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Fueling TOTE
Chiarello's Grand Plan

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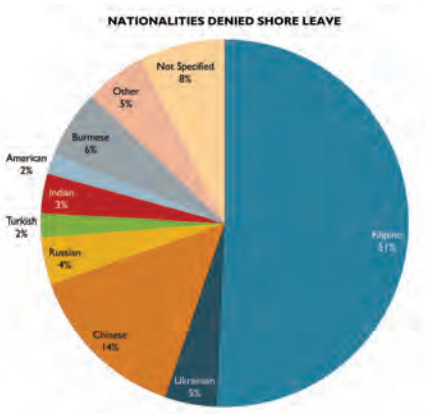

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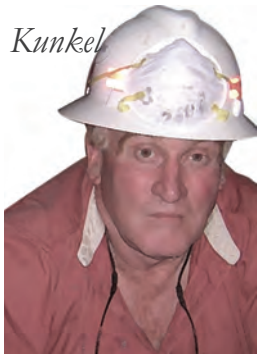
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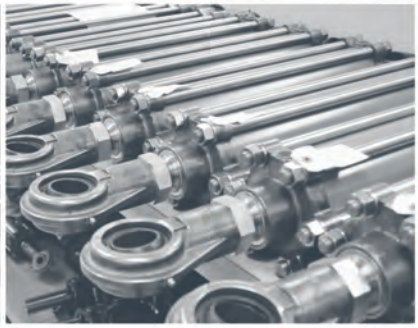

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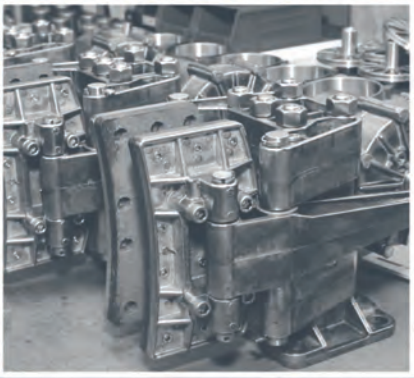

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MARX

Situations, Opportunities & Challenges

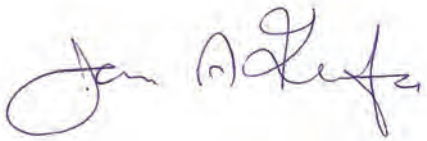
Take a brief respite from that stack of paper in your in-box and ponder the three biggest problems facing your far flung shipping operation in the coming month and years. What would those be? I completed that exercise only a few months ago in anticipation of this edition of *MarPro*. From where I sit, these headaches include the management of your fuel (bunkers) and power footprint, maritime security, and yes, human resources. The latter variable encompasses both the new Maritime Labour Convention (MLC 2006) and mariner recruitment; both arguably one and the same issue. All of that said; remember that there are no problems – only situations, opportunities and challenges.

For shipowners and operators, the above mentioned issues amount to a huge, collective *challenge*. For vendors and OEM's – partners, if you will – who will eventually be part of the solution, those challenges represent *opportunities*. And, for the regulators and flag states tasked with ensuring compliance on a broad range of statutory requirements, that *situation* is already here. The only question left to answer is whether all stakeholders are ready for what comes next. We think that they are. Here's why:

Power and fuel management go hand-in-hand with emissions control. There is no separating the two any longer. That's because it costs money to comply with complex pollution controls; money that many sectors of shipping just don't have. And it is here that the old adage of "thinking globally while acting locally" comes into play. In this issue of *MarPro* – in no less than four entries – we explore the logistics, finance, regional nuances and ultimately the measurement of performance that is involved with the ultimate decision of what to burn, why, where and how that is made possible. As you turn the pages to follow, you'll discover that not everyone is on the same page when it comes to that thorny question.

Leaving the heat of the stack emissions kitchen, we step quickly into the frying pan. Sure, MLC is here and you've already had your first set of audits. Approaching fast with a steady bearing and decreasing range is the global dragnet represented by the Tokyo and Paris MOU and the U.S. Coast Guard, who will collectively zero in on verification of watchkeepers' hours of rest, the vessel's Minimum Safe Manning Document (MSMD) and records of rest. Tens of thousands of inspections could be carried out. You probably won't be as ready as you think you are. Within these pages, you'll discover why. Along the way, you can also decode what makes the MLC rules tick, and what to do about it.

That leaves only security to consider. Too many choices, perhaps. Nevertheless, the broad range of solutions on the market today makes the task of mitigating the risks facing our ports and vessels that much easier. Here, as with our other challenges, there are partners who can get you to the Promised Land. The challenges are enormous. The situation is clear. And, there have never been more opportunities.



Joseph Keefe, Editor | **keefe@marinelink.com**

THE LIST People & Companies in This Edition

Insights

The Economics of Slowing Down Ships

MarPro crunches the numbers on vessel steaming economics. What should you do? It all depends, says Barry Parker ...

By Barry Parker

The topics of fuel efficiency, slow steaming and monetary savings have received tremendous attention from all sectors of the maritime business over the past few years. For operators of vessels burning heavy or intermediate fuels, the reasons are well known. High fuel prices (compared to historical levels) in the period from 2010 onward, and the prospects for even higher prices going forward as sulfur is squeezed out of fuels, have focused the eyes of C-level executives on fuel.

Starting in 2015, limits on sulfur emissions in Emissions Control Areas (ECAs) – which include the coasts of North America and Northern Europe – will drop to 0.1% from the present 1.0%. Down the road, in 2020, limits on sulfur emissions throughout the world are slated to drop to 0.5%, from the present 3.5%. Concern remains about the availability of marine distillates, where some 30 million tonnes are consumed annually by deepsea shipping.

Analysts at DNV-GL, in its Shipping 2020 report, suggest that annual demand six years out could exceed 200 million tonnes. Such predictions are behind the views of many commentators suggesting that the 0.5% deadline will be moved to 2025. The economics of fuel saving strategies, at a micro level – specifically, the trade-offs between cost savings and reduced revenues – have not always made it "above the fold" in numerous articles. Likewise, there's been little synthesis of micro views with possible developments at the macro-economic level, when the wave of recent vessel orders hits the market and what happens when ships slow down.

The economic analysis here looks at impacts in the product tanker sector with notional voyages in the North Atlantic. Though a preponderance of product tanker ordering last year brought the whole 'eco-ship' debate to the fore, the observations apply to other market sectors in shipping. In theory, eco-ships can earn premiums because they cost less to operate. Conversely, hires for less efficient ships are discounted because of their higher costs.

MICRO

At the vessel level, fuel efficient ships are just that – they burn fewer tons of fuel to achieve the same speed as a less efficient vessel. The trade-off is that it takes some capital costs to achieve fuel efficiency. Thus, when running numbers on voyage economics, the lower fuel component is (at least partially) offset by a higher capital allocation. A report from broker Poten & Partners offered the following parameters for speed and consumption of MR tankers – a 50,000 deadweight carrier of refined petroleum products. (see table below)

The largest builders of such ECO vessels in recent years have been Hyundai Mipo and SPP, both in South Korea. A leading U.S. tanker builder, the Aker Philadelphia yard, is deploying a variation of the Hyundai Mipo design. It's noteworthy that the product tankers built at Philadelphia, and similar vessels (using a Daewoo design) coming out of the General Dynamics Nassco yard, in San Diego, are described as "LNG-ready" – meaning that a switchover to LNG fuel could occur later on.

For our notional voyage, we will assume four different market scenarios: (1.) strong all around, (2.) weak all around, (3.) strong westbound/weak eastbound and (4.) strong eastbound/weak westbound. Many voyages in the tanker trades are booked on a spot basis, where freight rates are expressed in $/ton. On the other hand, shipowners prefer to see results on

	Eco MR		Standard MR	
Speed (KT)	Laden: MT/Day	Ballast: MT/Day	Laden: MT/Day	Ballast:MT/Day
11.0	11.3	10.2		
11.5	12.8	11.2		
12.0	14.3	12.7	19.5	18
12.5	15.9	14.2	22	19.5
13.0	17.7	15.9	23.5	22.5
13.5	19.5	17.8	34	
14.0	21.9	19.9		34

Source: Poten & Partners

> At the vessel level, fuel efficient ships are just that – **they burn fewer tons of fuel to achieve the same speed as a less efficient vessel.** The trade-off is that it takes some capital costs to achieve fuel efficiency. Thus, when running numbers on voyage economics, the lower fuel component is (at least partially) offset by a higher capital allocation.

a time charter or $/day basis.

The holy grail for shipping number crunchers is the daily "time charter equivalent", or TCE, which begins with freight rates expressed in $/ton of cargo carried. For analyzing impacts, shipping analysts will then look at a pro-forma voyage, where daily breakevens (the capital cost, and the vessel operating cost) are held constant. It's then possible to look at sensitivities in the $/day net (equivalent to hire that would be earned on a time-charter, hence the name) resulting from changes in vessel freights, vessel speed, fuel prices and fuel consumption, under the four scenarios.

The calculations reveal some obvious findings and some that are not so obvious. In all four scenarios, the eco vessel shows a higher TCE than a conventional vessel. That's intuitive. Less obvious though is the impact of slow steaming. In the strong market scenario (for both the conventional tanker and the eco tanker), the daily TCE actually ***drops*** when the vessel is slowed from 13 knots to 12 knots. By way of explanation, owners do better if they hurry up and get the next cargo. In weak markets, which are the norm, the daily return improves when slowing down, since reducing fuel expense has more impact than garnering marginal revenues that are actually below daily breakeven. In the two middle scenarios, where one trans-Atlantic leg is strong and one weak, the results are muddy, at best, with the conventional tanker seeing a very slight improvement in TCE from being slowed down.

There are two important realities that emerge from this type of analysis. ***First,*** in a very strong market, even the most fuel thirsty vessels will exceed their breakevens, including when running at maximum design speeds (in order to capture all those freight dollars). Charterers will pay for anything that floats, figuratively speaking, and owners of fuel guzzlers may slap down the discounts sought by charterers. In the strong market and the two directional strength examples here, TCE cash flow is positive – above the daily breakeven needed. There is a real return to equity, even for the non eco vessel.

STRONG WEST- US GASOLINE IMPORTS: Cargo demand into Northeastern United States and Mid-Atlantic

				SPEED-L	CONS.-L	SPEED-B	CONS.-B	
West	$	25.00	per ton					
East	$	15.00	per ton	13	23.5	13	22.5	CONVENTIONAL
TCE	$	15,265.40						
West	$	25.00	per ton					
East	$	15.00	per ton	12	19.5	12	18	CONVENTIONAL-SLOW
TCE	$	15,522.27						
West	$	25.00	per ton					
East	$	15.00	per ton	13	17.7	13	15.9	ECO TANKER
TCE	$	18,285.07						
West	$	25.00	per ton					
East	$	15.00	per ton	12	14.3	12	12.7	ECO TANKER- SLOW
TCE	$	18,214.20						

STRONG EAST- US PRODUCT EXPORTS: Increased refinery runs in Texas and high European diesel demand

				SPEED-L	CONS.-L	SPEED-B	CONS.-B	
West	$	12.00	per ton					
East	$	30.00	per ton	13	23.5	13	22.5	CONVENTIONAL
TCE	$	17,306.44						
West	$	12.00	per ton					
East	$	30.00	per ton	12	19.5	12	18	CONVENTIONAL-SLOW
TCE	$	17,438.73						
West	$	12.00	per ton					
East	$	30.00	per ton	13	17.7	13	15.9	ECO TANKER
TCE	$	20,326.11						
West	$	12.00	per ton					
East	$	30.00	per ton	12	14.3	12	12.7	ECO TANKER- SLOW
TCE	$	20,130.65						

STRONG MARKET SCENARIO: Very strong rates in the Atlantic for MR tankers

				SPEED-L	CONS.-L	SPEED-B	CONS.-B	
West	$	30.00	per ton					
East	$	35.00	per ton	13	23.5	13	22.5	CONVENTIONAL
TCE	$	35,481.88						
West	$	30.00	per ton					
East	$	35.00	per ton	12	19.5	12	18	CONVENTIONAL-SLOW
TCE	$	34,504.83						
West	$	30.00	per ton					
East	$	35.00	per ton	13	17.7	13	15.9	ECO TANKER
TCE	$	38,501.55						
West	$	30.00	per ton					
East	$	35.00	per ton	12	14.3	12	12.7	ECO TANKER- SLOW
TCE	$	37,196.76						

WEAK MARKET SCENARIO: Weak rate environment for MR tankers

				SPEED-L	CONS.-L	SPEED-B	CONS.-B	
West	$	12.00	per ton					
East	$	15.00	per ton	13	23.5	13	22.5	CONVENTIONAL
TCE	$	5,081.69						
West	$	12.00	per ton					
East	$	15.00	per ton	12	19.5	12	18	CONVENTIONAL-SLOW
TCE	$	5,960.12						
West	$	12.00	per ton					
East	$	15.00	per ton	13	17.7	13	15.9	ECO TANKER
TCE	$	8,101.36						
West	$	12.00	per ton					
East	$	15.00	per ton	12	14.3	12	12.7	ECO TANKER- SLOW
TCE	$	8,652.04						

For the analysis, we can run the vessels in the North Atlantic on a triangulated voyage, laden from Rotterdam to New York (in real life, a 3,300 mile voyage with gasoline), in ballast from New York down to Houston (2,000 miles), and then laden (in real life, with middle distillates) 5,100 miles eastbound to Amsterdam, and then 80 miles back to Rotterdam. In mid-July, rates per tonne were $12.35/tonne on the Rotterdam/New York run and $26.51/tonne on the Houston/ Amsterdam voyage. Port costs in the calculations are $50,000 in Rotterdam, $30,000 in New York, $50,000 in Houston and $40,000 in Amsterdam.

TIMING IS EVERYTHING

There are numerous moving parts in TCE calculations, which is why it's necessary to freeze as many variables as possible. Consider that newbuild prices for this type of vessel had surged up as high as $53 million in 2007 and 2008 (with a wave of deliveries two years later), so capital costs on a specific vessel may be much higher than a ship purchased after the market corrected. Making money in shipping is all about timing – the capital costs on the eco tankers in the examples shown here are also highly variable; in 2013 – newbuild pricing ranged from around $32 million to above $37 million. So, a well timed purchase, within the eco tanker realm, could save roughly $1,000/ day (depending on financing assumptions) in capital costs – lowering the daily breakeven dollar per dollar. In the strong market scenario, such differences are rounding errors – but in the weak market scenario, every dollar matters.

The converse, ***our second fact of freight life***, and the more frequently observed, is that in weak markets (which are the case in the proverbial "nine out of every 10 years"), vessels with a clear cost advantage will be cash-positive, even as they chase rates lower and lower. If there is a perception that hires (the $/day accruing to owners after deducting voyage expenses) will remain below breakevens, then vessels will exit the market (they will be scrapped).

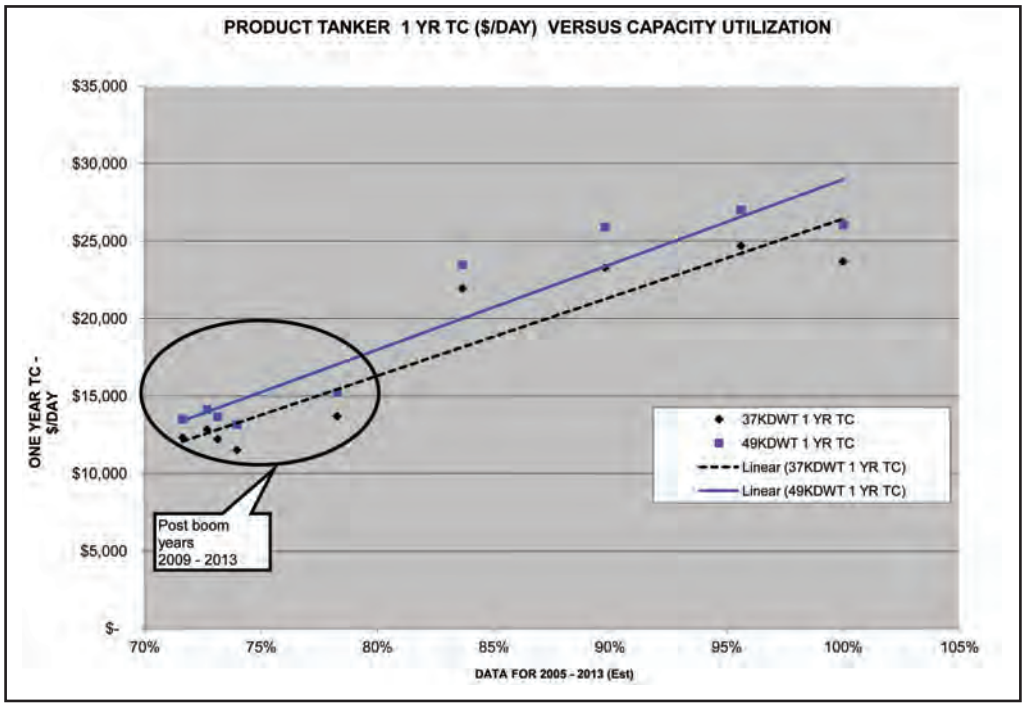
Assume daily breakevens, including the capital and operating cost components, of around $13,000/day for a newly delivered eco-tanker operating in the trade, ordered for a price of approximately $35 million. For comparison, we can also look at an existing non eco-tanker, which could have a lower capital component (representing a five year old vessel purchased in the second hand market, for a price of around $28 million). However, its operating cost might be $600 to $1,200/ day higher – as some proponents of eco tankers have claimed.

