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JANUARY/FEBRUARY 2012

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Front cover

Marsec can provide owners and operators with peace of mind when transiting a piracy 'high risk area'. A member of SAMI and adhering to the International Code of Conduct (ICoC) for security firms, the company offers a variety of services to ensure the vessel arrives at its destination safely, including both armed and unarmed shipboard security teams.

Can we legislate for spontaneous human actions that go badly wrong?

In the columns of Tanker Operator and also within the weekly news stories, regular references to the so called 'human element', in one way or another, can be seen.

Most take the form of rules, regulations, KPIs and guidelines, not forgetting training and experience gaining.

Papers, conferences and seminars aimed at trying to analyse human reaction to certain situations and risks are now part and parcel of today's shipping environment. In this issue alone, we have OCIMF looking at terminal interface operations and a leading training lecturer talking of ensuring all the parties involved in safely guiding a tanker to its berth in a harbour talk from the same hymn sheet.

All this is very laudable and necessary in today's ever increasingly litigious world. People in all walks of life should be educated not to take short cuts and to undertake a quick risk assessment of all their actions likely to affect others. One cause for concern is that the mutuals and hull & machinery insurers have become increasingly worried over the potential cost of future claims. A very high percentage of today's claims are caused by 'human error' so the insurers tell us, as they have analysed claims going back decades.

The mutuals are probably the best placed to spot trends in claims received, as they tend to be at the smaller end of the claims scale. Most have loss prevention departments who regularly publish warnings on certain trends picked up, sometimes in the form of posters to be distributed on board their members' vessels.

For example, the UK P&I Club told me recently that claims directly come out of the members' earnings, as the direct cost of membership will inevitably rise with the hike in claims. Most of the P&I clubs have already put a 5% increase on their membership fees for the February renewal cut-off date.

Good to talk

It is 'good to talk' was a slogan thought up by an advertising agency representing the UK's telecommunications concern BT a few years ago. Never could this be more true in the shipping industry, in which it is often the case where one person dictates the whole shipboard operation.

When entering, or leaving port, most vessels have their senior officers, including the Master, on the bridge. He, or she, will have at least one pilot and possibly at least one tug to contend with, not to mention the port authority (VTS), the terminal management, passing traffic and so on to talk to.

While a Master tends to be dictatorial, as he is in sole charge of his,

or her, vessel under the eyes of the law, does the Master interact with his team, who after all are supposedly helping the vessel to berth or unberth safely? Some undoubtedly do, but there are question marks about others.

Does a Master question a pilot's decision and indeed vice versa? Will a senior officer also question a Master, or pilot's decision? After all, he or she could be fearful of losing a promotion opportunity, or even worse, a job.

Different reactions

Put each individual in the same situation and you will often get different reactions. Put someone in a position where an instant decision must be made to avert a possible incident and you will quickly see what he, or she, is made of. Bridge and engine room team building is now part of every training centres' curriculum, using simulated situations. However, is a simulator as good as a real emergency, no matter how life like it is? Where is all this leading, I can hear you ask? In one week towards the end of January, we had two major incidents in European waters. The first involved a tanker striking a fishing boat off Milford Haven. Most people would blame the fishing boat's helmsman for not getting out of the way of a deep draft vessel entering a harbour. However, I have not seen the investigation results, so shouldn't draw conclusions without knowing the facts.

The second and far more serious was the sinking of the *Costa Concordia* with loss of life. The stories coming out in the media must make most Masters tear their hair out. How on earth could a Master, obviously with many years' experience, put his vessel and passengers in such a position? Did anybody on the bridge query his actions in taking the cruise ship so close to the island? Again I don't know the answer to this as yet, but let us hope so.

I think the moral of this story is - you can put all the systems in place, train the crew in risk assessments and to act as a team to help one another to react to certain situations all you like, it only takes that one person in charge to bring the house tumbling down through a single action. And there is sometimes simply nothing you can do about it! Or is there? Some would argue that there is, others say no there isn't. Psychologists argue that sheer panic can shut a person's brain down completely from thinking rationally. Although it is early days, first impressions say that this is what happened off Giglio. However, given my British sense of fair play, I will await the official enquiry before passing judgement and let everyone else have their say.

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2nd Floor, 8 Baltic Street East
London EC1Y 0UP, UK
www.tankeroperator.com

PUBLISHER/EVENTS/ SUBSCRIPTIONS

Karl Jeffery
Tel: +44 (0)20 8150 5292
jeffery@thedigitalship.com

EDITOR

Ian Cochran
Tel: +44 (0)20 8150 5295
cochran@tankeroperator.com

ADVERTISING SALES

Melissa Skinner
Only Media Ltd
Tel: +44 (0)20 8950 3323
mskinner@tankeroperator.com

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Subscription hotline:
Tel: +44 (0)20 7017 3405
Fax: +44 (0)20 7251 9179
Email:
jeffery@thedigitalship.com

PRODUCTION

Wai Cheung
Tel: +44 (0)20 8150 5291
wai@tankeroperator.com

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Ul. Bernardynska 1
41-902 Bytom
Poland



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Different sectors – different results

If 2010 could be described as a difficult year for tankers, then last year could at best be described as even more challenging.

The steady supply of new tonnage entering the fleet contributed to the dramatic fall in earnings particularly for the crude carriers, according to Gibson Research.

Deliveries of VLCCs averaged just over one a week (60) while a similar pattern was seen in the Suezmax sector (44 deliveries).

With almost all single-hull tonnage out of the tanker market, 2011 closed with first generation double-hulls finding trading conditions increasingly difficult, as some charterers showed a preference for younger tankers.

“We are beginning to see teenage VLCCs being sold for demolition, as asset values for 15 year old units gets closer to the scrap price. Thankfully, we have seen a dramatic fall in tanker ordering, especially for crude carriers, although there are several cash rich owners waiting to pounce as asset prices continue to fall,” Gibson said.

Increases in the oil price have also elevated bunkers prices by about a third since December 2010, forcing owners to be more creative with speed and consumption, which includes the slow steaming option.

Owners have come under considerable financial pressure with the result that several companies have had to restructure finance and debt and a couple of US stock market concerns have been forced to file for Chapter 11 to protect themselves from bankruptcy.

With very little floating storage in play

(other than Iranian), the tanker market was more influenced by political events, in particular Libya. The loss of 1.6 mill barrels per day of Libyan light sweet crude with 80% destined for European refineries meant that those replacement cargoes had to be sourced from outside the region.

The tragic events following the Japanese tsunami drastically reduced demand as a consequence of the closure of refineries for safety checks. VLCC rates plummeted in March and even fell into negative earnings in the third quarter. China’s demand for crude continued to support the tanker market and oil demand continued to rise.

However, tanker owners (& banks) need faster economic growth than the current forecasts to absorb new tonnage.

Firmer rates

In general, albeit with a few exceptions, tanker markets ended 2011 on a firmer note, compared to the disastrous performance seen in the third quarter of the year.

However, taking into account the persistent abundance of available tonnage, yet more tankers to enter the fleet and uncertainty about near term oil demand growth, it is difficult to imagine that freight rates will show sustainable improvements anytime soon. The supply/demand fundamentals are fairly dire across most crude tanker sectors, although to a varying degree.

For Aframax, apart from ongoing growth

in fleet size, the major concern is the restricted demand growth prospects due to declining crude production in the North Sea, Asia/Pacific and Mexico, stable output from Russia and only limited growth from other areas.

Despite such gloomy conditions, Gibson said that there is always short-term hope for owners, with the possibility of disruptions due to weather related delays, heavy ice conditions, political developments, changes to legal framework, strikes, or port congestion.

Perhaps, the most notable example of an ‘events driven’ market is in the Black Sea/Mediterranean and North West Europe, where bad weather, Turkish Strait delays and heavy ice conditions in the Baltic often lead to sharp spikes in freight rates.

The latest hike was witnessed last December when Aframax rates in the North Sea/Baltic spiked on the back of stormy weather, resulting in TCE returns rising to \$40,000 per day on a round voyage basis at design speed around mid-month, up from just \$4,000 per day a few weeks earlier.

In the Mediterranean, the market surged even higher on the back of Bosphorus delays, leading to TCE earnings for 80,000 tonne crude cargoes for Black Sea/Mediterranean jumping to over \$60,000 per day in late December, compared to just \$5,000 per day in November.

Although such spikes are typically brief, with the Mediterranean Aframax market

“ We are beginning to see teenage VLCCs being sold for demolition...Thankfully, we have seen a dramatic fall in tanker ordering, especially for crude carriers, although there are several cash rich owners waiting to pounce as asset prices continue to fall

”

- Gibson Research

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– Rob Frenks, Group ICT Manager; Vroon B.V.



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Asia-Pacific HQ: Singapore | info@apac.kvh.com
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How 2011 compared with 2010

	December 2010		December 2011		High / Low 2011
	WS	TCE/day	WS	TCE/day	
VLCC Rates: Mid East Gulf - Japan	53	\$12,000	58	\$13,000	WS 82 / WS 40
Suezmax Rates: West Africa – USAC	102	\$24,000	90	\$20,000	WS 112 / WS 57
Aframax Rates: North Sea - UKCont	194	\$65,000	126	\$24,000	WS 150 / WS 80
55k Naphtha: Middle East – Japan	131	\$9,000	120	\$4,750	WS 155 / WS109
37k Gasoline: UKCont – US	193	\$12,250	229	\$21,750	WS 242 / WS122
	End 2010		End 2011		
VLCC Total S/H D/H	42	507 (92%)	29	566 (95%)	
Suezmax Total S/H D/H	10	399 (98%)	8	438 (98%)	
Aframax/LR2 Total S/H D/H	41	846 (95%)	29	888 (97%)	
S/H in existence (over 10,000 dwt)	26.5 M dwt (382 vsls)		19.2 M dwt (300 vsls)		
OBOs O/Os 10,000 dwt+ (number)	84		61		
Tanker Orderbook: million dwt (10,000 dwt+) number	117.3 M dwt 896 excl. options		79.1 M dwt 612 excl. options		
VLCC's On Order	188 (58.7 M dwt)		120 (37.8 M dwt)		
New Deliveries (10,000 dwt+)	39.8 M dwt (374 vsls) (Jan – Dec)		37.3 M dwt (298 vsls) (Jan - Nov)		
Brent Oil Price (ICE Close) High/Low	\$94.14/bbl (Dec30th)		\$107.71/bbl (Dec21st)		\$93.33 / \$126.65
Bunkers 380cst Fujairah / Rotterdam	\$500 / \$486 tonne		\$664 / \$623 tonne		
World Oil Production (November)	85.8 M b/d (+2.6%)		87.8 M b/d (+2.3%)		
OPEC crude production	29.2 M b/d (+0.3%)		30.7 M b/d (+5.1%)		
Non OPEC -inc OPEC NGL &	56.6 M b/d (+3.9%)		57.1 M b/d (+0.9)		
Tankers Demolished (10,000 dwt+)	12.0 M dwt		9.0 M dwt		
Lwt price - China / India	\$425 / \$480		\$410 / \$490		
VLCC's sold for scrap dwt / number	14 vessels / 3.6 M dwt		12 vessels / 3.4 M dwt		
Tanker actual total losses - no. (dwt)	None		None		
US\$:£1	\$1.559		\$1.566		

Source - Gibson Research

already in decline, in the past these unpredictable situations frequently provided a temporary boost to owners' earnings, pushing average annual returns higher, Gibson said.

Turning to recycling, Gibson calculated that the final total tanker demolition sales for 2011 amounted to 9.5 mill dwt, down by 2.6 mill dwt over the volume achieved in the previous year.

Double hull scrapping

Although the bulk of the single hull tankers have already been removed from the fleet - 49 units amounting to 4.6 mill dwt were scrapped last year - 'mopping up' more of the remaining tankers (including eight VLCCs). However, more importantly, we have seen an increasing amount of double hull tonnage going for scrap.

Given the poor trading conditions

experienced by some markets during the year, particularly for the crude tankers, it is perhaps surprising that more sales were not concluded given that lightweight prices remained fairly firm throughout 2011.

However, as asset values fell and bunker prices spiralled higher, we began to see more sales of first generation double hull tankers and witnessed the sale of the first double hull VLCC for demolition.

The latest sales of double hull VLCC tonnage for recycling generated returns of around \$20 mill, at the same time as the secondhand price for a 15 year old VLCC had fallen to around \$24 mill. For example, one such sale was the 1998 built *Rion*, ex *Orion Trader* (267,736 dwt), which held the distinction of being the youngest tanker sold for demolition at a mere 13.9 years of age, although the actual sale price was

not reported.

Looking back at last year's statistics, 12 VLCCs (average age 22 years) were sold for demolition, with half of these concluded since late September. The largest tanker was the *Tian San* (357,128 dwt) sold to Bangladeshi breakers in February. Among the oldest units sold for demolition were four US flagged Jones Act MRs, totalling more than 190 years service between them. In addition, there were eight Suezmax sales, while Aframaxes accounted for a further 27 (average age 20.6 years), while seven Panamax and 55 MRs were also removed from the fleet.

The biggest talking point in 2011 concerned the absence of Bangladesh from the market for much of the year. Bangladesh has in the past been the traditional destination for tanker demolition sales but has taken no deliveries of any tonnage (wet or dry) since the beginning of November.

Other factors affecting the demolition market, particularly in India, has been the devaluation of local currency against the US dollar, which has had an impact on buyers being able to obtain credit. However, lightweight prices remained relatively firm and this plus a cocktail of factors could prompt more sales activity over the next few months should owners continue to be squeezed by poor margins, as well as increasing legislation.

Any sustained recovery in tanker earnings in 2011 were largely restricted by the steady supply of new deliveries.

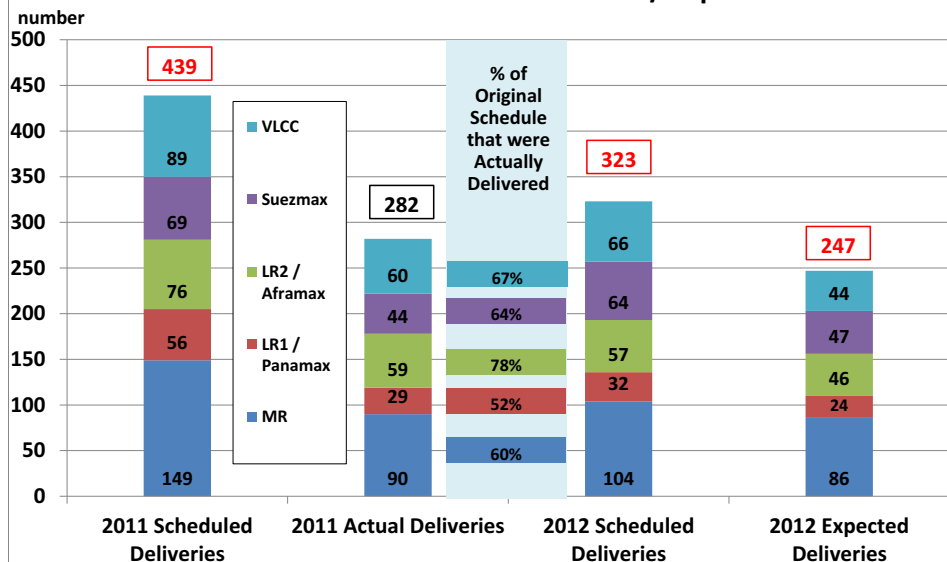
The increase in the tanker fleet largely outpaced demand growth, putting further pressure on earnings in an already highly competitive market. As mentioned earlier, VLCC deliveries in 2011 averaged over one a week (60), four higher than 2010, while there was a similar picture for Suezmaxes (44 deliveries), seven higher than 2010.

Of the 439 new tankers (25,000 dwt and over) originally scheduled to enter service in 2011, just 282 tankers were delivered within their original timeframe. The remaining 157 were either subject to newbuilding contract renegotiations resulting in delivery delays, or cancellations.

Breaking this down further by size, LR1/Panamax deliveries were just 52% of the original schedule; while MR and Suezmaxes were slightly higher at 60% and 64% respectively.

VLCC deliveries were marginally higher at 67%, but it was the LR2/Aframax newbuilds which were highest with over three quarters (78%) of all scheduled deliveries actually adhering to their original due dates.

Scheduled Tanker Deliveries vs Actual/ Expected



IMO addresses chemical tanker EEDI cubic capacity correction factor

Between 9th and 13th January, the IMO's intersessional working group (ISWG) on energy efficiency finalised guidelines on the calculation method of the attained Energy Efficiency Design Index (EEDI) for new vessels.

This included a cubic capacity correction factor for chemical tankers (fc) as proposed by the International Parcel Tankers' Association (IPTA), agreed by MEPC 62 and subsequently modified by the working group.

This decision by an ISWG of over 200 delegates completes the work on these important guidelines and it is significant that the ISWG has sent an agreed clean text to MEPC 63 for adoption, which should ensure a smooth passage of the MARPOL Annex VI amendments through the tacit amendment procedure, IPTA said.

Before the meeting, IPTA pointed out various submissions to the ISWG, which gave cause for concern in that the decision making processes at the IMO were apparently being questioned on the basis of just a small sample of the chemical tanker fleet.

IPTA has put together the sequence of events at MEPC 62, which led to the adoption of a 'cubic capacity correction factor (fc)' for chemical /parcel tankers. The decisions made on the fc were unambiguous and cannot be open to interpretation, the association said.

The Denmark/Japan submission takes the term 'fine tuning' to a level way and above that of any realistic understanding of the term and this based on a sample of no more than 35 chemical tankers!

The papers submitted by Norway raising new proposals went far beyond 'fine tuning' of the already agreed 'Correction Factor' and IPTA questioned whether an Intersessional group could even consider a submission that goes against a decision already made by the MEPC.

At the time of the submissions, IPTA said that it would defend the decisions taken at MEPC 62. At the MEPC 62 plenary, the initial debate on submissions where it affected chemical tankers said:-

Chemical tankers

6.73 The committee considered a proposal by IPTA to introduce a cubic capacity correction factor for chemical tankers (fc), due to their particular design features into the EEDI formula.

This would reflect concerns in relation to chemical/parcel tankers that were similar to those expressed for combination carriers, namely, that specific design features could lead to these ships being penalised under the current EEDI formula (MEPC 62/6/13).

6.74 The committee noted that a correction factor for chemical tankers (fc) would be incorporated into the calculation guidelines and so agreed to forward document MEPC 62/6/13 (IPTA) to the ISWG established under agenda item 5 with a view to considering the inclusion of a fc in the guidelines.

Following this, the action taken on the working group's report was to amend the document.

The relevant paragraph was deleted and replaced with – 'The group agreed to integrate the correction factor into the EEDI calculation guidelines and doing so would enhance credibility and confidence in the EEDI formula. However, the Group considered that the correction factor presented in document

MEPC 62/6/13 would require fine tuning.'

'The group noted that the guidelines for determining minimum propulsion power and speed to enable safe manoeuvring in adverse weather conditions should be developed in a relatively short time, since the guidelines are referred to in the regulatory framework of the EEDI as being voluntary.'

In addition, further paragraphs were amended to read- '...2 endorse the agreement of the group that cubic capacity fc should be included in the guidelines on EEDI calculation (paragraph 4.2); and 4..... endorse the draft work plan for further development of technical and operational measures for ships, as set out in Annex 1 (paragraph 6.7)'.

Plenary conclusions

The plenary conclusions and decisions made were -

5.32 Having considered the report of the ISWG, the committee approved it in general and, in particular (paragraph numbers are those of document MEPC 62/WP.15, as amended):

- 1) Invited interested delegations to provide practical information and examples of the energy efficient operation of ships to the Secretariat by 31st August 2011 for inclusion in the IMO Model Course (paragraph 3.3);
- 2) Endorsed the agreement of the group that cubic capacity fc should be included in

the guidelines on EEDI calculation (paragraph 4.2).

Background

As a background to the debate, in a submission by Denmark and Japan, it was said that at MEPC 62, the committee considered document MEPC 62/6/13 (IPTA) to incorporate a cubic capacity f_c into the EEDI formula.

While the committee agreed to include a capacity correction factor into EEDI calculation guidelines, the f_c presented by IPTA would require fine-tuning to avoid overcorrection (MEPC 62/24, paragraphs 5.31.1 and 5.32.2), and further consideration would be needed prior to adoption at the next session of the committee.

Therefore, this document provides a calculation formula to determine appropriate values of f_c based on the IPTA proposal.

Tankers' reference line

In regulation 21 of MARPOL Annex VI, amended by resolution MEPC.203(62), oil tankers and chemical tankers fall into the same category of 'Tanker' and are needed to meet the same EEDI requirement based on the reference line for tankers.

However, in attempting analysis of the fleet statistics, the regression curve of EEDI values for chemical tankers (hereinafter referred to as 'reference line for chemical tankers') lies on average 3.6% above compared to the reference line for tankers, ranging from 5,000

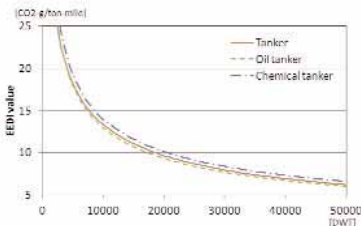


Figure 1: Reference lines – Tankers (all), Oil Tankers and Chemical Tankers

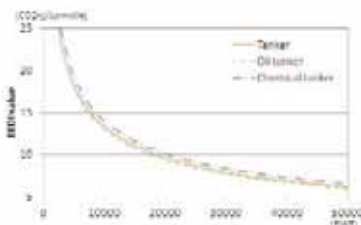


Figure 1: Reference lines – Tankers (all), Oil Tankers and Chemical Tankers

to 35,000 dwt.

This implies that it would be difficult for chemical tankers to meet the EEDI requirement, so that it would be appropriate to include the f_c into EEDI formula in order to

compensate 'fairly' the chemical tankers' EEDI values.

As a principle, it is important to establish a reasonable correction factor to avoid overcorrection and to minimise the risk of creating a loophole in the EEDI when applying the EEDI formula.

In light of this, the f_c should be the same as the differential ratio between the EEDI reference line for tankers and the average line for chemical tankers.

Furthermore, it should be noted that the value of correction factor f_c should be expressed as a continuous function because neither hull structure nor sizes could be clearly categorised by any boundaries.

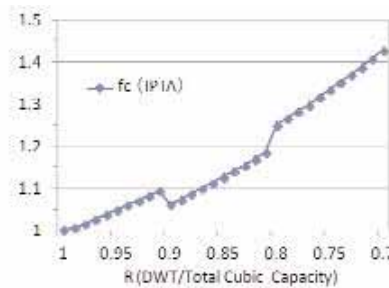


Figure 2: Design ratio R versus correction factor f_c

However, f_c as presented in IPTA's proposal is determined by a design ratio R (the ratio of summer deadweight to the total cubic capacity of each vessel) and the function of f_c is categorised according to the R ranges. As shown in figure 2 the function has points of discontinuities at $R = 0.8$ and 0.9 .

Taking the above principles into account, the co-sponsors have attempted to establish a more appropriate correction factor f_c aiming at both eliminating the discontinuities and avoiding overcorrection. This new proposal utilises the functional formula given below.

$$f_c = R - c \quad (c = \text{const})$$

For this purpose, Japanese shipbuilders have provided the data of 35 chemical tankers ranging from 8,000 to 35,000 dwt. R of these ships falls into ranges from 0.84 to 0.96 and its average is 0.89.

Figure 3 shows the degree of correction

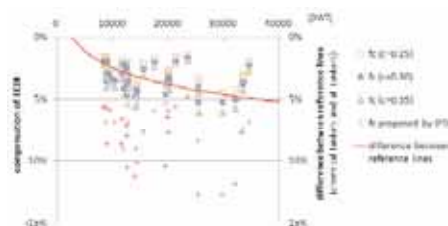


Figure 3: Effect of cubic capacity correction factor f_c

from each EEDI of these chemical tankers and the difference between reference lines for (all) tankers and chemical tankers when applying capacity correction factor f_c ($c=0.25, 0.30$ and 0.35).

In case of $c=0.30$, the correction degree of 35 chemical tankers and the difference between reference lines have the least deviation.

