices are made based on cost and efficiency considerations, but those goals don’t have to be in conflict with environmental aspects. In our system, some of the elements that deliver cost efficiency also bring with them a cleaner environmental footprint. You see more examples of businesses taking a different slant and rejecting the notion that sound environmental policies are somehow in conflict with their business model. Wal-Mart is a leader in pursuing transportation initiatives that both reduce costs and provide environmental benefits in a win-win situation that could aptly be called entrepreneurial environmentalism. I think we’re moving towards a tipping point where shippers will begin to give some consideration to the environmental aspects of their marine carriers. Tug-barge systems are well and positively differentiated in that area.

We highlight our environmental differences with a recognition programme that we call our Breathe Easy Award. Here, based on the containers a shipper moved with us over a given period, we calculate the absolute and percentage reduction in PM that can be linked with those shipments. For most, this is new information but it’s information that is always well received.

I can’t yet point to customers who have come our way primarily for our environmental aspects. That being said, just a few weeks ago we got a call from the head environmental person at a key prospect who requested data on various emissions per unit mile for our vessels. I’m also aware of environmental clauses that are beginning to appear in marine transportation contracts. In the shipping sector, vessel PM is the environmental issue of our time and it will raise environmental awareness throughout the industry and across the customer base.

In summary, it’s been eye-opening to me to learn about the in-place environmental benefits of tug-barges compared to self-propelled vessels. Our tug-barges allow us to lead with a more cost-efficient business model, but we now also know they allow us to follow through with 10 to 16 times less PM per unit mile, even with smaller vessels, than competitors with self-propelled vessels burning residual fuel. Knowing those facts makes me think that we’re providing an even more complete solution for our customers. Sustainability is an imperative for all companies, but the prime economic aspect is being joined by a rising environmental aspect. In a telling sign of the future, to my environmentally aware 14-year old daughter, the most relevant point of the business her dad is involved in is its relative green-ness.

Today, there are US flag tug-barges operating in the Jones Act that already have overall cost advantages, even with the more expensive distillate fuel that they use. With the coming changes that I believe will require self-propelled vessels currently using residual fuel oil to switch to distillates as early as 2010, the opportunities going forward for tug-barges in the Jones Act have never been greater. Their natural overall cost advantages will widen and they will still have a meaningful environmental edge as their more fuel efficient speed will still result in less PM emissions per unit mile. All the signs point to these environmental aspects beginning to play a meaningful role in marine freight decisions.

More cost-efficient US flag tug-barges and the more pronounced environmental benefits they offer will lead to a triple bottom line. The 3Ps of that bottom line are: profit, people and planet.
Neighbourhood watch

Tom Marion reports on how the crew of Buffalo Marine Service’s barge San Rafael helped to prevent a calamity on the Houston Ship Channel

On 1 July, US Coast Guard (USCG) Captain William Diehl, Sector Houston-Galveston’s Captain of the Port, awarded a Certificate of Merit to the crew of Buffalo Marine Service’s M/V San Rafael for heroism displayed on 24 May. The prestigious Public Service Award recounted the deeds of the crew in battling an inferno aboard the abandoned M/V Sarah K – a mere 15 metres from a loaded fuel barge.

The San Rafael’s involvement was triggered by a request-for-assistance broadcast that had been issued by the local Vessel Traffic Service (VTS). This was necessitated by the lack of available firefighting resources in the vicinity of the blazing towing vessel. Fortunately, the seasoned and well-trained crew of the San Rafael was within several minutes’ transit of the stricken vessel and they were keenly aware of the danger the fire posed to the local ship channel infrastructure. Thus, once called upon, the Captain raced to the scene as the crew charged fire hoses, discussed a plan of attack and stressed the importance of maintaining situational awareness throughout the firefighting efforts.

Led by Tankerman Joe Kesinger – a long-time volunteer firefighter – Tankermen Cal Johnson and Chuck McClure leapt aboard the Sarah K as flames roared from the galley up to the wheelhouse. While Kesinger and Johnson attacked the fire from opposite sides of the main deck, McClure closely monitored their progress from the vessel’s stern and communicated this information to Captain Ellis. Meanwhile, Captain Ellis ensured the San Rafael was positioned between the burning Sarah K and the loaded fuel barge while simultaneously keeping VTS watchstanders informed of the situation. He also warned vessel traffic in his vicinity to remain clear of the terminal.

After nearly 45 minutes of battling the vessel fire, Kesinger and Johnson were able to enter the engine room and secure the machinery that had remained running throughout the ordeal.