Tankers trading in the North American ECA will burn more expensive marine diesel oil (priced at around $1,000/ton) to comply with the maximum allowable sulfur content in fuel of 1.0%. Therefore, the calculations use a differential to reflect the additional cost, on the order of $300 to $400/ tonne of fuel, when inside the North American ECA.

MACRO

Shipping markets tend towards over-capacity; hence the notion of one good year each decade. Supply and demand models for shipping focus on "capacity utilization" to ascertain whether a particular sector will tighten up. For product tankers, data from Clarksons has been used to develop a highly simplified model of supply/demand interaction, making an arbitrary assumption that the boom market of 2005 represented 100% utilization. The graph shows the relationships between time charter hires (one year period), on the vertical axis, and utilization levels, on the horizontal axis. By this measure, when utilization exceeds 80%, we begin to see an upside breakout.

Photo: NASSCO



LNG FUELING: BRAVE NEW WORLD

The class society DNV-GL has been at the forefront of 'everything LNG' and this includes the beginnings of voyage economics for LNG fueling (the micro side) and the approximations for capital investment in LNG propulsion referred to in the article. In DNV-GL's article, the calculation of a trans-Atlantic round voyage contemplates bunkering in U.S. ports (where LNG is attractively priced) at between $12/million BTU (equating to $600/tonne) and $16/million BTU (equating to $900/tonne). They suggest that a 3,000 cubic meter tank would be required if all the fueling is to be done in the U.S. Mr. Alexandros Chiotopoulos, Consultant in the class society's Advisory division, also told MarPro, "The energy content of HFO is 40,500 MJ/tonne (a typical value used) and the energy content of LNG is 49,320 MJ/tonne. For example, a daily consumption of 22 t/day HFO is equal to 18.1 t/day of LNG." The DNV-GL team now sees commercial issues (not technical obstacles) as the bigger set of problems to be overcome as they assist clients implementing LNG fueling, adding, "Prices well below HFO levels are feasible with current US gas prices, but that price is still negotiated on a case by case basis depending largely on bunker volumes, location and other fuel alternatives."

The models require a mix of art and science; both movements of "products" and the actual annual cargo deliverability of vessels are imprecise. Nevertheless, the first cut through the model, factoring in a conservative 2% growth in cargo flows, and a fleet expansion reflecting likely vessel deliveries for 2014 and some estimates of scrapping, shows the sector's utilization to be mired between 70% and 75%. In other words, aside from temporary spurts (a feature of any of the shipping sectors), with a fleet of roughly 132 million dwt and nearly 1 billion deep-sea tonnes of "products" continuing to move annually in hauls averaging around 3,000 miles, there is no significant upward pressure, under normal market circumstances. Healthy demand growth over the next few years, and increasing lengths of voyages (as has been predicted for a number of years), would begin to change the equation.

Vessel supply, starting with the existing fleet at one point in time, reflects a forward delivery schedule, known with some certainty, tempered by a highly uncertain "deletion" schedule. Removal of vessels from supply typically occurs through scrapping. However, slow steaming also lowers the effective supply if it becomes a permanent feature of the marketplace – whether because of reduced design speeds, or as an ongoing reaction to high fuel prices. In econometric terms, it's incorrect to look simply at deadweight tonnage, without adjusting it for reduced speeds, if the deadweight is ***permanently*** reduced.

However, the micro analysis demonstrates that shipowners have an incentive to speed up, in response to a stronger market. In contrast, the lower design speed of the eco tankers, fleet-wide, contributes to a true reduction in carrying capacity. With deliveries of eco tankers only beginning in recent years, this effective reduction in deadweight is small, in comparison to the overall product tanker fleet. Hence, there is no significant ***permanent*** reduction in deadweight just yet.

Another variable will begin creeping into discussions of vessel supply. The pace of adaptation for the new fueling solution coming on the scene (LNG), will have an important impact on whether "uneconomical" vessels are retrofitted for better fuel consumption, or simply removed from the fleet. DNV-GL, in its Tanker Update (#1) for 2014, estimates the incremental additional cost of a newbuild dual fueled tanker (meaning that it can burn both LNG and conventional IFO), to be slightly less than $6 million. The authors, Martin Chr. Wold and Kjersti Aalbu, point out that such a vessel "… will be an attractive choice for trades with ECA exposure." The authors, part of the "DNV-GL LNG Ready" service, also note that: *"The first orders are likely not far away."* As the industry slides down the learning curve, this price could fall in coming years.

Another Kind of Change in Speed

Shipping people of a certain age may be so familiar with the types of analysis shown in this article that they can perform them on the "back of an envelope"- with accuracy rivaling that of a good Excel spreadsheet. But economics will be changing, as new technologies impact maritime propulsion. Already, engine manufacturers, shipowners and their advisors are developing algorithms for TCE's where LNG (and even methanol), rather than intermediate or heavy fuel, provides power. Technologists promoting wind power have developed calculations that quantify cost savings from investments in sails or rotors, working back, in turn, to TCEs. In the years ahead, the old envelope won't be suitable, as calculations consider impacts of new fuels and new technologies.

The Author

Barry Parker, bdp1 Consulting Ltd provides strategic and tactical support, including analytics and communications, to businesses across the maritime spectrum. The company can be found online at: www.conconnect.com

Insights

Maritime and Offshore M&A Evolution

By Harry Ward

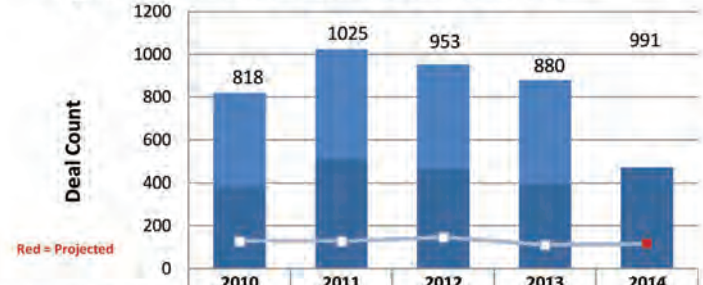
The broad market for maritime and offshore mergers and acquisitions has been shaped by turbulent macroeconomic conditions and shifting international business trends in recent years. Analysis of deal data from the past five years enables us to examine how the global recession and subsequent uneven recovery have been reflected in these large and vital worldwide markets segments.

Worldwide M&A Story Since 2010

Across the globe, maritime and offshore mergers and acquisitions have recovered from the depths of the recession. In 2009, deal activity fell precipitously with a worldwide deal count of just 656 for the entire year. Asset-heavy industries were plagued by suppressed demand and restricted access to capital. This low point was marked in the US by a number of distressed deals and defaults, including the memorable Chapter 11 filing by U.S. Shipping Partners L.P. **Figure 1** shows both worldwide and United States deal counts from 2010 through the first half of 2014. From the low of 2009, movement in the market recovered quickly, with 818 deals completed during the following calendar year.

By 2011, the energy markets experienced a wave of activity as optimism grew and oil prices climbed steadily through the spring. A number of high-profile deals were announced, among them, Ensco's (NYSE:ESV) acquisition of Pride International in a transaction valued at more than $9 billion. The same year also brought Transocean's acquisition of Aker Drilling for $3.4 billion and the acquisition of K-SEA by Kirby Corp (NYSE:KEX) for $618 million. K-SEA was just one of a handful of Kirby deals in 2011, and the inland/coastal liquid transport giant continued its buying spree in 2012 with the $298 million acquisition of Penn Maritime and the purchase of another tug and barge operator, Allied Transportation, for $116 million.

Figure 1: Maritime & Offshore M&A Deals



	2010	2011	2012	2013	2014
Worldwide Jul-Dec	435	518	488	482	520
Worldwide Jan-Jun	383	507	465	398	471
US Full Year	128	128	147	110	116

After the surge of deal activity in 2011, the markets fell into a two-year decline, as oil prices fell and anticipated shipping demand did not materialize quite as expected. Global deal counts as shown in **Figure 1** receded by more than 7% in each of 2012 and 2013 and total reported deal dollar values mirrored those pullbacks. One anomaly in the data is the 15% increase in US deals during this period. This variance was the result of expiring Bush-era capital gains tax rates at the end of 2012. American M&A markets across most industry segments experienced this same short-term bump, followed by a rapid fall in deal activity in early 2013.

Though this phenomenon resulted in lower activity in early 2013, the second half of the year did produce a few deals of interest, including the $460 million acquisition of Abdon Callais Offshore by Harvey Gulf International Marine, and Genesis Marine's purchase of Hornbeck Offshore Transportation's (NYSE:HOS) downstream tug and barge assets for $230 million. A notable trend in our chart data is an uncommonly large jump in deal activity from the first half of the year to the second, as the market recovered from the tax-driven market irregularity.

Global View of 2014

Momentum from late 2013 has continued unabated this year, with strong deal flow in the first half of the calendar year and a projected strong finish both at home and abroad, based on trends and averages in previous years. Figure 2 provides an interesting framework through which to view marine and offshore M&A transactions on an international level.

The table in **Figure 2** exhibits the number of buyers and sellers from each world region in the 432 transactions where such data was reported in the first half of this year. Cross-referencing the data, a number of highlights emerge about the nature of global M&A transactions in our chosen market. First, it is clear that two regions dominate deal-making in 2014: Europe and Asia/Pacific. Furthermore, the numbers show that the bulk of all deals are completed between buyers and sellers that are both in the same region. Leading this trend are companies in the Asia/Pacific region, where 142 deals were closed with both buyer and seller from that region. The same trend holds true in each of our global zones, though the total deal counts are much lower across the board for areas outside of Asia and Europe.

The data in this table also enable one to identify which regions are net sellers and which are net buyers of companies in the industry. For example, we see that companies in the Asia/

Figure 2: Worldwide Deals Jan-Jun 2014

BUYER \ SELLER	Africa / Middle East	Asia / Pacific	Europe	Latin Am/Caribbean	US & Canada	Total
Africa / Middle East	9	1	3	1	0	14
Asia / Pacific	4	142	16	6	5	173
Europe	6	5	133	6	3	153
Latin Am/Caribbean	0	2	2	7	2	13
US & Canada	1	4	21	1	52	79
Grand Total	20	154	175	21	62	432

Only Deals with Buyer and Seller Reported

Pacific region were on the "buy-side" in 173 transactions, but on the "sell-side" in only 154 cases. Europe almost perfectly balanced this incongruity in Asia/Pacific, with 153 buys to 175 sells. We famously see this same trend in government bond purchases, where China reaches out to invest surplus funds in foreign assets with steady performance. However, it is interesting to note that though China was present in a large number of the Asia/Pacific deals, there were significant players in sizeable transactions from diverse geographies including Malaysia, Qatar, Indonesia and The Philippines.

Recent Transactions

There have been several interesting technology-focused deals this year in the maritime and offshore segments. In June, TE Connectivity (NYSE:TEL) completed its acquisition of privately-held SEACON, a provider of systems and connector technology for the military marine and subsea sectors, including ROV's, AUV's, oil and gas, and oceanographic applications. Satellite communications systems provider KVH (NASDAQ:KVHI) made an interesting acquisition in London-based Videotel, a producer of training films and e-Learning services for the commercial maritime industry. Videotel products enable KVH to continue to provide valuable content to their critical maritime niche. Finally, Teledyne Technologies (NYSE:TDY) confirmed its focus on the autonomous marine vehicle market by entering a strategic partnership with an investment in San Diego-based Ocean Aero. Ocean Aero is designing a unique product known as the Submaran, a vehicle capable of operating in both surface and sub-surface environments.

Such marine technology deals are notable and interesting, but the bulk of investment dollars continue to flow to the oil and gas sector. Nine of the top 10 deals so far in 2014 are foreign offshore asset deals. Both in the Americas and abroad, the steady growth of global energy demand in tandem with ever-improving production technologies should continue to drive healthy M&A activity for the foreseeable future.

Insights

Nobody Rides for Free ...

Emissions-compliant fuel and strategies: the decision may ultimately be out of your hands.

By Robert Kunkel

The International Maritime Organization (IMO) and Environmental Protection Agency (EPA) emission regulations requiring a reduction in sulfur within the Emission Control Areas may bring more to your operation than cleaner air. That said; don't expect to breathe easier after January 1, 2015. That's because you will have a multitude of decisions to make within your fleet to comply with the regulations and they go well beyond a choice of what fuel to burn. Where and how you trade will affect your technical path forward. If that sounds complicated, then you will also find yourself in good company as you move forward with 'a bone in your teeth' (or maybe not).

Looking Ahead: act locally, think globally

The impending process will entail analysis of the future cost of energy within the United States or for that matter globally. It will affect the maintenance of your engines, your bunker logistics, and the speed at which your fleet operates. All of which will affect the profitability of your company. The way we see it, the decision-makers will be the energy producers, refiners and traders. Your future fuel goes well beyond transportation.

LNG has been in the lead as the "future fuel" needed to meet the new emissions requirements. Approximately 50 vessels have been delivered and another 55 to 60 are under construction with the intent to use natural gas as their primary propulsion fuel. But many of those vessels and future deliveries are actually vessels built to trade and carry LNG making the propulsion decision much easier than the surrounding market sectors.

The industry continues to debate the delay of the LNG infrastructure needed to support the propulsion change to gas. Trading LNG as a cargo was originally contracted to support the import of LNG into the United States. The 2013/2014 Far East ordering boom is now based upon the United States' ability to export LNG after 2016. That change has affected natural gas pricing worldwide along with jeopardizing gas field development in Australia and east Africa. The U.S. influence will continue to affect seaborne transportation of LNG, with most predictions showing a move away from historic long term charters and into short term tramp trading. Still others believe that development will help to build the required gas infrastructure needed for the fuel change. Others believe we got it wrong the first time and are more than capable of getting it wrong again as more cost effective means of capturing the gas at the well head are developed.

Those economic concerns have delayed the gas propulsion application and the build out of the bunkering infrastructure required in both ECA locations – Europe and the United States. Unfortunately we are still dealing with the proverbial "chicken and the egg" and at this point it may still be years before the questions become answers. We would hope not as the continued delay in determining a path forward affects many of us in the industry who spend our days on the deck plates.

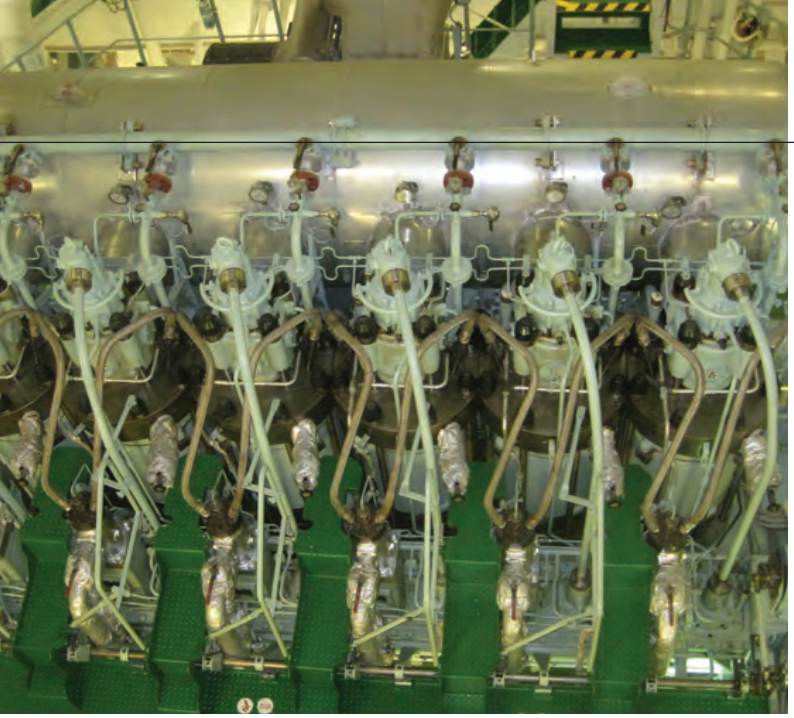
Methanol in the Mix

The next round of discussion brings "liquid gas" or methanol to the table. Clean as natural gas (though containing fewer BTU's), methanol does not contain sulfur, is bio-diversified, can be created from renewable and non-renewable feed stocks such as sugar cane, corn and other agricultural products and is more cost effective than the application of liquefied natural gas. The fuel is widely available and safely transported within an existing infrastructure. For those who would like to wave the "green flag" even higher, the fuel can be produced by recycling CO2 through flue gas emissions or by utilizing "captured" CO2 placed into storage. Plug that into your EEDI or company's greenhouse gas targets and the fuel looks like it answers all of the questions raised.

