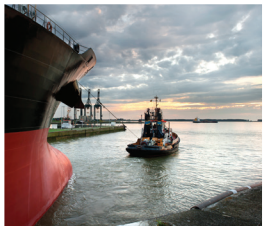
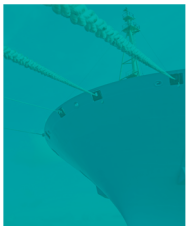
Shipping

April 2015

GREEN SHIPPING BULLETIN





Welcome to the April 2015 edition of our Green Shipping Bulletin.

The beginning of 2015 marked a significant milestone in the regulation of sulphur oxides (SOx) within Emissions Control Areas. The new limits are currently geographically isolated in relative terms, yet the drive towards SOx reductions also has proponents in East Asia. Building upon our previous examination of this area (http://www.hfw.com/Green-Shipping-Bulletin-October-2014), we explore the new regulations set to be implemented in Hong Kong later this year, as well as current port incentives in the Pearl River Delta (PRD).

Whilst sulphur emissions have dominated the headlines recently, the industry should not lose sight of other regulations on the immediate horizon. One such example is the Ballast Water Management Convention, which is set to enter into force by 2016. The Convention is likely to spur demand for significant, and potentially costly, technological solutions to ensure vessel compliance. We look at the Convention's key features.

Looking further ahead, the European Union is pressing on with its plans to monitor and regulate carbon dioxide (CO_2) emissions in shipping. We outline EU policy and how this fits in with International Maritime Organization (IMO) efforts in this area.

Finally, we have undertaken a broad review of the significant global uptake in 3D printing, investigating its projected impact upon the future of trade, and the shipping industry in particular.

If you require any further information or assistance on any of the issues raised in this edition, please do not hesitate to contact any of the contributors or your usual contact at HFW.

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Update on sulphur emissions regulations in Hong Kong and the PRD

Hong Kong voluntary fuel switch scheme becomes law

The "Air Pollution Control (Ocean Going Vessels) (Fuel at Berth) Regulations" (the Regulations) will take effect on 1 July 2015.

The Regulations prohibit Ocean Going Vessels (OGV) from using any fuels other than compliant fuel while at berth in Hong Kong, except during the first hour after arrival and the last hour before departure (i.e. while switching fuel).

Compliant fuels required by the Regulations are:

- Low-sulphur marine fuel which contains no more than 0.5% sulphur.
- LNG.
- Other fuels which may be approved by the Hong Kong Environmental Protection Department.

Under the Regulations, the Master and Owners are required to record the date and time of fuel switching and keep the relevant records for three years.

The Environmental Protection Department has stated that *"If an OGV uses technology that can achieve the same or less emission of sulphur dioxide (SO_2) when compared with using low-sulphur marine fuel, the OGV may be exempted from switching to compliant fuel."*

Once the Regulations come into effect, a Master and Owner who is found to use non-compliant fuel will be liable to a maximum fine of HK$200,000 (approx US$26,000) and imprisonment for six months. Masters and Owners who fail to comply with the recording requirements will also be liable to a maximum fine of HK$50,000 (approx US$6,500) and imprisonment for three months.

Hong Kong is the first city port in Asia to introduce compulsory low-sulphur fuel legislation.

These long awaited Regulations replace the voluntary Fair Winds Charter which was adopted by some 17 shipping companies in January 2011. Hong Kong is the first city port in Asia to introduce compulsory low-sulphur fuel legislation.

The requirement of low-sulphur fuel containing not more than 0.5% sulphur is still much higher than the 0.1% m/m requirement in the Emission Control Areas under MARPOL Annex VI which came into force on 1 January 2015[1].

Operating alongside these new Regulations is the Hong Kong Environmental Protection Department's "Port Facilities and Light Dues Incentive Scheme for Ocean Going Vessels using Cleaner Fuel" (the Scheme). Under the Scheme, Owners and Operators burning low-sulphur fuel receive a 50% discount on the port facilities and light dues of HK$43 per 100 tonnes, based on the vessel's tonnage. It covers about half of the additional costs of switching to low sulphur fuel in berth.