‘After nearly 45 minutes of battling the vessel fire, Kesinger and Johnson were able to enter the engine room and secure the machinery that had remained running throughout the ordeal’

This ‘port security’ dividend has been invaluable for the largest petrochemical complex in the US. The scores of terminals that provide berths for the hundreds of deep draft vessels from around the globe make the Houston Ship Channel particularly vulnerable to accidents or acts of sabotage. However, the active participation of stakeholders throughout the very diverse local maritime community in port security initiatives has attuned those mariners that regularly ply the Houston Ship Channel to the need to keep an eye peeled for activities or situations that appear out of sorts. This ‘neighbourhood watch’ mentality has detected and prevented many a life threatening situation and would not have been possible had it not been for the active outreach of port security officials from the USCG. Certainly, the fact that the local senior USCG official made the effort to recognise the selfless deeds of the San Rafael’s crew on the banks of the Houston Ship Channel reinforces the USCG’s appreciation for such acts.

As Captain Diehl departed Buffalo Marine, crewmembers from sister tows that had witnessed the presentation marveled at the fact that someone with so much responsibility and so little time consciously made the effort to praise their fellow shipmates. In light of this, there is little doubt that the Captain of the Port’s efforts to maximise stakeholder participation in port security undertakings are bearing fruit.
In an era of high oil prices and environmental anxiety, shipowners are facing untold pressures – from spiralling costs to increasing maritime rules and regulations.

Anything that can trim lubricant bills, or extend engine life in these trying times, is almost worth its weight in gold. Maximising vessel performance becomes an even higher priority under such circumstances, where reliability and durability can result potentially in savings worth thousands – or even millions – of dollars.

Kittiwake has for years provided the industry with innovative ship-based solutions to help onboard engineers monitor and test fuel, lubricant and water conditions to achieve better operational performance.

These critical fluid test kits, developed using patented Kittiwake technology, have pioneered machinery condition monitoring at sea, enabling engineers to check fuel and lubricant conditions and take remedial action where necessary at short notice.

In the past, this kind of precision analysis was confined to shore-based laboratories. Detailed testing of liquids on any vessel required samples to be packaged and then sent away with results returned typically after a period of weeks or perhaps months.

‘In today’s ultra competitive environment, ship operators cannot afford the luxury of this time,’ says Kittiwake’s marketing manager Paul Froome. ‘This is where onboard testing and analysis comes in. The reality is the sooner the engineers have the results in their hands the sooner they can take decisive action. By the time lab results come back it may be too late.’

Protect and serve

The latest innovation from the Kittiwake stable takes the concept of onboard testing one step further. Its LinerSCAN product is the world’s first real-time liner alarm system to alert engineers to potential sources of danger. LinerSCAN builds on Kittiwake’s own ANALEX® Total Ferrous Sensor monitoring technology but includes improved accessories and software. The company launched the product commercially in mid-2008, although LinerSCAN has been successfully trialled at sea for more than three years. The technology is now in commercial operation on container vessels and bulk carriers.

Current installations include many types of engine varying from six cylinders to 10 cylinders. A number of shipowners already using LinerSCAN intend to roll out the technology across their fleet. The monitoring system is easy to install and commission, and fits snugly with existing equipment, requiring minimal storage space.

‘Monitoring engine liner wear is critical to the health and performance of any modern vessel,’ said Froome. ‘With LinerSCAN, operators and engineers now have a first line of defence. The system can alert them to possible sources of danger, in real-time, allowing them to act at the earliest opportunity.’

Tackling engine liner problems before they undermine vessel performance can mean potentially huge cost savings, a vital consideration for owners and operators. A single liner failure can cost hundreds of thousands of dollars in parts, repairs and off-hire costs, possibly more. The average insurance claim for an unexpected liner loss is over $250,000.

Wear is very much related to engine parameters, such as speed, load, cylinder lubricant feed-rate, temperature, fuel and lubricant quality, and issues can arise suddenly. With LinerSCAN, scuffing can be seen not just a few hours before there is serious damage – the first unmistakeable signs can be seen very often up to a few days before.

Fuel and lube oil issues

Amid concerns of deteriorating fuel quality, the need for precise and immediate engine liner data becomes paramount, says Kittiwake application engineer Tom Kent.

‘There is a reported increase in harmful catalytic cracker (cat) fines as a result of the blending process,’ he says. ‘LinerSCAN
‘Tackling engine liner problems before they undermine vessel performance can mean potentially huge cost savings, a vital consideration for owners and operators’

picks up the ingress of fuel cat fines in real-time allowing preventative measures to be taken before extreme wear of engine liners is realised.’