With minor modification to existing bunker tanks and underdeck storage, methanol or "liquid gas" does not have the refrigeration requirements associated with the use of LNG. Ship modifications and engine modifications needed to use the fuel are much less restrictive and far less expensive. Most of the major engine manufacturers are moving forward with test bed engines to look at this liquid gas change. MAN B&W entered the test bed in July of 2013 with the development of the ME-LGI dual fuel engine for a sister company of Methanex, the world's largest producer of methanol. Following a similar path to LNG, the engine manufacturer has watched the recent boom in LPG ship construction and targeted this sector as the first available customer to use the fuel. MAN B&W hopes to achieve Tier III compliance with the ME liquid gas engine as testing progresses.

Ask the Right Question

We find the more important detail of the "which fuel to burn?" question to be "should the fuel change occur now?" Many of the major engine manufacturers believe that heavy fuel oil (HFO) will remain as a large segment of the bunker market and LNG will find its niche. The "half pregnant" two



MAN B&W ME engine

Have recent new construction contracts and deliveries in Korea addressed the emissions regulations?

stroke engines preparing for gas are an economically viable option and provide some media attention. However, the full ship designs typically neglect to fully address the most expensive part of the installation – the storage and delivery of the gas.

In smaller engine applications in the ECAs and for international vessels entering the IMO locations for limited periods of time, we have recommended the use of ultra-low sulfur MDO and MGO. Unfortunately, we are discovering that the change to these lighter fuels is not going as smoothly as hoped – or, for that matter, as predicted. The low sulfur fuel options in Europe and the U.S. look to have large amounts of "Cat Fines" and very low viscosity. Allowing the fuel to settle and paying strict attention to purification protocols on board are both now unavoidable and necessary procedures. Many of the latest internal corrosion issues, accelerated wear patterns associated with slow steaming and low load operations are now being tagged as a result of burning low sulfur fuels. Extended ignition delays and the fuel's capability to produce a slow burn also affect engine efficiency and maintenance.

It is also true that the marine industry today is going through the same issues that NASCAR and really, the general automotive business, went through in the 1970's, when the lead was removed from gasoline. It seems that lead and sulfur both do the same thing – provide lubricity and its removal causes big problems in both cases. Beyond this, today's shipboard marine engineers either haven't quite gotten the hang of switching from heavy fuel to distillates when entering ECA's or perhaps the differences between the two fuels is partly to blame. In any event, one need only look to the great state of California where regulations have long mandated the switch to low sulfur distillates when within the state's waters. The number of loss of propulsion (LOP) incidents there is well documented and these 'events' occur often enough to be, as a minimum, alarming.

Who's in the Driver's Seat?

A long hard look at the problems that the maritime industry is collectively facing in making this fuel decision raises the fact that the industry spent many long hours and dollars modifying historic marine diesel engines to burn heavy fuels. The refineries were grateful for the effort as it provided an outlet for them to sell the "remains" produced by cracking and manufacturing light end distillates. A recent development at Exxon/Mobil in Europe may indicate that the major oil companies and refineries are not ready to toss away that business.

Exxon has developed a premium HFO fuel named HDME 50, available in the heart of the European ECA – Amsterdam, Rotterdam and Antwerp. The product is a heavy fuel, with less than .10% sulfur content and capable of meeting the January 1, 2015 IMO emissions requirements. Add this fuel to your quiver and your decision process becomes only a selection of SCR and EGR costs to comply with the next set of NOx reduction requirements.

As a heavy fuel base, this product does not have the viscosity issues associated with the lighter low sulfur distillates, reduces the risk of thermal shock associated with the fuel change from 3.5% sulfur to the .10% ultra-low sulfur fuels, can be utilized in auxiliary engines and boilers and has not received "objection letters" from MAN B&W. We see many operators trading in Europe now moving towards this new product.

The development adds another unanswered question: will Exxon make the fuel available in other bunkering locations? The answer to that question reverts back to the title of this article: *"No One rides for free."* As much as the answers may look to be regulation and/or emissions-based, it always comes back to cost, market and profit. Whether it is Gas, HFO or Distillate, the future of environmentally sustainable propulsion will surely be ultimately determined by the producers of energy.

Insights

Fuel Management & Safety

The 2015 Baltic ECA requirements make the increase in marine casualties inevitable. You can do something about it.


By Captain Jeff Cowan and Claes Jakobsson

The march towards cleaner air in coastal areas is well underway. For example, the International Maritime Organization (IMO) amended the International Convention for the Prevention of Pollution from Ships (MARPOL) designating specific portions of U.S., Canadian and French waters as Emission Control Areas (ECA) in 2010. Since August 2012, the use of fuel oil which does not exceed 1.0% sulfur has been required. Ramping up the pressure even further, the limit drops to 0.1% sulfur in January of 2015. At this point, the use of distillate fuel will mandatory within the ECA.

Separately, the State of California – typically a leader in green initiatives – has for almost five years required ships to use distillate fuel within 24 miles of the coastline. As with many statutes created to improve life at one end of the spectrum, the requirements also come with unintended consequences. A well-documented increase in casualties involving Loss of Propulsion (LOP) has dogged the policy in California. To date, none of these incidents has resulted in a collision, allision or grounding. The myriad reasons for this trend, to one extent or another, all center around the switching from heavy fuel oil to distillates as the vessels enter the Golden State's local 'ECA.'

What operators do in the face of the coming environmental storm can make all the difference. Failing that, the policy of ECA's will certainly clean up the air that we breathe, but at the same time, (possibly) polluting coastal waters. That said; you have options.

A Change of Course

One way to limit the need to burn more expensive distillates is to simply change the routing of the vessels involved. The use of a great circle course until the ship is directly east or west of its destination, and then proceeding straight into that port using a rhumbline is one way to approach the problem. Unfortunately, the cumulative impact of changing routes will add more than one million miles to the collective voyages of these vessels. But while burning less desirable HFO during those longer routes, the net benefit to the bottom line is completely negated.

Unlike ships enroute to the United States, traffic headed

Table 1

Type of LOP	Cause, Symptoms and Implications
"Failure to Start" scenario	Typically stems from difference in British Thermal Units (BTU) of the distillate fuel versus the Heavy Fuel Oil (HFO). The fuel rack requires adjustment to ensure positive starts. Then there is the lack of ability to maintain RPM's at slow engine speeds from BTU issue and Ship Master continuing to order engine starts without engine calibration to offset the lack of BTU's.
Heat incompatibility issue	Heavy Fuel Oil (HFO) to Distillate fuel. To get the HFO to flow through the fuel lines it must be heated to 150°C or 302°F. Distillate fuel flows at ambient temperature and loses its limited viscosity if fuel lines and components are above ambient temp.
Fuel system leakage	"O" rings on engines adapted to run on HFO with the extra heat do not do well with the solvent qualities of distillate fuel, causing extraordinary leakage at times.
Clogged strainers/ fuel filters	The solvent quality of distillate releases asphaltenes from the fuel components which collect in the filters and strainers, causing shutdowns from clogged fuel lines.
Distillate less viscous, lubricity	Close tolerance parts, even if worn, do well with viscosity and lubricity associated with the heated HFO. Distillate has shown to be less tolerant of any wear in the fuel injectors/pumps, causing close tolerance fuel components to hang up; open or closed.

for Northern Europe will have to transit the English Channel. And, unlike arrival into the United States, where ships are typically still in open ocean after the switchover, these Channel and North Sea bound ships will be in close proximity to the European coastlines and considerable numbers of oil rigs. The increased risk is obvious in the event of an LOP situation in this scenario.

Loss of Propulsion – Unintended Consequences

California's Loss of Propulsion (LOP) incidents averaged 23 incidents per year on HFO prior to 2009. Following the enactment regulations requiring distillate fuel use there, that number jumped almost 200 percent. Extrapolating this data to other places where similar regulations will soon take effect provides some chilling conclusions. For example, the potential number of LOP incidents in the Gulf of Mexico could increase by 164 – or one every other day based on current traffic levels. All of this could occur within shouting distance of as many as 4,000 shallow water oil rigs, 800 manned oil rigs and 94 deepwater oil rigs in the Gulf of Mexico.

The UK Maritime & Coastguard Agency counts as many as 35,581 annual transits in the South West Bound Lane in 2013. During the same timeframe, the Northeast Bound Lane experienced similar levels of traffic. Again using a linear comparison to California traffic and LOP's, the real possibility of more than 600 LOP events occurring annually exists, with as many as 200 of those events caused by distillate fuel. Given the North Sea's heavy mix of offshore and gas business, 2015 could bring significant safety issues to the area. As it turns out, neither the U.S. Environmental Protection Agency nor the U.S. Coast Guard conducted risk assessments in conjunction with the evolution of the coming regulations.

There are five different types of loss of propulsion incidents that now occur in California waters. But, beyond the numbers, trends, and (disturbing) possibilities, those operators looking to be impacted by the coming ECA's have the benefit of taking advantage of California's learning curve, by paying strict attention to Table 1.

Scrubbers to the Rescue?

Scrubber technology, for many years, has been touted as the panacea for air emissions. Alternate compliance stack gas scrubbers cost about USD 5 to 10 million to install on existing ships for the main propulsion engine(s) and auxiliary generators. Capable of reducing sulfur oxide (SOX) when the less costly HFO is used, it has also been estimated that fuel consumption can increase using the scrubbers by 1.5% to 5%. That can add up. So can the cost of chemicals such as caustic soda, which can amount to as much as 20 tons per week while in the ECA. Beyond this, the typical operation will also consume fresh water if the system is a closed loop scrubber, ac-

centuating the need for robust evaporators to handle the extra demand for fresh water.

Hazardous effluent must be disposed of by either bringing the material to port or releasing it into ocean. An open loop scrubber system may emit wash water with arsenic, copper, lead, nickel and selenium. Clearly, this option comes with its own issues, something each and every operator has to assess in terms of their own situation, when preparing for stricter air emission standards.

Dial in the Weather

Prevailing weather conditions must be taken into consideration when transiting any ECA. That's because both North Atlantic and North Pacific winter sea states can and do exceed a consistent height of 4 meters with accompanying winds in excess of 25 knots. Engine loads increase in rough seas, which in turn forces the vessel to reduce load on the engine (reducing fuel) and slowing the ship even more. Extra wear will appear on the engine components on vessels which fail to act accordingly, further increasing the likelihood of a LOP. While burning distillate fuel inside an ECA, the potential for an engine casualty increases exponentially.

Alternate Compliance

Currently, ECA regulations related to ECAs list two options for achieving compliance. These include the use of exhaust gas scrubbers (allowing the use of HFO) and secondly, switching to lower sulfur distillates within the ECA. Each method carries its own baggage. Table 2 lays out the implications.

Scrubbers and Distillate Fuels: what is the alternative?

In 2009, the California Air Resources Board regulations related to emissions from ships operating within 24 miles of the California coast came into effect with the intent of protecting the public health and reducing emission related health issues. When data for the original Emission Control Area (ECAs) was compiled, the benchmark used ship "hull" speed. Aboard my former ship, consumption at "hull speed" was around 150 tons of Heavy Fuel Oil (HFO) per day. With the price of fuel increasing so quickly over the last five years, ship operators conducted experiments using the concept "slow speed steaming". What typically was a five ship service was increased to a six ship service, meaning that at the slower speed, six ships provide the same scheduled service as five.

One European ECA study reports findings that suggest that HFO consumption can be reduced by one-third by simply reducing speed by just proceeding 2-3 knots. Beyond this and more to the point, emissions decreased substantially across the board in conjunction with the reduction in speed. In other words, slowing a ship 2-3 knots while using low sulfur heavy fuel oil will cut carbon emissions better than a ship using distillate fuel at full speed. The ship proceeding at slower speed will also have lower NOX emissions than the ship using distillate. Particulate matter emissions will be the same for both described instances. While SOX emissions will be lower for the ship using distillates, the slower ship will have less NOX emissions which offset the SOX emissions and its effect on the environment.

Finally, there is cost. Using low sulfur heavy fuel oil – an ultra low sulfur version is now said to be available in Europe

Total number of LOP incidents per year, 2004 – 2014, in California waters

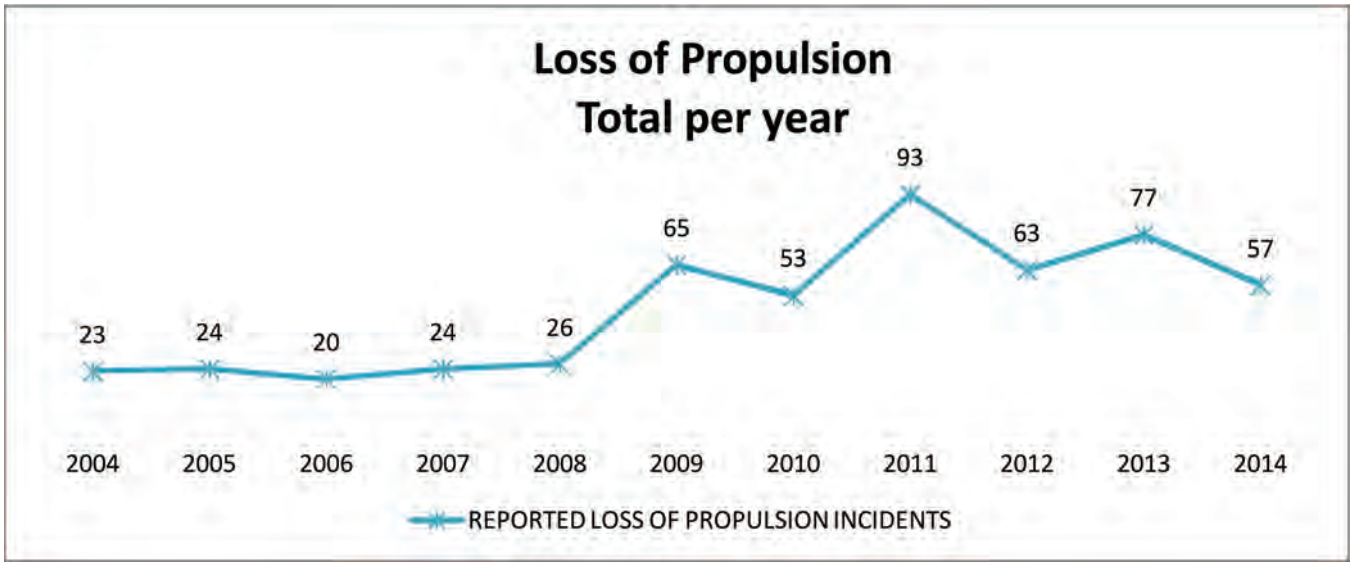


Table 2

Compliance Method	Exhaust Gas Scrubbers	Low Sulfur distillates
	Increased fuel consumption/carbon footprint.	Increased HFO consumption outside ECA (routing).
	Extensive use of caustic chemicals.	Increased chance of LOP incidents.
	Increased water consumption on ship.	Increased emissions outside the ECA.
	Increased evaporator capacity.	Increased engine load in winter weather.
	Increased load on vessel.	Lower BTU's in distillates.
	Costly disposal of effluent at port.	Wear on engine due to nature of distillate