The Scheme is due to expire on 25 September 2015, but is expected to be extended to 2018 with more stringent requirements, although the Hong Kong Marine Department and the Environmental Protection Department have not confirmed this.

Shenzhen clean-fuel incentives

Further north of Hong Kong up the Pearl River, the Port of Shenzhen has recently expanded its own voluntary incentive scheme, which is substantially more generous than that offered in Hong Kong. Under Shenzhen's incentive scheme, Owners and Operators will recover 75% of the cost of switching to fuel with not more than 0.5% sulphur and will cover 100% of the cost of switching to fuel with not more than 0.1% sulphur.

In addition, under the "Shenzhen Air Quality Enhancement Plan" new facilities are being built to provide OGVs with shore power facilities. The aim is that no fewer than 15 berths in Shenzhen will be equipped with short power facilities by the end of 2015. The Shenzhen Government is reported to be covering 30% of the cost installing the short power facilities at Yantian International Container Terminals and at Mawan Power Co Ltd Terminal.

However, Shenzhen's incentive schemes remain voluntary unlike the new Hong Kong Regulations. There remains a long way to go for the PRD to become the Emissions Control Area in Asia. Whether the law makers in the various city ports around the Delta can work in concert to create a cohesive plan on marine fuel emissions, remains to be seen.

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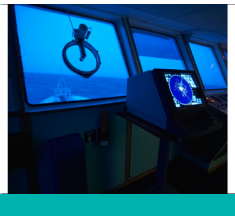
1 See our January 2015 Briefing: http://www.hfw.com/Sulphur-Emissions-A-New-Years-Resolution-January-2015



Sink or swim? The imminent ratification of the Ballast Water Management Convention

Ballast water is an essential component of vessel safety and efficiency throughout the global fleet. Each year, vessels transfer around 12 billion tonnes of ballast water across the oceans, a process which has been identified as posing potentially serious environmental problems. Discharged ballast water may introduce predatory species into host environments, leading to competition with native species and altering local ecosystems. Ultimately, this has an economic impact - estimated to be US$8 billion per year in the United States alone.

The Convention

To address these issues, the IMO adopted the "International Convention for the Control and Management of Ships' Ballast Water and Sediments" (the Convention) on 13 February 2004. The Convention enters into force 12 months after ratification by 30 States representing at least 35% of the world's tonnage. As of April 2015, 44 States have ratified the Convention, representing 32.86% of the world merchant fleet tonnage. It is anticipated that in the near future the Convention will attain the requisite signatories and will be in force by 2016[1]. Ballast Water Management (BWM) has therefore become an industry hot topic.

The Convention itself comprises 22 Articles and one Annex, supplemented by a further 14 Technical Guidelines to support port state authorities, shipmasters and owners, equipment manufacturers and class societies.

In essence, the Convention compels owners to:

- Implement a BWM plan.
- Keep a ballast water record book.
- Maintain vessel ballast water to an approved standard.

Compliance and enforcement

Compliance with standards can be established by one of two methods. First, owners can utilise ballast water exchange, but only if this can be achieved with a 95% exchange efficiency standard. The second method is to attain a compliant level of organism per unit of ballast water - the performance standard[2]. The latter method is favoured by the IMO and their intention is for ballast water exchange to be phased out as early as 2019.

It is envisaged that vessels will be vetted for compliance as part of routine port state inspection. Those in contravention of Convention standards will accordingly run the risk of detention, fines and possible criminal sanctions. Accordingly, those owners who choose not to comply will severely limit their vessels' trading limits.

Implementation and impact

Sanctions under the Convention will be implemented on a graduated basis. Vessels constructed prior to the Convention's entry into force will be obliged to comply with the Convention by the time of their first Oil Pollution Prevention renewal survey. This staggered introduction attempts to avoid bottlenecks in production at shipyards, in order to ensure compliance prior to the Convention entering into force. An example has been set by the United States, where an "alternative management system" was established by a similar phased process linked to vessels' first scheduled dry-docking date.