Although damage prevention is critical, the original reason behind the LinerSCAN project was to help vessels use less engine oil. Engines are regularly over lubricated to try to avoid problems like scuffing. This practice can sometimes have the opposite effect and lead to problems such as bore polishing and also high lubrication costs. An average container ship can spend $20 million on cylinder lubrication in its life.

The real beauty of LinerSCAN, says Kent, is that its use is not solely limited to the prevention of engine damage. Constant real-time monitoring gives engineers a vital tool in maintaining and optimising lube oil requirements, a huge cost saver.

On any ship, the optimal feed rate for oil is not fixed. It is dependent according to trade, load, running hours and many other factors, many of which are unknown. With LinerSCAN, the engineer just reads from a monitor how the engine is lubricated at any given time, there is no need to take additional oil samples.

‘LinerSCAN helps reduce cylinder oil feed rate to the optimal value, thereby reducing the cost and potential problems from liner lacquering or bore polishing due to over dosage of the cylinder oil,’ says Kent. ‘Our system typically means that you can use less oil.’

This is welcome news in an age where oil, regardless of its form, does not come cheap. Field trials over the past three years have at times decreased main engine oil lubricant usage by up to 50%. Ignoring all other savings, an extremely conservative 5% reduction in lubricant usage will pay back investment in months.

‘No other system gives you this level of confidence in your real-time feed rate alterations,’ says Kent. ‘Likewise, no other system can help you achieve this reduced lube oil consumption without compromising manpower or using laboratory analysis.’

Unknown territory
Aside from cost savings and the obvious safety benefits – a liner going down at the wrong time could be extremely hazardous for any vessel – the new Kittiwake system comes at a time of increasing environmental anxiety.

Environmental changes influencing the use of fuels could also pose a threat to marine engineers charged with monitoring engine performance. In these cases, LinerSCAN can again perform a valuable role, especially in such a changeable backdrop.

Changes in the fuel sulphur level, for instance, could potentially impact on the engine liner and ultimately the performance of the vessel. ‘Sulphur is a major contributor to the surface finish on the liner and its absence is unknown territory,’ says Kent. ‘Couple this with the changes that will need to be made to the oils’ base numbers and ship’s engineers will be continually learning.’

Europe already has its first Sulphur Emissions Control Areas (SECAs) in the North Sea, English Channel and the Baltic Sea, while other areas such as the United States look set to follow suit. This could see fuel sulphur content slashed from 4.5% in most places down to 1.5% and then 1.0% by 2010, and even 0.5% further on the horizon.

The message is to expect surprises as more changes are made. Slow steaming, driven by the International Maritime Organization (IMO) and the drive to cut fuel consumption, could throw up more complications. ‘Again, ships are heading into less well known territory,’ says Kent. ‘It’s not just a matter of slowing the engines down. For best efficiency, the timing, fuel pumps, and turbochargers all need to be matched to this new condition.’
In 2008, CBI Engineering has developed a new product, the CBI Portable Fuel Oil Test Kit, for measuring the key characteristics of heavy fuel oil.

Mikhail Yakushkin, CBI's Manager for Russia, has found that the new equipment allows customers to make an accurate analysis of such characteristics as viscosity and density within 15-25 minutes.

The kit consists of two instruments, a density meter and a viscometer, and comes in a heavy-duty flight case that is easy to carry. The new equipment does not require any expendable materials.

### Density meter

The density meter is needed to:
- confirm the quantity of fuel delivered
- verify that the correct grade of fuel has been delivered
- estimate the combustion performance
- and convert the viscosity in centipoise (cp) to centistokes (cst).

The density meter, which weighs only 2.2 kilogrammes (kg) and has dimensions of 18 x 23 x 10 centimetres (cm), uses hydrometers to measure the density of marine fuels corrected to kg per cubic metre (kg/m³) at 15ºC. With this information and the viscosity of the fuel, the density meter can determine such characteristics as:
- mass of fuel delivered
- calorific value
- and the anticipated combustion performance, as indicated by the Calculated Carbon Aromaticity Index (CCAI).

Hydrometers are currently available in three ranges. One of each is supplied with the density meter.

In order to ensure that the equipment operates correctly, the following specifications should be taken into account.