Figure 4 shows the relationship between f_c and R , and Figure 5 presents the distribution of the EEDI values of both attained EEDI without correction factor and those with f_c ($c=0.30$). Accordingly, the EEDI values are compensated by 3.3% on average and this could lead a conclusion that the following

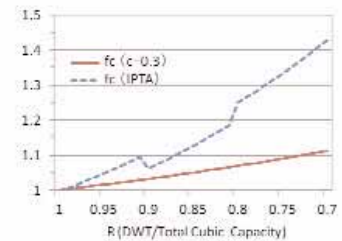


Figure 4: Design ratio R versus correction factor f_c ($c=0.30$)

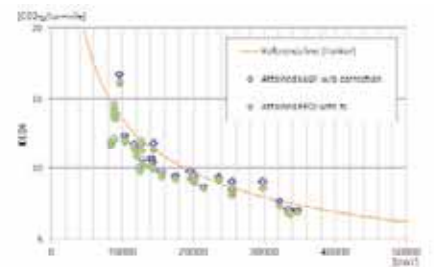


Figure 5: Reference line (Tanker) versus EEDI of chemical tankers ($c=0.30$)

formula for f_c could be within an acceptable level for correction to maintain a fair treatment for chemical tankers.

Amendments agreed

The ISWG January 2012 meeting agreed the following amendments affecting - Annex 1, Page 9 -the class notation CSR, the following capacity correction factor f_{cCSR} should apply:

$$f_{cCSR} = 1 + (0.08 \cdot LWT_{cSR} / DWT_{cSR})$$

Where, DWT_{cSR} is the deadweight determined by paragraph 2.4 and LWT_{cSR} is the lightweight of the ship.

4. For other ship types, f_c should be taken as 1.0.

12 f_c is the cubic capacity correction factor and should be assumed to be one (1.0) if no necessity of the factor is granted.

1.... For chemical tankers as defined in regulation 1.16.1 of MARPOL Annex II, the following cubic capacity correction factor f_c , should apply:

$f_c = R^{0.7} - 0.014$, where R is less than 0.98,
or
 $f_c = 1.000$ where R is 0.98 and above;

Where, R is the capacity ratio of the deadweight of the ship (tonnes) determined by paragraph 2.4 divided by the total cubic capacity of the cargo tanks of the ship (cu m).

2..... For gas carriers having direct diesel driven propulsion system constructed, or adapted and used for the carriage in bulk of liquefied natural gas, the following cubic capacity correction factor f_{cLNG} should apply:

$f_{cLNG} = R - 0.56$

Where, R is capacity ratio of deadweight of the ship (tonnes) as determined by paragraph 2.4 divided by the total cubic capacity of the cargo tanks of the ship (cu m).

13. Length between perpendiculars (LBP) means 96% of the total length on a waterline at 85% per cent of the least moulded depth measured from the top of the keel, or the length from the foreside of the stem to the axis of the rudder stock on that waterline if that were greater.

In ships designed with a rake of keel, the waterline on which this length is measured should be parallel to the designed waterline. The LBP should be measured in metres.

Blending on board

At the IPTA AGM last year, a question was posed about re-circulation of cargoes and whether this would be captured by the ban on blending on board during the voyage.

While the secretariat was of the opinion that this would not be affected, in order to be certain, IPTA asked for clarification from the 17th meeting of the ESPH Group.

The group provided confirmation, with the report of the meeting including the following text:

“The representative from IPTA asked the working group for confirmation that recirculation of a cargo within its cargo tank during the voyage for the purposes of maintaining cargo homogeneity is not prohibited under MSC-MEPC.2/Circ.8, including when two or more different products have previously been loaded into the cargo tanks within port limits.

“The group confirmed that since there was no transfer of cargo between tanks and no new product created during the voyage, MSC-MEPC.2/Circ.8 would not apply.

“The group further confirmed that the circulation of cargo through external heat exchangers was not intended to be prohibited under MSCMEPC. 2/Circ.8,” the group concluded.

January’s BLG 16 was asked to agree amendments to the IBC Code for adoption by the MSC and MEPC, with entry into force anticipated in mid-2014.

These amendments incorporated new products evaluated since the last amendments were adopted in 2007 and any changes to carriage requirements that have been agreed since then.

TO

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Bahraini repair yard completes expansion

Competition is hotting up in the Middle East ship repair sector. *TANKEROPERATOR* visited ASRY recently to learn of the company's plans.

With shipowners reducing the amount they spend on repairing large tankers and competition significantly increasing in the Middle East, leading Bahrain-based tanker repairer Arab Shipbuilding & Repair Yard Co (ASRY) is looking to other sectors to secure its future.

The yard was originally set up by the members of the Organisation of Arab Petroleum Producing Countries (OAPEC) – Bahrain, Saudi Arabia, UAE, Kuwait, Qatar, Iraq and Libya and opened for business in October 1977.

At that time there was a plethora of VLCCs and ULCCs loading oil at the various terminals in the Persian Gulf and so the need for a 500,000 dwt graving dock in the area was seen as paramount.

Down the years, ASRY's large capacity dock has been supplemented by two smaller floating docks of 120,000 dwt and 80,000 dwt capacity each, two slipways and 15 repair berths, the latest of which was officially opened on 11th December 2011. This year also marks the yard's 35th anniversary.

The new 1.38 km repair quay is the final part of a \$188 mill expansion programme, which has seen ASRY diversify away from

the more traditional large tanker repairs, although they still make up a significant part of the yard's workload. Among the different sectors now catered for are offshore and naval work. Indeed, several US and UK naval vessels have already been handled at the yard, including units of the UK's Royal Fleet Auxiliary (RFA) under an agreement with the A&P Group.

Today, the yard is marketed to all types of vessel owners and operators, including dredgers, jack-up rigs, offshore support vessels, tugs/barges and naval craft, plus the usual large commercial vessels. The marketing function is controlled by its London-based wholly-owned agency ASRYMAR.

Although the yard is currently undertaking the construction of four 40-tonne bollard pull tugs for its own use and has constructed workboats and soon barges, the management was adamant that, unlike other Middle East repair yards, ASRY would not become involved in commercial vessel newbuildings as such.

In addition to the repair facilities available, other major repair and service companies have set up shop at ASRY offering complimentary technical services to vessels using the facility, often with their own



ASRY chairman Shaikh Daij

warehousing.

To cater for the offshore oil and gas industry, ASRY Offshore Services was formed in 2008, the same year that the \$20 mill slipways were opened. In 2011, ASRY joined with UK-based power generation packaging specialist Centrax to form the joint venture concern ASRY-Centrax to design and build power barges for local Gulf energy consumption needs.

Commenting at the opening of the new repair quay, chairman Shaikh Daij bin Salman bin Daij Al Khalifa said: "This isn't the end for ASRY – not by a long way. Once the shipping industry picks up and gathers momentum, as I'm confident it will, ASRY will be able to push forward with new plans and ventures, both at home and internationally, but only when the time is right!"

Also commenting on the opening of large repair complexes at Ras Laffan and Duqm, Oman, plus the huge Dubai complex, Shaikh Daij said: "If you are afraid of competition, then shut up shop." He pointed to the growing number of vessels in the world's fleet and said that increased competition would lead to ASRY "...being a better company."

As for the ratio of large vessels calling at ASRY for repairs, 2011 has seen a reversal of the pattern of equal share between the GCC states' vessels and those controlled internationally. During last year, the ratio was split roughly 65:35 in favour of Arab-controlled tonnage.



KOTC's 35,600 dwt products tanker *Al Sabiyah* seen alongside the new repair quay.



Despite the slowdown, VLCCs still form a significant market for ASRY

Equipped for fire fighting duties, as well as for pollution control, they have also been designed for push-pull operations from the bow and for towing via a hook at the stern. They have also been fitted with sky windows to enhance ship handling during docking and undocking operations. A low air draught will enable them to handle highly raked vessels at close quarters, including manoeuvring under mooring lines.

Propulsion is achieved by the fitting of twin Schottel SRP 1010 CP steerable rudder propeller units with cp inward rotating propellers fitted in nozzles driven by two 1,324 kW Yanmar SN21 resiliently mounted diesel engines, via cardan shafts, flexible couplings and clutch.

The auxiliaries consist of two 99 kW Volvo Penta diesel generators and two 20 cu m per hour bilge pumps

will be fitted. For fire fighting, each tug is fitted with a 1,200 cu m per hour at 10.5 bar capacity pump, which is driven by the port main engine. The fire monitor is capable of delivering water, or foam.

For pollution control, a dispersant pump with two spray booms is fitted. Each tug can accommodate a crew of eight.

Future projects

For the future, ASRY is looking to enter the LNG for fuel conversion market, plus the fitting of abatement technology. In addition, the yard sees a market in the fitting of ballast water treatment equipment, which will have to ramp up in the near future, once the convention is ratified, possibly this year. The management confirmed that it was in talks with BWT manufacturers.

Overall, ASRY said that shiprepair sales had declined in line with the current shipping downturn, but offshore sales had increased,

hence the decision to form a dedicated subsidiary to cater for offshore craft, including jack-up rigs.

Shaikh Daij is also chairman of Bahrain's General Organisation of Seaports (GOP) and undersecretary for port affairs at the Ministry of Finance.

He explained that a plan was being put into place to create a maritime centre, or cluster in the Kingdom – part of Bahrain's Economic Vision 2030 plan. Despite its ongoing sectarian problems, he described the island as the Middle East's most free economy.

The 2011-2016 maritime plan includes the setting up of a maritime education fund for Bahrainis to undertake maritime studies internationally.

In addition, to enhance Bahrain's connection to the other Arab states, another causeway is to be built connecting the island with Qatar, which once open, will allow cars and trucks access to Qatar in just 30 mins. The original causeway connects Bahrain to near Dahrhan in Saudi Arabia and is being expanded to handle five times the amount of traffic using the causeway today.

Bahrain's National Oil & Gas Authority is also considering the construction of an LNG receiving terminal and dredging work on the entrance channel to the new container and cruise vessel port (Khalifa bin Salman Port) will allow vessels drawing up to 15 m to access the quay.

Although not in the scope of this magazine, the new container terminal, operated by APM Terminals, has been set up as a regional hub and coupled with a new logistics centre, it is hoped to serve Bahrain's neighbours, such as Saudi Arabia, Iraq and Qatar. In the long term, this could bring more vessels into Bahrain, thus giving the local shiprepair market a boost.

The original Mina Salman port is to be developed into a bulk handling terminal for the import of building materials to cater for



Arab controlled tonnage accounted for about 65% of the total number of vessels handled by the yard last year.

“ If you are afraid of competition, then shut up shop.
Shaikh Daij

”



The large drydock was built to cater for the VLCCs/ULCCs around during the late 1970s and 1980s.

the Kingdom’s massive civil infrastructure expansion plans. Again this should bring more vessels to the island.

The GOP currently handles all things maritime in Bahrain, including a new VTS, which allows Bahrain coastal surveillance, as

well as controlling the navigation in the harbour areas. All vessels in Bahraini waters must now be fitted with an AIS.

Finally, a list of maritime laws governing Bahrain is currently being drawn up under the auspices of the GOP. This is known as the

Maritime Code and is aimed at bringing Bahrain into line with international maritime conventions and protocols.

Despite the general downturn in the shipping market, ASRY still handles a variety of tanker traffic, including VLCCs/ULCCs.

For example, during the first half of last year, Vela drydocked three VLCCs at ASRY

– *Aries Star*, *Pisces Star* and the *Alphard Star* – while the National Shipping Corp of Saudi Arabia docked two VLCCs – *Ghawar* and *Ramlah*.

KOTC docked the VLCCs *Al Salhela* and *Kazimah III*, while Springfield Shipping docked the VLCCs *Olympic Legacy* and *Olympic Loyalty*.

Indian shipowners have also proved to be a lucrative market for ASRY down the years and during *Tanker Operator*’s visit in December of last year, the 40,146 dwt *Pratibha Tapi* was alongside one of the repair quays.

Two KOTC product tankers were also present – the 35,644 dwt *Al Sabiyah* alongside the newly opened repair quay and her sister *Al Kuwaitiah* in No 3 floating dock.

The large graving dock was home to a local tug and one of Maersk US’ containerships chartered to the US Military Sealift Command. A UK Royal Fleet Auxiliary (RFA) vessel was also alongside the new repair quay.



Indian tonnage regularly uses ASRY’s facilities.

TO

Cyprus receives taxation boost

What was called a triumph for Cyprus Shipping was achieved on 24th March 2010 when the European Commission officially approved the new, fully revised and upgraded Cyprus Shipping Taxation System.

At the time, the Cyprus Shipping Administration said that this approval constituted perhaps the most important success for Cyprus Shipping since the formation of the Republic of Cyprus and ensured the viability of the Cyprus Shipping Register and the Cyprus Shipping Industry as a whole.

The importance of shipping to the Cyprus economy was illustrated by the fact that it exceeded 5% of the country's GDP in 2010, despite the continuing international financial crisis.

Although it is early days, there has not been a rush of companies through Cyprus' door, perhaps explained by the continuing financial crisis and the fact that the island's shipping community is closely allied to Greece with a few exceptions.

Following intense lobbying from the Cyprus Shipping Chamber, the relevant Bill incorporating this on a national legislative level was presented, debated and approved by the Council of Ministers on 22nd April 2010.

The Bill was then sent through an 'express' process to the House of Representatives the same day and again under the same express process, the Parliament in a Plenary Session on 23rd April sent the matter for preliminary discussion to the Parliamentary Committee of Communications and Works on 27th April. It was finally approved on 29th April, 2010.

There was a fear that when Cyprus joined the EU, there would be an exodus of shipping companies, due to higher wage costs. However, by and large, this did not materialise. Indeed, the resident companies tended to grow in terms of tonnage and one-Bernhard Schulte Shipmanagement (BSM) - consolidated its whole operations on the island by amalgamating several worldwide companies into one entity, now run from Limassol.

Another leading Limassol-based shipmanagement concern, Columbia Shipmanagement (CSM), part of the Schoeller Holdings Group, said that the new 2010

Cyprus Tonnage Tax had not had any major impact on the operation of Cyprus flag vessels, as they have been enjoying the benefits of this system for a number of years. However, what was achieved was that this legislation was now in line with EU guidelines and directives; an accreditation that some other similar regimes have not achieved.

Attractive benefits

CSM said that the benefits for Cypriot-based shipmanagers were still as attractive as they were during the pre-EU era. Cyprus is a country with a highly educated, qualified and multilingual population, low set up and operating costs, advanced telecommunications, modern and efficient legal, accounting and banking services. In addition, Cyprus offers full exemption from exchange control restrictions for non residents, no taxes on crew salaries and no stamp duties on mortgage documents, the company said.

Mainly due to its strategic geographical position and good infrastructure, Cyprus remains in a favourable position to attract international shipping and remains the biggest

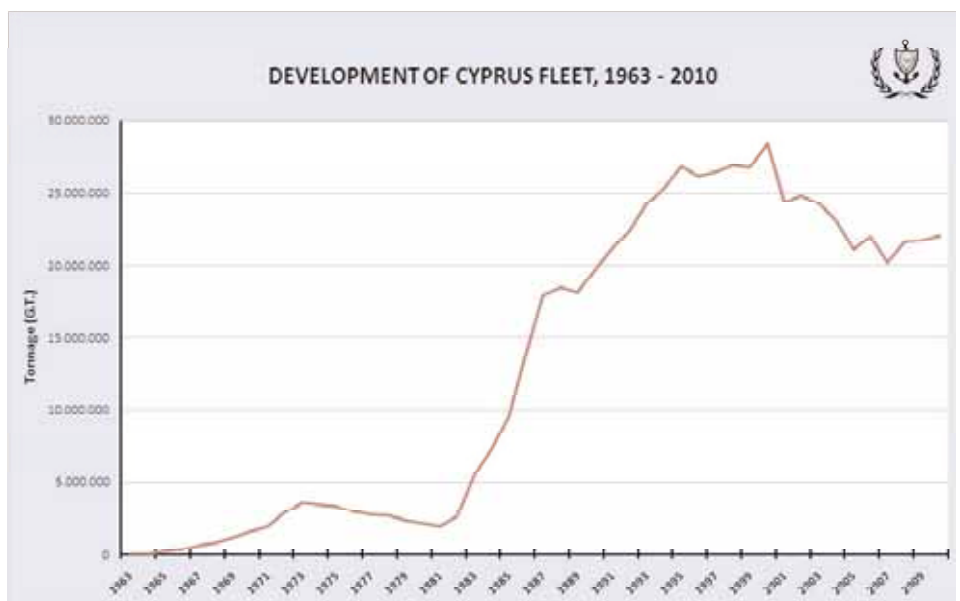
third party shipmanagement centre in the EU.

CSM is a member of the shipmanagers association InterManager and explained that shipmanagers should have a voice in the industry and this could only be achieved if an association has the strengths that its members provide. "Therefore, we support InterManager so that the organisation's voice is raised when and where appropriate," CSM said.

The majority of vessels are managed from CSM's main office in Cyprus, but Hamburg and Singapore also technically manage some of the vessels. For example, the chemical and product tanker fleet are being managed from all three CSM offices.

At present, the company has nine chemical tankers, 61 chemical/product tankers, 33 crude oil tankers under full management. CSM also provides seafarers for the Limassol operation, which also manages two LPG carriers.

In addition, the company has crew management contracts for chemical, product and crude oil carriers. CSM's crewing offices in Russia, Latvia, Georgia, Ukraine, Croatia and Philippines are all staffed with in-house trainers who are qualified Master Mariners, or Chief Engineers and can provide a series of



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training courses. Columbia also co-operates with a number of training centres and academies not only in the recruitment areas but also elsewhere for the provision of the necessary tools to its seafarers to carry out their tasks at the highest possible standards.

CSM pointed out that the joint venture shipmanagement company operated in co-operation with Tsakos is purely run from Athens. The company is also involved in newbuilding supervision having built some 250 vessels since 1988. CSM said that it is currently supervising the construction of another 21 vessels.

Going forward the company said that the main challengers were increasing running costs, a shortage of crew, growing environmental and safety legislation requirements, shipping market volatility and not least, the current economic crisis.

CSM explained its expansion plans by saying that these could occur in two ways: –

A) Enhancing the relationship with existing clients in terms of improved services with meeting an increasingly more demanding financial and operational environment

B) Increasing the number of ships under management at a pace that will allow the company not only to source the appropriately qualified crew for any new tonnage under management without prejudicing existing client relationships, but also to make a careful financial risk assessment of any potential new client.

Donnelly Tanker Management agreed that the Cyprus Tonnage Tax was a positive move, as it meant that the company could place its chartering activities under the tax rules, but not the technical and crewing management aspects of the company's activity.

The company thought that the most important aspect of the new regime was that the tonnage tax and not the income tax was EU approved. A minus for Donnelly was that the commercial activities did not come under the tonnage tax, but rather income tax, which the company claimed was still the lowest in Europe.

Donnelly Tanker Management is part of the InterShip Group and manages all of its vessels from Cyprus. Its fleet includes nine Handy MRs (37,000 dwt- 40,000 dwt), two 50,000 dwt MRs and three LR1s. All are operated in the United Product Tanker Pool. The company's newbuilding programme was completed in September 2011 and Donnelly said that it had no plans to order any further tonnage for the next couple of years. For example, last year Donnelly took delivery of

the LR1s *Andes* and *Himalaya*.

Being part of InterShip/Hartmann Group, Donnelly has access to a common training establishment, which is wholly owned. The greatest challenge to the company going forward as with many others is the investment in people.

Joint venture

Cyprus' strong ties with Greece was illustrated in 2010 when Schoeller Holdings, owner of Columbia Shipmanagement (CSM), teamed up with Tsakos Shipping & Trading to form Tsakos Columbia Shipmanagement (TCM). At the time, the companies said that the purpose of the new company was to expand its services to third party owners and continue the technical management of the existing Tsakos managed fleet.

CSM was established in Cyprus in 1978 and as mentioned, the company currently provides either crew and/or technical shipmanagement services to about 350 vessels of every type and size.

Late last year, Interiorient's crew training culture was claimed to be strengthened by Seagull Systems, meaning that Seagull is now the sole provider of training for the Interiorient fleet.

Limassol-based Interiorient employs over 300 shore-based staff and more than 1,200 seafarers on around 60 fully managed ships, including a number of predominantly ice class product tankers.

The global provider of marine transportation services has used Seagull training modules since 2005, starting with Seagull's Crew Evaluation System (CES), the computer-based assessment tool which is used to evaluate the knowledge of seafarers as part of the company's recruitment and promotion process, and to identify future training requirements.

Shane Rozario, Interiorient's corporate training coordinator, says: "The CES is a tool we continue to use extensively to verify the competence of new joiners to the company, as well as to enhance the professional knowledge of our existing crew members."

Each vessel operated and managed by Interiorient, through either of its two main offices in Cyprus and Hamburg and its managing office in Miami, is equipped with a Seagull training computer loaded with Seagull Training Systems (STS).

The STS incorporates Interiorient's Career Development System (CDS), and company-specific training programmes, as well as a wide range of generic CBTs and training

videos.

Rozario said: "In view of our recent fleet growth and our desire to raise the skills of our officers to a higher level, we realised the need to enhance crew training and provide seafarers with a systematic career development strategy. The result is the CDS."

Interiorient and Seagull have been working together for almost four years to create a CDS specifically for Interiorient's seafarers. "We determined that this should be a structured system of on board training courses, including Seagull's standard CBTs, as well as various bespoke training modules developed to meet our specific needs," said Rozario. "Most importantly it also had to include hands-on training based on our in-house safety management requirements."

The CDS has gradually been rolled out across the fleet and by early 2011 all vessels operated by Interiorient were equipped with and running the Seagull CDS.

Interiorient intends to obtain class approval for the CDS in the near future. "Together with Seagull we aim to develop the CDS system as a central point for maintaining all onboard training activities, including drills and training related to the types of cargoes being carried," explained Rozario.

In addition to shipboard training, Interiorient has equipped its branch offices in Riga, St Petersburg, Manila and Cebu with both CES and CMT training facilities, helping to enable crew to carrying on with their training while they are ashore. The company uses more than 40 Seagull CBT titles and training videos.

This year Interiorient switched to Seagull's online platform, allowing its seafarers to use CBT training, conduct CES tests and view their training records via the internet.

By far the largest shipmanagement concern on the island is Bernhard Schulte Shipmanagement (BSM), as the group as a whole caters for more than 650 vessels in what are called 'service and crew delivery centres (SDCs)' located in 25 countries worldwide. Altogether, BSM employees around 17,000 people, either afloat, or ashore. More than 90 vessels are fully, or part-owned by the family firm.

As from 1st January, BSM put a new management team in place worldwide. The senior changes affect David Furnival based in Isle of Man and Ravi Korivi based in Hong Kong, previously group managing directors, who took up the roles of chief operating officer (COO) and chief marketing and business development officer (CMBDO) respectively.

TO

Keep the tiger in the cage at all times

Most P&I Clubs have active loss prevention initiatives. The claims can easily be analysed and categorised by type and cost, giving the managers a good idea of what is going wrong on board a ship, thus enabling remedial action to be taken.

The UK P&I Club, part of the Thomas Miller Group, has been analysing claims for 23 years and after much study and in-depth trials with certain member shipowners, the club has launched a risk management scheme, which utilises a 'BowTie' approach to identifying areas of risk and minimising the occurrence of incidents.

The Club's loss prevention director, Karl Lumbers, explained: "Working with those members who wish to identify the various threats to the smooth (claim-free) running of their vessels, we conduct reviews on those areas which may cause claims. Thomas Miller P&I Ltd, the manager of the UK Club, has access to an incomparable amount of claims data resulting from extensive analysis of previous incidents over a period of 23 years and it is this that has enabled the Club to identify 'threats', 'consequences' and 'controls', the foundations of developing BowTie reports on individual vessels."

As an example, on one vessel, a Panamax bulk carrier, five 'hazards' were selected as being the most frequent liability claim areas seen by the Club. These were:

Crew hazardous activities – personal injury; Carriage of cargo by sea – cargo damage; Ship in transit – collision/grounding damage; Ship/crew actions – third party property damage; Carriage of pollutants by sea – pollution damage.