Estimates indicate that the process of selecting and installing a BWM system will take between six months and one year, at a cost of up to US$4 million per vessel. Further cost implications of BWM systems include:

- Increased fuel consumption.
- Administrative costs, such as training.
- Future surveys.
- The ongoing costs of ensuring compliant protocols on board.

Owners' concern that ballast water standards will tighten in the near future (even before the Convention enters into force) was somewhat addressed by the IMO in October 2014, when it announced the intention to revise the Convention to provide some (as yet undefined) protection to owners who install BWM systems before the revised guidelines are applied. There also remains a need for the harmonisation of Convention standards and those implemented separately in the United States, the latter of which imposes more stringent limits.

The imminent implementation of the Convention may mark a challenging and expensive period for owners. We will continue to provide updates on developments.

For more information, please contact Karis Barton, Associate, on +44 (0)20 7264 8327 or karis.barton@hfw.com, or your usual contact at HFW. Research by Alex Andreou, Trainee Solicitor.

1 BIMCO Position dated 13 November 2014
2 As more particularly detailed at Annex Section D BWM Convention: http://www.imo.org/About/Conventions/ListOfConventions/Pages/International-Convention-for-the-Control-and-Management-of-Ships%27-Ballast-Water-and-Sediments-%28BWM%29.aspx

hfw Building steam: the European Union's drive towards the decarbonisation of shipping

Since the formulation of the UN's Kyoto Protocol in 1997, efforts towards the global reduction of carbon dioxide (CO_2) has received widespread public attention. In light of the tighter regulation of SOx and NOx emissions, we look at plans within the European Union seeking to address this important greenhouse gas in shipping.

MARPOL Annex VI and vessel efficiency

Currently, the international regulation of CO_2 in shipping is governed by the IMO's Energy Efficient Design Index (EEDI) and Ship Energy Efficient Management Plan (SEEMP), introduced within the framework of MARPOL Annex VI. Since 2013, the EEDI has required that all newbuilds are more efficient than a reference line, calculated on the basis of industry averages for particular types of vessel, which will be reduced every five years. SEEMP, also introduced from the beginning of 2013, requires all vessels (existing and newbuild) to have an energy efficiency plan on-board, though it does not require shipowners to take active steps to improve efficiency.

In recent years there have been increasing calls for shipping to do more to reduce its CO_2 emissions, which are thought to make up 3-4% of the global carbon footprint. The IMO's ultimate intention is for a global system to monitor ships' CO_2 emissions, which would then be used as the basis for a "market-based-measure" (MBM). The MBM would likely be along the lines of the carbon trading schemes already operating in industries such as energy and aviation, under which operators are allocated "emissions allowances" which can be traded.

The fact that the EU has pressed on with MRV and not waited for the IMO to implement a global scheme has been controversial...

JAMIE ROBINSON, ASSOCIATE

However, concerns about the cost of CO_2 regulation on the shipping industry, as well as uncertainty as to implementation methods, has slowed progress at the IMO level.

European Union – Monitor, Report, Verify

In the meantime, the European Union is forging ahead with its own CO_2 monitoring policy.

From 1 January 2018, all ships over 5,000 GT, calling at EU ports, will have to comply with the Monitor, Report, Verify program (MRV), regardless of the ship's flag. Owners will have to monitor emissions using one of four approved methods, the first three of which involve calculating the emissions from amount of fuel used (measured by using bunker delivery notes, fuel tank levels or fuel flow meters) and the distance sailed. The fourth method is to measure the amount of CO_2 emitted directly from the ship's funnel.

MRV will also require each vessel to have an emissions monitoring plan, which will have to be checked by an approved third party verifier.

Some protection will be afforded to protect data which is exceptionally commercially sensitive, which will either be aggregated or otherwise not published.