#### Density meter specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>800-1010 kg/m³ at 15ºC (ISO 8217 fuel grades DMA - RML 55)</td>
</tr>
<tr>
<td>Test time</td>
<td>Heating from 15ºC for 10 minutes Repeat test in 30 seconds</td>
</tr>
<tr>
<td>Cleaning</td>
<td>1 minute</td>
</tr>
<tr>
<td>Temperature</td>
<td>50ºC or 70ºC</td>
</tr>
<tr>
<td>Calculations</td>
<td>Density at 15ºC in vacuum, centipoises (CP) to centistokes (cst) Calculated Carbon Aromaticity Index (CCAI)</td>
</tr>
<tr>
<td>Accuracy</td>
<td>Within +/- 0.1% (800-1010 kg/m³)</td>
</tr>
<tr>
<td>Power</td>
<td>110-250 VAC. Auto selected at 50/60 Hz 200 VA</td>
</tr>
<tr>
<td>Fuse rating</td>
<td>2.5A 20 mm 250 VAC HRC A/S (T) Ceramic</td>
</tr>
</tbody>
</table>

### Heated viscometer

Viscosity is one of the most significant characteristics of a fuel. It is important for verifying that the correct grade of fuel is delivered, as well as being a key factor in calculating combustion performance and in
Fuel Oil Testing

making adjustments for fuel handling and injection systems.

The CBI viscometer is extremely rugged and can be used in severe climatic conditions. It is suitable for a wide variety of applications, including diesel engines, gear boxes and hydraulic systems.

The viscometer can be used in the following ways: unheated with automatic viscosity correction to 40°C for lube oils; heated to 40°C for distillate fuels and lubricating oils; and heated to 50°C for residual fuel oils.

The prime function of the viscometer is to monitor lubricating oil viscosity, in order to prevent costly engine and machinery failures. In addition, it can verify a fuel oil grade is correct, and that the fuel viscosity is acceptable for storage.

### Viscometer specifications

| Range               | 20-810 cst at 50°C (ISO fuel grades RMA10 to RML55)  
|                    | 20-810 cst at 40°C (lubricating oils SAE 5 through 50)  
| Test time          | Heating from 25°C: 10 minutes  
|                    | Viscosity at 40°C: 3 minutes (unheated).  
| Repeat test        | In 30 seconds  
| Calculations       | Viscosity at 50°C or 40°C (heated)  
|                    | Viscosity at 40°C (unheated, corrected to 40°C)  
|                    | Viscosity at 100°C (calculated)  
|                    | Calculated Carbon Aromaticity Index (CCAI)  
|                    | Density correlation from 50°C to 15°C in vacuum  
|                    | Variable viscosity index (for unheated mode)  
| Accuracy           | Within +/- 3% (20 - 450 cst) or +/- 2 cst  
| Power              | 110 - 240 VAC 50/60Hz 200VA  
| Fuse rating        | 2.5A 20 mm 250 VAC HRC A/S (T) Ceramic  

Heating from 25°C: 10 minutes  
Viscosity at 40°C: 3 minutes (unheated).

Viscosity at 50°C or 40°C (heated)  
Viscosity at 40°C (unheated, corrected to 40°C)  
Viscosity at 100°C (calculated)  
Calculated Carbon Aromaticity Index (CCAI)  
Density correlation from 50°C to 15°C in vacuum  
Variable viscosity index (for unheated mode)  
Within +/- 3% (20 - 450 cst) or +/- 2 cst  
110 - 240 VAC 50/60Hz 200VA  
2.5A 20 mm 250 VAC HRC A/S (T) Ceramic
Team ships have been burning residual fuel for more than 100 years and motor ships for more than 60 years, and until the 1980s the only topic to hit the headlines was that washing the fuel off your hands with gasoil and sand would give you dermatitis. We even put the old sump oil from the diesel generators into the bunker tanks when a new charge was used.

Life is different now: we know so much more about what we are burning; we understand ship systems better; and we have acquired a whole industry devoted to alerting us to the terrors waiting in our bunker tank.

In all fairness, some engineer superintendants in the late 1970s were aware that there was a risk that unscrupulous suppliers might be supplying fuel that could cause engine damage and lobbied to get a formal specification for the fuel supplied.

The history of the development of fuel specifications is well known and documented, and it goes without saying that the efforts of the General Council of British Shipping, which culminated in the adoption of the British Standard BSMA-100 in 1982, provided the foundation for sensible and practical standards.

The topic that fascinates me is the appearance of a new ‘bogeyman’ every couple of years which threatens the safe running of our engines. Now, don’t get me wrong, many of the issues raised are important and justify attention to make operators and suppliers aware of them, and in some cases there is a pragmatic argument to get changes and adjustments made to our standards. The problem comes in trying to legislate for every unwanted element in our fuel oil.