Following an extensive on board survey, 'threats' relating to all five hazards were assessed, 'controls' that needed attention were identified and recommendations for changes in working practices were proposed to the master and owner/manager.

Despite taking a drybulk carrier as an example, UK Club deputy chairman Nigel Carden told *Tanker Operator* that the analysis equally applied to the tanker sector. Indeed, the club has been talking to oil companies about the human error problem. Lumbers said that the club had identified seven primary risk

Recognising the fact that P&I premiums and claims can eat into a shipowners/operators profit margin, marine mutuals are committed to reducing the number and size of insurance claims they receive.

hazards; 76 common threats, which if not contained could cause an incident; and 450 controls which need to be in place and effective if the threats are to be contained.

He said: "Although 60% of UK Club claims are caused by 'human error', human error is often only 'the straw that breaks the camel's back' – the last event in a chain of causal events.

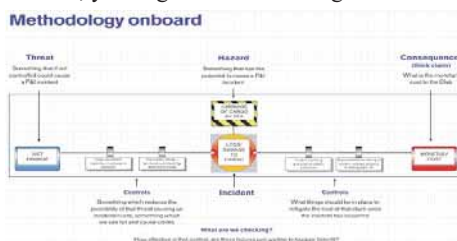
"These causal events can normally be traced back to failures in one or more areas of ship operation; we sometimes refer to them as 'accidents waiting to happen'.

"How can we reduce the frequency of these 'accidents waiting to happen'? What 'controls' should we be looking at to ensure the 'threat' is contained and an 'incident' does not occur?" he asked.

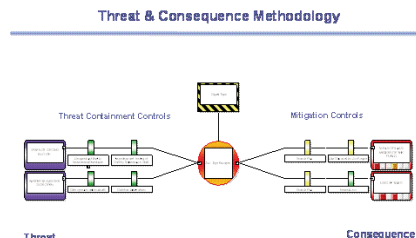
Lumbers cited 'the Tiger in the Cage example' as a way of explaining the BowTie methodology:

As more threats are considered, so the complexity of the diagram develops to give the BowTie effect.

Putting the caged tiger into a maritime context, you begin with something like:



and as threats are added, it expands to provide a diagram that encompasses the full scope of the risk. These diagrams are an excellent method for building participation in risk management through the organisation, the club said. They can then be discussed initially with the ship's crew and subsequently with the owner.



The BowTie Effect

The Club's approach offers strategic guidance to owners and operators on tackling the root cause of expensive claims. Using quantified real-life case examples owners/operators are able to invest proportionately in risk management and loss prevention activity.

The detailed reports and reviews enable information to be shared across the fleet and operational departments enhancing credibility, co-operation and effectiveness. The result will be a consistent and inclusive approach that encourages sustained and measured loss prevention activity over the longer term.

Teamwork and focus assists with Port State Control (PSC) compliance speeding up that process and reducing the delay to ships and the burden on masters and crew during port calls. The transparency of approach enables owners/operators to demonstrate good practice to their customers, contractors, maritime agencies and other third parties.

Lumbers reported that several members who have been briefed on its BowTie approach to risk management have been enthusiastic and have requested surveys that they can consider and discuss among their management teams and sea-going employees.

He said: "With this system you can also look beyond its primary role (for the Club and owners), namely the reduction in claims levels, to the bigger picture. It should always be remembered that behind so many claims are incidents that lead to serious bodily and loss of life. For those affected, including families and friends of the victims, anything that helps make life safer at sea has to be welcome."

Lumbers said that this began when the Club reviewed its system some two to three years ago and came up with this initiative about six months ago. For the past two to three months, it has been trialled by member companies on board ship.

TO

Checking disbursement accounts made easy

Since it was formed in 2001, web-based disbursement account (DA) service concern DA-Desk has come a long way.

Down the years, DAs are arguably one of the most onerous tasks facing an owner, or operator. It is a time consuming exercise and for many years, disbursements were checked by hand by a company's operations department having been received by post, or courier in paper form as a folder from a ship's port agent.

This service is entirely web-based, which means that the client does not have to invest, or install software, there are no integration costs and training in the system's use only takes around one hour. All the company's servers are housed in Europe and the databases and audit trails are maintained online.

The company is heavily involved in the tanker sector, as it mainly handles tramp voyages. DA-Desks' customer sector mix in 2010 was - chemical tankers (21%), crude oil tankers (17%) and oil/products carriers (15%), giving the overall tanker sector 53% of the vessel types signed up for the service.

To prove that by using an independent third party company to undertake the finalising of DAs, time and therefore costs can be considerably slashed, DA-Desk calculated the time and cost involved in handling a typical account in-house.

The research concluded that a typical account would take between three to six hours to complete from start to finish. If a company operates 80 vessels calling at 30 ports each then the vessels make 2,400 port calls per year, and the operations department would accumulate 12,000 hours at five hours per account. At 20-40 vouchers per account, this amounts to 48,000 invoices.

The cost of signing off a DA was calculated at \$100-\$150 per hour per person. The internal cost for managing the accounts would then be \$1.2 to \$1.8 mill per year. Disbursement accounts average \$40,000 per port call, giving

a total annual port cost spend of \$96 mill for the 80 vessels.

An average vessel operator could use between 300-400 different ports and only some of these on a regular basis and hence up to 400 different agents. Each agent is a counterparty that the company should know well.

Today, banks usually demand company accounts on a quarterly basis, being regulated, meaning that all the disbursements needed to be finalised in a timely fashion. This is important for both the principal and the port agents. A company could be faced with up to 5,000 payments with two to three port payments per port call, with an advance needing to be paid upfront before the vessel arrives.

In the tanker sector, the contracted claims time bar also has to be taken into account, whereby all claims on the voyage accounts need to be settled within a stipulated timeframe, which mainly affects the settling of demurrage.

DA-Desk claims to offer its independent port cost management services on a purely controlled, totally transparent basis and will not become involved with operators commercial decisions. Today, two core services are offered – PortSpend Management and PortPayables.

The company told *Tanker Operator* that it can provide economies of scale through its involvement in more than 100,000 port calls per year, enabling favourable rates, such as courier and bank fees, to be negotiated, the reduction of unit costs, thus passing savings on directly to the client. A customer's confidentiality is also strictly adhered to, the company said.

DA-Desk claimed to have the in-house knowledge to implement and maintain the level of governance required in today's regulatory environment. For example,

Sarbanes Oxley compliance, OFAC and anti-money laundering regulations are integrated into the company's processes.

Currently, the company has around 350 multi-national employees and offers a 24/7 service to more than 150 principals. More than 8,000 agents worldwide are included on the company's database. Around 8,000 vessels' accounts were handled in 2010 and the company said that it expected to complete more than 100,000 DAs last year.

To counteract the threat of liability, the company is a senior member of the Thomas Miller's mutual - International Transport Intermediaries Club (ITIC).

The company's flagship service is PortSpend Management, which as the name suggests, has been set up to automate and streamline the time consuming process of the DA lifecycle with what is claimed to be a highly efficient process, which includes – DANomination, DAProForma, DAFinal and DACostAccounting.

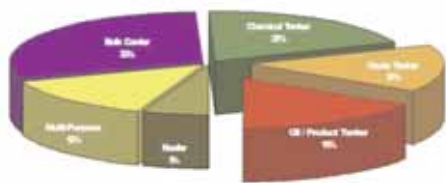
DANomination creates an appointment with an agent, checks his or her credentials, confirms the appointment and then notifies all the parties involved of the appointment.

DAProForma obtains the proforma invoice in 24 hours of the appointment, screens and approves it, updates the information online, provides advance payment advice, provides the netting/balancing confirmations.

DAFinal enters the final DA, receives the actual DA from the agent, scrutinises it, provides final approval online and determines the balance of the settlement recovery, while DACostAccounting rebills the owners and/or charterers, provides the balance of payment advice and archives all the port call(s) documentation.

As for PortPayables, this is a cash management service offered to the company's PortSpend Management clients in conjunction with DA-Desk's banking partners, including

Deutschebank and Citibank. It can provide improved banking terms and up to 100 payable currencies due to the company's consolidation of more than \$2 bill payments through these partners – about \$1 mill is related to competitive foreign exchange payments. Around 70,000 payments are handled every year.



Da-Desk's ship type split.

PortPayables handles all the tasks related to payments, transfers, confirmations, nettings, accounting and reconciliation. These tasks are carried out using one of four features – DAAccounts, DAForex, DALiquidity and DACompliance.

The full DA cycle, including payables have been brought down from about 100 days to 65 days due to improving the process, which again helps negate the possibility of tankers being time barred and it ensures faster settlement of balances with agents.

Despite the fact that the DAs are reconciled online, a document control compliance service is offered whereby the agent is requested to courier the DA to the company in paper form. The paperwork is then archived for seven years.



Da-Desk co-founder Jens Loren Poulsen is also non-exec chairman.

TO

Da-Desk's increasing success with tanker operators

As mentioned, tanker owners and operators make up a slight majority of vessels catered for by DA-Desk, which purposely doesn't offer its services to liner operators, or agents.

All types of tanker and gas carrier port calls are processed. For example, the company's core port disbursement services for VLCCs/ULCCs are supplemented by specific sub-processes to provide systematic processing for lightering operations, the application of Worldscale rates where appropriate and expense time bar management.

Companies operating these larger vessels sometimes employ hub agencies, and DA-Desk has developed processes to allow for dual operations using these hubs for operations and DA-Desk for cost administration. This means that hub agents may be kept informed about new calls via DA-Desk, even when the appointment is made directly to the local agent.

Turning to product tankers, with experience in a wide variety of these trades and vessel sizes, DA-Desk's flexibility allows for the simple creation of business divisions within companies and process variations per business division.

For product tankers, DA-Desk specifically monitors activities in respect of Green Award rebates where appropriate, as well as rebates applicable for SBT vessels and the

application of Worldscale rates and rules.

Time bar management processes are the 'norm' with most product tanker operations, with additional efforts made to obtain accounts prior to recharge time bar dates. Enhanced reporting on time bars is provided and operators are continually made aware of the status of accounts in which recharge time bars apply, the company explained.

With chemical and gas tankers, complex parcelling, transshipment, multiple berth and short sea operations prevalent in this sector, processes exist that cater for the allocation of costs per charterer and berth within the same disbursement account.

In addition, multiple cargo plan file attachments may be included in agency appointments. The abbreviated processes for short sea allow for very short passages with small time periods between subsequent calls, thus reducing agents' workloads to manageable levels.

DA-Desk defines short sea operations as those with short transit times to ports that are called at with a high frequency. Estimated port costs by vessel class are established annually that cater for weekends, activity and overtime. Batch and automated approvals are possible within DA-Desk's short sea operations and these are typically used in cases where costs are low and variances between class estimates and actuals are within threshold values, the company explained.

DA-Desk maintains estimated pro-forma DAs on behalf of vessel operating companies, hence minimising vessel operator workload. Short sea operations may apply to small product, chemical and gas tankers.

Pool operations can often mean complex accounting processes. This complexity may be compounded by different processes for chartered-in tonnage within various operating pools.

DA-Desk said that it catered for this complexity by allowing for automated but variable treatment of owner's expenses by vessel and by operating pool, or business unit. Data exports are made to operations and accounting systems that allow for preset commission deductions customised by vessel where appropriate.

In many cases, vessel operating companies may own all, or part of the fleet under operation. In these cases, processes vary between chartered-in tonnage and owned vessels. In addition to handling preset commission deductions, DA-Desk allows for separate owner's expenses approval stages between operations and technical management and even within individual technical management departments.

To allow the owners viewing access where requested, users may be created for third party entities, with strict control over access rights. ■

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Plague of piracy is a call for the world to unite as one

As calls for a UN naval task force to combat piracy grow stronger, a leading maritime lawyer gives his views.*

In October, I addressed the Indian Shipping Summit in Mumbai. As a commercial lawyer who specialises in Shipping Arbitrations, I thought I would be asked about cargo disputes and Bills of Lading. The Indian Shipping Community however, despite always being a profoundly commercial group, had one thing on their minds that overtook even their bottom lines.

International world trade relies on the ability of traders to transport huge amounts of goods on giant moving structures across the most hostile seas in the world. These traders face enough challenges from nature and ill-fortune. It is nothing short of outrageous that, over the last few years, shipowners and seafarers have been forced to add the very real threat of violent piracy to the dangers of their normal lives.

Piracy is a major threat not only to the shipping industry, but also to peace throughout the globe – if the world does nothing to stand up to people who use AK-47s and grenades to take the property of others, then what will stop thieves adopting the same tactics on the land?

The Gulf of Aden off the coast of Somalia is now almost a no-go area for international ships. The most recent large scale act of piracy took place during the Indian summit, when the Italian Capesize bulker *Monte Cristo* was captured in this area. The crew managed to hide in their citadel, while the rest of the world wondered what could be done.

It is a matter of great satisfaction that an international NATO force took charge and freed those men, but that is something that has not happened enough. More commonly, ransoms are paid for seafarers and cargo, meaning that expensive 'Kidnap and Ransom' insurance policies have added to the cost of shipping.

The individual navy vessels from different countries that attempt to counter piracy are

few in number and grossly inadequate for the task of patrolling the whole of the Indian Ocean. There is at present no co-ordinated approach. As a result, pirates are often captured only to be fed and returned to Somalia, free to go back to their old work of piracy.

Combine efforts

If international forces are to co-ordinate in order effectively to tackle piracy in the long term, I believe that they must combine their efforts into a UN naval task force. This force could then concentrate on patrolling the coast of Somalia, from where the vast majority of the pirates emerge. I hope that we will all be surprised by the effect that could be brought about by such a force monitoring all small vessels leaving Somalia's coastline to ensure they were genuine fishing vessels.

With that in mind, I have used my position as a permanent member of the IMO to force the issue. I had intended to move a resolution at the IMO for this purpose, but I will not now do so, as the outgoing secretary general of the IMO has informed me that he himself will be moving this resolution. At the IMO's General Meeting in November, I was hoping to contribute to the pressure that will be required to create a Naval task force that may be able to save many lives, as well as a lot of money, by taking control of the Indian Ocean back from the pirates.

Short of the creation of a UN naval taskforce, it is not going to be practical to control the plague of piracy. The Somali pirates are effectively the same as any other terrorist. The only difference is that while international terrorists have so far indulged in acts of terrorism for the sake of their professed political causes, Somalia's pirates indulge in terrorism only to fill their own pockets.

Arming ocean going vessels will go some way towards dealing with pirates, but for this

course of action to work, many obstacles must be overcome. For example, Egypt will not allow vessels passing through the Suez Canal to carry on board guns and ammunition (since believed to have been reversed).

What also is of concern is the growing 'industry' around piracy. The total loss to the international trade community on account of piracy in 2011, thus far, is estimated to be \$2 billion. Out of this total, only about \$110 million represents ransom paid to the pirates, just over 1% of the total loss. The rest of the loss is mainly represented by increased insurance premiums, the cost of adapting ships to higher security standards and payments made to the specialist security companies, which have sprung up to deal with piracy.

TO

**This article was written by Sarosh Zaiwalla who is a leading maritime law specialist and senior partner of London-based Zaiwalla & Co Solicitors and is also a permanent representative to the IMO.*



Maritime lawyer Sarosh Zaiwalla

Armed guards – nearing legitimacy?

A second round of discussions on the BIMCO standard armed guards contract took place in London at the offices of Ince & Co on 5th January.

A preliminary draft contract has been prepared and is currently the subject of a detailed review by BIMCO's sub-committee, which was due to meet again on 16th January to complete the process.

The organisation said that it planned to release a consultation draft to a number of international private maritime security companies, as part of the development process.

Comments from these companies as well as from documentary committee members were to be taken into account by the sub-committee on producing their final draft for approval and publication.

BIMCO said that the sub-committee was working flat-out to develop and fine-tune the draft contract so that it can be released for use by the industry as soon as possible.

However, there are many complex legal and liability issues to be resolved and it is not a task that the sub-committee is undertaking lightly. Parallel work on a set of standard rules for the use of force (RUF) is ongoing and the sub-committee was looking to tie the draft RUF to the work on GUARDCON at the 16th January meeting.

The sub-committee members were Tor Langrud, Wilhelmsen (chairman); Dan Carr, Stolt International; Stephen Askins, Ince & Co; Elinor Dautlich, Holman Fenwick Willan; Andrew Moulton, Ascot Underwriters; and Andrew Bardot and Chris South, International Group of P&I Clubs.

Meanwhile, the International Association of Maritime Security Professionals (IAMSP) has issued a document on the 'Use of Force' (UoF). It contains guidance with respect to UoF by private maritime armed security companies.

It is intended to provide guidance and advice to those seeking to address issues regarding this challenge, but is not intended to provide legal advice, security sources said.

Rival concern Security Association for the Maritime Industry (SAMI) commented on the UK's House of Commons Foreign Affairs

Committee report on 'Piracy off the coast of Somalia'.

The report stated that it was unacceptable that the Indian Ocean had become so dangerous for commercial shipping and supported the UK Government's decision to allow private armed guards to defend UK flagged shipping against Somali pirates.

SAMI said; "The fact that, as yet, no vessel has been taken by pirates when guarded by armed teams speaks volumes. The decision to allow armed guards by the UK was a turning point globally, as a number of other governments looked to the British lead and have started the process of allowing their own vessels to use armed guards, as appropriate."

However, according to SAMI founder Peter Cook, "the bold decision to allow vessels to use armed guards was just the start. Now the authorities must set about the task of ensuring the systems and rules for the use of force which they employ are appropriate and adequate."

Limited guidance

The report recognised that the UK Government's guidance on the use of force, particularly lethal force, is limited and there is little to assist a vessel's master make a judgement on when force can be used. There remains a lack of critical detail and questions as to whether a private armed guard on board a UK flagged vessel can open fire at a fast approaching skiff need clear unequivocal answers on what is permissible and what is not.

SAMI warned that monitoring the fast approach of a pirate skiff, as the rockets crash into the wheelhouse, is not the time for questions of legality to be ranging through the heads of Masters and security guards. They need to know what they can do, how and when.

Masters must be guided, so they become comfortable, confident and cogniscent in the use of force from their vessel.

"There are many fears and concerns for masters today, and as they wrestle with issues

of criminalisation, we have to recognise their concerns and allay them.

"There is also a danger that unless unequivocal guidance is produced, then we may once again give pirates the upper hand. When pirates approach vessels on which armed guards are unsure whether they can fire, then without clear and decisive guidance, there is a danger we may emasculate the very frontline solution, which is currently keeping piracy at bay," SAMI said.

As 2011 came to an end, the IMO's work under the banner 'Piracy: Orchestrating the Response', has seen the foundation for cautious optimism as pirate attacks have reduced. Through political engagement, efforts to improve information sharing and expediting the release of seafarers, the organisation can look back at relatively good progress, said OCEANUSLive in a recent weekly report.

A delegation from the UK visited Mogadishu to lay the groundwork for the eagerly awaited international conference on Somalia in London on 23rd February this year. In the meantime, the US Secretary of Defence, Leon Panetta, claimed that Djibouti had become a key partner in the fights against terrorism and piracy. The US recently opened an embassy compound in Djibouti.

After the EU announced the boost to funding for the African Union on 5th December last year, the organisation said that an agreement for the basis of a new mission to combat piracy off the Horn of Africa and Western Indian Ocean states, with the aim of strengthening maritime capacities, was in place.

As mentioned, privately armed commercial vessels have enjoyed a 100% success rate against Somali pirates, thus far. There are now many security concerns offering armed guards and it is claimed that demand outstrips supply.

However, one company said that the biggest headache facing shipping companies is various governments' (flag states) legislation regarding the use of weapons on board their vessels.

Raising standards at the terminal interface

Following its success with initiatives, such as SIRE and TMSA, the Oil Companies International Marine Forum (OCIMF) has turned its attention to raising standards at tanker and gas terminals worldwide.

For many years, the organisation has worked to improve safety at the ship/terminal interface and also with ship-to-ship transfers. Now OCIMF's Ports and Terminals Committee (PTC) is to address safety and environmental issues at the terminals themselves.

The whole initiative, called OCIMF Marine Terminal System, will take the form of four distinct projects, which are to be developed separately, but sequentially. The first phase kicked off late last year and took the form of an oil, gas and chemical terminal particulars questionnaire (TPQ).

OCIMF said that by generating information using the TPQ together with the SIRE database, vessel programmers, schedulers and operators will be able to better assess the compatibility of vessels to terminals to ensure the safe asset and environmental protection.

A notice was sent out to OCIMF's 86 members (now 90) on 3rd October last year asking them to send a TPQ to all the independent terminals used by the membership. The organisation said that it thought that enough information would be garnered for end

users some six months after the notices were sent out, ie around 3rd April, 2012.

Before the notice was sent out, TPQ had been trialled using around 100 terminals in the previous six months. The whole project's planning started in late 2009. By the end of November, some 30 terminals had registered

OCIMF estimated that there were more than 10,000 terminals worldwide, including single point mooring facilities. Any terminal will be eligible for inclusion - gas, crude oil, products, chemicals and those with multiple jetties/berths etc, the organisation said at its release last November.

The type of information requested is the hardware available, berth measurements and oil/gas transfer rates.

Terminal operators will retain full control of the data inputted and once a critical mass of information has been included on the database, it can easily be updated and it will be free of charge.

The end users were expected to be owners/operators/managers, vessel Masters, vetting departments, agents, brokers, traders, local authorities, pilotage organisations and

others. One area of improvement that could be seen by using the data is demurrage, as a vessel's waiting time could be cut by marrying up the terminal and its facilities correctly with the vessel's capability in terms of dimensions, draft and load/discharge rates. Individual terminal booklets can also be attached to the TPQ as an addition to the terminal's own input.

OCIMF stressed that the main intention of the TPQ is to capture accurate and reliable data regarding marine terminals and their berths.

This will enable all parties involved in the scheduling of tankers to operate at such berths to make the correct decisions to ensure that:

- Both the tanker and the berth are dimensionally compatible with one another (ie the tanker is neither too big, nor too small to safely moor to the berth).
- The tanker is outfitted with the appropriate equipment to load cargo from, or discharge to a berth (ie the cargo handling connections are of the right size and type to safely transfer the cargo).
- The tanker's draft is not too deep for the navigational channel to and from the berth and for the tanker to remain safely

OCIMF's Marine Terminal System (MTS) highlights

- 1) Higher safety standards, leading to fewer incidents, which in turn will lead to lower insurance costs over time.
- 2) Improved operational efficiency through better matching of terminals and vessels.
- 3) Improved effectiveness and efficiency with better dissemination of terminal information.
- 4) A rigorous self-assessment and review-based approach to the continuous improvement of safety management.
- 5) A secure process that is owned and managed by the terminal operators who retain full control over their data.

In addition, OCIMF said that it will raise the bar of terminal operations, as the improved quality of terminal and berth

information will reduce likelihood of accidents resulting from reliance of erroneous information, such as:

- Groundings, due to incorrect data regarding depth of water in the navigational channels leading to and from the berths and alongside the berth itself.
- Failure of mooring system components, due to lack of compatibility of the mooring equipment on the tanker and the berth and/or ineffective mooring leads.
- Loss of containment of cargo to the environment, due to incompatibility of tanker and berth cargo connections.
- Ineffective means for enabling escape of personnel to a safe location in the event of an emergency.

- Ineffective contingencies to address the hazards of the particular grade of cargo being transferred between that tanker and the marine terminal.
- Ineffective communications between key staff on both the tanker and marine terminal resulting in loss of containment to the environment or other emergency situations.

In addition, improved marine terminal safety management systems will reduce the likelihood of tanker personnel exposure to un-addressed safety hazards, or those arising from the acts or omissions of terminal operators with regard to fulfilling their role in a safe and effective manner while the tanker is operating at the terminal. ■

alongside the berth without going aground.

- The firefighting and safety equipment on both the tanker and the berth are appropriate for the hazards associated with the type of cargo being transferred between them.

In the past, obtaining definitive data regarding marine terminals and their berths has not proved to be straightforward, as there are a variety of information sources, which very often include specific data items that conflict with one another.

It is hoped that the TPQ will become the definitive source for such data in the future and that the individual terminals will update their own data sets as and when any changes are made, OCIMF said.