There is, as yet, no plan for how the information collected by MRV will be used. However, the intention is that it will allow for the introduction of an MBM or alternatively a mandatory efficiency standard, which could be used to penalise the least efficient vessels.

Reaction

The fact that the EU has pressed on with MRV and not waited for the IMO to implement a global scheme has been controversial, drawing criticism from the International Chamber of Shipping as failing to respect 'the primacy of IMO as the regulator of international shipping'[1]. This stance echoes previous comments directed at France for its decision to unilaterally implement CO_2 emissions monitoring plans for the transport sector.

In light of these concerns the EU has stated that MRV will be reviewed if and when the IMO introduces global regulation, and may be aligned with the IMO's regulation, though this is not guaranteed.

Although future developments are uncertain, the coming years are likely to see significant new regulatory requirements for shipowners relating to CO_2. The introduction of MRV is likely to mark the beginning. The possibility of a similar IMO measure, and eventually an emissions trading scheme, would likely have a significant impact on the industry.

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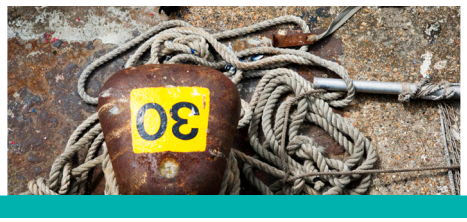
1 http://www.ics-shipping.org/docs/default-source/Submissions/EU/ics-preliminary-comments-on-eu-mrv-proposal-(no)-525-2013.pdf?sfvrsn=2


Another dimension to shipping: the effect of 3D printing on global trade

This article first appeared in the October/November 2014 edition of Baltic magazine and is re-produced with permission.

Commentators have predicted that the next decade will see refinements to AM, such that the capability will exist to produce a multitude of everyday and specialist items through 3D printing on a global scale.

MAX THOMPSON, ASSOCIATE

3D printing, or "additive manufacturing" (AM), has until relatively recently only existed in the popular consciousness as futuristic 'space age' technology. Today, however, 3D printers are readily available to buy and use in the home and workplace, with designs and techniques for end-user printed items becoming increasingly sophisticated. 3D printing has already become an everyday tool for many physical designs and prototyping.

Engineers have furthermore used AM to print such varied items as artificial limbs, bespoke parts for supersonic cars, and food. In 2006, just 4% of 3D printed goods were final products; by 2012 this had risen to 25%, and analysts predict this figure will be 50% in 2020. Widespread uptake of 3D printing by end-users, or on an industrial level, has the potential to affect global trade and consequently the international demand for shipping.

What is 3D printing?

AM is a process of converting computerised model data into physical objects, usually by precisely layering material, as opposed to conventional 'subtractive' manufacturing, which largely relies on sculpting the end product from solid blocks of material. As a result, a major advantage of AM is that wasted material is significantly reduced. Furthermore, the application of computerised modelling introduces far greater flexibility to the manufacturing process, granting end-users enhanced control over the design of their product. This in turn allows businesses to factor in 3D printing as an 'on demand' element in their commercial model. However, the sacrifice for this level of customisability is that manufacturing times using AM are significantly longer than subtractive mass-manufacturing.

Commentators have predicted that the next decade will see refinements to AM, such that the capability will exist to produce a multitude of everyday and specialist items through 3D printing on a global scale. It is, however, up for debate as to the extent to which AM will be taken up by consumers. As a result, the future of manufacturing, retail and logistics (including shipping) could tread one of a number of paths. We consider below both the broad eventualities of widespread and limited uptake.

Widespread uptake

The scenario of widespread uptake envisages that 3D printers will be a commonplace item, used on an everyday basis by businesses and consumers to fulfil their needs. AM could be carried out in the home or workplace, alternatively, 3D printing services could be provided by high street operators in much the same way as stationers today. In either of these eventualities, the expectation is that supply chains would be shortened significantly. Some economists have gone so far as to suggest that this will result in manufacturing returning to post-industrial regions, and a fall in outsourced industrial production to regions of relatively lower costs[1].