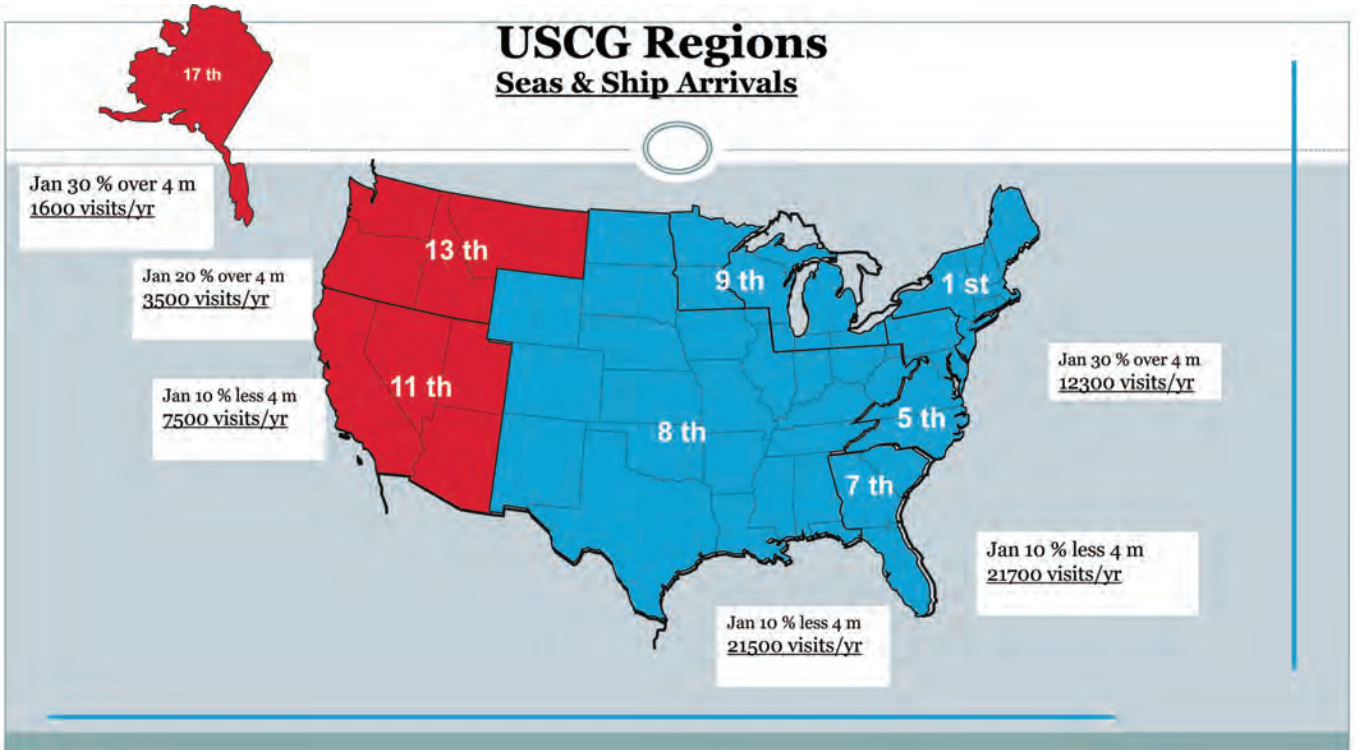
– is less expensive than distillate, not to mention the cost of installing a scrubber or exhaust gas recirculation apparatus. And, let's not forget the more forgiving nature of HFO versus distillate. Ships will have fewer LOP's which could result in a catastrophic allision, collision or grounding. At the end of the day, cleaner air should not come at the expense of dirtier water. And, it doesn't have to.

The Authors

Captain Jeff Cowan graduated from the California Maritime Academy, ultimately earning and sailing on his Master's license. He remains involved in maritime issues and is a regular contributor to Maritime Professional and MarineNews magazine(s).

Claes Jakobsson was born in Sweden and earned a degree in marine engineering from Chalmes University of Technology in Gothenburg Sweden. He has been involved in several interesting projects and energy saving programs but has focused much of his time on ship emissions issues.

Sea states are presented as the percentage of time in January that seas are over 4 meters. Arrival numbers are per each CG District.



U.S. COAST GUARD

Admiral Paul F. Zukunft

Commandant of the United States Coast Guard

By Joseph Keefe

When Admiral Paul Zukunft assumed the duties of the 25th Commandant of the U.S. Coast Guard on May 30, 2014, he also assumed a role which puts him closer to the general public and the industries that he regulates than any of his peers in the other armed services could ever imagine. But, that's the nature of the Coast Guard's multi-missioned mandate. As such, its CEO should in theory be a little better-rounded. That's ADM Zukunft, in a nutshell.

Prior to his confirmation as Commandant, Zukunft served as Commander, Coast Guard Pacific Area, where he was operational commander for all U.S. Coast Guard missions in an area encompassing more than 74 million square miles and provided mission support to the Department of Defense and Combatant Commanders. In 2010, he served as the Federal On-Scene Coordinator for the Deepwater Horizon Spill of National Significance where he directed more than 47,000 responders, 6,500 vessels and 120 aircraft during the largest oil spill in U.S. history. Before that, he served extensively in the cutter fleet where he commanded the cutters CAPE UPRIGHT, HARRIET LANE, and RUSH. He graduated from the U.S. Coast Guard Academy in 1977; from Webster University in 1988 with a Master of Arts degree in Management; and from the U.S. Naval War College in 1997 with a Master of Arts degree in National Security and Strategic Studies. He is a graduate of Harvard's Kennedy School of Government National Preparedness Leadership Initiative course.

In July, *MarPro* caught up with ADM Zukunft at the gleaming, brand new U.S. Coast Guard headquarters, where – although he's had little chance to catch his breath since assuming command – he spent an hour laying out what's to come next, why, and how that should all come about for the nation's fifth uniformed military service. On his way to the top, Zukunft says that a management style of inclusiveness, transparency, and empowerment has served him well. "E-1 to O-10, everyone has an observation and a contribution to make to the service," said the Commandant, adding, "As a senior leader, oftentimes you're the messenger of those great ideas, and then, figuring out how to get those great ideas funded into the budget process."

Covering a lot ground in those 60 minutes, the Commandant's focus always seemed to come back to just one thing: people. That said; Zukunft focuses less on headcount than he does on the competence and morale of however many coastguardsmen (and women) that the federal budget allows. It is here where industry should sit up and take notice.

Job 1: 21st Century Assets

Reinvesting in 21st century assets is Zukunft's first priority.

He says that this is a 'continuity theme' from his predecessor, explaining, "Admiral Papp's legacy will clearly be the national security cutter. But as you look at where our next largest gap is going to be in terms of our capability and capacity, it's in the offshore domain right now, and that will be the offshore patrol cutter (OPC)." He added for emphasis, "The National Security Cutter and our polar ice breakers are actually our largest hulls, as well as the Healy. The Arctic is a whole other challenge for us. We need to look at the Arctic separately, which would require a top-end adjustment to our budget right now to be able to bring on a heavy ice breaker into our shipbuilding process." Zukunft admits that the money simply isn't there.

The Arctic remains a serious problem for the Coast Guard. Absent another modern icebreaker, the Coast Guard says Zukunft, finds itself once again 'doing more with less.' "The national security cutter was never designed to operate in the Arctic domain. Conditions are such that there is a relatively ice-free season which coincides with the peak in human activity in the Arctic. And, so we are able to deploy national security cutters during that narrow ice-free season which still hasn't even commenced yet. It provides some modicum of presence – but not persistent presence – in the Arctic domain."

Where the National Security Cutter has proven their value, he insists, is in the fact that the Coast Guard no longer does 75-day patrols with national security cutters. Instead, these now deploy. He adds, "The fact that we can have that degree of presence and then work across the full scope of our offshore mission threats is really a testimony to the capability, not just of these platforms, but it really comes down to the people that man them."

Alluding to the Coast Guard's all-important mission of drug interdiction, Zukunft told MarPro, "It really does come down to capacity. There's a lot of ocean out there and just not enough resources. And the Navy is challenged, as well. They're bringing the Perry-class frigates out of service, and those are the exact same hulls that we put our law enforcement teams to expand our capacity in the transit zone."

Coming back full circle to the Arctic, however, Zukunft says the Coast Guard needs an icebreaker. Pointing to what he characterizes as 'the value proposition in the Arctic,' he says, "There are other countries that are making tremendous investments in the Arctic where the United States is not, Russia in particular. We have not ratified the Law of the Sea Convention, yet we have an extended continental shelf that's roughly twice the size of California, in addition to our EEZ. Eventually, there may be offshore oil in production in the Arctic domain, 24/7, not seasonal. So this becomes an issue of national sovereignty, and if there is a threat in those sovereign waters, other than the ice-free season, what are you going to do about it? And it takes years to be able to design and build a heavy ice-breaker, and right now time is not in our favor."

By some estimates, a new icebreaker could cost $1 billion, and if built, would almost certainly entail a top line adjustment to the Coast Guard budget. But, says Zukunft, this issue isn't necessarily just a Coast Guard problem. "There are a number of stakeholders that have equity in the Arctic, and this really is a policy issue first of how do we invest in the Arctic going forward."

Marine Safety

Zukunft wants a more inclusive relationship with the industry that the Coast Guard regulates – with caveats. "That's a relationship. It's not a partnership, but it's a relationship. There's a nuance between the two but I don't think any of us would consider our relationship a partnership, for example, with the Internal Revenue Service. We have an inherent relationship, but if you're a regulator, you can't be a partner at the same time. But you need to listen to the industry that you regulate."

Zukunft worked in the marine safety department during one phase of his 37-year career. At the time, he felt that the Coast Guard provided a very good one-stop shop for maritime governance. At the same time, he recognizes gaps in service that require attention. "Industry is changing at a much more rapid rate than our marine inspectors that go out and ensure that these vessels come into compliance. We get very good at the way we operate aircraft, because those aviators they go to flight school and then they stay in that program right up through the time that they're an instructor pilot and maybe beyond. But we haven't done the same thing with our marine safety program, so I'm committed to making a similar investment in our human resource capital that we grow marine inspectors that understand and are the subject matter experts in the industry that we regulate, as well."

Indeed, a May 2013 report issued by the Office of the Inspector General, Department of Homeland Security took the service to task, saying, in part, "The USCG does not have adequate processes to investigate, take corrective actions, and enforce Federal regulations related to the reporting of marine accidents. These conditions exist because the USCG has not developed and retained sufficient personnel, established a complete process with dedicated resources to address corrective actions, and provided adequate training to personnel on enforcement of marine accident reporting."

Zukunft brings with him to the Commandant's office a plan to fix all of that. Diverging from former Commandant ADM Papp just a little bit, he sees little if any value to ensuring that everyone goes to sea at one point or another in their Coast Guard career. He explains, "Fundamentally, we try to get every junior officer, every ensign coming out of the Coast Guard Academy, into a seagoing billet. But, there are not enough ships and as a result, there's very little value in sending 15 ensigns to a national security cutter when there are not 15 meaningful jobs for them to do."

With that in mind, the Commandant also insists that coast-

guardsmen, at a much earlier point in their career path, make a decision as to what they want to do. This is especially true, he says, in the field of marine safety. Emphasizing his point, Zukunft says, "Certainly, within ten years of anyone's Coast Guard career, any individual should be able to say 'I am a subject matter expert in at least one area.' At a more senior level, perhaps, that's not necessary. But, for the first ten years, you should be at the tactical level a proven expert in any one of the number of fields that we have in the Coast Guard." And that's exactly where he hopes to bring the Coast Guard's marine safety division. Time will tell.

Subchapter M – the Towboat Rule: when?

For the domestic towboat industry – arguably the backbone of the U.S. merchant marine that includes more than 40,000 hulls, of which all but perhaps 700 can be considered brown water, shallow draft vessels – the passage of the so-called subchapter M towboat rules is a hot button issue. Rarely is there a time and a place where both industry and the Coast Guard are so squarely on the same page as one another in terms of regulatory change. Industry stakeholders and advocates – notably the voice of the domestic tug and barge industry, the American Waterways Organization (AWO) – have called for the rule's swift enactment.

And yet, the process drags on. On that subject, Zukunft had plenty to say, but perhaps not necessarily what the commercial waterfront necessarily wanted to hear. "With our rule-making process, we fully engage our federal advisory committees. We go through the notes of proposed rule-making through the hearing process, the reconciliation, and then before it goes to final rule, then there is a separate clearance process that goes into place. That's a challenge. So it's not a timeline that I can guarantee because it does go through several other layers of review here at the federal government. But at the end of the day, I will assure that industry has their say before we come out with a final rule. So the process that we follow, protracted as it may be – the hearing process, the rebuttal to those hearing comments, the feedback that we provide, and especially listening to our federal advisory committees – all of those are critical links as we aim to put good regulations out on the street for industry."

Deepwater: no longer a dirty word

The so-called Deepwater recapitalization program had its

Commandant Office

starts and stops, well-publicized problems, failures and cost overruns. Eventually, the Coast Guard stood up its own acquisition group to address those issues. Zukunft was asked to rate their performance in recent years. According to the Commandant, it has come a long way. "As we came out of the starting block with our major acquisition program, what we learned from that is how to generate requirements. And we know what the Coast Guard needs into the 21st century. What we didn't have when we took on Deepwater is the certified professionals, the acquisition experts, to oversee a program of that magnitude. I'm pleased to say today, in fact we just had the Department of Homeland Security put out an annual list of recipients of procurement and acquisition awards, and the Coast Guard took 5 of the 7."

As proof of that, Zukunft points to the policy of fixed-cost contracting, and the fast response cutters being built in Bollinger shipyard coming out on-time, on-budget. And, he says, the third national security cutter is also proceeding on-time, on-budget. "Actually, I could not be more pleased with the professionalism that now exists within our acquisition program. It just didn't exist before the integrated Deepwater system came to be. And we quite honestly didn't appreciate the magnitude of how much this would consume the Coast Guard, not for a one-time buy but for the lifecycle of the systems that we're bringing on board."

People: not head count

The Department of Homeland Security describes the Coast Guard as a force about 42,000 members, but that number is actually about 39,600. That's because for the last several years with unpredictable budgets, they've been forced to trim their workforce. Zukunft shakes his head at those numbers and says, "That's almost an irrevocable risk that you take, because I can't buy those back, absent what I call a 'black swan event.' So, if I have to surge for a hurricane this season, and then I have another event, what I end up doing is stripping people from one area that may be at lower risk. But, there is never 'zero' risk. Right now, as I told my team, as we go forward, we need to 'hold fast.' But, we cannot draw the Coast Guard down any smaller than we are today."

If he could get those numbers back up to 42,000, Zukunft would do it in a heartbeat – again, with caveats: "We need to be smart about what we do, and we need to demonstrate what the value of each and every one of those individuals have been. We often look at a person as a dollar line item, and we tend to underestimate the investment that we have made for them to become leaders and competent at the work that they do."

This has to begin, says Zukunft, with benchmarking what is it that the Coast Guard needs to complete all of its regulatory missions. That's something the Commandant says has never been done. Add to this the challenges presented by budget cycles that often necessitate a drawdown in force and the policy

of moving people every two to three years, and the problem becomes even more exacerbated. Laments Zukunft, "Ironically, we move them right in the peak of our search and rescue and hurricane season; during the summer months." Questioning the need to move people as frequently as the service does today, he offers, "We should provide them better geographic stability. It makes them more proficient at what they do. It allows industry to better understand and build on that relationship. And it's less stress on the families, as well."

Zukunft again emphasized the need to invest in people with an immediate goal of ridding the Coast Guard of sexual assault. Within the service, however, and at the deck plate level, members are tired of hearing senior officers talk about ridding sexual assault from the Coast Guard. Zukunft responds by saying, "I get paged out every time there is an allegation of sexual assault anywhere in the service. And the day I can go more than a month – because right now I can't go more than three days without an allegation of a sexual assault in the Coast Guard – I will get off this pedestal."

Zukunft can (and will) talk all day about his service members and their families. "People are our most valuable asset in our service. It's not just the people, it's the families that don't take an oath, but they support our folks just as much as anybody else. I want to look at the investment we make to make people proficient at what they do, leaders within the service, and within the community, and admired among industry, as well. That's an investment that I will make."

Zukunft equates taking even one person out of service to the painful task of laying up a ship. That's because, he says, "I can't surge proficiency; I can't surge expertise in time of a crisis or a time of a regulatory change. So I'm keeping a very close eye on the health of our service right now, at a time when outside employment opportunities are actually improving. Right now, we're probably about a thousand short in meeting this year's recruitment goals for our recruits coming through Cape May."

Zukunft's Coast Guard

For his part, ADM Zukunft yearns for a day when strategy drives his budget, as opposed to the budget driving strategy, as so often happens during the budget process. That won't be easy. "We can start by asking what the Coast Guard needs to look like in four to five years. In the past, we've taken an approach of trying to look out twenty years, but quite honestly in twenty years, you can't predict a 'Katrina.' You can't predict a 9/11. And those are what I call black swan events. Those will

be challenges. You can maybe look out five years, but trying to look out twenty years is a bit of a challenge for us."