The organisation explained that the terminal questionnaire initiatives could be undertaken through the auspices of the relevant port authorities. As for the questionnaire, terminals can be viewed online once about 40-50% of the questions had been answered, OCIMF concluded.

Self-assessment

The second project will be launched at the end of 1Q12 and will be an update of its existing Marine Terminal Baseline Criteria. It will take the form of its successful TMSA initiative, which is now used by around 90% of all tanker operators and will be restyled Marine Terminal Management and Self-Assessment (MTMSA).

This project is aimed at assisting terminal operators to assess the effectiveness of their management systems, including for berthing operations and ship/shore interface. It will provide best practice and key performance indicators against which the management system's effectiveness can be assessed.

With OCIMF's self-assessment culture at the heart of MTMSA, members can use the guide to develop their own review methodology. They can then use the internal review results to continuously improve their safety and environmental performance and to identify and



OCIMF aims to raise the bar in terminal operations.

share best practice around their terminals.

Members can also submit their assessment report to OCIMF's terminal database and choose how widely the information can be shared, the organisation said. OCIMF stressed that it would not be involved in terminal vetting, but rather going down the self-assessment road, similar to TMSA. It will consist of 14 elements to TMSA's 12. The extra two are – security and ice conditions.

In the long term, it is intended that an assessor employed by an entity with no connection to the marine terminal will conduct periodical verification visits to the terminal to review its self-assessment report and measure it against evidence that can be provided by the terminal to support its outcome. At the conclusion of a visit, the assessor will provide the terminal's management with appropriate feedback, which will assist in improving the terminal's safety management system.

Training

Following MTMSA, a Marine Terminal Operating Training System (MTOTS) will be put together, which should be ready as a guideline in 2013. Work started on this third element of the project in October last year.

This will review and update OCIMF's Marine Terminal Training and Competence Assessment

guidelines and the Society of International Gas Tanker and Terminal Operators' (SIGTTO) Suggested Competence Standards.

It is being developed to help members develop and commission their own terminal operator training programme to ensure that the personnel employed on the ship/shore interface have the required skills and competence.

Again OCIMF stressed that it was not a training organisation, but said that this is a good example of how it can bring together and share best practice from its members and elsewhere, to provide guidance and personnel training, which can in turn improve safety and environmental protection standards worldwide.

Finally, the Accreditation and Assessor Programme (MTAA) is still under consideration. The idea is to give members confidence that the staff they use to conduct the MTMSAs are suitably assessed and accredited.

OCIMF said that the accreditation programme and process will be developed once the MTMSA programme had been finalised.

OCIMF also stressed that although this initiative was developed for members, third party independent terminals would be encouraged to take the four elements on board. For example, the Port of Rotterdam has recognised best practice by giving awards to all the terminals within the port using NVQs. **TO**



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Teamwork essential in restricted waterways

There is no denying that a port, or relatively narrow sea passage, is a risky place in which to operate a ship. The necessity of these operations to the fundamental purpose of supporting maritime operations does not change this fact, but it does however mean that all parties involved in port operations, or in confined waters, need to do their utmost to mitigate this risk.

Commercially and operationally, port and waterway authorities hold the responsibility for ensuring that these risks are mitigated to the fullest extent within their jurisdiction. This is a logical approach, as they will incur the greatest practical, financial and reputational damage should an incident occur.

However, it is those actually carrying out the operations within the ports – primarily pilots, tug companies and ships crew that have the most impact on the day-to-day operations within a port. The legal burden mainly rests on the authority's shoulders, yet they rely on third parties to make sure their risk assessments and advice is followed, creating an apparent gap between the limits of their control and the responsibility of those pilots, tug masters, ships crew and other involved parties.

In this situation then, who holds the responsibility for ensuring that everyone is trained to the proper standard and works together as a team to maximise safety and efficiency?

In the current operating environment, depending on the location and organisation of the authority, when the pilot boards a ship, they often will not interact as fully as they ought with the vessel's crew when performing their duties, even though they are required to do so if their flag state is a signatory to the IMO convention. This communication is all the more important if they have not piloted that vessel type before and are therefore unfamiliar with its handling characteristics.

The pilot can sometimes unintentionally give unsatisfactory orders to the tug master, especially if the pilot is ordering a manoeuvre

This paper examines the apparent gap between responsibility for risk mitigation in port and those who operate within them.*

that is not practically possible and could jeopardise the tug's safety. Moreover, if the working relationship between the pilot and tug master is sub-optimal, the tug master may not inform the pilot that what has been ordered is not achievable and therefore not being followed.

Advanced 'tugology'

Tug technology continues to become increasingly advanced, but some pilots do not use tugs to their fullest capability. Instead they use them only as conventional push/pull tugs, often unattached. If pilots better understood the tools at their disposal, it would not only safeguard the escorting, manoeuvring and berthing operations, but also make their job much easier and quicker to perform.

A simple path to ensuring safe vessel handling between the pilot boarding area and the designated berth, or pilot disembarkation area, is training for all parties involved. Increasing understanding of the forces in effect upon the vessel, how to work more closely as a team, cope with 'worst-case-scenarios' and introduce modern operational techniques and equipment will enable them to work smarter.

Knowing how to integrate with and utilise the services of the ships crew is essential in helping to monitor and execute the transit effectively, as well as embedding the essential communication skills and protocols that would need to occur should an emergency situation arise. Every endeavour is always made to ensure that emergencies rarely occur, but familiarisation with emergency scenarios and what to do to protect the vessel and the environment – is something that is best practiced by routine in a simulator, or

practical training for each type of vessel.

Although some skills might require special attention from the pilot - such as how best to use the tugs at their disposal, or familiarisation training for new types of vessels entering the port, or confined waterway - training should be given across the spectrum of ships crew, tug masters, pilots and other involved parties. The physics involved in port operations is essential knowledge, for the understanding of the maximum meteorological and oceanographic operating limits for that location and the type of vessel being handled. This thereby underlines the operating parameters at all times throughout the transit, based on known information and best practices.

Clear understanding

One area in which knowledge can make a real difference is in making sure that each party knows what the others are trying to achieve and has a clear understanding of each other's responsibilities; only then can the team offer the best possible support to each other, focused on safety and efficiency. GAC Training and Service Solutions (GTSS) said that it believed that this shared knowledge breaks down barriers and can remove the threat of the 'sil mentality', so that groups of individuals with specialist roles can become teams working together for the best possible outcomes.

This is why the GTSS 'Oil Tanker Operations in Port' course includes information that aims to provide pilots', ships crews' and tug masters' co-operative and team working skills through experience and knowledge of where the responsibilities lie during these operations. Simply removing that obstacle to improve communication and understanding so that the tug master can tell the pilot how and most importantly why, what he is doing is different from what the pilot has asked, so that the pilot can react and change his approach accordingly, means that the whole operation is safer and more efficient.

Experience is important, but training should

not be a dirty word. It doesn't mean that knowledge or experience is lacking. Effective training can greatly improve overall understanding and professional ability by enhancing or refreshing previous knowledge, particularly on scenarios not frequently encountered. For example, many senior pilots, tug masters and ship masters, perhaps with over 30 years problem-free operations each, may one day encounter a situation which must be dealt with to save life, property and reputational damage.

Without 'worst case scenario' training, this unexpected event could go terribly wrong with severe and costly consequences, simply because they have gone so long without encountering this sort of scenario. However, if they have recently spent time in a simulator refreshing their knowledge of what to do under such circumstances, they should be able to respond more quickly and decisively with the knowledge that they have successfully dealt with something similar before.

Operations within ports and confined waterways can always be improved and those responsible for overseeing such operations are ideally positioned to introduce such measures, often with little or no cost to them. An authority can mandate the pilots and tug companies in their jurisdiction to introduce just such training to enhance safety and

improve efficiency. Tanker owners and operators have a vested interest in supporting local authorities to ensure that those who are trusted to safely conduct their vessel, or cargo through port and confined waters are effectively trained to do so.

Training and familiarisation, along with the use of modern electronic aids such as Portable Pilot Units (PPU) that can keep ports and waterways open during periods of poor visibility, have been proven to enhance safety, improve efficiency, reduce shipping delays and alleviate traffic congestion. This reduces risk and in turn could reduce insurance premiums depending on the underwriters used.

Introducing a relatively small increase in charges to all port and waterway users and shippers and/or by independent pilot associations and tug companies slightly increasing their tariffs to shipowners and/or charterers can achieve the relatively small cost of training. The users benefit by visiting ports with enhanced safety and greater efficiency, which equates to less accidents, or incidents and faster turnaround times.

Ultimately, the issue of training for port operations suffers from a split incentive; the legal responsibility for mitigating risk lies with the port or waterway authorities, but those carrying out the operations are not always answerable to the authorities.

When operating in confined waters, it is clear to see that experience, training, and teamwork are all essential but too often day-to-day routines and set methods of working can mean that the issue of driving up professional standards can be overlooked by those at the coal face. They are relied upon to conduct safe operations and so they must be empowered to do so to the best of their abilities.

To conclude, investing in people is the surest way to ensure safe, efficient port operations that minimise the risks to seafarers, vessels, the environment and corporate reputations. **TO**

**This article was written by Capt Stephen Gyi, GTSS' 'Oil; Tanker Operations in Port' lecturer. Gyi designed the GTSS' 'Oil Tanker Operations in Port' course.*

He has worked in oil and gas for over 40 years, experiencing both upstream and downstream sectors. He has sailed on and commanded all types and sizes of oil and gas tankers, managed tanker fleets and been involved in the commercial and legal side of the tanker business, including inquiries, arbitration and the building, repairing, buying, selling and scrapping of tankers. He is now also involved in the design and construction of ports and terminals, especially oil and gas terminals.



Training and familiarisation should be undertaken by all those involved in bringing a tanker into port.

ICS' new Flag State Table

The International Chamber of Shipping (ICS) has published its latest annual Shipping Industry Flag State Performance Table.

As usual, the Table collates various data available in the public domain. Under the supervision of ICS' member national shipowners' associations, the presentation of the 2011 Table has been modified slightly in order to address feedback from governments.

However, the purpose is the same: to encourage shipowners to examine whether a flag state has substance before using it and to encourage them to pressure their flag administration to effect any improvement that might be necessary, the ICS said.

ICS said that it believed a balance has to be struck between the commercial advantages of shipowners selecting a particular flag and the need to discourage the use any flag that does not meet its international obligations. While it is shipping companies that have primary responsibility for the safe operation of their ships, it is the flag state that must enforce the rules.

ICS secretary general, Peter Hinchliffe explained: "ICS makes no apology for continuing to subject flag states to scrutiny, in the same way that ships and company procedures are rightly subjected to inspection by governments. Our overriding interest in promoting high performing flags is that they are less likely to tolerate substandard operators who would otherwise enjoy an unfair commercial advantage over the vast majority of fully compliant shipping companies."

TO

Footnotes

Port State Control

Source: Paris MOU Annual Report 2010, Tokyo MOU Annual Report 2010, USCG Port State Control Annual Report 2010 (including Qualship 21 Qualifying Registries for 2011).

Paris and Tokyo MOU data relate to their 'black lists' but not their 'grey lists'. The USCG methodology for evaluating PSC detention ratios (USCG target list and Qualship 21) uses the detention ratio formula of

BLANK SPACES SUGGEST POSITIVE PERFORMANCE INDICATORS

	PORT STATE CONTROL						RATIFICATION OF CONVENTIONS					A739	AGE	REPORTS	IMO			
	PARIS MOU WHITE LIST	PARIS MOU BLACK LIST	TOKYO MOU WHITE LIST	TOKYO MOU BLACK LIST	USCG QUALSHIP 21	USCG TARGET LIST (SAFETY)	SOLAS 74 (AND 88 PROTOCOL)	MARPOL INCLUDING ANNEXES I - II	MARPOL ANNEXES III - VI	LL 66 (AND 88 PROTOCOL)	STCW 78	ILO 147/MLC	CIC/FLIND 92	RECOGNIZED ORGANIZATIONS	LOW AGE (SHIP NUMBERS)	STCW 95 'WHITE LIST'	COMPLETED FULL ILO REPORTS	IMO MEETINGS ATTENDANCE
ALBANIA														N/S				
ALGERIA																		
ANTIGUA & BARBUDA																		
ARGENTINA														N/S				
AUSTRALIA																		
BAHAMAS																		
BAHRAIN														N/S				
BAHGLADESH																		
BARBADOS																		
BELGIUM																		
BELIZE																		
BERMUDA *																		
BOLIVIA																		
BRAZIL																		
BULGARIA																		
CAMBODIA																		
CANADA																		
CAYMAN ISLANDS *																		
CHILE																		
CHINA																		
COLOMBIA																		
COSTA RICA														N/S				
COTE D'IVOIRE														N/S				
CROATIA																		
CUBA																		
CYPRUS																		
DEM. PEOPLE'S REP. KOREA																		
DEM. REP. OF THE CONGO														N/S				
DENMARK																		
DOMINICA																		
EGYPT																		
ESTONIA																		
FAROE ISLANDS														N/S				
FINLAND																		
FRANCE																		
GEORGIA																		
GERMANY																		
GHANA														N/S				
GIBRALTAR *																		
GREECE																		
HONDURAS																		
HONG KONG (CHINA)																		
ICELAND														N/S				
INDIA																		
INDONESIA																		
IRAN																		
IRELAND																		
ISLE OF MAN *																		
ISRAEL																		
ITALY																		
JAMAICA																		
JAPAN																		
JORDAN																		
KENYA														N/S				

N/S – No data submitted to IMO - can be regarded as negative indicator.

* – UK dependent territories - entries for ratification of conventions, STCW 'white list' and IMO meetings attendance as UK.

continued next page

Footnotes (contd)

detentions/distinct vessel arrivals, rather than detentions/inspections as used by the Paris and Tokyo MOUs.

There are various other regional and national PSC regimes worldwide, but in the interests of simplicity the performance Table only uses data from the three principal regional PSC authorities. Some flags may not be included on regional PSC ‘white lists’ (or ‘black lists’ too) because the low number of port calls by their ships makes them ineligible to qualify. The fact remains, however, that ships flying such flags will be more likely to be subject to inspection than ships on PSC ‘white lists’.

Non-Ratification of Conventions

Source: IMO report ‘Status of Conventions – full list’ (end June 2011), IMO website; ILOLEX listings (ratifications of Conventions), ILO website.

The criteria for the Conventions listed in the Table are:

International Convention for the Safety of Life at Sea, 1974 as amended (SOLAS 74) - includes the 1988 Protocol.

International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978 (MARPOL 73/78) - the Table includes one column for the ratification of MARPOL and its mandatory Annexes I (oil) and II (bulk chemicals); and a second column for the remaining Annexes III (dangerous packaged goods), IV (sewage), V (garbage) and VI (atmospheric pollution) which from January 2013 will also cover CO2 reduction.

International Convention on Load Lines, 1966 (LL 66) - includes the 1988 Protocol.

International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 as amended (STCW 78) which will include the 2010 amendments from January 2012.

International Labour Organization Merchant Shipping (Minimum Standards) Convention, 1976 (ILO 147) - excludes the 1996 Protocol; or the **ILO Maritime Labour Convention** (MLC 2006) which will supersede ILO 147 when it enters into force, probably in 2013.

International Convention on Civil Liability for Oil Pollution Damage, 1992, and the **International Convention**

BLANK SPACES SUGGEST POSITIVE PERFORMANCE INDICATORS

	PORT STATE CONTROL						RATIFICATION OF CONVENTIONS						A739	AGE	REPORTS	IMO		
	PARIS MOU WHITE LIST	PARIS MOU BLACK LIST	TOKYO MOU WHITE LIST	TOKYO MOU BLACK LIST	USCG QUALSHIP 21	USCG TARGET LIST (SAFETY)	SOLAS 74 (AND 88 PROTOCOL)	MARPOL INCLUDING ANNEXES I - II	MARPOL ANNEXES III - VI	LL 66 (AND 88 PROTOCOL)	STCW 78	ILO 147/MLC	CLC/FUND 92	RECOGNIZED ORGANIZATIONS	LOW AGE (SHIP NUMBERS)	STCW 95 'WHITE LIST'	COMPLETED FULL EO REPORTS	IMO MEETINGS ATTENDANCE
KUWAIT	*						*					*						*
LATVIA																		
LEBANON	*	*	*				*								*			*
LIBERIA								*										
LIBYAN ARAB JAMAHIRIYA	*	*	*									*	*					
LITHUANIA			*			*												*
LUXEMBOURG			*															
MALAYSIA	*						*			*								
MALTA			*			*						*						
MARSHALL ISLANDS																		
MAURITIUS	*		*			*		*				*						*
MEXICO	*		*			*		*				*						*
MONGOLIA	*		*	*		*						*	*	*		*		*
MOROCCO	*		*			*		*				*						*
MYANMAR	*		*			*		*		*		*		N/S	*			*
NETHERLANDS			*			*												
NEW ZEALAND	*		*			*		*				*						
NIGERIA	*		*			*		*		*		*			*			
NORWAY			*			*		*		*		*						
PAKISTAN	*		*			*		*		*		*						*
PANAMA			*			*		*		*		*		*				*
PAPUA NEW GUINEA	*		*	*		*		*		*		*						*
PHILIPPINES	*		*			*		*		*		*			*			*
POLAND			*			*		*		*		*			*			*
PORTUGAL			*			*		*		*		*						*
REPUBLIC OF KOREA			*			*		*		*		*						*
ROMANIA	*		*			*		*		*		*						*
RUSSIAN FEDERATION			*			*		*		*		*						*
ST. KITTS & NEVIS	*	*	*	*	*	*		*		*		*		*	*	*	*	*
ST. VINCENT & GRENADINES	*	*	*	*	*	*		*		*		*		*	*	*	*	*
SAO TOME & PRINCIPE	*		*	*	*	*		*		*		*		N/S	*	*	*	*
SAUDI ARABIA	*		*	*	*	*		*		*		*		*	*	*	*	*
SIERRA LEONE	*	*	*	*	*	*		*		*		*		*	*	*	*	*
SINGAPORE			*			*		*		*		*						*
SOUTH AFRICA	*		*			*		*		*		*						*
SPAIN			*			*		*		*		*						*
SRI LANKA	*		*			*		*		*		*						*
SWEDEN			*			*		*		*		*			*			*
SWITZERLAND	*		*			*		*		*		*						*
SYRIAN ARAB REPUBLIC	*	*	*			*		*		*		*						*
THAILAND	*		*	*		*		*		*		*						*
TONGA			*			*		*		*		*		N/S	*	*	*	*
TRINIDAD & TOBAGO	*		*			*		*		*		*						*
TUNISIA	*		*			*		*		*		*			*			*
TURKEY	*		*	*	*	*		*		*		*			*			*
TUVALU	*		*	*	*	*		*		*		*			*			*
UKRAINE	*	*	*			*		*		*		*		*	*			*
UNITED KINGDOM			*			*		*		*		*						*
UNITED STATES OF AMERICA	*				N/A	N/A		*		*		*		N/S	*			*
URUGUAY	*		*			*		*		*		*		N/S	*			*
VAHGIATU	*		*			*		*		*		*			*			*
VENEZUELA	*		*	*	*	*		*		*		*		*	*			*
VIET NAM	*		*	*	*	*		*		*		*		*	*			*

N/S – No data submitted to IMO - can be regarded as negative indicator
N/A – Data not applicable - US not eligible for Qualship 21 or USCG target listing

on the Establishment of an International Fund for Compensation for Oil Pollution Damage, 1992 (CLC/Fund 92) - includes the 1992 Protocols.

Average Age

Source: IHS Fairplay Ship Database (3rd quarter 2011).

Second register ships are incorporated under main national register. Includes trading ships over 100 gt.

Reports

Source: Report of the ILO Committee of Experts on the Application of Conventions and Recommendations 2011; ILOLEX database, www.ilo.org; various IMO MSC circulars.

IMO Attendance

Source: IMO Meeting Reports.

A busy year in prospect at the IMO

IMO member flag states can expect a busy year as the organisation tackles various issues, not least the Ballast Water Convention and the Energy Efficiency Design Index.

To cope with the perceived increase in the workload, after taking office on 1st January 2012, the IMO's new secretary-general Koji

Sekimizu immediately announced a number of changes in the structure of the organisation's secretariat.

Sekimizu said: "The biggest challenge I see in the coming years, in terms of management of the organisation, is how to improve the 'delivery mechanism' in the secretariat to address the demanding issues we face, such as anti-piracy measures, the introduction of the mandatory Member State Audit Scheme and our ever-increasing workload.

"To address this will require effective human resource deployment and redeployment, the creation of new ways of handling our work and improvements to our working methods. It will also require close co-operation between the secretariat and member governments," he said.

Sekimizu has transferred assistant secretary-general, Andrew Winbow, from the Administrative Division to the Maritime Safety Division, as its director. He also further transferred Jo Espinoza-Ferrey from the Marine Environment Division to head the Administrative Division as its director and consequentially promoted Stefan Micallef to the post of director of the Marine Environment Division.

To ensure that the organisation makes further progress dealing with piracy, Sekimizu

appointed Hartmut Hesse as special representative for maritime security and anti-piracy programmes.

Hesse will be taking responsibility for the implementation of the Djibouti Code of Conduct and will also act as the IMO representative to conferences and meetings dealing with piracy issues.

In order to prepare for the successful introduction of the Member State Audit Scheme and to provide ample resources for these activities, Sekimizu reorganised the subdivision for implementation and co-ordination of the Maritime Safety Division into a department for Member State Audit and Implementation Support in the Maritime Safety Division.

Laurence Barchue was appointed as head of the new department.

Finally, the secretary-general also strengthened the functions dealing with internal audit and matters of ethics and appointed K-R Min to senior deputy director in charge of the internal oversight and ethics office.

A move that is affecting ship registries already, is the entering into force on 1st January of major revisions to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), with a five-year transitional period until 1st January 2017.

The 'Manila Amendments' were adopted at a Diplomatic Conference in Manila, held in June 2010 and are aimed at ensuring that the

necessary global standards will be in place to train and certify seafarers to operate technologically-advanced ships for some time to come.

The important changes to each chapter of the Convention and Code include the following:

- Improved measures to prevent fraudulent practices associated with certificates of competency and strengthen the evaluation process (monitoring of parties' compliance with the convention).
- Revised requirements on hours of work and rest and new requirements for the prevention of drug and alcohol abuse, as well as updated standards relating to medical fitness standards for seafarers.
- New certification requirements for able seafarers.
- New requirements relating to training in modern technology such as electronic charts and information systems (ECDIS).
- New requirements for marine environment awareness training and training in leadership and teamwork.
- New training and certification requirements for electro-technical officers.
- Updating of competence requirements for personnel serving on board all types of tankers, including new requirements for personnel serving on liquefied gas tankers.
- New requirements for security training, as well as provisions to ensure that seafarers are properly trained to cope if their ship

“The biggest challenge ... is how to improve the 'delivery mechanism' in the secretariat to address the demanding issues we face, such as anti-piracy measures, the introduction of the mandatory Member State Audit Scheme and our ever-increasing workload.”

- Koji Sekimizu, secretary-general, IMO

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comes under attack by pirates.

- Introduction of modern training methodology including distance learning and web-based learning.
- New training guidance for personnel serving on board ships operating in polar waters.
- New training guidance for personnel operating Dynamic Positioning Systems.

Transitional provisions

Regulation I/15 Transitional provisions of the amended STCW Convention states that:

- 1) Until 1st January 2017, a party may continue to issue, recognise and endorse certificates in accordance with the provisions of the convention, which applied immediately prior to 1st January 2012 in respect of those seafarers who commenced approved seagoing service, an approved education and training programme, or an approved training course before 1st July 2013.
- 2) Until 1st January 2017, a party may continue to renew and revalidate certificates and endorsements in

accordance with the provisions of the convention, which applied immediately prior to 1st January 2012.