This would result in a dramatic change in global shipping patterns. Products would no longer need to be dispatched around the world at their different stages of production, and assembly lines would accordingly be reduced. Consequently, some market experts have predicted the requirement for long-haul logistics – notably, containerised transport - for finished products, from their manufacturing bases to consumers, could decline.

On the other hand, if uptake for AM is widespread, demand for the provision and transportation of raw materials (feedstock) required to create 3D printed products will be an additional factor shaping shipping trades. Currently, AM feedstocks are largely composed of plastics or metal powder, although scientists are exploring other substances, including

1 *'Freight Miles – The Impacts of 3D Printing on Transport and Society'*, Birtchnell et al (2012)

reclaimed and organic materials. The mass production and transportation of feedstocks – in bulk or in packages – could be a significant driver of demand for shipping, depending on the areas where feedstock production is focused.

Finally, recycling could become a more prominent issue where consumers enjoy the ability to print items on demand. Depending on local facilities for recycling, and the makeup of feedstock, this could increase the global transport of spent AM materials to recycling hubs.

Limited uptake

The alternative scenario is that AM remains in its current role, namely, primarily for prototypes and specialist items. Uptake could furthermore be limited to industrial production only, as opposed to being driven by end-users. Some have considered this to be a more likely eventuality, where factories consider 3D printing as a complementary process to conventional manufacturing techniques, as opposed to a direct alternative. This view is supported in China, where pioneering work on AM has been developed in tandem – not in competition - with conventional mass-production.

As might be expected, limited uptake of AM would likely have a muted effect, if any, on current shipping patterns. As above, if 3D printing takes off on an industrial scale, then in turn the bulk shipment of feedstock is likely to increase. However, international containerised transportation of finished and intermediate products will still be necessary.

Experts predict that the sectors that will be most likely affected by developments in AM are rubbers and plastics, textiles and clothing, and furniture markets. Those sectors where 3D printing is likely to have less impact are vehicle and industrial machinery construction, where there is scope for individual customised components to be 3D printed, as opposed to entire vehicles or machines. Mass production will continue to have its role to play where speed and volume are a priority.

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FELICITY BURLING, ASSOCIATE

What does the future hold?

It would be well advised for the shipping industry to continue to monitor developments in AM, where there is scope for major market changes in the medium to long term. In the nearer term, operators of vessels in particular should keep AM close to mind. It is becoming increasingly viable for 3D printing capability to be installed on vessels themselves, in order that spare parts can be printed, on demand, in short order. This has the potential to streamline vessel maintenance and increase responsiveness in the event of breakdown, and consequently minimise non-earning time. The prospect is already being explored by owners, most notably Maersk, who are seeking to improve vessel inventory management and reduce the time and cost of routine repairs.

AM technology remains in relative infancy, limited mainly to objects printed from one type of material, either from plastics or metal powders. 3D printing of a higher order of complexity – such as electronic circuitry or other components requiring variable heating and cooling capabilities - remains problematic, as does the relatively slow speed of AM processes. Nevertheless, with the advent of affordable and increasingly sophisticated 3D printers, it could be only a matter of time before the technology becomes popular on a global scale, and key to shipping in more ways than one.

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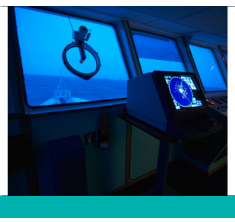

Conferences and events

Offshore Technology Conference 2015
Houston
4–7 May 2015
Attending: Paul Dean and Jonathan Martin

IBA - Maritime and Transport Law Conference
Geneva
7-8 May 2015
Presenting: Andrew Chamberlain

CWC Oil & Gas EPC Conference
Dubai
19–21 May 2015
Hosting: Max Wieliczko, Michael Sergeant and Robert Blundell

Comité Maritime International
Paris
12-13 June 2015
Attending: Christopher Brehm

ACI – Offshore Support Vessels Summit
Aberdeen
17–18 June 2015
Presenting: Paul Dean
Attending: George Eddings

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