The first ‘big issue’ was catalytic fines and this was brought into the standards (albeit as an appendix) right from the introduction of BSMA-100. At least we knew where it was coming from. However, there is the continuing argument over how we control it: should we set limits on aluminium (Al) at 30 parts per million (ppm), aluminium plus silicon (Si) at 80 ppm, Al + Si at 60 ppm etc. The fact is that the real problem is abrasive catalyst fines, and as yet we can only quantify the amount using Al + Si and we can’t yet control particle size. A pragmatist will accept that the current 80 ppm limit works very well as long as the ship does its job (running the fuel treatment plant properly) and we don’t get unlucky with particle sizes.

The next issue was waste lube oil. Not only had the ships been dumping waste lube oil into their own bunker tanks, but in certain countries, marine bunkers were seen as an environmentally friendly way to dispose of waste lube oil. Some of the testing agencies believed that there might be a link with poor purifier performance and started to raise this issue — culminating in the Kalamos case, which actually went in favour of the supplier.

Then we got polymer contamination, usually polystyrene, polypropylene and the like. These caused big problems in the fuel handling and treatment on board, and we had difficulty in identifying how these polymers were getting into the fuel. It was a straightforward contamination issue. Some buyers wanted to get these polymers included in the standards (which did not make sense); others just stipulated that they were not to be present — but that in itself is a problem if you don’t define an absolute quantitative limit. The incidents were widely reported but each related to a single contaminated cargo and the overall number of bunkering affected was not that many.

About the same time as this last ‘scare’, Alfa Laval and BP embarked on a research project to quantify the effect of waste lube oil on purifier performance. The results indicated that, because of the additive package in automotive lubricants, there was an effect. This finding spurred

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Scare stories

Nigel Draffin looks at the changing nature of the debate on bunker fuel specifications

‘Until the 1980s, the only topic to hit the headlines was that washing the fuel off your hands with gasoil and sand would give you dermatitis’
the inclusion of a limit in the subsequent revision of the bunker fuel standards.

Next were organic acids – a scare in the late 1990s in North West Europe in marine diesel oil (MDO) and then a major incident with residual fuel in Singapore in 2002. The problem here was in identifying the contaminant. The use of Fourier Transform Infrared Spectroscopy (FTIR) screening techniques and then further investigation using Gas Chromatography Mass Spectroscopy (GCMS) allowed the laboratories to identify a number of organic compounds which were responsible for the damage. All of these had been illegally dumped into the fuel. Whilst inorganic acids are specifically excluded, the number of legitimate organic compounds that might be present in fuel means that there is no way that the standard can be worded to specifically exclude those that are harmful.

At the end of the day, we cannot continue to add limiting parameters to the standards for each new contaminant. We need to be able to rely on the clause 5.1 of the International Organization for Standardization’s ISO 8217 defining what can and cannot be included in marine fuel. It is not a perfect answer but in general it is serving us well. The only cloud on the horizon is the arrival of bio components in fuel, which is a topic currently exercising the minds of the ISO 8217 working group for their next revision. As the wording stands, with its emphasis on ‘hydrocarbons derived from petroleum refining’ there are questions being asked – and no answers yet!

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Events

IBIA Believes in Action

IBIA’s Annual Convention in November will provide the Association’s members with the perfect opportunity to determine its future. Ian Adams, Secretary General of IBIA, outlines some of the highlights that can be expected in Cape Town.

The International Bunker Industry Association (IBIA) Annual Convention 2008 will be held in Cape Town, South Africa. IBIA is committed to rotating the location of its convention around the world. Those of you who have attended the past four will probably be aware that, had we followed the logical rotation, we would have been in Asia this year. However, as this year is a Singapore International Bunker Conference (SIBCON) year, it was considered sensible to reverse our rotation and head back to the European/African time zone.

Since 2006 in Monaco, one theme which has been a feature of our Convention has been ‘The Future of IBIA’. This is a topic which sets the IBIA Convention apart from the other conventions/conferences that are organised around the world. No other convention empowers the delegates to influence what the Association does. The IBIA Convention is the opportunity for IBIA members to discuss and debate the current issues. This is then used by the IBIA Council and Secretariat to set policy, and represent our members at the various governmental and inter-governmental bodies. It is also the chance to highlight other areas that the delegates may feel need to be looked into, such as training, technical and safety issues.

This year, after the opening session with the keynote speeches and introductions, ‘The Future of IBIA’ takes centre stage. Two years ago IBIA commissioned a ‘Members’ Needs Survey’. The purpose of the survey was to find out what our members believed to be the areas that IBIA should be working on. One of the messages was that the members felt IBIA needed to restructure in order to address the issues of today more effectively. This process is not one which can be completed overnight. Having initially started the work within the Executive Committee, once the basic framework had been thrashed out, it was then handed to a consultant who has 15 years experience in running and advising associations. The result of this work is that the members’ approval at a General Meeting. The Convention is the logical place to do this as it provides an opportunity to explain what the changes are, why each decision has been made and, above all, ensure that what is proposed is what members want.