2012 Meetings

- 30/01/12- 03/02/12 Sub-Committee on Ship Design and Equipment (DE).
- 13/02/12- 17/02/12 Marine Environment Protection Committee (MEPC).
- 27/02/12- 02/03/12 Sub-Committee on Radiocommunications and Search and Rescue (COMSAR).
- 12/03/12 - 16/03/12 Sub-Committee on Flag State Implementation (FSI).
- 26/03/12 - 30/03/12 Legal Committee (LEG).
- 16/04/12 - 20/04/12 Sub-Committee on Standards of Training and Watchkeeping (STCW).
- 30/04/12- 04/05/12 Maritime Safety Committee (MSC).
- 16/05/12 - 25/05/12 Technical Co-operaton Committee (TC).
- 06/06/12- 08/06/12 Council meeting.
- 11/06/12- 14/06/12 Sub-Committee on Safety of Navigation (NAV).
- 17/09/12- 21/09/12 Marine Environment

- Protection Committee (MEPC).
- 09/10/12- 11/10/12 Consultative meeting of contracting parties (London Convention 1972) and 7th meeting of contracting parties (London Protocol 1996).
- 29/10/12-02/11/12 Council meeting.
- 05/11/12-9/11/21 Maritime Safety Committee (MSC).
- 26/11/12-30/11/12 Sub-Committee on Fire Protection (FP).

Naturally, class societies play an active consultancy role in analysing the debate at the IMO.

For example, Germanischer Lloyd (GL) recently introduced a new online service: GL Focus - Regulatory and Technical Update.

GL Focus offers comprehensive and timely information on new maritime regulatory developments from the IMO, individual flag states, Port State Control and GL rules.

It also includes guidance and interpretation on these topics from GL experts.

Recent subjects included an analysis of the new class advisory note from the Antigua and Barbuda flag state on the Emergency Towing Manual.

Isle of Man forges ahead

An illustration of a modern flag state was given in a statement issued by the Isle of Man ship registry regarding its significant entered tonnage growth.

A member of the UK's Red Ensign group, the Isle of Man ship registry, recently announced record tonnage for the year ending 2011.

A year-on-year comparison shows a 12% increase in total GRT, climbing steadily from 12.36 mill GRT at the end of 2010 to 13.84 mill GRT at the beginning of this year.

With the growth in tonnage, the Isle of Man ship registry now claims to be among the top 15 ship registries in the

world. Significant growth was seen in the larger vessel types registering illustrated by the fact that the register topped 10 mill GRT for the first time in its history in April 2009.


The geographic market segment, which saw a rapid take-up rate, was the Asia/Pacific region, particularly Japanese and Singapore-based corporations, who are now more perceptive of the flag's value.

Dick Welsh, director of the Isle of Man Ship Registry, said: "The growth in numbers shows that we are well placed to provide a

more cost effective solution for registration without any compromise in quality or service for ship operators and owners."

"Having just recovered from the global crisis of 2008, shipowners are bracing themselves for another rocky year in 2012. An oversupply of ships, together with the global economic downturn, is keeping freight rates down and making it difficult to keep vessels operating profitably in many sectors.

"Despite the bleak outlook, the uptake on



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Registry offering

- Quality – it is highly rated in the industry's Flag State Performance table.
- Port State Control status - highly positioned on the 'White Lists' of the Paris and Tokyo MOUs permitting ships to trade worldwide without restriction.
- A modern flag registry with a strong emphasis on quality, high standards and efficient service to its clients.
- Low cost – no annual tonnage dues.
- No insurance premium tax.
- Ease of registry – simple process with friendly and approachable staff available out of normal hours.
- Flexible and pragmatic approach to the regulation of ships.
- Parallel (demise) registration (both 'in' and 'out') with other jurisdictions.
- Ship registry team of island-based maritime professionals providing sound practical and technical support and assistance ~ 24/7
- Island-based survey teams provide survey and audit services worldwide.
- Ships fly the 'Red Ensign' and are entitled to British consular services worldwide.
- Flexible ownership criteria including limited partnerships.
- Flexible crewing requirements and manning arrangements, plus a fast, friendly and responsive turn-around for STCW certification.
- Available network of 'representative persons' on Island for ships to satisfy the registration criteria.

“The growth in numbers shows that we are well placed to provide a more cost effective solution for registration without any compromise in quality or service for ship operators and owners.”

- Dick Welsh, director, Isle of Man Ship Registry

the flag registration has been encouraging. We are seeing an increased level of enquiries for vessels under construction, or in-service, which are planning to register, or change to Isle of Man registration. This hopefully will translate to an increase level of activities for us over the next two to three years especially across the Asia/Pacific region.”

Cost savings

The ship registry’s offering of high quality and high service levels combined with a low cost fee structure continued to attract larger companies involved in wet cargo (oil and gas) and drybulk trades. The cost savings

are significant, especially for the larger vessels, the registry claimed.

Maintaining the quality of the fleet and the Isle of Man’s results in the world’s port state control statistics and other quality benchmarks is still paramount. Once again, the Isle of Man was recognised by the US Coast Guard and shared top place on the annual ‘Flag State Performance Table’ issued by the industry bodies, the registry said.

The Isle of Man Ship Registry was established as an international register in 1984. Since then it has become recognised as a quality register and today claimed to have some of the world’s most highly

respected shipping companies among its clients.

Of course, with a record amount of tonnage recently delivered and more to come, many flag states will have benefited in terms of additional tonnage entered. However, with today’s checks by various authorities, plus the IMO audit scheme, the ‘flag of convenience’, or ‘tax dodge’ tag is fast disappearing, except in a few minority cases.

Regulations are due to tighten up even further in the next few years, which will ensure that it is virtually impossible to run a sub-standard operation anywhere in the world.

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Gungen takes delivery of first super efficient Suezmax

Two fourth generation Suezmaxes are being delivered to Turkish interests by Hyundai Heavy Industries. They are claimed to offer greater operational and fuel efficiency than their counterparts.

Built to the company's stringent demands and high specifications, the two 150,000 dwt tankers are claimed to provide a 10% fuel saving when compared with other Suezmax hull designs operating at the same service speed. They were thought to have cost around \$15 mill more each than a standard Suezmax, due to their extra equipment and enhanced design.

The first vessel – *Ottoman Integrity* – was handed over to Gungen Maritime & Trading on 29th November 2011, while her sistership – *Ottoman Tenacity* – is scheduled to be delivered on 8th March this year.

Both vessels boast a raft of voluntarily additional systems aimed at optimising the vessels' fuel efficiency, maximising operational safety and minimising the risk of any potential damage to the environment.

With their hull designs, when full to 98% of their capacity, the vessels will be able to lift 1 mill barrels of oil, which is claimed by the owner to comply with most receivers' and suppliers' terminals able to accommodate vessels of this size.

The vessels have been fitted with 12 cargo tanks, six each side, plus two slop tanks. The cargo tanks are epoxy coated from the deck head to 3 m below and the inner bottom up to 0.5 m above. Three grades of crude oil can be carried. The slop tanks are fully epoxy coated.

To handle the load/discharge of oil, three Shinko steam driven, vertical single stage, double-suction centrifugal type cargo pumps each with a capacity of 4,000 cu m per hour, have been fitted per vessel. The pumps are driven by Shinko RVR vertical three-stage velocity compound impulse steam turbines. Shinko also provided an automatic discharging system and a steam driven, reciprocating stripping pump with a capacity of 250 cu m per hour.

Korea Keystone was responsible for installing the valves in the cargo and water ballast tanks, pump room and deck area. They are of hydraulic, remote control type, operated from the cargo control room. High velocity pressure/vacuum (P/V) valves are fitted on each cargo and slop tanks for ventilation purposes. A Mast Riser equipped with P/V breakers is also installed on all cargo and slop tanks as standard. Calibrated vapour locks are fitted to perform complete closed loading, ullage and sampling procedures.

An oil discharge monitoring system was supplied by VAF Instruments to monitor the discharge of oily water and this is also controlled from the cargo control room.

Aalborg Industries supplied the inert gas system for both the cargo and ballast tanks, while the crude oil washing system is of Tanktech Cleanmax UPM series. Tank gauging is performed by a Kongsberg K-Chief 500 radar type gauges. A Metritape level gauge system is fitted on each of the ballast water tanks for draft monitoring.

Computer network

A Kockums Sonic loading computer receives data from the tank gauging system for the cargo and ballast water tank levels. The computer can calculate deadweight, trim drafts, shear forces, bending moments plus the intact and damage stability. The vessels are fitted with a comprehensive computer network to monitor various tasks at different locations.

All of the cargo and slop tanks are fitted with heating coils made of aluminised steel pipes heated by steam. This system is capable of rising the temperature from 44 deg C to 66 deg C in 96 hours during a voyage.

The segregated ballast tanks are fully pure epoxy coated and sacrificial anode protected. They are inerted with nitrogen during a ballast voyage. Two Shinko electric motor driven, vertical centrifugal, single stage ballast pumps with a capacity of 2,500 cu m per hour have been installed.

The ballast tanks and pump room are fitted with a Consilium Salwico gas detection system to monitor flammable gases. Also flammable gases are monitored at three other locations on board, near the galley's and accommodation air intakes.

Bearing in mind the imminent IMO Ballast Water Treatment (BWT) convention, an OceanSaver BWT system has been installed. It consists of four stages – filtration, cavitation, nitrogen super saturation and disinfection. This system is claimed to be the first fitted on board a tanker operating by 'physical filtering'.

On deck, the Suezmaxes are fitted with an Oriental Precision and Engineering hose handling crane with a lifting capacity of 15 tonnes. Two provision handling cranes for each vessel were also supplied by the same manufacturer.

They are also fitted with a single point mooring (SPM) system consisting of two

Cargo tank segregation

Grouping	Cargo tank No	Capacities (cu m at 98%)	%
No 1	No 1 & 4 (P&S) Slop (P&S)	55,217.6	32.6
No 2	No 2 & 5	58,222.8	34.3
No 3	No 3 & 6	56,136.4	33.1

tongue chain stoppers, capable of handling 76 mm dia chain. The SPM winches have a break holding capacity of 2 x 20 tonnes. The windlass and mooring winches were supplied by Rolls-Royce and the vessels have also been fitted with an emergency towing system.

The main machinery in each vessel consists of a six-cylinder Hyundai-B&W 6S70ME-C8 with a maximum continuous rating of 16,780 kW at 85.5 rev/min. The continuous service rating is 15,100 kW at 82.5 rev/min. The engines are turbocharged and reversible. Also fitted is an ABB exhaust gas bypass system for low load optimisation operation.

The main engine is fitted with a bearing wear and temperature monitoring system and a MAN PMI diagnostic system giving direct display of the engine performance data on an online, or offline basis and also offline for the generators.

Each vessel is also fitted with two Himsen 1,550 kW at 900 rev/min auxiliaries, plus another of the same make developing 900 kW at the same rev/min. As for the boilers, there is one Aalborg marine composite boiler per vessel. The boiler water quality is continuously analysed and chemicals are automatically dosed into the water with sufficient amount in accordance with the water analysis.

The vessels are also fitted with an Alfa Laval fresh water generator, an STX-Cummins emergency generator and a Hyundai-Atlas incinerator capable of handling sludge oil and solid waste simultaneously.

Principal Particulars

DNV Class +1A1, Tanker for Oil ESP, CSR, PLUS-1, COAT-1, E0, HMON (E1, C1, O1, G4, A1), SPM, VCS-2B, CCO, TMON, CLEAN, OPPE, BWM-E (s,f), COAT-PSPC(B), BIS, BWMT, ECA (SOx-A).

Length, overall	269.17 m
Length, bp	258.00 m
Breadth, moulded	46.34 m
Depth, moulded	24.40 m
Scantling draught	17.50 m
Design draught	16.20 m
Service speed at scantling draught	15 kn
Service speed at design draught	15.40 kn
Extreme summer draught	17.52 m
Distance bow to manifold centre	133 m
Height keel to top of mast	50.65 m
Height keel to manifold centre	26.50 m

Tonnages

Summer deadweight	150,058 t
Design deadweight	136,308 t
International GT	80,112 t
Suez gt	82,226 t
International Net	48,515 t
Suez Net	76,002 t
Lightweight	25,179 t



The first of the two super efficient Suezmaxes seen fitting out.

The steering gear is a Fluetek-Kawasaki electro-hydro system with two pumps and emergency controls, while the silicone coated propeller fitted on both vessels is a four-bladed 8.3 m dia Hyundai aerofil type.

Fuel switching

The main engine, diesel generators and boilers are able to operate on heavy fuel oil (HFO) on a 'pier to pier' basis, or they can continuously operate on marine gas oil (MGO). Switching between HFO and MGO is automatic and they are fitted with a Jowa automatic blending system to obtain intermediate sulphur content. There are segregated double skin bunker tanks and settling tanks for low sulphur fuel oil (LSFO).

A US Coast Guard (USCG) approved vacuum type Hamworthy sanitation unit has also been fitted to each vessel. This consists of one sewage holding tank (EVAC) and a Super Trident biological sewage treatment plant with a capacity to handle up to 33 persons per day. This is fitted in the engine room.

For fire fighting, a NK Co CO2 system was fitted in the engine room and pump room for the separate release of CO2. Fire fighting on the upper deck is achieved by using a fixed water system installed in parallel with a fixed foam system.

Both Suezmax hulls are fitted with a hull stress monitoring system consisting of four strain gauges, one bow accelerometer unit, a zener barrier and a logger/display unit. The vessels' performance is continuously analysed using online information collected from the shaft power meter, coriolis fuel counters and navigation equipment.

Other features include the capacity to store grey water, a garbage compactor, high pressure fresh water washing system, steam super heater, a satellite TV system for crew recreation and a gymnasium.

Enhancements

As mentioned, the vessels are claimed to be extra operational and fuel efficient through the many innovative systems fitted. Some of these

have been highlighted by the shipowner.

For example, high modulus polyethylene mooring lines have been fitted, which are described as lightweight and very tensile. These lines have 10 times the minimum break load when compared with steel wire mooring lines. The company said that the mooring lines pose a reduced risk of snapping and are lightweight, therefore easier to handle quickly by fewer seafarers. They are not subject to corrosion and do not have to be greased.

These are also claimed to be the first vessels of their type to be fitted with chock liners, which are synthetic self-lubricating liners for the steel chocks. They have replaced chaffing sleeves, which are placed on the mooring lines to avoid friction between the mooring lines and the chock. The chock liners are claimed to reduce the risk of injury as mooring personnel do not have to stand close to the tensioned mooring lines in order to keep the chaffing sleeve in place. There is also reduced friction on the mooring lines, therefore less abrasion giving a longer life expectancy.

The deck machinery is fitted with load monitoring system, which is connected to the main vessel alarm system. This reduces the risk of overloading the winches, which can cause a risk to those on the open deck. The dedicated SPM winch picks up hawsers' lead through tongue type bow chain stoppers in a strait line to dedicated winch drums, thus there is no risk of whiplash injuries. Seafarers do not have to stand forward of the winches.

As for the fuel system, as mentioned above, the main engine, generators and boilers can operate continuously on HFO, or MGO and the switching mechanism between fuel is automatic. All of the fuels run through independent dedicated pipes and pumps. The company claimed that this meant that there was no risk of fuel contamination, or a vessel blackout due to faulty fuel switching. Also, the pumps will have an extended life expectancy as they operate with just one type of fuel with a fixed viscosity.

The voluntarily fitted double skin bunker

tanks and their connections are designed to rearrange the distribution of different grades of fuel oil when necessary, allowing easy adaptation of the quantities stemmed to the ever changing regulations and with them the voyage patterns. The inclusion of double skin bunker tanks eases the threat of pollution from collision, or grounding damage, Gungen claimed.

Also the voluntary fitting of a BWT ahead of the convention enables the Suezmaxes to be in full compliance with impending IMO, California and New York rules. They are claimed to be the first Suezmaxes to be fitted with such a system.

Another innovation is that the ballast water is saturated with NO2 as part of the BWT stage, forcing the oxygen out of the water and out of the ballast tanks through the P/V valves. This is claimed to significantly reduce the possibility of corrosion occurring in the ballast tanks due to the absence of saturated oxygen in the water and air in the atmosphere.

What is claimed to be another first on a vessel of this type is a boiler water treatment and management system. The feed water running through the boilers, condensers and turbines is permanently monitored for pH, saturated oxygen, minerals etc. The feed water temperature is adjusted and chemicals added automatically to obtain the best conditions. This way, high sensitive and crucial systems coming into contact with the water are given protection against corrosion, which gives the vessel an extended life expectancy.

The ship performance monitoring and the main engine online diagnostic systems mean that all available electronic data is relayed to the vessel and shore-based analysis system. The information is relayed ashore at regular intervals and is stored for the life of the vessel for analytical benchmarking purposes.

Yet another first is a computer aided cargo operations and onshore simulator. This is an ergonomically designed cargo handling and load computer allowing for a one person control of the cargo, ballast, bunkering and inerting operations. The same simulator is available onshore for training and experience. This innovation is claimed to lead to the increased control over the entire system, thus solving problems as they appear. In addition, less crew are needed on deck during these operations as most valves are operated remotely.

A shipwide intranet system and data exchange has been installed with a Kongsberg Shipviewer. This Shipviewer displays all the data in the operational systems on mimic diagrams throughout the vessel. This allows for increased control and as a result the less likelihood of a breakdown and/or injuries, the company said.

Hydraulic components

An electronically controlled main engine was chosen, which does away with the need for a camshaft, injection, exhaust, lubrication etc, as the mechanical parts have been made redundant and replaced by easily exchangeable/ interchangeable hydraulic parts. This allows for the fine tuning of the main engine for increased efficiency.

In addition, the main engine is fitted with a bearing wear and temperature monitoring systems, as well as water in luboil monitoring system. These detail the engine’s condition in real time, which allows proactive maintenance and control.

The vessels have also been fitted with a separate hydraulic tank for the main engine hydraulic controls. This is described by the company as being very rare on a main engine installation. Instead of using luboil, the main engines’ hydraulic units have a dedicated

closed oil loop.

All the cargo pumps are driven by steam turbines having three rotor stages. The turbines transform a large part of the incoming steam energy into rotating energy allowing for increased efficiency hence requiring less steam and thus saving fuel.

The steam produced by the boilers is superheated with flue gases – exhaust and waste heat – from the boiler burners. This leads to operational savings and environmental protection and gives the pumping systems extra efficiency. Fuel savings are claimed to be as high as 10-15% and the waste heat recovery system leads to lower consumption for the discharge of cargo

Steam flow is measured and then converted into a quantity of fuel necessary to make it. This leads to the accurate invoicing of fuel consumed for heating the slops and cargo. In addition, a composite boiler allows the main engine waste heat to be recovered when available, which can also be used to heat the slops and cargo.

Last but by no means least, the main engine turbocharger is optimised for low load operation while allowing high load operation without incurring large losses. The company claimed that fuel savings of up to 1.5 tonnes per day can be achieved when operating at the low load level.

The accompanying comparison table details the consumptions of three Suezmax designs currently available in the market. It is notable to see that despite a mere 4.4% difference in cubic capacity with 0.35 m difference in draft, Gungen’s vessels consume 22.8% less in ballast condition at the same speed (15 kts). Effectively, the additional 7% cubic capacity is dead space as the company claimed to be able to lift the maximum cargo traded on today’s Suezmaxes.

TO

Comparison Table of Main Particulars

	Unit	151K DWT Class	158K DWT Class	165K DWT Class	Remark	
LOA (abt.)	(m)	269	274	←		
LBP		258	264	←		
Breadth		46	48	50		
Depth		24.4	23.1	←		
Design (d1) Scantling (d2) draft		16.2 / 17.5	16 / 17.5	←		
DWT at d1 / d2	(MT)	136,286 / 150,486	144,800 / 158,300	151,000 / 165,100		
Cargo Volume	(m ³)	173,000	173,000 [+0.29%]	180,000 [4.39%]		
M/E	Type	-	6S70MW-C8	6S70MC-C8	Nox Tier II	
	MCR	(kW x rpm)	16,780 x 85.5	19,620 x 91 [+16.92%]		
DFOC	at ballast draft		39.4	46.7 [+18.5%]	48.4 [+22.8%]	Speed: 15 Knots (Reference only)
	at design draft		58.4 [+10.8%]	60.3 [+14.4%]		
	at scantling draft		62.7 [+9.8%]	63.5 [+11.2%]		

Ultra-long-stroke engine and Handymax tanker propulsion

This is a summary of an MAN Diesel & Turbo two-stroke technical paper in connection with the recently introduced G80ME-C9 engine, which first appeared in MAN's magazine 'Diesel Facts'.

This paper was written following the introduction of MAN Diesel & Turbo's ultra-long-stroke G80ME-C9 engine in October 2010 and the subsequent addition of further bore sizes in May 2011.

The updated engine programme supplemented the original G-type engine with G70ME-C9, G60ME-C9 and G50ME-B9 engines. The G-types use designs that follow the principles of the large-bore Mk-9 engine series that MAN Diesel & Turbo introduced in 2006. The longer stroke reduces engine speed, which paves the way for higher-efficiency ship designs.

At the time of the G80ME-C9 launch, Ole Grøne, senior vice president low-speed sales & promotions said: "MAN Diesel & Turbo always follows developments in the shipping market closely, and we have kept a focus on the trend for fuel optimisation in recent years. As such, we have experienced great interest in the G-type engine during extensive consultation with industry partners and are currently working on a variety of projects with shipyards and major shipping lines.

As a result, we have reached the conclusion that the introduction of the G-type engine programme is both viable and timely. The speed and power of these G-type engines have been carefully evaluated with a view to optimising propulsion efficiency while, at the same time, facilitating their adoption by shipyards," he concluded.

Recent developments have made it possible to offer solutions, which will enable significantly lower transportation costs for Handymax tankers, as well as bulk carriers.

One of the marine industry's primary goals today is the reduction of CO2 emissions by reducing fuel consumption at any load, as much as possible. This also means that the

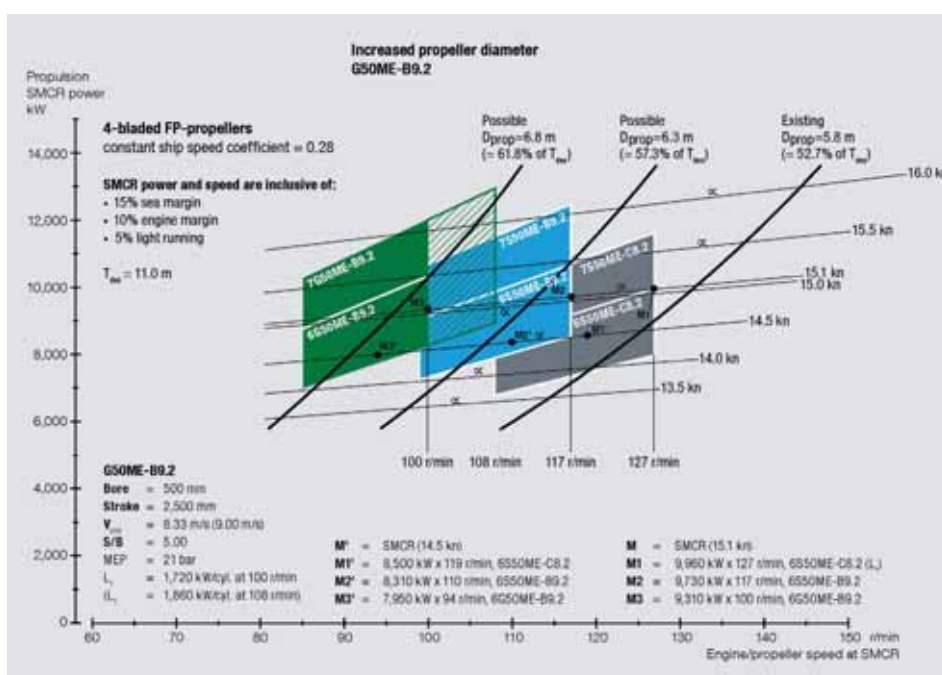


Fig. 1: Different main engine and propeller layouts and SMCR possibilities (M1, M2, M3 for 15.1 knots and M1', M2', M3' for 14.5 knots) for a 46,000-50,000 dwt Handymax tanker operating at 15.1 knots and 14.5 knots, respectively.

inherent design CO2 index of a new vessel – the Energy Efficiency Design Index (EEDI) – will be reduced.