Looking beyond the obvious challenges facing him over the course of the next four years, Zukunft is clearly optimistic about what's to come. And, he's pleased with the hand he's been dealt. "Really, we are the best coast guard in the world. I don't say that to be arrogant, but I've seen most of them, and been to more countries than we have states in the union. And to a person, they all model themselves after the U.S. Coast Guard. They can build the neat ships. They can paint them white with that orange stripe, but they can't replicate the one thing that we have and that's the character and the quality of our people."

As usual, any discussion that involves the Coast Guard always leads the Commandant back to his people. The next four years may be, on the surface, all about getting the National Security Cutters funded and built. It may also be about the OPC sweepstakes and, perhaps, it will involve the process necessary to fund another icebreaker for the Coast Guard. None of that will be possible, says the Coast Guard's 25th Commandant, without the right people to get the job done. With a weather eye on the human aspect of his command, Zukunft, just two months into his tenure at the top, is already hard at work.

Savvy Fuel Management Fuels TOTE's Growth

As Tote pioneers the use of natural gas as a marine fuel with two groundbreaking projects, Anthony Chiarello combines the strength and diversity of the Saltchuk group of companies with a forward-thinking, environmentally correct Tote business plan.

By Joseph Keefe

As TOTE prepares to bring the world's first natural gas-powered containerships to the maritime industry, the firm will also be the first to convert its existing fleet to run on natural gas. Two Orca Class vessels, operated by Totem Ocean Trailer Express (Totem Ocean) in the Alaska trade, will be converted with minimal time out of service and return as the most environmentally advanced ships in the nation. At roughly the same time, TOTE's Marlin-class vessels will arrive and arguably be the most advanced, environmentally responsible vessels of their kind – reducing vessel sulfur emissions by 98 percent while providing safe, reliable cargo deliveries that keep communities moving. The first two Marlin-class vessels will be built at the General Dynamics NASSCO shipyard in San Diego. These American-made ships are scheduled to be delivered in late 2015 and early 2016, and will operate between Jacksonville, Florida and San Juan, Puerto Rico. NASSCO is also designing the conversion of the Orca vessels.

That part of the story isn't breaking news, but the nexus of why it came about and how TOTE President and CEO Anthony Chiarello and his team will execute their business plan, certainly is. Chiarello, who joined TOTE (formerly American Shipping Group) in August of 2010, was previously COO and executive vice president of NYK Logistics (Americas), Inc. Prior to NYK, Chiarello was with the AP Moller/ Maersk organization for 16 years. Before that, Chiarello served as Deputy Executive Director of the Maryland Port Administration in Baltimore, Maryland. Along the way, he learned a few things about planning and logistics. That experience is evident as he guides TOTE forward – and leads the maritime industry – into a new era of environmentally responsible transportation.

TOTE's headlong rush into LNG power and the realignment of the organization's five operating companies into three distinct lines of business is not without risk. A lot of water has since passed under the proverbial bridge since the decision to repower the fleet and build still more vessels was made. The concept of using LNG as a fuel on this side of the pond has gathered momentum, but also seen setbacks in terms of commitments for bunker infrastructure and other fuels and environmental strategies have emerged. For his part, Chiarello hasn't wavered one iota from his grand plan. MarPro caught up with him midsummer at his Princeton, NJ offices for an update on all things TOTE, as well as his assessment of the state of the industry.

Fueling Change

As far back as the Spring of 2010, TOTE began an exhaustive investigation as to how its Alaska ships were going to meet the soon-to-be implemented eco-requirements. They looked at everything, including scrubbers. Chiarello explains, "After that two-year investigation, we came to the decision to convert the Orca ships to LNG. So that was the beginning of LNG for Tote as a marine fuel and then it just became a very easy decision when we decided to construct the Marlin ships to go with LNG as well. We'd already done the homework relative to the Orca conversions."

Pressed on the wisdom of his decisions regarding LNG, now with two years of hindsight in his back pocket, Chiarello refused to concede a single point about his retrofit and newbuild plans. Concerns over the uncertain future price of LNG, the arrival of a (possible) new white knight in the fueling mix (methanol), the high cost of infrastructure – both on board and ashore – and the slow pace of progress on the domestic bunkering scene did not seem to concern the TOTE CEO.

Addressing the price issue first, Chiarello insists, "We did not – and I've said this every time I've been asked – make this decision from an economic perspective. We made this decision purely from an environmental impact perspective. When we first started the Orca conversion project, I said, 'We don't know what the cost of LNG is going to be when the ships come out. We hope it's low, but we don't know.' So our decision was solely based upon the environmental impact of LNG. We hope that there's an economic benefit as well, but we're making a significant, half-billion dollar investment between the two new ships as well as a reconversion and re-engining of the Orca ships."

In terms of today's price, Chiarello couldn't even guess as to where it was, adding. "I don't follow it. I don't watch it closely, to be honest with you, because it really doesn't matter until the first ship is launched. But I don't think it's moved much and we don't expect that it will."

Logistics, as it turned out, played a large role in TOTE's decision(s). Chiarello pointed to the fact that the domestic U.S. market is different than it is overseas. Not always constrained by the ECA's, it makes sense for a carrier transiting open ocean much of the time to go with a low-sulfur diesel engine that you can scrub, if needed. The decision process for domestic, Jones Act carriers is a little different. Chiarello says, "Our Alaska trade is in the ECA one hundred percent of the time. We never get outside of 200 miles. Our Puerto Rico service, we estimate is probably around 35 to 40 percent of the time we're in the ECA. So, absolutely – the LNG makes sense for us." Using the Baltic bunkering model as an example, he added, "We have two ports of call, running two ships a week. It's just a ferry service, basically, back and forth. As long as you know where you're going, the logistics work."

Conceding that the cost to build these environmentally correct vessels was 10 to 15 percent higher than those being built with conventional propulsion, TOTE's CEO also addressed the question of lost deadweight and TEU capacity due to the LNG bunker configurations. He also declined to estimate how long it would be before TOTE earned back the engine price differential, saying instead, "The capacity loss, approximately 55 TEUs, is less than 2 percent. A very small amount." And he added, because TOTE is bringing in twice the TEU capacity in that trade corridor, the built-in economy of scale for that route will be increased by a factor of two. Chiarello insists, "Losing 50 TEUs wasn't really a factor in the decision. Absolutely not."

As to the apparently slowing of bunkering infrastructure construction ashore, TOTE, says Chiarello, is naturally watching the developing landscape but remains not only upbeat, but on schedule with their own particular arrangements. "As soon as we announced that we were going to go with LNG in the new builds and also the conversion of the Orca ships, there were no less than half a dozen parties, literally, every week contacting us about being LNG suppliers, being partners with LNG suppliers. Shell [in reference to the oil major's pullback in several high profile North American LNG projects] is a big player in that landscape, but there are other significant players, and as a result, we've got a network of what we feel very strong partners for the LNG supply in the Pacific Northwest, which we haven't formally announced yet. In the Southeast, in the Jacksonville area, we have arrangements with AGL Resources, Pivotal and WesPac. So we have no concern today or going forward relative to having LNG supplied for our vessels, on either coast."

Like Harvey Gulf CEO Shane Guidry, Chiarello and TOTE have no intention of ever running their new and repowered hulls on anything but LNG. Both CEO's cite the enhanced maintenance issues that running on diesel would bring. On the other hand, TOTE went for the 'dual fuel' option for other reasons, some of which weren't immediately obvious to the market. Chiarello explains, "We went dual fuel, in part, because these are U.S., Jones Act vessels. The military, as happened to one of our ships many years ago in Desert Storm, could come to us and say, 'We need your ships. We're in a time of war.' With LNG, you know, our tankage is going to be enough to handle the trades that we're in which are very short; +/- 1,200 nautical miles. But, If they're going to end up going over to the Middle East or Asia, they will have to burn diesel. So, we want to be flexible to not have a stumbling block from a fuel source side, to be able to make those requirements."

Partnerships: building blocks for LNG

TOTE is the first to admit that the effort to bring LNG propulsion to the container trades is anything but a task to be done in a vacuum. And the list of industry parties stirring the pot in the kitchen is wide, and it is impressive. General Dynamics NASSCO is constructing the Marlins at their shipyard in San Diego, CA while Daewoo Ship Engineering Company part of Daewoo Shipbuilding and Marine Engineering is providing

the vessel design. Significantly, TOTE is the launch customer of MAN's innovative ME-GI engine design with the main and auxiliary engines manufactured by Doosan. LNG bunkering will be handled by Pivotal LNG, Inc., a wholly owned subsidiary of AGL Resources, and WesPac Midstream LLC will supply LNG in Jacksonville, FL.

In July, the arrival of the world's first dual-fuel slow-speed engine at NASSCO marked the next phase of construction for TOTE's Marlin Class vessels. Earlier this year, Doosan completed the engine's Factory Acceptance Tests, a culmination of months of testing to ensure compliance with U.S. regulations and restrictions. In addition to the engines, two 900 cubic meter tanks, manufactured by Cryos, were delivered. These massive stainless steel cryogenic tanks weigh 380 tons each and will store liquefied natural gas aboard the Marlin ships.

Separately, Norwegian-based Air Products was selected by TOTE to provide Nitrogen Membrane Generators for the vessels. The system, approved by all international marine standards, has a reduced footprint and lowers the operational cost at the same time. Maintenance is kept to a minimum thanks to a robust design and carefully selected materials. Air Products also provided Nitrogen Membrane Generators – a key safety component for any LNG system – to another North American LNG pioneer, Harvey Gulf International Marine. Harvey Gulf, in its own niche OSV market, is transforming the offshore oil service sector in much the same way TOTE is shaping the future of ocean freight. For its part, Air Products has been in business for more than 30 years and claims a market share of 90 percent, having delivered almost 400 systems over time.

In terms of the Orca conversions, new standards for environmental responsibility will be set by reducing sulphur oxide (SOx) emission by 100 percent; particulate matter (PM) by 91 percent; nitrogen oxide (NOx) by 90 percent; and carbon dioxide (CO2) by 35 percent. In this case, Wärtsilä will supply main engines, generators and integrated LNG storage and fuel gas handling systems (LNGPac).

Shuffling the TOTE Deck

The realignment of five operating companies into three distinct lines of business – Tote Maritime, Tote Ship Management, and Tote Logistics, was, says the TOTE CEO, a carefully planned and executed move. He explains, "We wanted to re-brand and leverage some of our existing businesses. And certainly Totem was the first company that Saltchuk ever purchased. It had the strongest brand, so that's when we decided to use Tote as the overarching holding company brand. And then we looked at our businesses and said, 'We're in marine – obviously Sea Star and Totem Ocean – we had some logistics services under the brand of Spectrum, which was in the Southeast.' We hadn't yet purchased Carlile Transportation. And we had what was previously known as Inter-Ocean American Shipping. So we had ship management, we had some logistics and it was definitely a look ahead that logistics would grow to try to leverage our existing asset infrastructure, and we had the maritime piece. When we started looking at rebranding, we placed it into three buckets: maritime, logistics, and services. And that's how we've grown up from there. And any acquisitions we do, any organic growth, we try to keep into those three buckets."

The three distinct lines of business interact with one another. But, Chiarello insists that putting targets of placing certain percentages of business within one group or the other is not the way to go. "We don't do that to the point of saying, 'You're responsible for putting 10 or 20 percent of all the logistics business that you do on a Tote ship or on a Sea Star ship.' I don't think that drives the right behavior. I think it should be first what the customer needs and wants – it may be a Tote ship, it may not."

When the talk turns to TOTE, people invariably want to focus on the LNG and the newbuilds because it's exciting. But, there is more going on there than just LNG. The Saltchuk Group, TOTE's parent, has grown to over 20 independent companies, 5 operating groups with TOTE being one of them. Today, TOTE is the biggest division within the Saltchuk Group, represent-

TOTE is the launch customer of the ME-GI engine, a significant advancement in propulsion technology.

ing as much as one-third of all revenues. Fleshing out that relationship a bit more, Chiarello says, "The TOTE group has been a core part; it remains a very strong focus of the group, very capital-intensive, the largest capital-intensive group within the Saltchuk division. And, I think it just continues to provide a foundation for our growth in the Jones Act trades." Chiarello pauses, and adds, "All of our divisions are very important; we all interact very, very closely. Take Foss, or interstate transportation, as an example. But I think there's kind of a fondness in their heart for the Tote group of companies because of the fact that was the first acquisition that the founders ever had."

TOTE & LNG: underway, full speed ahead

At NASSCO, the first hull is already under construction, with the keel laid. With the first piece of steel cut in February of this year, the launch of that ship will take place April of 2015. Chiarello adds, "It's right on schedule, actually a little bit ahead of schedule. And then the launch of the second, hull 496, will take place the end of August 2015. We'll take delivery early in the 4th quarter of the first hull, and delivery of the second hull early in the 1st quarter of 2016. So we're actually a little bit ahead of schedule."

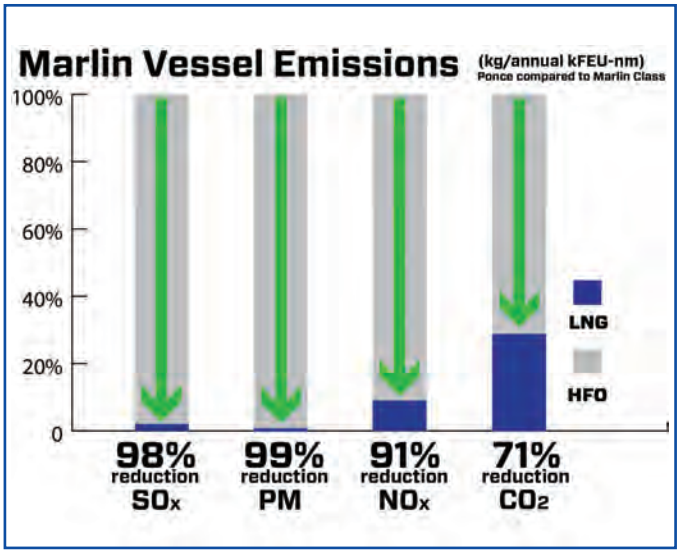
Options for three additional ships, says Chiarello, have expired. "We had to execute. We probably could have held the

> "We did not – and I've said this every time I've been asked – make this decision from an economic perspective. We made this decision purely from an environmental impact perspective. When we first started the Orca conversion project, I said, 'We don't know what the cost of LNG is going to be when the ships come out. We hope it's low, but we don't know.' So our decision was solely based upon the environmental impact of LNG."
>
> – TOTE President and CEO Anthony Chiarello

options longer if there hadn't been such a significant uptick in construction of Jones Act vessels, because the yard was getting full. So we just weren't ready to pull the trigger on options yet." That said; the market should not assume that TOTE isn't bullish on what's to come next.

Shedding full light on their plans – with or without the option vessels – Chiarello says, "Our position is that we're running two vessels today of around 1,200 TEUs. These new vessels will be 3,100 TEUs, so the capacity that we're bringing, or the capability of capacity that we can handle, is significantly greater than what we're doing today." Significantly, about half of that capacity will be capable of handling 53-foot containers.

"These ships will increase shipping capacity, reduce air emissions, and ensure a cleaner environment for our workers and port communities." – Anthony Chiarello



The 53 foot model works in the Caribbean trade, and as Chiarello already knows, it works in Alaska. That's because, if you don't have to unpack a 53-footer that comes down the highway, you just roll it onto the boat, faster, with less labor involved and more economically. Chiarello adds, "That's what we do in Alaska. They're roll-on/roll-off ships exclusively. In the current trade today, we have, in Puerto Rico, a portion of the ship is roll-on/roll-off; a portion of the ship is lift-on/lift-off. So we wanted to go to lift-on/lift-off because we think in that particular trade it's more efficient from a vessel perspective, but we needed 53-foot capacity. So we ended up going with half the ship being 53-foot."

According to Chiarello, the on board combination will make TOTE's competitive position extremely strong for that trade, insisting, "It's going to be a major paradigm shift. Crowley was a year or so behind us on their announcement, and you see what they're doing – they're having some 53-foot capacity, as well. We believe it's the right equipment for that trade."

Looking Ahead

With the intent of improving its position in the trades that they currently service and growing the logistics platform (through acquisition of Carlile), the corporate vision of becoming a broader supplier of transportation and logistics services is coming to fruition. Chiarello charts the future by saying, "I think we'll continue down that same path. Looking at trades – Jones Act trades – that we're not in today, there's one, obviously, very glaring place that comes to mind. So, we have thought about how we possibly service that market because there's a lot of customers that ask us about it."