The afternoon of the first day is devoted to examining the region we are in. This will be done over two sessions, one on South Africa, and the other on the rest of Africa. The South African market will be covered in general, followed by a look at the unique nature of the legal framework there. Delegates will then be told about the future plans for development within the ports of South Africa.

The overview of Africa will consist of presentations on North, East and West Africa and the parts of Southern Africa not covered by the previous session. Given the size of the continent, it is likely that the nature of the industry in each of these regions will differ considerably.

The second day moves away from the local theme to look at the issues affecting the industry internationally.

The first session will look at operational issues. The presentations will be wide ranging, with the latest developments in engine design, fuel quality standard ISO 8217, in-line metering and on-line monitoring, all designed to highlight the advances being made in these areas. It will be an opportunity to understand what the technology offers the industry and how well the various trials are going. Of particular interest will be the update from Singapore on the trials of in-line metering, which IBIA has been supporting.

IBIA gained consultative status at the International Maritime Organization (IMO) in December 2005. This was a momentous time for the Association, but little did we realise just how important this would prove to be in the coming years. This convention, coming as it does almost three years on, will provide an opportunity to reflect on IBIA’s contribution to the legislative process. IBIA has been closely involved in the revision of MARPOL Annex VI and the process and reasoning behind the IBIA positions will be explained and debated. Events at the various IMO meetings will be explained to enable delegates to better understand why things happen the way they do. IBIA has also been involved in other issues at the IMO, including Material Safety Data Sheets (MSDS). This debate is still ongoing and an update will be provided by a member of the IBIA delegation who
has been dealing with the matter. By the
time of the Convention, the revision
process for MARPOL Annex VI should
have been finalised, with the revised text
having been adopted at the IMO’s Marine
Environment Protection Committee
(MEPC) meeting MEPC 58 in October
2008. That does not mean that IBIA’s role
at the IMO will become a passive one. The
debate has already begun on the next big
issue to affect the shipping industry – and
therefore the bunker industry. Greenhouse
gases (GHG) have already been discussed
at length at the IMO, both at MEPC 56
and 57, in correspondence groups and at an
inter-sessional meeting held in Oslo in June
2008. GHG is a topic to which everyone can
contribute and we look forward to a lively
debate about how the bunker industry can
play its part.

The afternoon of the second day starts
with the reaction to the previous session of
both the buyers and suppliers of marine fuels.
While the changes to the rules will have
been explained before lunch, this session will
examine what are the practical implications
for both sides of the industry. It will also
be a chance for delegates to contribute
with suggestions on how the industry can
work together to deal with the issues. As
an industry association, rather than a sector
association, this is one of the true benefits
of IBIA, bringing both sides of the industry
together to talk about and, hopefully, resolve
the challenges we face today. It is far better
for the industry to solve its own issues rather
than leave it up to the legislators!

The final session will see a round-up of
the conference and a discussion about what
actions the Association is to take away from
the Convention. This will truly help to
shape what the Association does over the
following months. It is important that the
members contribute to their Association, so
that it carries out what the members want
it to do.

In addition to the busy Convention
programme, there is a social programme
which will include on the opening night,
Tuesday 25 November, a cocktail party
kindly sponsored by Addax Bunkering
Services. Other events will be added to the
programme in due course.

In conclusion, I trust that as many IBIA
members will attend the Convention as
possible. This is the only event in the year
where you can have your say and actually
make a difference. We are so fortunate
to be situated in a fantastic location and at a
particularly great time of year for that region.
I believe that the committee has developed
an inspirational programme which has
something for everyone, and I look forward
to seeing you in Cape Town in November!
SEPTEMBER

UNITED KINGDOM: The Oxford Bunker Course
8-12 September, Oxford
A five-day intensive residential course covering technical, operational, commercial, financial and legal aspects of bunkering.
Contact: Luke Hallam Evans
Tel: +44 1295 814455
Fax: +44 1295 814466
Email: luke@petrospot.com
Web: www.petrospot.com/events/oxford

UNITED STATES: Global Greenship
16-17 September, Washington DC
This event is organized by Marine Log at the Washington Marriott Hotel.
Contact: Michelle M. Zolkos
Tel: +1 212 620 7208
Email: mzolkos@sbpub.com