This often results in operation at lower-than-normal service speeds compared to earlier, resulting in reduced propulsion-power utilisation. The design ship speed at normal continuous rating (NCR), including 15% sea margin, used to be as high as 15-15.5 knots. Today, vessel speeds can be expected to be 14.5 knots or even lower.

A more technically advanced development drive is to optimise a ship's aftbody and hull lines – including its bulbous bow and taking operation in ballast condition into consideration – making it possible to install propellers with a larger diameter and, thereby,

obtaining higher propeller efficiency, but at a reduced optimum propeller speed. As the two-stroke main engine is directly coupled to the propeller, the introduction of the 'green' ultra-long-stroke G50ME-B9.2 engine with an even lower-than-usual shaft speed meets this target.

EEDI

The EEDI will become the mandatory calculation for new ships soon and represents the amount of CO2 per gram emitted when transporting one deadweight tonnage of cargo one nautical mile. For tankers, the EEDI value is essentially calculated on the basis of the maximum cargo capacity, propulsion power, ship speed, specific fuel oil consumption (SFOC) and fuel type. However, certain

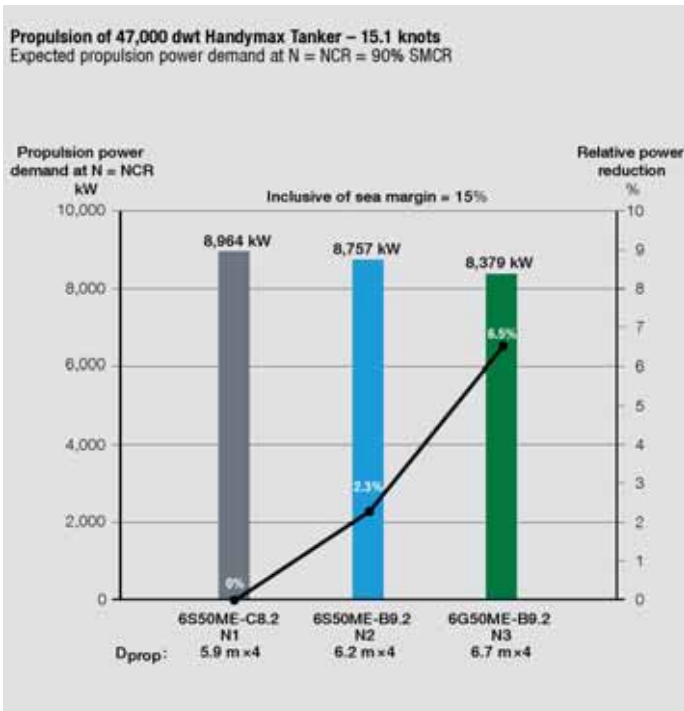


Fig. 2: Expected propulsion power demand at NCR = 90% SMCR for 15.1 knots.

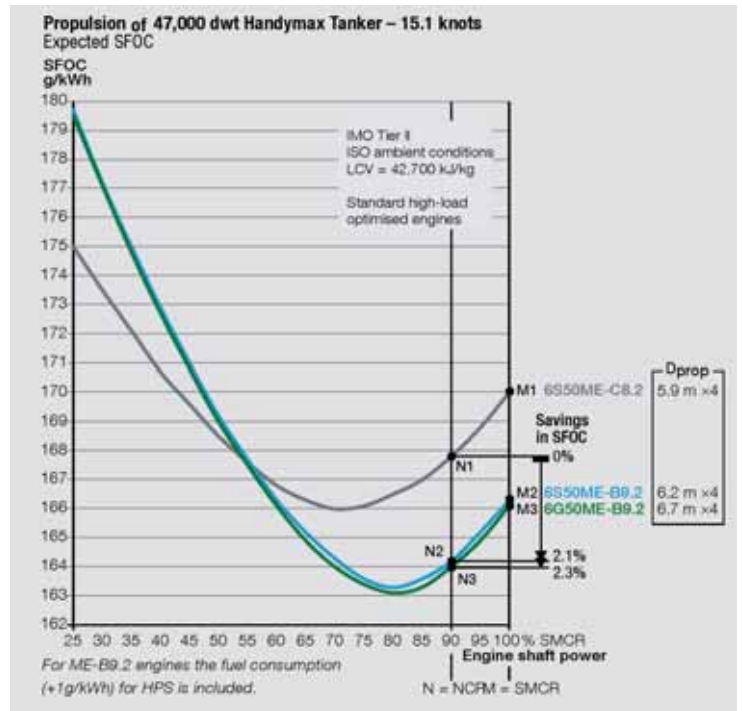


Fig. 3: Expected SFOC for 15.1 knots.

correction factors are applicable, for example, for installed waste-heat recovery systems. The main engine's 75% SMCR figure is applied in the EEDI calculation as standard, and CO₂ emissions from auxiliary engines are also included.

In general, the larger the propeller diameter, the higher the propeller efficiency and the lower the optimum propeller speed. When increasing the propeller pitch for a given diameter with optimum pitch/diameter ratio, the corresponding propeller speed and efficiency may also be reduced. The same is valid for a reduced pitch, but here the

propeller speed may increase.

The efficiency of a two-stroke main engine particularly depends on the ratio of the maximum firing pressure and the mean effective pressure. The higher the ratio, the higher the engine efficiency, that is, the lower the SFOC. Additionally, the higher the stroke/bore ratio of a two-stroke engine, the higher the engine efficiency.

This means, for example, that an ultra-long-stroke engine type, such as the G50ME-B9.2, may have a higher efficiency compared with a shorter stroke engine type, like an S50ME-C8.2.

The application of new propeller design technologies may also encourage the employ of main engines with lower rev/min. Thus, for the same propeller diameter, these propeller types are claimed to have an about 6% improved overall efficiency gain at about 10% lower propeller speed. Therefore, with these propeller types, the advantage of the new low speed G50ME-B9.2 engine can be utilised, also in cases where a correspondingly larger propeller cannot be accommodated.

For 47,000 dwt Handymaxes, the following case study illustrates the potential for reducing fuel consumption by increasing the propeller

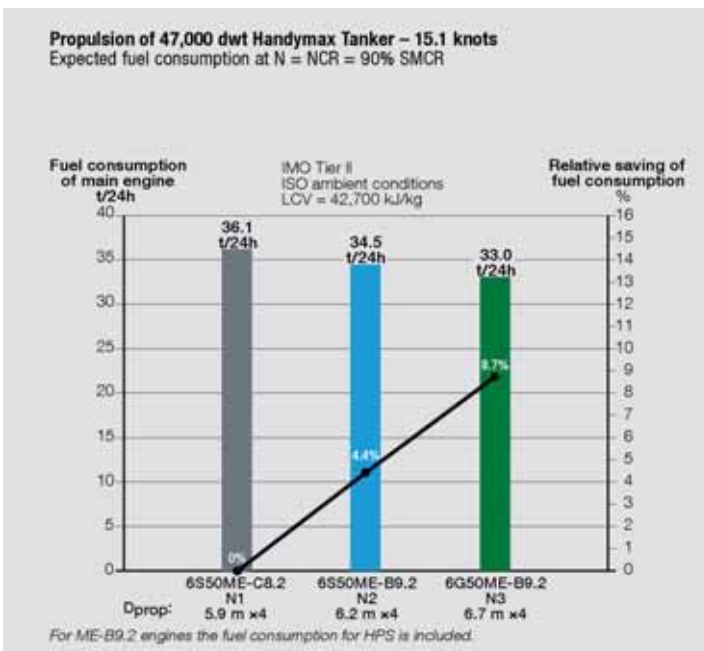


Fig. 4: Expected fuel consumption at NCR = 90% SMCR for 15.1 knots.

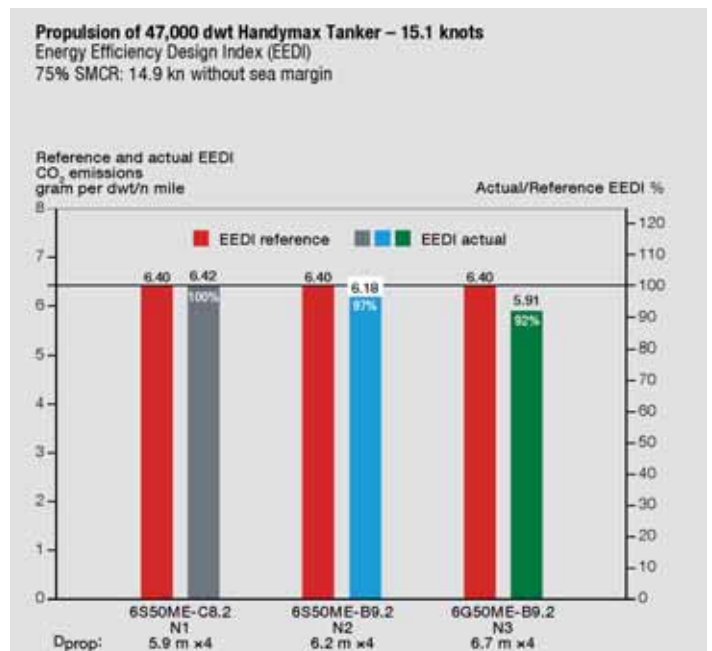


Fig. 5: Reference and actual Energy Efficiency Design Index (EEDI) for 15.1 knots.

diameter and introducing the G50ME-B9.2 as main engine.

MAN Diesel & Turbo made a power prediction calculation for different design ship speeds and propeller diameters and the corresponding SMCR power and speed, point M, for propulsion of the Handymaxes is found – see Fig 3.

Referring to the two ship speeds of 15.1 knots and 14.5 knots respectively, three potential main engine types, 6S50MC-C8.2, 6S50ME-B9.2 and 6G50ME-B9.2 and pertaining layout diagrams and SMCR points have been drafted in Fig 1, and the main engine operating costs have been calculated and are described here individually for each ship speed.

The layout diagram of the G50ME-B9.2 or equal to 100 rev/min is especially suitable for Handymaxes (and bulk carriers) whereas the speed range from 100 to 108 rev/min is particularly suitable for tankers with limited room for the installation of a large propeller. The S50MC-C and S50ME-C engines (127 rev/min) have often been used in the past as prime movers for Handymaxes, whereas the relatively new S50ME-B9 (117 rev/min) has not yet been installed. Thus, a comparison between the new 6G50ME-B9.2 and the existing 6S50ME-C8.2 is of major interest in this paper.

Operating costs (15.1 kn)

At 15.1 knots, the calculated main engine examples are as follows:

- 1) 6S50ME-C8.2 (Dprop = 5.9 m);
M1 = 9,960 kW x 127 rev/min.
- 2) 6S50ME-B9.2 (Dprop = 6.2 m);
M2 = 9,730 kW x 117 rev/min.
- 3) 6G50ME-B9.2 (Dprop = 6.7 m);
M3 = 9,310 kW x 100 rev/min.

Handymax principal particulars

Length, overall	183 m
Length, bp	174 m
Scantling draught	12.2m
Design draught	11 m
Sea margin	15%
Engine margin	10%
Design ship speed	15.1 & 14.5 kn
Type of propeller	FPP
No of propeller blades	4
Propeller diameter	target

Source: MAN Diesel & Turbo.

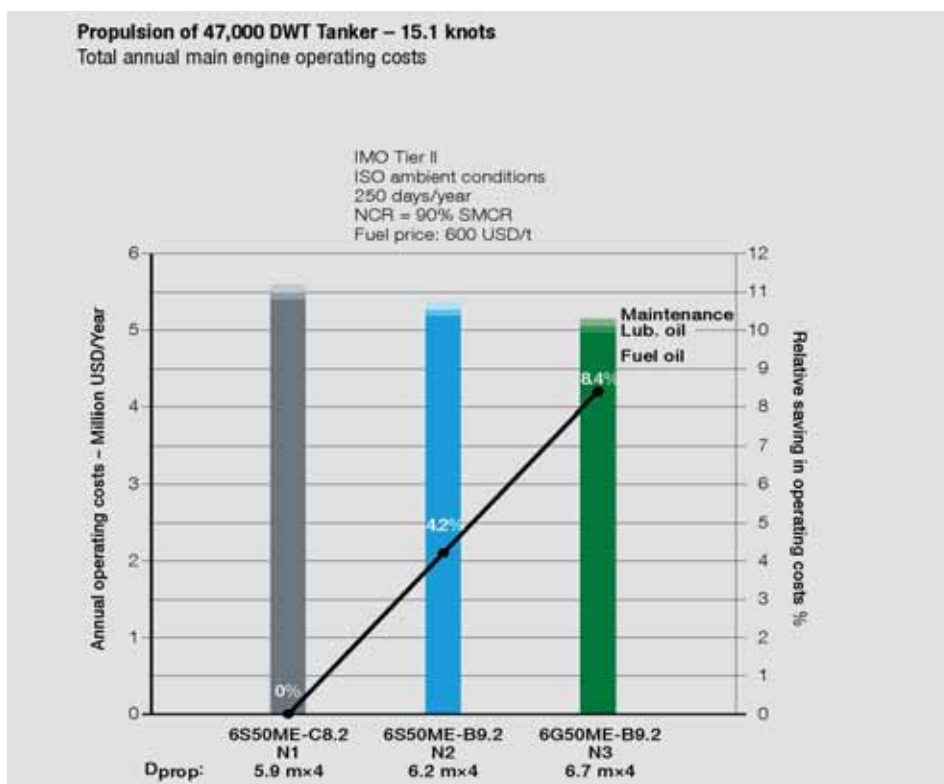


Fig. 6: Total annual main engine operating costs for 15.1 knots.

The main engine fuel consumption and operating costs at N = NCR = 90% SMCR have been calculated for the above three main engine/propeller cases operating on the relatively high ship speed of 15.1 knots, as often used earlier. Furthermore, the corresponding EEDI has been calculated on the basis of the 75% SMCR-related figures (without sea margin).

Fig 2 shows the influence of the propeller diameter with four propeller blades when going from about 5.9 m to 6.7 m. Thus, N3 for the 6G50ME-B9.2 with a 6.7 m propeller diameter has a propulsion power demand that is about 6.5% lower compared with N1 valid for the 6S50ME-C8.2 with a propeller diameter of about 5.9 m.

Fig 3 shows the influence on the main engine efficiency, indicated by the SFOC, for the three cases. N3= 90% M3 for the 6G50ME-B9.2 has an SFOC of 164.0 g/kWh and almost the same 164.2 g/kWh for N2 = 90% M2 with 6S50ME-B9.2 where in both cases for the ME-B engine, the +1 g/kWh needed for the hydraulic power supply (HPS) system is included.

The 164.0 g/kWh SFOC of the N3 for the 6G50ME-B9.2 is 2.3% lower compared with N1 for the nominally rated 6S50ME-C8.2 with an SFOC of 167.8 g/kWh. This is because of the greater de-rating potential and the higher stroke/bore ratio of this G-engine type.

When multiplying the propulsion power

demand at N (Fig 2) with the SFOC (Fig 3), the daily fuel consumption is found (see Fig 4). Compared with N1 for the existing 6S50ME-C8.2, the total reduction of fuel consumption of the new 6G50ME-B9.2 at N3 is about 8.7%.

The reference and the actual EEDI figures have been calculated and are shown in Fig 5 (EEDIref = 1,218.8 x dwt -0.488, as at 15th July, 2011). As can be seen for all three cases, the actual EEDI figures are equal to or lower than the reference figure. In particular, case 3 featuring the 6G50ME-B9.2 engine has a low EEDI that is about 92% of the reference figure.

The total main engine operating costs per year, 250 days/year, and fuel price of \$600 per tonne, are shown in Fig 6. The lube oil and maintenance costs are also shown. As can be seen, the major operating costs originate from fuel costs – about 96%. After some years in service, the relative savings in operating costs in net present value (NPV), see Fig 7, with the existing 6S50ME-C8.2 used as basis with the propeller diameter of about 5.9 m, indicates an NPV saving for the new 6G50ME-B9.2 engine with a propeller diameter of about 6.7 m.

Following 25 years in operation, the saving is about \$8.3 mill for N3 with 6G50ME-B9.2 with the SMCR speed of 100 rev/min and propeller diameter of about 6.7 m.

Operating costs (14.5 kn)

Operating costs for the main engine at 14.5 knots. The calculated main engine examples

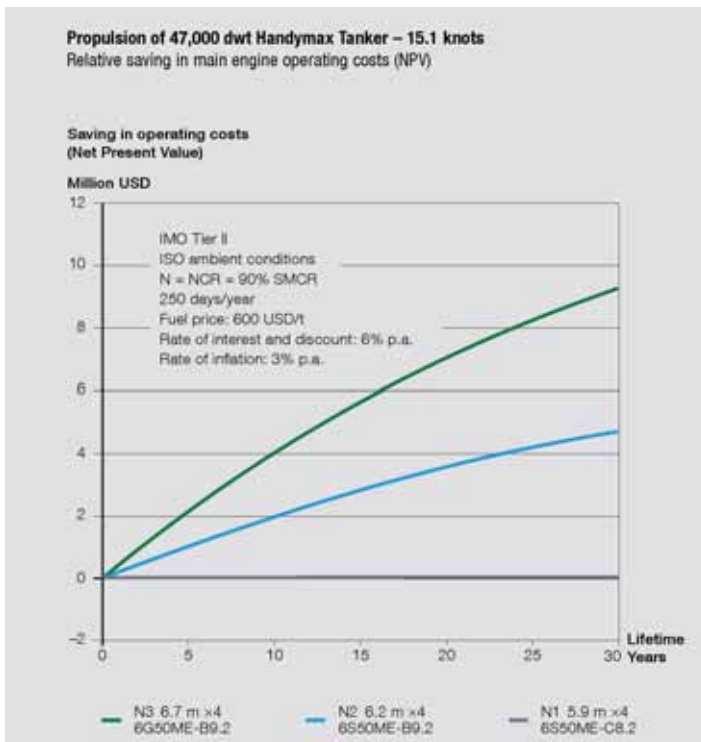


Fig. 7: Relative saving in main engine operating costs (NPV) for 15.1 knots.

are as follows:

- 1) 6S50ME-C8.2 (Dprop = 5.9 m);
M1' = 8,500 kW x 119.0 rev/min.
- 2) 6S50ME-B9.2 (Dprop = 6.2 m);
M2' = 8,310 kW x 110.0 rev/min.
- 3) 6G50ME-B9.2 (Dprop = 6.7 m);
M3' = 7,950 kW x 94.0 rev/min.

The full version of this paper carried a comprehensive study of a 14.5 knot scenario, the most important results of which were:

- Fuel consumption and EEDI: N3' for the 6G50ME-B9.2 with a circa 6.7 m propeller diameter has a propulsion power demand some 6.5% lower compared with the N1' for the 6S50ME-C8.2 (Dprop = 5.9 m).
- SFOC: N3' = 90% M3' with the 6G50ME-B9.2 has a relatively low SFOC of 161.5 g/kWh compared with the 165.1 g/kWh for N1' = 90% M1' for the 6S50ME-C8.2, ie an SFOC reduction of about 2.2%.
- Total reduction in fuel consumption of the 6G50ME-B9.2 is circa 8.6% compared with the existing 6S50ME-C8.2.
- In all three cases, actual EEDI figures are somewhat lower than the reference figure because of the relatively low ship speed of 14.5 knots. Case 3' with 6G50ME-B9.2 has a low EEDI, some 82% of the reference figure.
- Operating costs: after 25 years in operation, savings of \$6.8 mill for N3' with the 6G50ME-B9.2 with the SMCR speed of 94 rev/min and propeller diameter of about 6.7 m can potentially be made compared with an existing 6S50ME-C8.2 engine. TO

The original version of this paper, entitled 'Propulsion of 46,000-50,000 dwt Handymax Tanker' was written by Birger Jacobsen, MAN's senior two-stroke researcher.

digital gauging



Honeywell Tanksystem introduces the world's first portable, digital, automatic, topping-off monitoring system.

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First LNG-fuelled retrofit resumes service

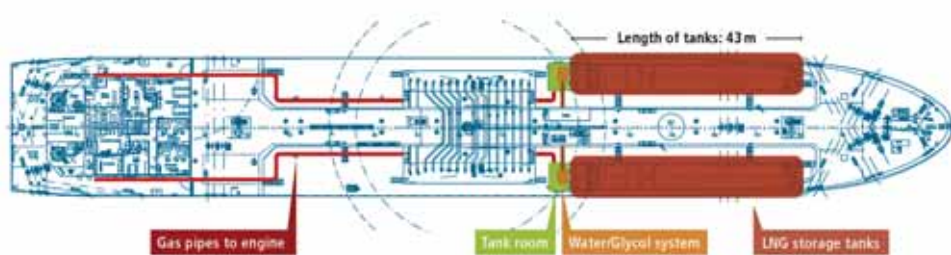
The 24,783 dwt chemical tanker *Bit Viking* was the world's first vessel converted to run on LNG while in service. After successful sea trials under GL supervision, the vessel has resumed commercial trading.

The conversion project was undertaken under the supervision of Hamburg-based class society Germanischer Lloyd (GL). Once converted, the tanker has become a dual-fuel vessel, able to burn fuel oil, or liquefied natural gas (LNG).

Ronnie-Torsten Westerman, GL's business development manager, writing in the class society's magazine 'Nonstop', explained: "The project started with a kick-off meeting of representatives from Wärtsilä, the owner Tarbit Shipping and GL in April 2010."

Manufacturing of various new components began in early 2011. They were then transported to the shipyard in Landskrona, Sweden. "The *Bit Viking* arrived at the yard on time and the conversion commenced in August," said Westerman. Upon her arrival, the new equipment necessary for LNG operation was installed in the vessel.

GL's staff played a critical role in this process by monitoring the manufacture and installation of the components, such as piping, valves, safety equipment and LNG tanks and ensuring safe construction, use of suitable materials and application of appropriate welding methods.



General arrangement drawing showing the deck layout.

The two main engines were converted from Wärtsilä VASA type 46 D to type 50 DF. Westerman said: "Virtually everything was replaced except the crankshafts and frames."

The *Bit Viking* was then taken to Risavika/Stavanger for completion of the pipe installation, the testing and calibration of the newly installed equipment. She was then ready for her first bunkering of LNG. "The first time we prepared for bunkering we had to cool down the LNG storage tanks on the fore deck using liquid nitrogen at -192 deg C", explained Westerman.

She then successfully bunkered LNG, which has a temperature of -162 deg C, for a main

engine test run at the pier. By the end of October, the *Bit Viking* was finally ready for her official sea trials.

"She performed as expected and no major discrepancies were noted. GL had two surveyors on board during the sea trial. The technical challenge in steering the conversion process was immense," said Westerman.

Key concerns were the proper interpretation of class rules for safe construction, ensuring that the equipment manufacturers clearly understood the class rules and anticipating how the flag administration (Sweden) would understand and accept the required risk analysis. "Particular focus was on bunkering and how it should be performed, since this is a somewhat critical operation that requires special knowledge and equipment," Westerman said.

Bit Viking fact file

Bit Viking was built at the Edwards Shanghai shipyard in China with double engine rooms, propellers, steering gears, rudders and control systems – a full redundancy package.

Having previously been powered by two 6-cylinder in-line Wärtsilä 46 engines running on heavy fuel oil, the conversion

has changed these to 6-cylinder in-line Wärtsilä 50DF dual fuel engines, capable of operating on LNG supplied from two 500 cu m LNG storage tanks on the fore deck.

The 24,783 dwt chemical tanker is currently on long term charter to Statoil, trading on and around Norway's west coast, thus qualifying for Norway's emission tax rebate.

Testing the rules

The conversion of the *Bit Viking* also provided a good opportunity to put the GL rules for gas as ship fuel (see box) to the test. Following the successful conversion, Westerman expressed optimism; "The existing rules are sufficient for a conversion such as that of the *Bit Viking*. However, some modifications will be made in the future as regulations, such as Marpol, are updated to reflect the option of gas as a ship fuel."

While the advantages of LNG-fuelled ship engines are well known, there are a few performance drawbacks compared to fuel oil. Furthermore, the two 500 cu m capacity LNG tanks and the associated piping and valves add several hundred tonnes to the weight of the vessel. On the other hand, the ship enjoys increased buoyancy and lifting cargo capacity. Westerman said;” You clearly win on the environmental side.”