Chiarello continues, "Hawaii is the one place that we don't have ships and I'm not sure that we will have ships there any

time in the near future, but there are other ways to provide logistic services into those trades, maybe as an NVOCC or something like that. So, we need to continue to look at that, because I've been in this business for 35 years, and I've always been very customer-focused. And if your customer who you're providing reliable and timely and cost-effective services in Puerto Rico and Alaska says to you, 'What about Hawaii?' then, if we don't have ships, we need to figure out how to meet their needs."

In the end, Chiarello points to the fact that, very soon, he will be running the most environmentally responsible vessels in these trades. "If you can prove that, most times, if not a large percentage of the times, customers are willing to pay a premium for that. Because then they can go sell that to their customers and say, 'Look, we're running on the Tote ships and they are the most environmentally-friendly ships in the trades that they service.' We aren't in Hawaii today. Hopefully, someday we will be."

Long Terms Rewards: more than awards

In May, TOTE President & CEO Anthony Chiarello was among 11 individuals honored by the White House as 2014 transportation industry "Champions of Change." Chiarello was chosen for his role in leading the U.S. maritime industry toward natural gas as fuel. Separately, and before that, the Marlin-class earned the Next Generation Shipping Award at the 2013 Nor-Shipping Conference, making TOTE the first U.S. company to take home this prestigious award.

Chiarello takes the accolades in stride, saying only, "Certainly those awards were very humbling for the group. I don't look at it for me; I look at it as for the group. Because as a result of the work of many people both internal folks within the Tote organization as well as partners such as the Coast Guard and MARAD and our suppliers on the LNG side, we were able to put in a solution here for Jones Act ships that hadn't been done previously. That's exciting and very rewarding."

Given everything that's happening at TOTE in 2014, it probably shouldn't be any surprise that Saltchuk – TOTE's parent – was also named in March by the Ethisphere Institute, an independent center of research promoting best practices in corporate ethics and governance, as a 2014 World's Most Ethical Company. No doubt TOTE and Chiarello's management team played a big role in that decision. With scores generated in the five key categories of ethics and compliance program, reputation, leadership and innovation, governance, corporate citizenship and responsibility and culture of ethics, the undisputed domestic leader in green marine practices probably got started with a leg up on the competition. And that's exactly where Anthony Chiarello wants TOTE to stay. As he embarks on that effort, not too many folks will bet against him.

Moving Ahead with MLC:
the true course to compliance.

By Joseph Keefe

The Maritime Labour Convention 2006 (MLC) impacts the world's 1.3 million mariners in one way or another. In a nutshell, MLC embraces fundamental principles found in other international labor conventions and applies to all ships entering member port states, as well as to all flag state signatories. Entering into force on 20 August 2013, one year after registering 30 ratifications of countries representing over 33 per cent of the world gross tonnage of ships, the convention today has been ratified by more than 60 states, representing 80 percent of global shipping.

The MLC Code addresses the minimum requirements for seafarers to work on a ship, conditions of employment, accommodations and amenities, healthcare and social issues. For some operators, it means simple compliance with a minimum set of standards and managing the costs associated with that standard. For others, it entails a genuine effort to improve the lot of mariners everywhere. For all of them, audit, enforcement and certification of compliance are also part of the game.

Compliance and Enforcement

As Port State Control authorities prepare to launch a crackdown to ensure that watchkeepers are getting the hours of rest set by the STCW Convention, MLC compliance will also be on the minds of shipowners everywhere. A three-month Concentrated Inspection Campaign (CIC) starting on September 1 2014 by Tokyo and Paris MOU inspectors will zero in on verification of watchkeepers' hours of rest, the vessel's Minimum Safe Manning Document (MSMD) and records of rest. As many as 10,000 inspections could be carried out during the CIC.

The road to compliance can entail a minimal effort or it can mean an extraordinary leap forward for those seafarers lucky enough to toil for a progressive thinking operator. Whichever route is taken by the operator, the effort begins with certification of compliance. Typically, this involves the use of an auditor as named by the flag state of the vessel in question, but this is dependent on the individual flag state's rules and other "recognized organizations" can be named to perform the audits. As a rule, this aspect of the process is rigidly controlled.

Lloyds Register (LR) is one such approved organization. Robert Brindle is LR's MLC & STCW Lead Specialist, Marine Management Systems, in the Classification Group. Brindle told *MarPro* in July that Lloyds Register had, to date, carried out more than 5,000 individual MLC inspections since January 2013. As with any new protocol, he said, ships and their operators get better at compliance with practice. MLC has been no different.

In all cases, the process involves looking at how an operator and the vessel manage the MLC Code. That starts with a close look at the declaration of compliance (Part II – the company's responsibility) and part one (flag) – the summary of flag rules. Says Brindle, "The goal should be to meet the regulations and improve the life of the seafarer."

Brindle, who at one time sailed for the Cunard Steamship Company Ltd and holds a Class I Master's certificate, brings the deep experience of a human resources (HR) manager to the job. The rare combination serves him well as he leads a global team of auditors who are navigating sometimes uncharted waters in much the same way that the vessels they audit are trying to do. Brindle explains, "I'm here to lead a team of global inspectors. We need to educate inspectors to look at things that they never had to do before." This includes the understanding of the collective bargaining agreement in place.

The review begins by making sure that the operating company's declarations are in concert with flag rules. Then, every vessel is done in sequence. LR's Brindle says that a ship review can be done within a day, with the on board inspection usually spanning about 6 to 8 hours, depending on what is required for a particular flag state. Brindle explains, "Typical hot button issues include comparing the hours of rest against the records of Overtime and then verifying that the crew is actually getting paid for the work that they do."

One common deficiency noted by LR inspectors is that Seafarer work agreements sometimes do not meet the requirement of MLC. Along with that, says Brindle, is the responsibility of the seafarer to carry their work contract with them at all times. He adds, "This is just as important as any other competency certificate." Another area needing attention is the formatting of medical certificates, but Brindle says that this is usually a flag state issue or in other words, an observation, not a deficiency. And, he says, some flags, to their credit, have made changes.

Other garden variety deficiencies include finding discrepancies between Work and Overtime records, but, he says, this mostly involves seafarers not filling out the forms properly, as opposed to outright falsification. As for living conditions on board vessels, this aspect of the global merchant fleet is improving. Brindle admits, "You see it [poor sanitation, ame-

nities, living conditions], but far more rarely than in the past." That's good news.

All violations of the MLC Code are reported to the flag state. Serious issues could result in a vessel's detention. According to LR, any and all deficiencies must be corrected within 3 months. As the process matures, it is getting smoother and Brindle says that the Code is beginning to have its desired impact, saying, "Deficiencies are reducing over time. For example, a company operating 40 ships might undergo the first 10 vessel inspections with varying degrees of success and typically, the next 30 will go smoother because they know what inspectors are looking for." In other words, practice makes perfect.

Like safety, real commitment to the tenets of MLC has to start at the top, where the decision to invest time, energy – and yes, sometimes money – has to be made. And, crew welfare involves far more than just a clean ship and a fair day's wage. Shipowners who buy into that concept are already well ahead of the curve.

Crew Comms: Key Morale Builders

The new normal for merchant seamen includes access to an adequate array of communication options while employed on board. Shipowners who do not provide such amenities are now finding it tough to keep mariners on board. Looking to leverage that growing demand from the marine sector, KVH Industries provides, in addition to myriad other products, in-motion satellite TV and communications systems for vessels. Recent KVH acquisitions of Videotel (July 2014) and Headland Media (May 2012) have now been rolled into KVH Media Group and allow KVH to bring more eLearning and better tracking of each crewmembers certificates to shipowners.

The company's global reach now reaches as many as 25,000 vessels, with services varying from training and eLearning services (about 11,000 vessels) to movies and newspapers deliver by DVD, email, etc., (about 10,000 vessels) and the KVH miniVSAT service (about 4,000 vessels). Tens of thousands of mariners are receiving the benefit of robust connectivity, quality entertainment and the advantage of on board learning that potentially reduces the amount of time which has to be spent training during vacation periods. For shipowners, New SOLAS Regulations and STCW benchmarks are becoming harder to comply with and still harder to track. KVH helps to track all of it, in a turnkey package, allowing an operator to confidently outsource the task, if desired.

All of that is great news for the crew, but it also costs money. On the other hand, KVH provides low cost content delivery – large amounts of data delivered just once to all customers

– which frees up bandwidth to do other things. Jim Dodez, KVH Senior Vice President for Marketing and Planning says, "Ships no longer have to 'resize' comms to allow both. This can save a lot of money."

Moreover, KVH now reaches more than 105,000 seafarers on its innovative CrewToo social media site.

CrewToo is a social media site for mariners, or as Jim Dodez calls it, "The Voice of the Seafarer." In a nutshell, it allows communication and socializing, and is open to crewing agencies and job seekers alike. In some cases, it can help verify the qualifications of a mariner prior to hiring.

Recently KVH delivered the World Cup via IP Mobilecast service to approximately 1000 seafarers. Dodez explains, "We talked to our best clients and got great response." He added that other premium content, including English Premier League football, would also be delivered in the near future. But owners and crew don't have to be satisfied with what KVH thinks is interesting. The service allows customers to pick and choose what content they want based on the demographics of the crew. And the new KVH business acquisitions brought on a lot of new media expertise into the picture. Today, KVH is collecting news broadcasts and rebroadcasting to ships, sometimes with only 3-4 hour delay.

Market leading operators naturally turn to market leading equipment and service providers. For example, Harvey Gulf International Marine and its President and CEO Shane Guidry are known as high end providers of multi-missioned offshore support vessels in the Gulf of Mexico, and beyond. Proving conclusively that even flag states that haven't signed the MLC Code can still more than comply with its intent, Harvey Gulf is updating its onboard communications solution with KVH.

New Harvey Gulf mariners quickly find out what long time employees already know. All Harvey Gulf newbuild hulls have all the bells and whistles related to crew comfort and amenities. Acquisitions of used tonnage get upgraded – or they get sold. In terms of communications options for the crew, the KVH provided suite is impressive. It includes, 24/7 access to telephone services, DirectTV on all vessels (the Captain and Chief Engineer have their own receivers and some vessels have TV access in all cabins), access to the KVH newly acquired content from Headland Media and of course, Internet. Notably, Harvey Gulf is in the process of rolling out WiFi across all of its vessels.

MLC and Medical Predictors

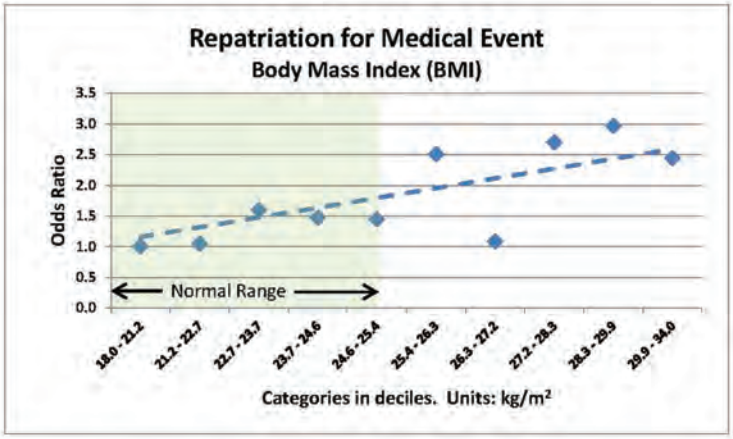
There are few things more important than the health of a mariner. For that reason alone, the well being of mariners is central to the central purpose of MLC. With that in mind, more than one year ago, the Yale University School of Medicine, in conjunction with managed healthcare solution provider Future Care, Inc., released a study entitled Preliminary Evaluation of Seafarers Health Care and Determination of Predictors of Illness. The effort to provide proactive as opposed to reactive healthcare to mariners was underway. Until then, very little research had been conducted on the health and general welfare of the world's seafarers.

With the goal of determining risk factors for injury, illness and disability among seafarers, the collection of anonymous, protected and genericized data was begun. The effort, according to Dr. Martin Slade, Director of Research, Occupational & Environmental Medicine at Yale University School of Medicine, has now been expanded toward trying to determine predictors of repatriation among seafarers. Slade and his colleagues began to look at repatriation as the maritime counterpart of an emergency room visit for land based workers.

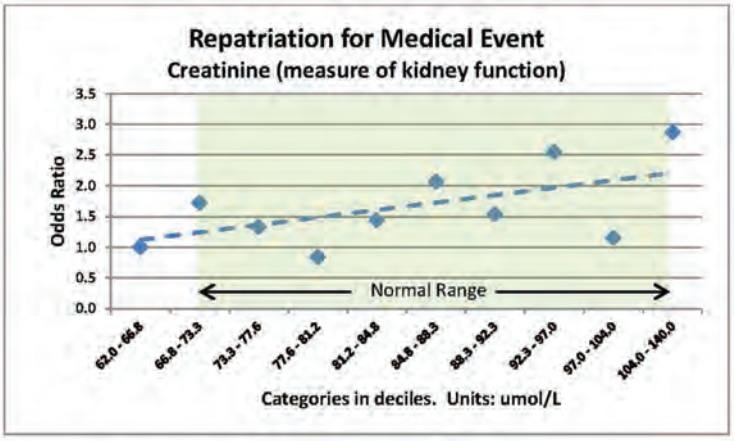
With pre-employment medical examination data on approximately 20,000 seafarers in hand, they matched that data to those seafarers that were repatriated. Initial observations based on analysis of this data revealed that lifestyle conditions were strongly associated with repatriation. The relatively simple interventions that could be developed to significantly reduce repatriation rates and costs are only now becoming evident.

Based upon the data, the strongest predictor of repatriation was the seafarer's body mass index (BMI). BMI is a measure of relative weight based upon a person's height. People

Graph 1



Graph 2



with values between 18 and 25 are considered normal, people with values between 25 and 30 are considered overweight, and people with values above 30 are considered obese. Compared to seafarers with normal BMI, overweight and obese seafarers are 50% more likely to be repatriated. *Graph 1* amply demonstrates this tendency.

Another surprising predictor of repatriation is the measure of kidney function (Creatinine), something can be measured via simple blood test. Even at the high end of the normal range of measurement (deciles / umol/L), the incidence of repatriation is twice that of those seafarers at the lower end of the scale *(Graph 2)*.

More in-depth analyses are underway to identify other demographic, medical and occupational predictors of repatriation as well as to see if there are separate predictors for different subpopulations of seafarers. Yale and Future Care are on the case. Imagine what could be accomplished if all shipowners pooled this pre-employment health data in a responsible fashion, with the ultimate goal of the seafarer's wellbeing at heart?

MLC by Design

Central to the care and comfort of the seafarers is, quite naturally, largely a function of the environment that he or she is asked to work in. Thirty years ago, it was not unusual to see a shipowner abruptly cancel plans for an elevator shaft in a newbuild design after choking on the exorbitant cost to put it in. There wasn't much thought given to the mariner's comfort in those instances, and if you were unlucky enough to get assigned to such a vessel, you certainly didn't forget anything when you came down to work in the morning. It was a long way back up.

Today – with the MLC Code and seafarers who actually have choices – and in the highly competitive world of offshore oil & gas, the equipment that ensures both comfort and operational readiness is everything. Because of that, even naval architects and designers are getting involved in the MLC Code.

According to Curt Leffers at the Elliott Bay Design Group (EBDG), his firm gets involved with the MLC convention in designing the accommodation layouts in their OSV designs. For example, sound damping is usually something that EBDG talks about with the Owner at the very beginning the vessel design process. He told MarPro, "There are a couple of damping systems for sound insulation available, and we have been specifying them much more frequently over the last couple of years. Additionally, it's important to point out that it is becoming more common to place main engines in resilient mounts to reduce vibration and improve the crew experience."

And, crew comfort – MLC or not – is coming to the forefront. Leffers says, "As designers, we do get involved in the creature comfort aspects of the vessel design even if they aren't' directly related to the MLC convention. We have seen a shift over the years in the desire for vessel Owners to provide additional comfort for crew members. This is especially true for workboats, where some of our clients have mentioned that providing additional comfort is an important element in attracting good crew members." One way in particular that designers are getting involved in crew comfort, adds Leffers, is in the design of the HVAC system. The systems, for example, can be designed where each berth has an independent thermostat so crew members have more control of in the temperature of their berths.

Jim Hyslop, Manager of Project Development at Robert Allen LTD also weighed in. The MLC Code is definitely impacting the design process, says Hyslop, adding, "Clients are asking for this. From our perspective, it's got primarily to do with crew accommodations. The size of cabin, the amount of natural light they have – those are the main things."