GERMANY: SMM 2008
23-26 September, Hamburg
The Shipbuilding, Machinery & Marine Technology trade fair attracts 45,000 visitors and 1,600 exhibitors and is the leading international gathering for the shipping industry.
Web: www.hamburg-messe/smm

OCTOBER

NETHERLANDS: Bunker Experience
6-9 October, Vlaardingen
Organised by Vergo Consultancy at the Delta Hotel, Vlaardingen, this all-inclusive hands-on training course covers barging, labs and ports. Limited to 18 delegates.
Contact: Goris Vermeulen
Tel: +32 484 166780
Fax: +31 847 474573
Email: info@bunkerexperience.com
Web: www.bunkerexperience.com

SINGAPORE: SIBCON 2008
15-17 October, Singapore
Offered as part of Singapore Maritime Week 2008 and entitled Powering Global Shipping: The Marine Fuels Challenge, this year’s Singapore International Bunker Conference is expected to attract up to 800 delegates. Organised by the Maritime & Port Authority of Singapore, and managed by IBC Asia, the event will be held at the Shangri-La Hotel.
Contact: IBC Asia (S) Pte Ltd
Tel: +65 6514 3180
Fax: +65 6733 5087
Email: register@ibcasia.com.sg
Web: www.sibconsingapore.com

GREECE: Tanker Economics
20-21 October, Athens
Organised by Platts. Speakers will look at how shipowners can strengthen their competitive position and awareness in the market, while limiting their exposure to price, regulatory and delivery risks.
Contact: Sophie Adams
Tel: +44 20 7176 6558
Email: sophie_adams@platts.com
Web: www.platts.com/Events

UNITED STATES: Sustainable Shipping
29-31 October, Washington DC
Entitled Political will, practical solutions, this event takes place at the Mandarin Oriental.
Tel: +44 1753 272 250
Email: conferences@sustainableshipping.com
Web: www.sustainableshipping.com/events/washington2008

UNITED KINGDOM: Winter Bunker School
29-31 October, London
Held at the Lloyd’s Maritime Academy and organised by Lloyd’s List Events.
Contact: Andrew Whipp
Email: andrew.whipp@informa.com
Web: www.lloydsmaritimeacademy.com

NOVEMBER

UNITED KINGDOM: The Marine Credit Risk Assessment Course
3-4 November, Oxford
An advanced level workshop on credit risk in the maritime sector, with particular emphasis on bunkering, that digs deep into the complexities of the high risk, volatile shipping and bunker markets. It helps delegates avoid problems, and covers credit risk analysis, real life experiences, marine credit reports, credit insurance, debt collecting, factoring and legal recourse. It is aimed at those working in trading, supply, purchasing, accounting, credit control, finance and legal departments of shipping, chartering, bunker and other maritime companies.
Contact: Luke Hallam Evans
Tel: +44 1295 814455
Fax: +44 1295 815566
Email: luke@petrospot.com
Web: www.petrospot.com/events/risk

HUNGARY: Platts European Storage
24-25 November, Budapest
The theme of this event is Sustaining value in a shifting market.
Contact: Sophie Adams
Tel: +44 20 7176 6558
Email: sophie_adams@platts.com
Web: www.platts.com/Events

SOUTH AFRICA: The IBIA Annual Convention
24-27 November, Cape Town
Now in its fifth year, the IBIA Annual Convention takes place at the Westin Grand Cape Town Arabella Quays Hotel. There will be one and two-day training courses, an exhibition, and an issue-led conference (see page 50). Organised by Petrosport on behalf of IBIA.
Contact: Luke Hallam Evans
Tel: +44 1295 814455
Fax: +44 1295 814466
Email: luke@petrospot.com
Web: www.petrospot.com/events/ibia
Europe

Steven Bee has joined Lintec Testing Services as Operations and Key Account Manager, while Maurice O’Donoghue has been recruited as Sales & Marketing Manager and Michael Price-Griffiths has become the new manager of Lintec’s Darlington-based laboratory. Lintec has also promoted Michael Green to the position of Customer Services Manager. Tel: +44 1325 390 180; Fax: +44 1325 460 055; Email: testing@lintec-group.com.

Jiskoot Ltd has appointed Murzy Sethna as Projects & Operations Manager in Tunbridge Wells, while Steve Windley has joined as the new Sales Manager for the Mideast, North Africa and the former Soviet Union. Tel: +44 1892 518 000; Fax: +44 1892 518 100; Email: information@jiskoot.com.

Elena Chernikova has joined A/S Dan Bunkering Ltd as a bunker trader in its Kaliningrad office. Tel: +7 4012 519 009; Direct: +7 4012 530 858; Mob: +7 911 452 3094; Fax: +7 4012 519 008; Email: lch@dan-bunkering.ru.