An LNG-powered vessel at this developmental stage is slightly more expensive than a conventionally powered equivalent, which increases capital costs. Yet with the advent of cash incentives for lower emissions in some Scandinavian countries, notably Norway where the vessel is trading under a charter to Statoil, ship operators can also save money via rebates.

Where Scandinavia has taken the lead, others will follow, GL said. Under rules drawn up by IMO, vessels must cut SOx emissions from 1% currently to 0.1% by January 2015.

“Within the short period of operation since her conversion, the *Bit Viking* has already achieved considerable benefits for the environment,” said Westerman. “Greenhouse gases have been reduced by 20% to 25%, NOx gases by 9 %, sulphur output has been cut entirely and particle emissions have been brought down by 99%.

“An official emissions measurement has been conducted, but the final results have not yet been publicised. However, these estimates should be pretty close to the actual



The gas tanks clearly seen on deck.

outcome,” he said.

According to GL, Tarbit Shipping is very pleased with the environmental footprint of its newly converted vessel and all project partners expressed their appreciation of the good spirit of co-operation. “We all held firm and stayed focused on the quality and safety outcome of the project,” said Westerman. “It

was the final result that counted. This was very important, since there is no room for errors in dealing with an LNG plant!”

Bit Viking resumed commercial trading on 25th October 2011. Ever since, she has been performing as expected and the crew has successfully refuelled her from the shore, GL said.

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The vessel has been operating successfully as a gas-powered vessel since October last year.

GL Guidelines for Gas as Ship Fuel

GL has prepared guidelines for gas as a ship fuel.

Developed by the IMO sub-committee on Bulk Liquid and Gases (BLG) with GL assistance over the past few years, the interim guidelines are the first step towards the envisioned general code for gas as a ship fuel, the so-called IGF Code.

This Code is currently under development by the IMO and is expected to enter into force conjointly with the revision of SOLAS 2014.

The GL guidelines will help shipowners and yards prepare for the introduction of gas as a ship fuel.

They provide criteria for the design arrangements and installation of propulsion and auxiliary machinery powered by natural gas to ensure a level of integrity, safety, reliability and dependability equivalent to that of comparable, state-of-the-art machinery burning conventional fuel oil, GL said.

Ready for the off?

With the ratification of the IMO's Ballast Water Treatment (BWT) Convention edging ever nearer, leading manufacturers are announcing new orders and various stage approvals with increasing regularity.

Opinions differ as to the size of the market, but it is probably at least 35,000 vessels, if not nearer 60,000 vessels that will need fitting with a system sooner rather than later. According to who you talk with, the market's value could be in the region of \$16 bill.

Obviously, it will be easier to fit equipment on a newbuilding where the space for such a system has already been included at the design stage. However, the retrofit market could be enormous, endorsed recently by leading Bahraini shiprepair yard ASRY who told *TANKEROperator* that the yard's marketing teams were in dialogue with BWT equipment manufacturers about using its facilities to carry out the work.

The 30-odd active manufacturers, with more waiting in the wings for their various approvals to be granted, vary in equipment capacity, as taking tankers as an example, the main size ranges have completely different ballast water pumping capabilities.

In this article, we have taken a few random companies and highlighted their latest offerings, approvals, contracts and general comments regarding BWT issues.

What was claimed to be a very successful forum was held on 27th September last year, by the first Greek concern to design, certify and manufacture a BWT system - **ERMA FIRST ESK Engineering Solutions**.

More than 250 people, including executives from the major Greek shipping companies attended the forum in which, the IMO regulations were presented and analysed while attendants were informed about the latest developments in legislation, testing and sampling.

Marine biologist Dr Stephan Gollash, an expert in on board and shipboard testing, analysed the sampling procedure and the future challenges related to the regulation implementation, plus on board surveying/sampling by authorities and coast guards.

Frank Fuhr, marine biologist and senior researcher at NIOZ (The Royal Netherlands Institute for Sea Research), presented the procedures and the conditions/requirements of land-based tests, as dictated by the IMO.

ERMA FIRST ESK Engineering Solutions uses seawater electrolysis technology to produce active substances combined with high performance mechanical separation of particles through state-of-the-art hydrocyclones that ensure full compliance both for IMO D-2 and also for even more stringent limits.

The ERMA system can handle vessels of up to 2.500 cu m pump capacities, meaning that it can be installed on large tankers, providing space has been made available for fitting.

International sales manager Konstantinos Fakiolis told *TANKEROperator* that the system is currently being marketed and that newbuilding projects are being pursued.

ERMA has been awarded basic approval for its system and all the land-based and on board tests have now been completed

Final approval was expected during MEPC 63 and type approval is anticipated by March of this year. Type approval is being conducted by LR on behalf of the Greek flag state.

An ex-proof version will also be made available after IMO type approval is granted, Fakiolis said.

Dual solutions

In the UK, **Hamworthy**, now part of the Wärtsilä' group, agreed that ratification of the IMO's BWT Management Convention is widely anticipated within the next 12 months.

Recognising that no one solution will be suitable across all ship types, sizes and environmental conditions, Hamworthy's ballast water research and development team has developed two different treatment solutions under the banner of **AQUARIUS™**.

Dr Joe Thomas, managing director, Hamworthy Ballast Water Systems, claimed: "We are currently the only OEM offering a choice of ballast water treatment solutions to both the newbuild and retrofit markets. We believe this gives our customers every confidence that by working with Hamworthy they will be able to find the technology best suited to their particular needs."

The **AQUARIUS™** -UV system is a two stage approach with filtration followed by disinfection using ultraviolet light and so does

not use any active substance. As there is no detrimental effect on water quality, ballast water can be safely discharged from the ballast tank at any time. Furthermore, to ensure maximum disinfection, UV treatment is utilised during the discharge cycle, as well as on ballasting.

In developing the system, Hamworthy formed a strategic partnership with UK-based Hanovia, a specialist in UV system design and manufacturing. Hamworthy assumed overall responsibility for performance compliance against the required regulatory standards, with the UV system being an essential component to integrate with its BWT solution.

Hamworthy is also marketing the **AQUARIUS™** -EC ballast water system, which similarly employs a two stage approach, but in this case disinfection using an active substance, generated using side stream electro-chlorination.

For this system, Hamworthy is collaborating with Magneto Special Anodes for the development of advanced electrolysis technology. Upon de-ballasting, the system neutralises any remaining active substance using sodium bisulfite, ensuring that the ballast water can be safely discharged back to the sea.

Dr Thomas said "Both systems provide a robust solution for the treatment of ballast water across a range of challenging ship operating end environmental conditions, exceeding the required IMO standards. We have also adopted a modular approach to system design in both cases so that equipment can be flexibly arranged to suit conditions on board. Furthermore, both the **AQUARIUS™** systems are designed and supplied to treat ballast water across a full range of ballast pump sizes."

The **AQUARIUS™** systems achieve filtration using automatic back-washing screen filter technology. The filter is designed specifically for ballast water applications and filters particulates down to 40µm. Operation of the filter includes automatic back-washing to ensure efficient removal of particles that are discharged back to the environment of origin, the systems are PLC-controlled with user friendly touch screen operation.

All relevant data is stored by the PLC in accordance with IMO requirements and the system can be fully integrated into the main control system to achieve complete BWT management on board the ship.

Land-based testing of both the AQUARIUS™ -UV and AQUARIUS™ -EC systems were successfully completed in early 2011 at NIOZ and sea trials involving both the systems are currently underway with the first official trial sampling resulting in a full pass against requirements of the IMO D2 standard. Hamworthy is also conducting AQUARIUS™-EC specific corrosion and paint coating tests according to MEPC requirements.

With all testing complete Hamworthy will secure IMO type approval for the AQUARIUS™ range this year.

Receiving final testing approval from the South Korean Government on 27th November for its eco-friendly electrolysis HiBallast system was **Hyundai Heavy Industries (HHI)**.

HiBallast treats seawater by filtering and sterilising bacteria and plankton bigger than 50 µm through electrolysis. The HiBallast system can sterilize 8,000 cu m of seawater per hour, reduce power consumption and extend the life of the ballast.

The new HiBallast is the second BWT system HHI has developed. The first-EcoBallast - received its final test approval in March of last year. It sterilises seawater using ultraviolet rays instead of electrolysis. HHI claimed to have already received orders for HiBallast and EcoBallast system to be installed on board about 30 vessels.

Milestone

Norwegian concern **OceanSaver** has claimed to have achieved a milestone in the BWT industry with the commissioning of the first treatment system to include filters on a crude

oil tanker building in South Korea.

The 159,000 dwt Suezmax, *Ottoman Integrity*, was delivered from HHI last November to Turkish owner Gungen Maritime & Trading (see Ship Description, page 33). She is fitted with an OceanSaver dual system capable of treating ballast water at a rate of 2 x 2,500 cu m per hour.

OceanSaver's Mark I technology has been installed, which includes filtration, cavitation, disinfection and nitrogen super saturation. The filter and cavitation units are fitted in the vessel's pump room with the disinfection unit and nitrogen system in the engine room and casing area, respectively.

Filtration of sediment and biological material from the uptake water is achieved by in-organic fully automatic back-flushing filters. At the shipowner's request, the filters were operated for over 70 hours during sea trials, without any operational issues or constraints, performing according to specifications and yard, owner, class, charterers and to OceanSaver's satisfaction, the company said.

The Suezmax picked up her first cargo at the end of November where the OceanSaver system was part of normal operations. Owner Osman Gungen said: "In order to get the best possible system for your type of vessel, it is important to keep a close co-operation with your selected maker all the way through the project from early sales stage until first cargo is on board.

"The system has been perfectly designed into the vessel," he said. "The sub-components selected from OceanSaver show that the company does not balance on a thin line," he said.

"The nitrogen super saturation component offers shipowners the potential for reduced vessel maintenance costs through the improved corrosion performance of inerted

ballast tanks. It is particularly suited to newbuildings, or high specification, specialist vessels and is an optional item in the OceanSaver Mark II system", explained Tor Atle Eiken, OceanSaver's senior vice president sales & marketing.

The key features of the OceanSaver system with respect to BWT are:

- Capable of large flow capacities.
- Ex approval (gas hazardous areas).
- Small footprint and high modularity (flexible component location).
- Maintenance cost savings due to reduced corrosion.

In January of this year, it was announced that Rongsheng Shipbuilding Heavy Industries had chosen OceanSaver's Mark II version for two 317,000 dwt VLCC newbuildings.

The contract comes just weeks after the DNV type approval, certifying Mark II to fully meet the requirements of the new convention and previous system orders placed by Bohai Shipbuilding Heavy Industry and SPP Shipyard for two Suezmaxes and four bulk carriers respectively.

Scheduled for completion in June 2013, the contract is valued at \$3 mill and represents OceanSaver's first VLCC system delivery for its new Mark II technology. The delivery covers the supply and installation of two sets of Mark II BWT units, giving ballast water flows at a rate of 6,000 cu m per hour.

"The contract was won due to the proven technical ability of Mark II and the fact that several leading shipyards in China and Korea have also ordered similar systems," said Eiken.

A consistent, cost effective and dependable BWT application for medium and large vessels, Mark II introduces better performing filtration technology and reduces piping installations considerably, OceanSaver claimed. "Mark II is recognised by the market for its small footprint

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and high-end technology for ballast water treatment applications. Mark II is widening our core market segments to include medium-sized vessels,” explained Eiken.

Russian approval

Bremen-based RWO's ballast water treatment system CleanBallast has received Russian Maritime Register of Shipping (RMRS) type approval.

During the NEVA exhibition in St. Petersburg last year, Victor Grishkin, senior principal surveyor at RMRS, handed over the certificate to RWO, meaning that CleanBallast can now be installed on any Russian-flagged vessel.

The modular BWT system can easily be integrated in existing on board processes and systems and is thus applicable for newbuilds as well as retrofits; the components can be arranged to suit the available space and piping layout of ballast water systems.

Currently, RWO has 47 CleanBallast units in its order book and as of end-September last year, several installations had been successfully carried out. The start-up of most of these units took place in China and were tested in the Yangtze river, one of the most difficult ballast water rivers in the world.

In the tanker sector, RWO has won orders from Sumitomo to fit BW systems on board Aframaxes, the company told *TANKEROperator*.



RWO's CleanBallast has found success in the Aframax market.



Skid-mounted BALPURE BWT system.

Four newbuilding LNGCs are to be fitted with **Severn Trent De Nora's** type approved BALPURE BWT system.

They are to be fitted on board four gas carriers being built for Mitsui OSK Lines (MOL) by Hudong-Zhonghua Shipbuilding at its shipyard in Shanghai.

Upon delivery, the 172,000 cu m LNGCs will be long term chartered to China Gas/ExxonMobil and will be the first new gas carriers to install the BALPURE system.

Hudong-Zhonghua Shipbuilding purchased four skid-mounted BALPURE BP-5000 systems, one for each of the LNGCs. Each system is capable of treating ballast water flow rates of up to 5,000 cu m per hour.

The first BALPURE system will be installed in August 2012, while the last fitting is to be completed before the end of 2013.

BALPURE, which utilises electrolytic disinfection technology, is claimed to be an advantageous and economical BWT approach for LNG/LPG carriers. Its slip stream treatment approach, where 1% of the total ballast water flow is used to generate the hypochlorite disinfection solution, enables remote mounting away from the main ballast line.

This slip stream treatment approach, coupled with a design that requires treatment only during the uptake of the ballasting cycle, offers significantly reduced power requirements when compared to competing technologies – ensuring low operational costs, Severn Trent De Nora said.

BALPURE offers a virtually maintenance-free approach to BWT through the use of proprietary self-cleaning electrodes that eliminate the need for chemical and mechanical maintenance that could otherwise be time consuming for ship's crew.

“We believe that this order with Hudong-Zhonghua Shipbuilding Group is a positive

endorsement of the BALPURE technology by shipping leaders Mitsui OSK Lines and ExxonMobil,” said Jim McGillivray, BALPURE general manager for Severn Trent De Nora.

“With the Ballast Water Management Convention getting closer to ratification, owners and operators have begun to shortlist their preferred ballast water treatment solutions. Since our Type Approval in July 2011, BALPURE has begun to take a leading position on many of these preferred vendor listings,” he claimed.

STEP programme

In August 2009, The *S/R American Progress*, a 30,000 gt, double-hull US flag tanker, operated by SeaRiver Maritime, was accepted into the US Coast Guard's Shipboard Technology Evaluation Program (STEP) to demonstrate the use of and collect data on the effectiveness of the Severn Trent De Nora BALPURE BWT system.

In its acceptance letter, the Coast Guard stated the ship; “has an accepted means of compliance with Ballast Water Management regulations found in US Code of Federal Regulations, title 33, part 151.2035.”

The US Coast Guard established the STEP programme in 2004 to promote the development of alternatives to ballast water exchange as a means of preventing invasive species from entering US waters through ships' ballast water.

STEP participation is available to all international and US domestic vessels subject to the Coast Guard's Ballast Water Management regulations, 33 CFR, part 151, subparts C and D.

Later, in August 2010, the *S/R American Progress* was authorised to discharge treated ballast water into Californian waters. This means that the tanker may continue to discharge treated ballast water with the BALPURE system into California waters, as long as the vessel remains in the USCG STEP and operates in accordance with its specific conditions.

The California State Lands Commission also considered the vessel to be in compliance with the state's performance standards for a period not to exceed five years from the date that the interim performance standards are implemented - for this vessel class on 1st January 2016.

Corrosion testing

A corrosion testing programme undertaken by GL Noble Denton for the BALPURE system was successfully completed in March 2011. The extensive corrosion testing programme

included accelerated studies for the impact of the BALPURE system in untreated and full-salinity, treated seawater up to 8 mg/liter (ppm) total residual chlorine.

Comparative studies were made using uncoated steel test specimens and coated test specimens. All specimens met IMO Resolution MSC.215(82) ballast tank coatings requirements. The test specimens were evaluated for weight loss, pitting corrosion of the parent metal and pull off (adhesion), cracking and blistering tests of the coated panels. The adhesion pull-off strength test results recorded for the coated panels removed after six month exposure indicated no significant difference between the three test environments.

This test programme conclusively found that for seawater treated by the BALPURE system with higher than normal levels of free chlorine there is no measurable effect to the normal life of ballast tanks, ballast tank coatings and associated pipe work, valves, fittings and instrumentation, the company said.

The testing proved the BALPURE system has no effect on coated steel, naval bronze and Cu-Ni alloys. Testing proved an insignificant

effect on bare steel – so small that the acceleration of corrosion due to the presence of free chlorine has minimal practical implications in ballast tanks.

Severn Trent De Nora has letters of confirmation from AkzoNobel (International Paint) and AMERON International that further attest to the non-corrosive nature of the BALPURE system. BALPURE is approved and acceptable for use on their paint up to a dose rate of 8 ppm.

Despite recently agreeing to purchase Hamworthy, Wärtsilä's approach to the BWT market has been to develop a treatment technology solution suite suitable for all types of vessels and BW pump capacities.

The company told *TANKERoperator* that it had specifically designed its BWT solution with large pumping capacity vessels in mind.

Historically, it had been difficult for these types of vessels to take advantage of environmental and operational benefits UV based BWT technologies provide, because of their footprint and power requirements.

Wärtsilä said that its integrated BWT solution has been purpose designed and built for this application creating the opportunity to

significantly reduce the footprint and power requirement. This approach facilitates the use of its BWT solution on larger vessels with larger pumping capacity.

The company said that it was in the process of validation testing for IMO type approval certification of its BWT units. Testing is being performed at DHI (Danish Hydraulic Institute) under supervision of DNV, as third-party surveyor. Type approval will finally be issued by DNV on behalf of Norwegian flag state.

All of the validation testing is also being undertaken with due consideration for the upcoming US ballast requirements, Wärtsilä said.

The company said that it was able to manufacture large tranches of BWT systems. This is one of the reasons Wärtsilä partnered with Trojan, being the largest supplier of UV treatment system in the world. Presently Trojan is delivering UV based treatment systems worldwide, the company explained.

Wärtsilä uses the two stage process with filtration and UV treatment technology. UV is physical disinfectant and does not change the chemistry of the water. Therefore this technology has no impact on ballast tank coatings, the company claimed.

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New benchmark to prove coatings performance

Strong academic research and firm ship operating evidence of the correlation between applying specific fouling control coatings and reducing fuel consumption and CO2 emissions has found further backing.

This followed on from the forming of a new industry partnership between International Paint (IP) and BMT ARGOS, who came together to use the new BMT SMARTSERVICES system to verify, through independent monitoring and software analysis, the contribution to vessel performance, fuel savings and reduced emissions made by IP's highest performance fouling control coatings - Intersmooth SPC (self polishing copolymer) antifouling and Intersleek foul release coating.

Understanding hull roughness is an important factor in understanding ship performance, IP pointed out. Any increase in hull roughness will increase the hull frictional resistance, which will either require additional power and fuel to maintain vessel speed or, if maintaining constant power, will result in speed loss and longer voyage times.

IP claimed fuel and emissions savings for its Intersmooth SPC coating, citing evidence gathered from over 5,000 vessel drydock and inspections for fouling rating, combined with AHR (average hull roughness) measurements.

Behind this specific argument, IP's Dataplan system has coating details of over 1.7 bill dwt, representing almost 200,000 drydockings that allow antifouling performance to be predicted and assessed. Results are derived from analysing the in-docking condition of a vessel, its coating performance and assessing the type, severity and extent of any fouling, if present. In conjunction with the vessel's trading pattern, operational profile and drydocking interval, an antifouling performance rating can be calculated.

Dataplan also records the vessel's coating condition, including the type, severity and extent of any corrosion, cracking, blistering, detachment and mechanical damage, all of which contribute to and are included in,

hull roughness measurement.

IP also cited the report, 'Energy and GHG Emissions Savings Analysis of Fluoropolymer Foul Release Hull Coating', by Professor James Corbett's Energy & Environmental Research Associates, dated the 10th December 2010.

Aframax analysed

The report analysed the latest fuel consumption data of three vessel types coated with Intersleek 900; *Prem Divya*, a single engine 21,126 bhp tanker, *Ikuna*, a twin engine 3,400 bhp bulker and five identical post panamax container vessels, three of which were coated with SPC antifouling and two with Intersleek 900.

The results were remarkable for the correlation they showed between the coating applied and the fuel consumed. The report showed that fuel consumption was reduced by

10% on the *Prem Divya*, 22% on the *Ikuna* and by 5% in five container vessels (based on all five ships carrying a comparable load). The report stated that if similar fuel efficiency results were realised by all tanker and bulk cargo vessels within the commercial fleet that: "annual fuel oil consumption could be reduced by roughly 16 mill tonnes per year, fuel expenditures could be reduced by \$4.4 bill to \$8.8 bill per year, and nearly 49 mill tonnes of CO2 emissions could be avoided annually".

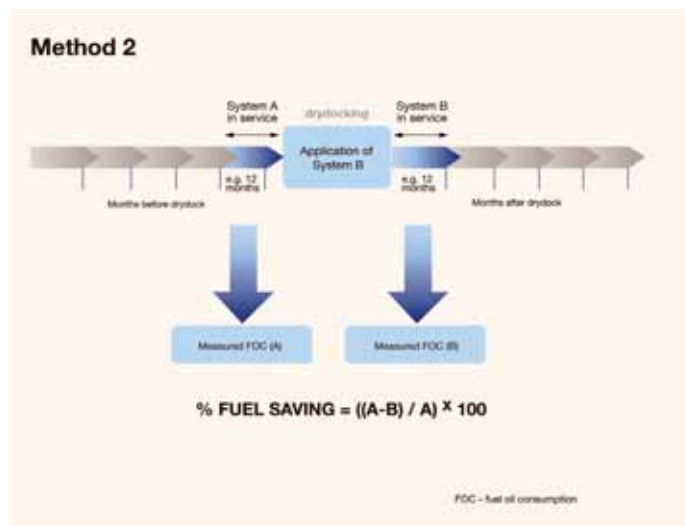
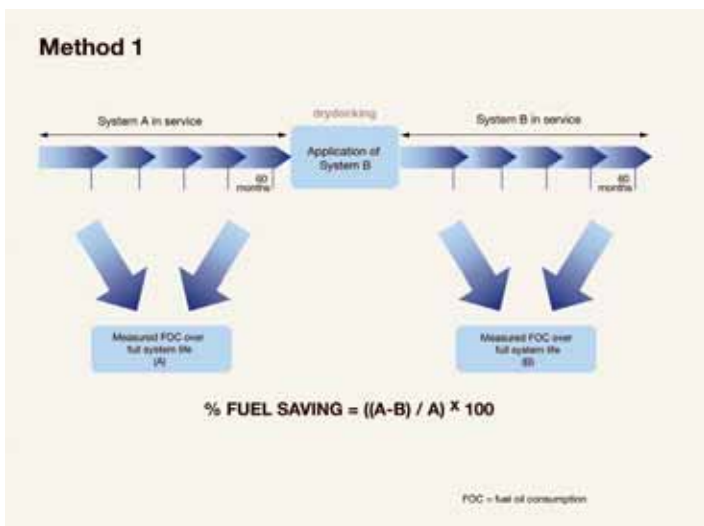
At a more detailed level, the report said that the latest generation fluoropolymer foul release coating could offer average fuel and emissions savings of up to 9%.

Challenge

For some, though, such claims are always open to challenge. Critics argue that, no matter which coating is applied, a ship will naturally move through the water more



Coatings' performance can now be benchmarked.



Two of the three fuel savings methods.

smoothly, if it has been blast cleaned during drydocking. Furthermore, they argue, the linkage between hull smoothness and reduced emissions is tenuous: traditionally, extra smoothness was more likely to lead to some ships being driven faster, not to fuel savings.

On the face of it, seemingly persuasive such arguments could be readily countered by observing the growing propensity for owners to operate slow steaming policies specifically in pursuit of fuel (and consequently emissions) savings. Again, while no one would dispute that depending upon the fouling control system employed, a newly grit blasted, or hydroblasted, freshly coated hull will perform better than a hull at the end of its docking cycle, the point is surely to measure how quickly hull performance deteriorates over time in the context of the coating systems applied.