Hyslop also points to noise as an important issue. "First, it is important for the crew to have low noise levels, also low vibration levels. These are separate things. We do a lot of work on that, it's a big issue on tugs because they have big engines for size of the boat. Most of the noise and vibration comes from the engine, so most of the tugs do employ resilient mounting – that's when the engine is mounted on rubber or steel."

MLC and the Bottom Line

For some operators, MLC might represent just another headache – and an added expense – in the daily effort to balance the books. Still others see it as a way to stay out in front of the competition. Separately, the U.S. Coast Guard's 25th Commandant, ADM Paul Zukunft, points to his service members and calls them his most important assets. Using that logic, the easiest route to MLC compliance may well involve addressing those issues before anyone comes up the gangway. That process can take many shapes and forms, from medical predictors to shipyard design, or providing creature comforts and high-end amenities. For those that do, the upfront costs will eventually translate into backend dividends.

U.S. COAST GUARD

Walter J. Brudzinski

Chief Administrative Law Judge, United States Coast Guard

By Joseph Keefe

Just recently, we had an opportunity to discuss the Coast Guard's Administrative Law Judge Program with its Chief Judge, Walter J. Brudzinski. Judge Brudzinski has been a Coast Guard Administrative Law Judge since 2003 and was appointed Chief Judge in June 2013. We caught up with him this summer in Washington and asked him to describe what an Administrative Law Judge (ALJ) is, what the Coast Guard's ALJ Program does, how he got to be where he is, and his vision for leading this Program.

Administrative Law Judges:

There are thirty federal agencies with Administrative Law Judges, including the Coast Guard. The number of ALJs per agency varies from approximately 1,400 at Social Security to just one at the U.S. Postal Service. The Coast Guard is authorized for seven. Administrative Law Judges are appointed pursuant to 5 U.S.C. § 3105 and accompanying regulations and these laws provide for strict controls on employing agencies to ensure decisional independence.

Appointments are made with U.S. Office of Personnel Management oversight using a competitive process. Judges are provided special civil service protections and the expectation of lifetime careers. Agencies may not control ALJ's salaries, conduct performance reviews, or provide monetary/honorary awards.

In the exercise of their judicial functions, ALJs retain decisional independence within the limits of law, regulations, and agency appeal decisions. They exercise independent judgment and can review the evidence before them free from pressures of the parties or officials within the agency.

The Coast Guard's ALJ Program:

Coast Guard Administrative Law Judges primarily adjudicate Merchant Mariner Credential Suspension and Revocation (S&R) cases. Coast Guard Investigating Officers initiate S&R cases against mariners for negligence, misconduct, incompetence, violation of law or regulation, and use of dangerous drugs.

Respondent-mariners may appear with an attorney, a non-attorney representative, or self-represent. They may call witnesses, introduce documentary evidence, cross-examine Coast Guard witnesses, and submit rebuttal evidence. The Judge's decision is final unless appealed to the Commandant. Further appeals can be made to the National Transportation Safety Bureau (NTSB) and to an appropriate U.S. Court of Appeals.

The purpose of S&R proceedings is to promote safety at sea. Often confused with the criminal justice court system, S&R actions against merchant mariners' credentials are remedial and not penal in nature. They are intended to help maintain standards for competence and conduct essential to the promotion of safety at sea.

The Coast Guard ALJ Program disposes of approximately 600 cases each year. The overwhelming majority of S&R cases involve use of dangerous drugs and most cases are disposed of by settlement agreement. The remaining cases are disposed of at hearing which are conducted in a similar fashion to trials in federal court without a jury.

Coast Guard Administrative Law Judges are also authorized to adjudicate Class II civil penalties assessed under the Federal Water Pollution Control Act and the Comprehensive Environmental Response, Compensation and Liability Act. Coast Guard Judges also adjudicate cases initiated by agencies within the Department of Homeland Security and other agencies the Coast Guard supports. These cases are adjudicated on a reimbursable basis, pursuant to law, and as caseloads permit. For example, in 2003-2004, Chief Judge Brudzinski was temporarily assigned additional duties to hear cases for the 9/11 Victim Compensation Fund. Coast Guard Administrative Law Judge are located in Seattle, WA, Alameda, CA, Galveston, TX, New Orleans, LA, Baltimore, MD, and New York, NY. The Chief Administrative Law Judge is located in Washington, DC.

How he got there:

Chief Judge Brudzinski was initially appointed U.S. Administrative Law Judge in 1996 with the Social Security Administration. He was previously an Assistant and later Deputy Commonwealth's Attorney for Virginia Beach. Prior to his prosecutorial career, he served in the U.S. Coast Guard as a commissioned officer both afloat and ashore and in various legal assignments as a judge advocate.

During his last judge advocate assignment, he also served as Special Assistant U.S. Attorney. He is a graduate of the University of Maryland and the George Mason University School of Law (with distinction) where he was a member of Law Review. Chief Judge Brudzinski also holds a Master's and Ph.D. in Judicial Studies from the University of Nevada and has earned Certificates in Judicial Development in Administrative Law, Dispute Resolution, and General Jurisdiction Trial Skills from the National Judicial College. He attributes his success as a Coast Guard Judge to his litigation background, Coast Guard experience, the professional training programs at the National Judicial College, and the academically rigorous Judicial Studies Program at the University of Nevada.

As Coast Guard's Chief Administrative Law Judge, he is widely published and has authored many articles in a wide variety of venues, trade journals and other publications. Chief Judge Brudzinski was admitted to practice in Virginia, Maryland, and Pennsylvania; the U.S. District Court for the Eastern District of Virginia; the U.S. Court of Appeals for the Fourth Circuit; the Court of Appeals for the Armed Forces; and, the Supreme Court of the United States. His professional affiliations include the American Bar Association – Judicial Division; the Federal Administrative Law Judges Conference; the National Association of Administrative Law Judiciary; the Maritime Law Association of the United States; and, the Connecticut Maritime Association.

Vision for Leading the Program:

Chief Judge Brudzinski's vision for the Coast Guard ALJ Program is simple: "We are dedicated to performing our judicial duties fairly, impartially, and in a manner that secures the trust and confidence of the regulated community, the agency, and the general public. We secure that trust and confidence by treating the parties with respect and by issuing clear decisions and orders the public understands and accepts as correct, fair, and well-reasoned."

Brudzinski's vision reflects the ALJ's Organizational Goals which promise fast, impartial, and well reasoned judicial services; to clarify agency policy concerning cases brought before them; to promote confidence in the administrative adjudicative process; and, to create an atmosphere in which the parties recognize they have been dealt with fairly.

To maintain the highest standards of quality in their written decisions, Coast Guard Judges receive training at the National Judicial College. They also subject their written work products to rigorous editing and review to ensure legal sufficiency and clarity.

Of note are two ongoing initiatives being addressed by Coast Guard judges. The first initiative is to further ensure due process for unrepresented mariner-respondents. Brudzinski says, "We do this by facilitating opportunities for them to obtain representation from attorneys that have previously indicated to us they are willing to represent mariners at no cost." The second initiative is to have Coast Guard attorneys appear at hearings on a regular basis, in addition to the Investigating Officer. Brudzinski explains, "Coast Guard S&R proceedings are adversarial and our experience has shown that the process works best when both sides are represented by counsel. These two initiatives will improve the overall quality of the S&R process and we expect them to be finalized in the near future."

Evolving Threats Met by *Market Innovation*

A look at commercial off-the-shelf technologies and products designed to mitigate risk at sea and in port.

By Joseph Keefe

In a post 9/11 world, many facets of maritime security only seem to grow. Global threats, despite best efforts, do not diminish. Chief among these issues are port security, the protection of critical energy assets and the scourge of piracy on the high seas. As the cost of meeting both challenges climbs, ship operators and port executives look to economically manage their risk. The effort weighs heavily on the bottom line at a time when many maritime sectors are struggling in the red. Nevertheless, ADM Jay Cohen (U.S Navy, Ret.), former Chief of Naval Research, told MarPro in July, "Life is risk versus cost." As the man tasked with protecting U.S. Trident submarine assets in Georgia immediately following 9/11, Cohen ought to know.

In terms of today's maritime security threats, managers are measuring the risk of losing the assets that make them money against the cost of providing adequate protection. The quandary is not unlike that which faced safety managers in the not-too-distant past. Eventually, the discussion of safety evolved from one which was viewed purely as a cost center to an effort where quality ship operators now understand that robust safety programs actually make money. Maritime security efforts, if they are headed in the same direction, arguably have not reached the same plateau. That hasn't stopped the market from rolling out new equipment and technology to meet the growing global threat against maritime assets and infrastructure. In this issue of MarPro, a look at just a few of these innovations gives the waterfront new hope in the war on terror.

HALO MARITIME DEFENSE SYSTEMS

HALO Maritime Defense Systems markets a system designed to provide waterside protection of ports and harbors with maritime security barriers that are stable and effective. According to HALO, a majority of maritime security barriers in use today are inherently unstable, prone to flipping over in rough seas and provide limited security. Legacy maritime security barriers, most dating back to the period immediately following 9/11 when the emerging threat to ports was only becoming evident, are commonly referred to as 'Type I' barriers. HALO's new system offers a breakthrough design, termed Type II Maritime Security Barriers, to overcome those deficiencies.

The world of port security changed forever on October 12, 2000 with the attack on the USS Cole. That incident clearly demonstrated that the threat from a determined terrorist in a small boat was both real and very difficult to defend against. The rush to deploy an adequate solution eventually saw the U.S. Navy procuring inflatable boat barriers. This 'Type 1' equipment provided some protection, but with them came a raft of other issues, including inferior stopping power, instability in rough seas and sometimes high maintenance costs.

Today, the U.S. Navy is looking for a better mousetrap. Beyond that market, however, the world's 440 nuclear plants – all situated on or nearby water – need protection, as well. The growing LNG market, which will necessitate the proliferation of both import and export marine facilities here and abroad, has its own vulnerability problem. Looking past the

HALO Maritime Defense Systems

USS Cole, the Mumbai attacks certainly disproved the theory that the commercial waterfront is secure.

A typical scenario for waterside security for just two miles of waterfront can involve five boats, 24/7 surveillance and all of that providing only an 80 percent probability of interdiction. HALO President Brendan Gray asks, "How do you identify the threat in the adjacent or next door marina?" He adds, "Today, landside asset security is excellent. In and on the water; not so much." But, he cautions, "It is a mistake to consider security an overhead cost. One day of profits would pay for multiple barriers. And, because HALO barriers reduce manpower costs and need for boats, that lets you focus the security workforce where they are most needed."

HALO's Type II barriers are a catamaran, double wall barrier, designed to stop an attacking boat upon impact and thus deny access to the port. According to ADM Jay Cohen, Chairman of HALO, Type II barriers stop boats upon impact, less than 10 meters, withstand harsh ocean conditions and heavy sea states, stop different types of attacks, including swimmers, divers, and small boats and can additionally support additional security assets such as sensors, Radar and cameras. Using advanced commercial off-the-shelf extruded pipes and maritime grade ropes, the barriers require minimum maintenance in the marine environment. The equipment can also be fitted so as to provide optional blast and ballistic protection.

Unlike Type I barriers, HALO's Type II barriers stops an intruding vessel on impact by transferring the kinetic energy of the force into the water mass that is trapped between the walls. The anchoring system, unlike with the Type I barrier, is used for station keeping only and not for stopping power. As a result, the Type II barrier has uniform strength and stopping power across the length of the barrier. It does not matter where the attacking vessel strikes; the stopping

power is the same.

The port security barrier units that Jay Cohen helped develop in 2001 are still in use 13 years later. While sequestration has presented challenges in getting suitable replacements, the answer may finally be at hand. And, while the low hanging fruit and immediate need seems to be rooted in high risk naval bases and assets, the greater market probably resides in the commercial sector. That's because the HALO system is collapsible, can be deployed remotely or via winch operation from either side. The wide, easily movable gate accommodates large commercial vessels with considerable beam.

Incorporated in January of 2008, HALO today has grown to 50 full-time employees. The HALO system is currently in the last phase of validation (at the Aberdeen Proving Ground) and is in full production. A half scale model is available to facilitate the "mobile" needs of events such as a G8 summit. With their first sale already finalized to a foreign government at a strategic base in Mediterranean Sea, that first installation will be completed by year's end. The HALO barrier will also be demonstrated to senior Naval leadership in San Diego in January.

The next generation barrier by HALO already has earned nine patents and has four pending. ADM Cohen, as the Chairman of HALO, obviously has skin in the game at this point. But, he also represents the leading edge of research in this area, dating back to his days at the Office of Naval Research. Of HALO, he says simply, "It represents the biggest major breakthrough in this arena since 9/11."

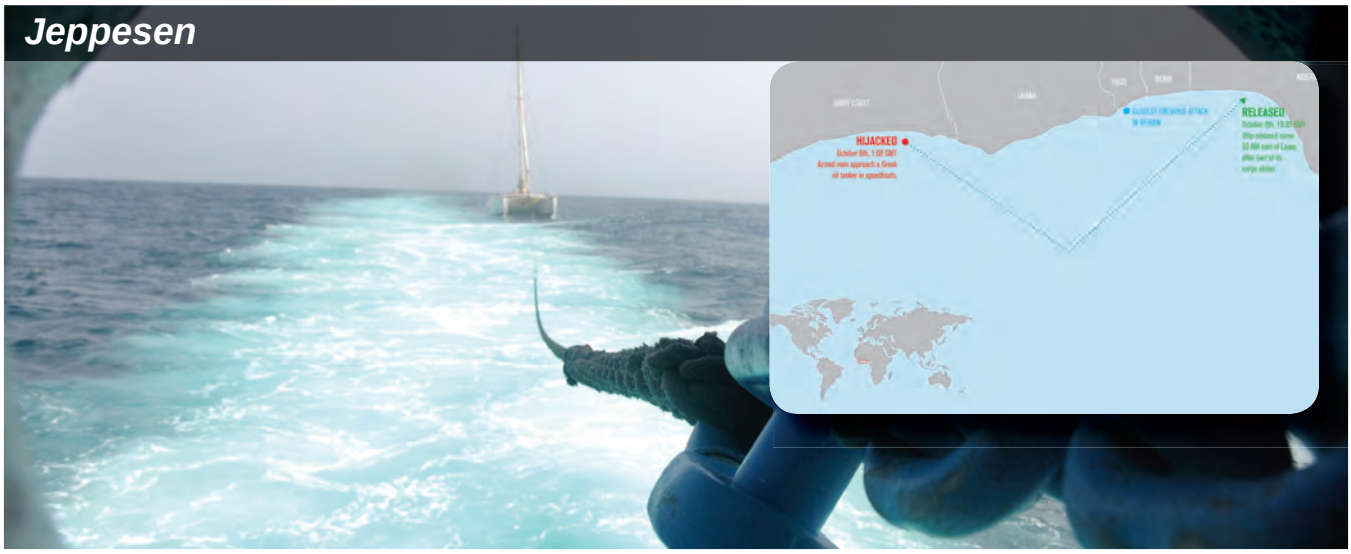
MARINE ARMOR SYSTEM'S ANTI-PIRACY

With the "Golden Age of Piracy" of the 1650s to 1730s now resigned to the history books, and a sharp decline in the number of attacks in today's previous hotspot area of Somalia does this indicate piracy is a waning issue? Not according to the IMB Piracy Reporting Centre whose 2014 "Live Piracy and Armed Robbery" report details 67 incidents this year already. Indeed, the piracy "industry" is an industry so lucrative for the criminals involved that it in fact shows no sign of waning, just moving location. Clearly piracy still poses a very real threat and the need to protect vessels passively is a priority for ship owners and operators.

One answer is to hire armed security guards. And while it is true that no merchant vessel has yet been taken when armed security is on board, the use of contract guards can create its own headaches. In some areas, the transit of weapons is expressly prohibited, and when that doesn't present a problem, certainly, glaring errors and tragedies have occurred. Despite increased regulation and standardization of this rapidly expanding service sector, some owners, flag states and ports are reluctant to introduce guards to the equation.

For operators who eschew the use of armed guards, Marine Armor System manufactures, supplies and installs passive solutions against maritime piracy around the world, providing ballistic protection to the crew. MAS is a non-lethal vessel protection system based on ballistic blinds, protecting vessels and rigs against pirate attacks and other potential threats such as armed robbery, terrorism and acts of sabotage. The system is fully patented and includes anti pirate blockades, bunkers and armored citadels or safe rooms onboard, protecting crew with a bulletproof barrier in case of pirate boarding, in line with IMO recommendations published in BMP4.