Diana N. Rizi has joined A/S Global Risk Management Ltd’s Middelfart office as an Assistant Risk Manager. Tel: +45 8838 0000.

Wrist Bunker Supply GmbH, part of the O.W. Group, has appointed Jesper Jensen as a trader and Cornelia Runge as a Management Assistant within sales and marketing in its Hamburg office. Contact +49 40 3255 900; Fax: +49 40 33 04 71. Jensen: Tel: +49 40 3255 9040; Email: jesper.jensen@wristbunker.de. Runge: Tel: +49 40 255 9031; Email: cornelia.runge@wristbunker.de.

Rupali Mody, previously of Global Fuels & Lubricants Inc., Mumbai, and Davies Newman Wake Ltd in London, has joined Oldendorff Carriers GmbH & KG as a new manager in the shipping company’s bunker purchasing department in Germany. The department now includes three managers, all reporting to the Director of Bunkers Department, Jens Mau Jorgensen. Tel: +49 451 1500 342; Mob: +49 172 439 20 86; Email: Rupali.mody@oldendorff.com.

Michael Thomsen has left Nordic Shipping GmbH as joint managing director in order to establish his own bunker broking company, Hanse Fuels GmbH, based in Hamburg. Thomas Petersen, currently joint managing director of the company, will continue as sole managing director for Nordic Shipping. Contact details for Thomas Petersen: Tel: +49 40 355 2000; Email: bunkers@nordicshipping.de. New contact details for Michael Thomsen: Tel: +49 40 822 99240.

Philip Steffen has joined the bunker trading department of Hamburg-based Hanseatic Bunker Services GmbH. Tel: +49 40 3600 1471; Mob: +49 172 425 4801; Email: philip@hanseatic-bunker.com.

Chemoil has opened a new sales and marketing office in Greece, headed by Costas Karanikolau. He is joined by Cathie Papanicolaou, previously with OceanConnect, Aegean Marine Petroleum SA and Fuel and Marine Marketing LLC (FAMM), who is Sales and Marketing Executive. Contact: Chemoil International (GR) Pte Ltd, 12, Filikis Eterias & 22, Laodikis Strs, Glyfada 166 74, Tel: +30 6944 372 302; Email: grmarketing@chemoil.com.

Aegean Marine Petroleum Network Inc. (AMPNI) has named Spyros Gianniotis as the Company’s new Chief Financial Officer, effective 1 September, 2008, succeeding Ziad Nakhle who is to pursue other interests. Konstantinos Koutsomotopoulos has been appointed to its Board of Directors. Tel: +30 210 4586 000; Fax: +30 210 4586 245; Email: marinfuels@ampni.com.

Unicorn Bunkering has relocated to Str. BILCIURESTI nr. 9A Sector 1, 014012, Bucharest, Romania. Contact: Daniel Balaucu. Tel: +40 21 233 2770; Fax: +40 21 233 2769; Mob: +40 752 15 0008.

Mahesh Mohan has joined Bomin Oil Pvt Ltd as a bunker trader in its Kaliningrad office. UK. Contact: +44 1892 518 000; Fax: +44 1892 518 100; Email: mahesh@bominflowt.ae.

Asia Pacific

Chemoil has appointed Soh Guan Tin Colin, previously with Petroval Pte Ltd, as Trading Manager in Singapore and Harrison Chang as a non-executive director. Chang has been the Managing Director of Golden Gate Investment Management since January 2005. Tel: +65 6536 3974; Email: spmarketing@chemoil.com.

Deborah Donalata, previously with Addax in Geneva, has joined the new Singapore office of Denmark’s Monjasa as Office Manager. Tel: +65 6823 1310; Mob: +65 9131 5924; Email: singapore@monjasa.com.

Americas

Farouk Ayoub Jr, previously with Conoco-Phillips, and Rudy Stoett, formerly with Chevron/FAMM, Ocean Connect and Banque Paribas, have joined Houston-based Bominflot Bunker Oil Corp. Ayoub will focus on business development for Bominflot’s US East Coast operations. Tel: +1 713 353 9534; Fax: +1 713 977 1275; Mob: +1 713 295 1126; Email: fayoub@bominbunkers.com. Stoett will focus on Bominflot’s US Gulf Coast operations. Tel: +1 713 353 9515; Mob: +1 713 305 7730; Email: rstoett@bominbunkers.com.

To list details of bunker related moves contact: Tel: +44 1295 814455, Fax: +44 1295 814466, Email: luci@petrospot.com

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