Measurement methods

For this reason, IP has been explicit in detailing the alternative methods that have been used as the means of establishing linkage between the fouling control system selected and potential fuel savings.

Some common methods were as follows:

- 1) Directly comparing the in-service vessel performance when using one fouling control system over its full lifetime to that of another fouling control system over its full lifetime.
- 2) Directly comparing a period of time in-service prior to drydocking with one fouling control system to the same period after the drydocking and application of a new fouling control system. Different before and after periods can be used and in general are much less than full in-service periods, ie 12 months before a drydocking, compared to 12 months after application of the 'new' paint system.

Other factors need to remain the same, eg no engine overhaul at drydock.

- 3) Directly measuring the same fouling control system over a given time period. This method uses an 'industry view' that a vessel on average will lose 5% speed over a 60 month period. This 5% speed loss would translate to roughly a maximum average of 15% increase in fuel in order to maintain speed. This assumption is not specific on fouling control type. The baseline data is then compared to the performance predicted, or measured in service.

Antifoulings as examples

Using method 1, comparing a 60 month docking cycle of a typical rosin-based system with another 60 month docking cycle with Intersmooth SPC, IP calculated an annual average 4% fuel saving for Intersmooth SPC over the rosin-based system.

If method 2 were to be used and compared 12 months before drydock for a rosin-based system with 12 months after drydock with Intersmooth SPC, IP calculated fuel savings would be higher, at 9%. However, as the periods in service are at different time periods in the docking cycle, the company argued that there are limitations of this method and that the resultant high value of the improvement is misleading. It suggested that this method should not be used.

As for method 3, IP pointed out that in 1986 evidence was published of vessel performance using SPC technology. Townsin et al^[1] showed that the effect of hull roughness on fuel consumption could be related in a fairly simple formula - % Power Increase = $A(\text{AHR}2-1/3 - \text{AHR}1-1/3)$ - that for every increase in hull roughness of 25 microns there

would be approximately a 1% penalty in the fuel consumption of the vessel.

For typical rosin based antifouling systems, hull roughness increases by around 40 microns per year. However, due to polishing, smoothing and minimal build up of leached layer, an SPC antifouling increases in roughness by only 20 microns per year.

Therefore for SPC technology, the fuel consumption increase over the full period (of 60 months) would be just under 1% per year, reaching 4% in year five (for the vast majority of vessels that return from service in a clean condition).

Using data generated in the comprehensive Townsin paper and a detailed analysis of antifouling performance from Dataplan, the fuel consumption increase over a 60 month period for a rosin based system can be calculated as 15%, the same figure as what has been described as the 'industry view'.

The calculation of 15% is as follows; Rosin containing systems were measured to increase in average hull roughness by 40 microns per year. Over a 60 month period, this would be a 200 micron increase. A 25 micron increase in average hull roughness equates to a 1% fuel increase. This means an 8% fuel increase on roughness alone. Between 36 and 60 months a rosin based system is highly likely to foul, typically due to the build up of a large leached layer preventing biocide release. This results in increased roughness and drag. The effect of this on fuel consumption has been measured and then calculated to increase by 7%; this gives the total increase in fuel consumption of 15%.

If only SPC products are measured, then the fuel consumption increase over the 60 month period will be 4%. Not being specific on fouling control type highlights a potential flaw

1. Townsin et al paper entitled 'Fuel economy due to improvements in ship hull surface condition 1976-1986', (Maritime Technical Information Facility, last modified July 27, 1994).



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in using an 'industry view' average of fuel loss, IP said.

One important omission in Method 3 is that there is no allowance given for any fuel consumption rise effects that are non-fouling related, such as a damaged propeller, mechanical damage to the coating, or general engine wear and tear.

Going forward, IP stated that it recognised the importance of providing owners with as much information on the performance of its products as it can.

Breaking new ground

The new relationship with BMT looks to do just that; it will provide the independent monitoring that the partners believe will make both the evidence and methodology cited above incontrovertible.

The BMT SMART^{SERVICES} system, developed by BMT ARGOSS, will capture and compile real vessel data and independently monitor and report on vessel performance. It will record data automatically from ships' sensors to monitor engine torque, the speed log, navigational signals (heading and speed over ground) and provide performance information to the crew and to shore-based management for analysis. The system, which can be installed at the newbuilding stage, or as a retrofit, automatically records thousands of readings per day, providing unparalleled, accurate analysis of vessel performance, IP claimed.

The system will clearly and transparently measure the in-service performance of IP's hull coatings, drawing on BMT's 24/7 in

house high quality and validated MetOcean data. The significance of the MetOcean data gathered automatically from high resolution, highly accurate satellite monitoring for use as part of BMT SMART^{SERVICES} should not be underestimated.

While it is clearly essential to monitor information on board, such as the relationship between hull roughness condition and fuel consumption, this information needs to be integrated with the environmental conditions being experienced by the vessel. This MetOcean data includes factors, such as wind speed and direction, currents, (speed and direction) and wave height and direction.

The system has been modelled using weighted performance coefficients to provide the basis for measurement of vessel performance against the condition of the propeller, hull, engine and fuel consumption. In depth analysis can be used to monitor the propulsive performance of a ship and to indicate how much additional power, or fuel, would be required as a consequence of the combined effects of weather and fouling, or of the isolated effects of fouling on the hull or propeller. This analysis enables data trending, which can be used to optimise any scheduling of hull and propeller cleaning events and can be subsequently used to quantify the effectiveness of any such events.

To ensure complete data integrity, all information collected will be sent to BMT. The client and IP will be able to view vessel data in graphic, or tabular form, to develop trend analysis via a secure access web interface. However, the data cannot

be changed or manipulated.

The consortium pointed out that accurate monitoring has several benefits for the ship operator:

- 1) Proof of compliance to charter agreements.
- 2) Ability to determine the energy efficiency of the vessel within the EEOI (Energy Efficiency Operational Index) encompassed in the SEEMP (Ship Energy Efficiency Management Plan) guidelines.
- 3) Ability to act immediately on anything adversely affecting the optimum running of the vessel, eg hull fouling, propeller fouling, trim optimisation, hull damage etc.

In achieving these benefits, it is essential to be able to show that there is an agreed way of recording standardised data, using an agreed scientific approach that will be generally accepted by the industry.

Clear information

IP and BMT said that they wanted to provide shipowners and operators with information in a completely open and transparent way to provide clarity to those using the information. They wanted owners to get fuel saving benefits, but wanted to ensure that there is a complete understanding of the actual savings possible, rather than just accepting the largest number.

It is from many years of proven in-service performance with data from owner/operators, from Dataplan and from independent testimony that they claim that they know exactly what benefits each of their technology types can deliver. They also said that they believed this new partnership will make that knowledge completely transparent.

TO

Online coatings inspector courses launched

Lloyd's Register offers online courses to support compliance with marine coatings standards.

Good marine coatings are vital for the maintenance of safe and efficient hull structures and surfaces.

The IMO and IACS require compliance with coatings standards. Inspections under the IMO's Performance Standards for Protective Coatings (PSPC) and IACS' UI SC223 must be carried out by qualified coatings inspectors certified to National Association of Corrosion Engineers (NACE) Coating Inspector Level 2, The Norwegian Professional Council for Education and Certification of Inspectors for Surface Treatment (FROSIO) Inspector Level III, or equivalents.

To help meet demand for qualified inspectors, LR has developed a new series of

online, marine coatings training courses.

Coatings and Corrosion Control with the use of Protective Coatings, is an internationally accredited series of coatings-inspection courses.

"Students will be able to earn either certificates or diplomas, depending on the level they study, in coatings and corrosion control. The qualification achieved by taking the course on *Performance Standards for Protective Coatings* is equivalent to the NACE and FROSIO qualifications required by IMO and IACS," said Andrew Williamson, LR's marine training manager. "Students can learn and progress at their own speed, and when it is convenient for them."

The courses - recognised by the Institute of Corrosion (ICorr), the British Coatings Federation (BCF), the Society for Protective

Coatings (SSPC) and the University of Portsmouth -- "make it easier and more cost-effective for unlimited numbers of students to enrol," Williamson said.

Students can register for the course at www.lr-training.org. After users have registered and paid their fees, they will gain access to the online training and will have 12 months in which to complete the course. They must achieve 100% to pass.

To achieve the IMO PSPC certificate, students must also pass (with a minimum 70% mark) a theoretical and practical assessment. For the diploma course, following completion of the online training section, students will need to produce written assignments for a number of specialist subjects.

A three-hour examination then completes the diploma course.

TO

Time to put away the chipping hammers

In a paper to the NACE International Marine Coatings Summit in Shanghai in October 2011, ABS chief technology officer Todd Grove addressed the evolution of marine coatings from must-have to value-add.

Not so long ago, coatings were considered little more than an added capital cost in the shipbuilding process. The chipping hammer and red lead paint were the standard maintenance weapons. The exterior hull plating, above and below the waterline, was the primary focus. Minimal attention was paid to the protection of the internal spaces other than perhaps a cement wash of the fresh water tanks.

Today, the cost of the coatings for a double-hull VLCC newbuilding comprises a significant portion of its delivered cost. Environmental pressures have spurred regulatory requirements that encourage research into more effective and less costly anti-fouling systems. And ground-breaking research is being undertaken on the incorporation of nano-technology into the coatings of the future.

Against this background, the role of class with regard to coatings has been subject to considerable debate. Our traditional focus was on the strength of the hull structure at the initial design stage, during construction and through the life of the ship.

How the vessel is maintained was, and still remains, the responsibility of the owner. When wastage reached the tolerance margin established in the rules, steel renewal was required. In determining a maintenance philosophy, the owner struck a balance between the cost of day-to-day upkeep and the cost of extended steel renewal at later surveys.

However, both the cost of the initial coatings for a newbuilding and the current regulatory framework that seeks to minimise the risk for in-service corrosion, have changed the basic dynamic.

The IMO's 2006 amendment to SOLAS that introduced Performance Standards for Protective Coatings (PSPC) for dedicated seawater ballast tanks and double side skin spaces of bulk carriers provided clarity to the oversight of the coating issue for all parties.

Since the introduction of PSPC, it is my belief that owners, shipyards, paint

manufacturers and class societies have worked co-operatively to promote these new standards, with each party well aware of its responsibilities. The success of the PSPC procedures has led to wider discussions at the IMO regarding the extension of the regulatory regime to cover cargo holds and tanks, as well as void spaces and the through-life maintenance of coatings.

This is evidence of widespread industry acceptance that the quality of the corrosion protection, mainly provided by coatings, directly affects the structural integrity of the ship and its environmental performance.

Enhanced surveys

There are multiple results of this enhanced focus on coatings.

The enhanced survey programmes implemented by classification societies give clearer definitions of corrosion in the ballast tanks and the allowable margins for wastage.

The development by ABS and other class societies of computer-based systems to assess and record the condition of the coatings and extent of corrosion in all spaces provides for more effective, targeted planned maintenance.

There is also a realisation that the new IMO Ballast Water Treatment (BWT) requirements may not have fully taken into account the impact of some of the proposed treatment systems on the coatings of the seawater ballast tanks – an issue on which NACE is taking a leadership position.

Continual improvement of the coating application process has required significant investment by shipyards. This is still evolving, driven to no small extent by ever more stringent environmental regulations on coatings, in particular volatile organic compound (VOC) emission limits, combined with ever-increasing performance expectations.

While the PSPC requirements have focused on the internal structure of the ship, the Anti-Fouling



ABS' chief technology officer Todd Grove.

System Convention (AFS) took on equal importance with respect to the coatings applied to the underwater section of the outer hull.

With the elimination of TBT-based coatings achieved, the regulatory emphasis has now moved to the possibility of the marine growth on the ship's outer hull providing transport for the same harmful, invasive aquatic pathogens that the BWT Convention seeks to eliminate. In July 2011, IMO adopted new biofouling guidelines and some states are already working on making such biofouling control mandatory.

If anything, both regulatory and commercial pressure to further improve coating performance is only likely to accelerate. We

can expect mandated low-VOC coatings and waterborne and solvent-free coating systems will begin to receive regulatory attention soon.

But the regulatory aspect is only one facet of the increased importance that is being placed on underwater coatings. As shipping has come under scrutiny for its contribution to global CO2 emissions, the vessel fuel energy efficiency lost to hull frictional resistance has become a hot subject.

Reducing that penalty can be achieved using new hull coatings and by adopting hull cleaning strategies that minimise hull resistance and improve hydrodynamic performance – a concept already recognized

by the IMO in its 'Guidance for the Development of a Ship Energy Efficiency Management Plan'.

Recently, ABS established a Marine Coatings Resource Center within its technology department, which provides industry guidance and support and conducts research projects related to coatings.

Some of the centre's projects illustrate how we can use our experience and knowledge to contribute towards better coating performance in the future. These include re-evaluating traditional ship structural configurations to determine if a more 'coating-friendly' approach may provide superior application, better in-service performance and easier maintenance and repair.

So what can we expect for the future of coatings technology? The near term and long term horizons promise much.

Smart coatings that are able to both monitor and repair themselves in the case of small mechanical damages are under development. Intelligent coatings are already being produced which require no thickness measurement. Light-reflecting components are added to the coating so ultraviolet light can scan over a treated area to reveal places where the thickness is below requirements.

Hybrids are being developed for application all over the vessel to minimise the number of different coatings required during building and maintenance, while laser beam instruments are able to produce roughness profiles without spoiling the surroundings with grit blasting.

Non-toxic, nano-engineered coatings are showing significant potential for reducing resistance of the hull both from their super-hydro-phobic (water-repelling) properties and an ability to reduce bio-fouling.

Other innovations have similar resistance-reducing properties. These include technologies such as riblets, surface polishing, or polymer injection. Surfaces can also be designed to be oleo-philic, whereby the coated surface soaks up oil, causing it to act as a natural oil-water separator. There are also processes that enable delivery of many different types of phobic coatings to repel low surface tension liquids, such as oil and alcohols.

Some of the items on this list sound like science fiction but be assured - they are real and they are not far away. Coatings are no longer an afterthought, or a cost line item. Instead, through research, development and application experience, with guidance and input from ABS professionals, they are a value-add for improved performance, simpler maintenance, increased energy efficiency and enhanced environmental protection.

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Pump supplied to reduce corrosion on tankers

Hughes Pumps has recently supplied a specially designed and manufactured pumping system to MOL Tankship Management (Europe).

The pump will be used for repair and maintenance on two of the company's methanol tankers, while they are at sea.

To reduce corrosion and extend the working life of their fleet, MOL identified a need for ultra high pressure (UHP) water jetting

equipment to remove loose scale and coatings from ballast tanks and deck areas prior to recoating.

Drawing on expertise and experience gained in the supply of UHP surface preparation equipment to the marine and offshore industries, Hughes developed a system solution that overcame several challenges, such as designing an hydraulic motor driven pump-set that could utilise the ships own hydraulic supply to power the UHP pump and

would fit within the 1.2 m wide flying bridge that runs the length of the deck.

The result, a purpose built, hydraulically driven, compact ultrabar 24 pump-set with a performance of 23lpm at 2750 bar (40,000 psi), uses a four man riding crew, supplied by MOL, to carry out water jetting on the company's methanol tanker fleet, during voyages between the Caribbean, US Gulf and Europe. Fresh water is used in the jetting process, followed by a wash-down, de-humidifying and repainting.

Hughes told *TANKEROperator* that the pump was configured to suit MOL's hydraulic power capacity for use on the two vessels, as one pump is moved between the two vessels. The unit has the ability to compensate for differences between the two vessels, the company claimed.

It was not trialled beforehand as the build specification was too bespoke/specialist to be built for a test. However, Hughes demonstrated the same pump performance to MOL at its factory utilising a more conventional diesel engine driven pumpset, the company explained.

There is no problem with residue, as with such a low water usage, the UHP process heats the water leading to most of it evaporating leaving dry paint/rust particles for easy collection/bagging for disposal onshore, Hughes said.

Ultra high pressure (UHP) water jetting, also known as water cutting, or hydro-blasting, has long been the preferred method of surface preparation compared to grit blasting and is a process promoted by all paint manufacturers, as the most powerful and environmentally sensitive cleaning technique available to industry.

The Hughes Pumps range of UHP surface preparation equipment is available in electric motor, or diesel engine driven, suitable for use in safe, or hazardous areas.

TO



A Hughes' pumping system working on deck of a tanker.

API appoints global sales head

Danish-based API Marine – designer and manufacturer of integrated automation systems and sensors for marine and industrial applications – has expanded its sales team to meet growing demand.

Effective 1st January 2012, Allan Lydersen has joined API Marine to assume

responsibility of API Marine's global sales activities.

API Marine partner & managing director, Sven Egelund Rasmussen said: "I am pleased to announce that Allan joins API Marine. I have had the pleasure of working with Allan in the past on global business development within the marine electronics business, achieving notable results. I am confident that

this expansion of the sales force at API Marine further strengthens API Marine's position in the market."

With three large contracts signed and a number of orders placed, 2011 has proven to be a fruitful year for API Marine, yielding over 40 complete integrated automation system orders thus far for sea/river tankers, scheduled for delivery through to the end of 2013.

TO

Hamworthy secures further ethylene carrier work in China

Hamworthy Oil & Gas Systems has secured more contracts for the delivery of complete cargo handling systems to two liquid ethylene gas (LEG) carriers to be built at Sinopacific Offshore & Engineering (SOE) in Nantong.

The two 12,000 cu m capacity, 139 m long semi-pressurised and refrigerated LEG carriers, are part of an ongoing project for the construction of six ships ordered by Luxembourg-based Jaccar Holdings/Eitzen Ethylene Carriers.

The owner is to operate under a new name, Evergas and the new ships will be built in accordance with Sinopacific's 'Tiger' design. Delivery is scheduled from this year onwards.

This contract follows systems for the first six LEG carriers in the 'Tiger' series Hamworthy signed with Sinopacific towards the end of 2010. Scope of delivery for the newbuildings again covers engineering and the supply of cargo handling systems, including reliquefaction plant and Hamworthy Svanehøj deepwell cargo pumps.



A model of the 'Tiger' class LEGs.

The on board cargo handling systems are designed for high flexibility cargoes, as the vessels have to be capable of transporting LEG at temperatures down to minus 104 deg C.

"China is a leading country in the new contract market and, increasingly, it is investing more in vessels for gas transportation," said Stein Thoresen, Hamworthy Oil & Gas Systems, LPG business unit director. "We see this innovative project as a very significant reference for Hamworthy in the gas ship market in China."

The three tank arrangement 'Tiger' series are configured to achieve enhanced intact and damage stability performance, easy cargo loading operations and excellent floating conditions for navigation.

Each of the vessels meet exacting hull efficiency and reduced fuel consumption requirements, are conferred with 'Green Passport' notation by class and comply with provisions set out in the Maritime Labour Convention 2006 for crew accommodation, which is due to enter into force during, or after 2012.

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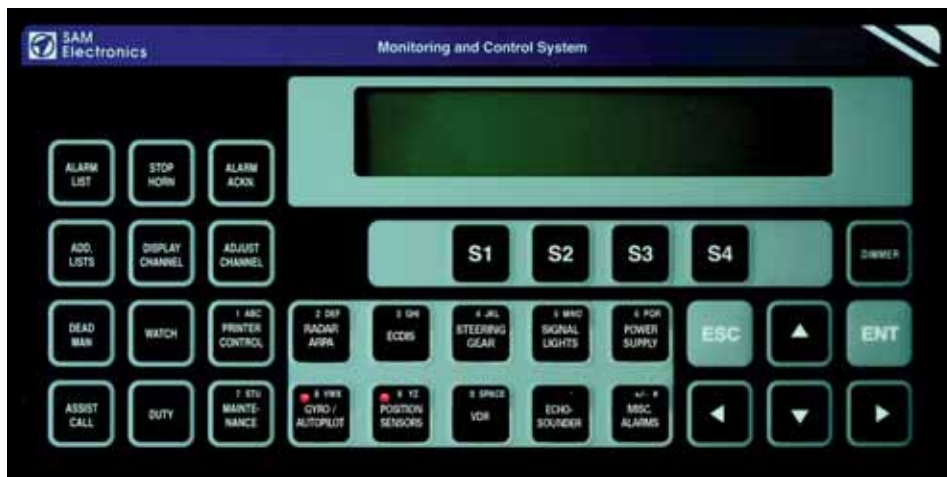
BNWAS from SAM Electronics

L-3 subsidiary SAM Electronics, has launched a series of Bridge Navigational Watch Alarm Systems (BNWAS) designed for simple installation on board both new and existing vessels of any type or size.

They have been designed and manufactured in accordance with IMO carriage regulations, due to become effective from this July.

Type-approved by major international classification societies, such as ABS, GL, ClassNK and RINA, the new alarm and monitoring series ensures enhanced safe vessel operation via continuous surveillance of bridge activities, including detecting any operator malfunctions that could lead to accidents, SAM claimed.

Alerts can be automatically relayed to the ship's Master and other watch personnel by way of an alarm system and all the backup call functions, timer settings are controlled and handled from the bridge console's centralised alarm panel.



SAM Electronics BNWAS is designed to be fitted on vessels of all types and sizes.

Basic features of SAM's BNWAS include main alarm panel with dimming, ship accommodation alarm panels, an assist call facility, motion sensors, reset push buttons, activation switch, reset timer inputs from radar and force activation, via steering gear and/or Trackpilot supported by

flexible interfaces.

Systems also meet latest IEC 6216 performance standards and are optionally available, either as stand-alone units, or for integration as part of the NACOS Platinum range of all-purpose integrated bridge management assemblies.

TO

New low speed engines for medium size vessels

Last year, Wärtsilä won the first orders for the W-X35 and W-X40 low speed diesel engines.

The new engines cover a power range of between 4,000 kW to 9,000 kW and are claimed to be ideal for Handysize and Handymax product tankers of between 10,000 dwt and 55,000 dwt, plus other vessel types.

One of the first W-X35 engines will be installed in an asphalt carrier.

In this power range, the W-X35 and W-X40 have several combined benefits and advantages.

For example, Wärtsilä said that it had

selected a footprint, which included key parameters, such as the engines' crankshaft centre line, which ensure that the W-X35 and W-X40 can be fitted into standard vessels.

Furthermore, the engines consume substantially less ancillary power than other available solutions on the market, the company said.

Wärtsilä said that it ensured the high reliability of the engine by simplistic manufacturing allowing a simple quality assurance. Extensive testing was undertaken of all key engine components, such as fuel injection equipment, cylinder lubricating system, exhaust valve drive and UNIC engine control system, during the development phase.

Furthermore, the experience gained from the entire portfolio of Wärtsilä electronically controlled low speed engines and especially the latest RT-flex82C and RT-flex82T type engines before their release onto the market, have been incorporated, ensuring a five year interval between overhauls.

Claimed to be unique for this segment, Wärtsilä has combined the advantages of variable fuel injection and exhaust valve timing in the W-X35 and W-X40 engines. With the efficient scavenging and the different tuning opportunities, such as standard, delta and low-load tuning, substantial savings in fuel cost can be achieved.

Depending on the load profile of the engine, this amounts to around 3%, or \$70,000 savings per year for a W6X35 type. By adapting the pulse lubricating system (PLS) for the small-bore engines, a guide feed rate of 0.7g/kWh for the cylinder lubricating system is possible.

Further advantages and benefits claimed by the manufacturer, include direct driven servo oil and fuel pump, which saves around 40% of specific ancillary power. In addition, Wärtsilä's common rail technology allows the engine to run down steadily to about 20 rev/min for the W-X35, which is claimed to be ideal for manoeuvring with a fixed pitch propeller.

The engines are specified for constant speed operation, so they support the fitting of controllable pitch propellers and connected generators (power take-off).

The first Wärtsilä X35 low-speed engines was successfully started at the Yuchai Marine Power (YCMP) plant in China. A Wärtsilä licensee since October 2009, YCMP is a part of the Yuchai Machinery Group.

YCMP's is located in Zhuhai on the southern estuary of the Zhujiang Delta in Guangdong Province. The Zhujiang Delta is the third largest shipbuilding area in China and is an area targeted by the Chinese government for further shipbuilding development.

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