MAS is tailor-made to suit each individual vessel's requirements, allowing for a quick and neat installation on board. Prior to installation, MAS technicians work together with the ship's security officers to complete a risk assessment of each vessel to determine what level of protection is best for each area and then submit a report with a security hardening proposal, considering itinerary, schedule, threat level and other existing self-protection measures on the ship.



Manufacturing and pre-assembly takes place in the MAS factory based in the Canary Islands; a location purposely chosen due to its vicinity to the Puerto de la Luz base where ships make technical stopovers on their way through the Atlantic. Installation timings vary, dependent on the size of the vessel or rig, level of protection and the scope of work; as an example, it takes approximately one week to protect the bridge only. Installation can take place anywhere worldwide and does not interfere with the ship's normal activities. MAS also offer fitting during the construction of new builds, with a current project ongoing for the creation of citadels on four supply vessels in Malaysia.

Considering what many companies operating in the commercial shipping and oil industries spend on protection with private security companies, MAS might be considered a cost-effective, long-term solution. As opposed to other protection methods, MAS requires little maintenance and works without crew involvement. Only one man is required to secure the whole vessel or platform.

The installation of MAS prevents pirates from being able to take control of the bridge onboard a vessel and is also suitable for the creation of citadels to protect crew. In case of pirate boarding, MAS allows private security officers to focus on saving lives and not in securing access/windows.

Designed to suit the ship's interior, when in use MAS does not reduce visibility and is easy to maintain. When not in use the system requires no storage and remains hidden. MAS is currently being used on several ships and oil rigs operating in East and West Africa, with ongoing projects in Singapore, Malaysia and Indonesia. Anti-piracy solutions today aren't necessarily "one size fits all," but the MAS system provides a viable alternative to those firms whose business models and routing prevent the use of armed guards.

JEPPESEN FIGHTS PIRACY – INTELLIGENTLY

While global piracy is constantly changing, modern technology adapts to exploit the weaknesses in the pirates' mode of operation. Intelligence gained from such technologies enables voyage planners and navigators to steer clear of harm – but what kind of information is required? While the image of the Somalian pirate is still high in the public's mind as the number one piracy threat, the reality is not as straightforward.

Pirates have had to change their tactics in the last few years, with a geographical expansion to the oil-rich Gulf of Guinea, including the waters off Nigeria, Ivory Coast, Ghana, Benin, Togo, Cameroon and Lagos. However, pirates are not shy of extending their roaming to Angola and Congo and seizing opportunities arising from political instability in Syria, Egypt and Libya. Beyond these areas, from India and Indonesia to Peru and the Philippines, piracy is still a threat. Many platforms and small vessels used for crew transfer remain unprotected and can be easy prey.

While piracy has evolved, so too have its countermeasures. In addition to armed guards and navy protection, which are still an effective deterrent, e-Navigation solutions can provide valuable information to help seafarers avoid an encounter.

Jeppesen's PiracyUpdate is an electronic chart overlay for ECS and ECDIS that helps identify, understand and manage the risks associated with crime at sea. Based on intelligence from recognized sources on global sea piracy, it is used by mariners, shipowners, insurers and several national navies to reduce the likelihood of attacks. As pirates rely on certain sea states to operate, weather information is an essential element of anti-piracy data. Jeppesen OceanView is a marine planning software combining navigational charts, weather information and automatic route planning to create a more comprehensive picture for decision support in high risk areas.

Jeppesen also recognizes that too much data can bring along complications in the shape of information overload. Feedback from the PiracyUpdate and OceanView customers helped Jeppesen to optimize and streamline the voyage planning process within free-to-use NauticalManager software, which aggregates both weather and piracy data into a lean and user-friendly interface.

Today, with a tool like Jeppesen NauticalManager, ship's staff can incorporate daily piracy activity notices with up-to-date weather information. In OceanView, "alarm limits" for weather conditions (wave height, for example) can be set. This would reduce the time required to create a complete voyage plan from two days down to 20 minutes, and adapting to new circumstances would take minutes instead of hours. The integration of electronic nautical charts with information such as weather and piracy and e-Navigation software yields significant benefits for the mariner. It not only optimizes voyage safety and fuel efficiency, but also streamlines the entire voyage planning process.

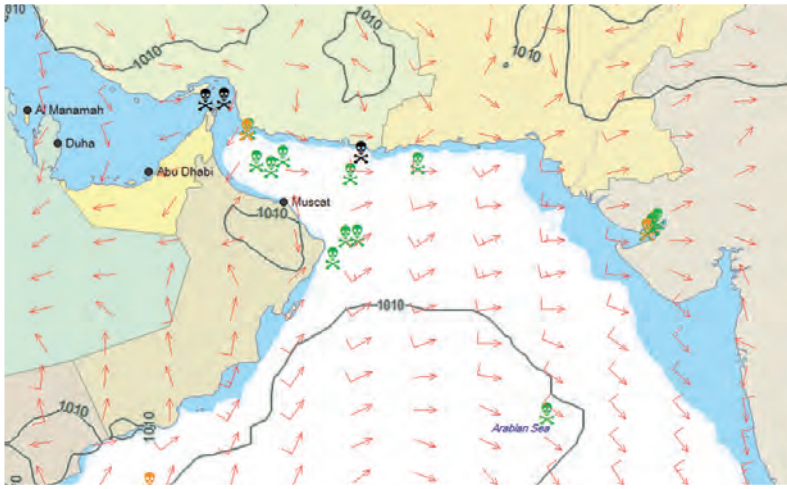
OceanView in conjunction with PiracyUpdate has widely been used to identify high-risk areas and obtain up-to-date information on the latest piracy activity. This includes keeping track of hijacked ships and the involvement of pirate mother ships. During a hijacking of a Greek oil tanker off the Ivory Coast, Jeppesen's partner Bergen Risk Solutions (BRS) used a digital anti-piracy tool to provide vital insight to lawyers, insurers, the owner, charterers and other parties involved.

In this case, a vessel carrying fourteen hijackers armed with AK-47 assault rifles and knives approached the 73,400 deadweight ton oil tanker, which was in the process of carrying out two ship-to-ship transfers off Abidjan with 30,000 tons of gas oil on board. Before the second operation took place, the vessel displayed suspicious behavior, switching off all lights and sailing directly south without explanation. BRS used PiracyUpdate to compare this suspected hijacking with similar incidents and was able to inform the client as to what had happened, the risk to the crew, vessel and cargo, as well as on what was likely to happen next.

BRS was tasked to coordinate the logistics involved in preparing the eventual release of the hostages and the vessel. This usually includes helicopter transfer, possible medical evacuation, liaising with the protection and indemnity (P&I) insurance holder of the vessel and more. At this point, however, when and where the release would have taken place was unknown. BRS started plotting the tanker's movement. Based on their experience and incident reports in OceanView, they soon realized the vessel was heading for a known piracy stronghold in Nigeria. This information was parsed among the parties involved in the rescue such as navies and rescue services so they could converge on the location of the hijacked tanker. When the pirates realized their plans had been compromised, they accepted to release the hostages and the vessel in exchange for amnesty. Technology, in this case, provided just one more "passive" method to combat piracy.

MARITIME SECURITY

ADM Jay Cohen insists, "The world isn't getting any safer and nothing is foolproof," adding quickly, "and the market is growing because we in the commercial world are moving offshore, moving deeper and putting offshore assets at risk." He's right about all of that. At the same time, the model for piracy has changed and shifted location(s) while the risk to port-based assets and infrastructure grows with the increasingly violent terror threat; here and abroad. Fortunately, the marketplace has responded in kind. As it does, the maritime sector evolves to meet the threat, mitigate the risk and embrace new technologies along the way.



MLC

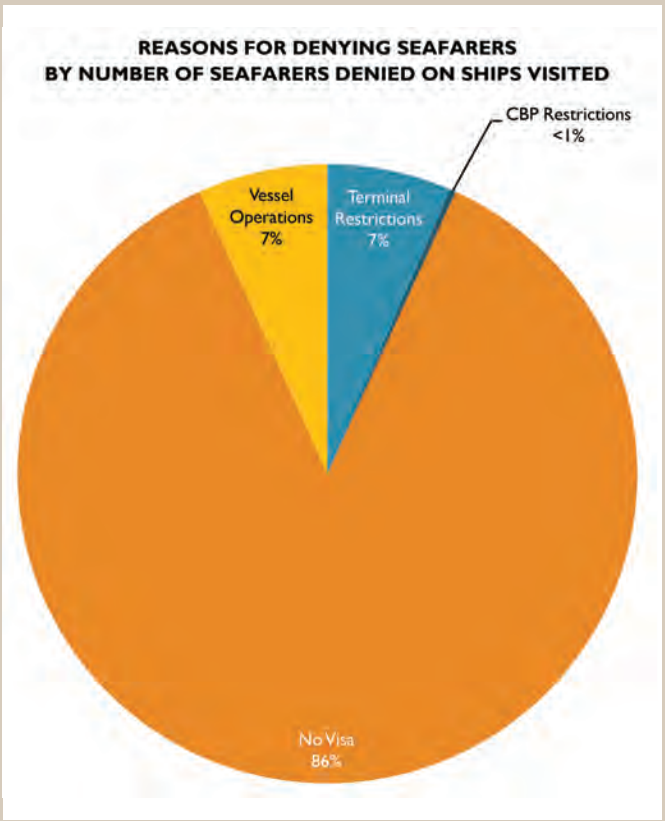
Seafarer Shore Leave: MLC Business, or not?

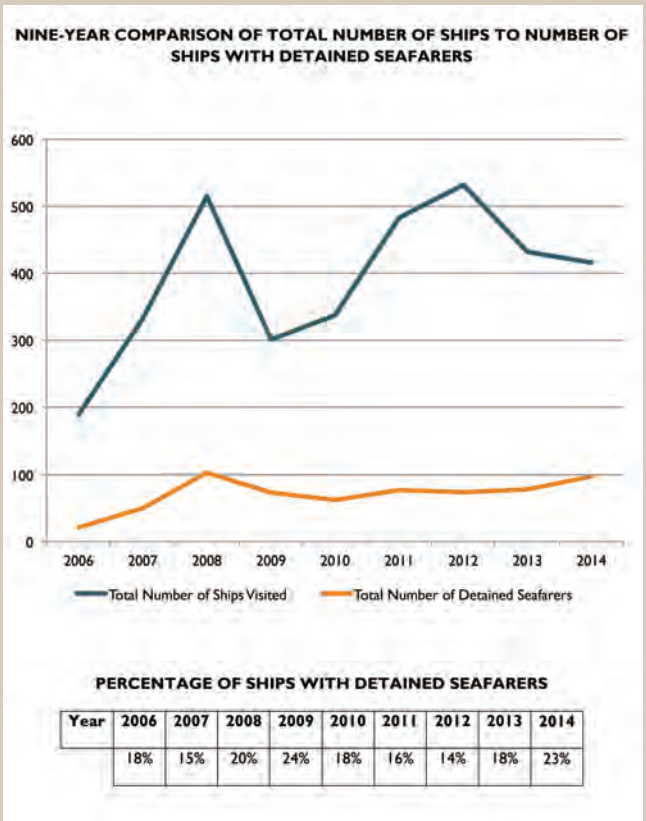
By Joseph Keefe

The Seamen's Church Institute's (SCI) Center for Seafarer's Rights conducted its thirteenth annual Seafarer Shore Leave Survey during the week of May 18-24, 2014. Port ministries in 27 U.S. ports visited 416 vessels with 9,184 crewmembers (representing 60 nationalities). A total of 1,030 seafarers on 97 vessels were denied shore leave. An overwhelming majority (86%) of these seafarers were denied shore leave because they did not have visas. Other reasons for shore leave denials included terminal restrictions (7%), vessel operations (7%) and U.S. Customs and Border Protection restrictions (< 1%).

The problem, well known here in the United States, makes a difficult job even harder, especially considering that some of these mariners spend six months or more on board and never get to even go down the gangway during that period. Which brings up another issue: should the denial of shore leave be considered a violation of the newly enacted Maritime Labour Convention (MLC 2006)? We think it is. This year's survey was the first SCI conducted after MLC came into force. Standard A1.4 Section 5(b) of the code requires shipowners to pay for seafarers' visas. Furthermore, flag states must verify shipowners' compliance with the MLC, 2006 recruitment and placement requirements, which include Standard A1.4 Section 5(b), before issuing a Maritime Labour Certificate. Curiously, approximately 79% of the seafarers denied shore leave because they did not have a visa were serving on ships registered in countries where MLC is in force. Notably, these included Antigua and Barbuda, Bahamas, Cyprus, Greece, Liberia, Malta, Marshall Islands, Panama, Philippines and Singapore.

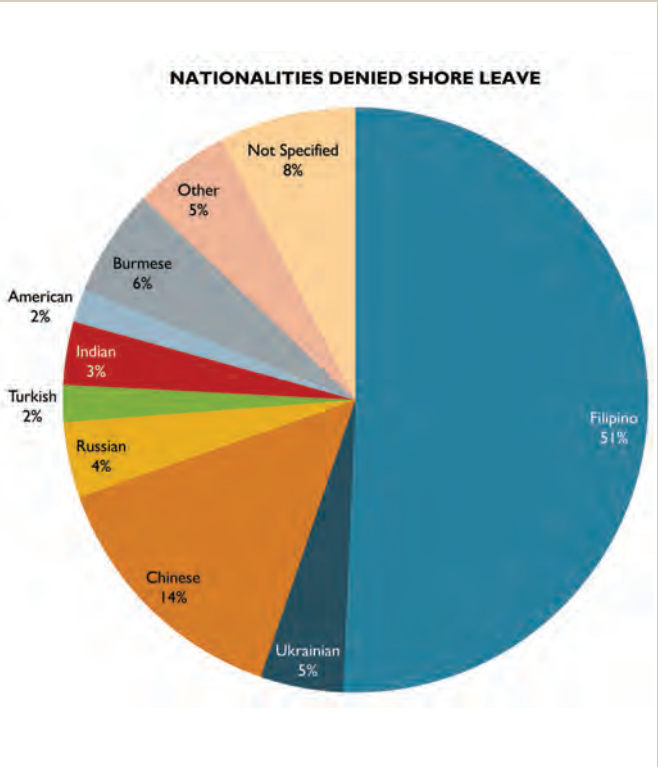
SHORE LEAVE RESTRICTIONS: Ninety-seven of the 416 vessels (23.3%) had at least one seafarer on board denied shore leave, representing about 11 percent of the mariners on those vessels. Compared to last year's survey, this year's data shows an increase in shore leave denials—both in the percentage of ships with at least one seafarer denied shore leave and in the percentage of seafarers denied shore leave. Where it was possible to determine seafarers' nationalities, more than one-half of those detained for lack of visas were from the Philippines (484) with China (148) a distant second. Reports also detail that 70 seafarers (approximately 7%) were denied shore leave because of vessel operations.

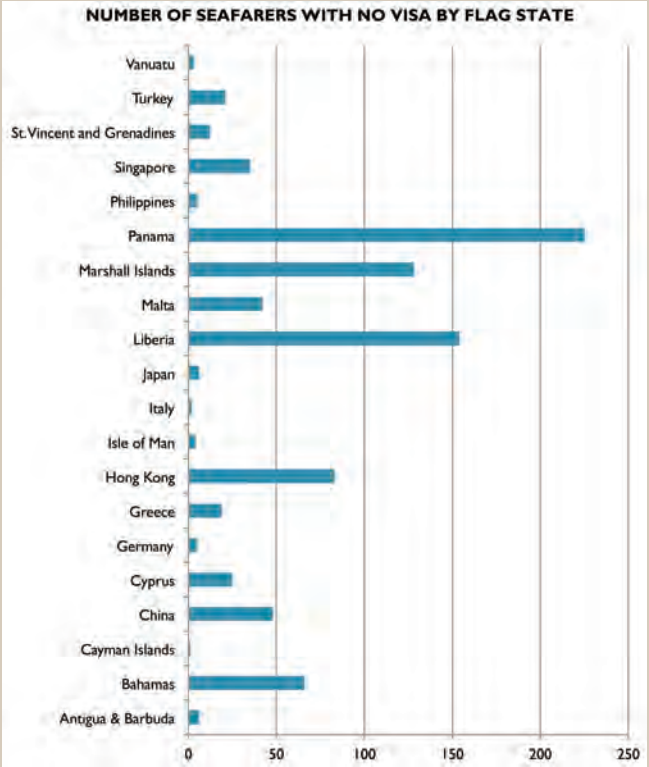




PERCENTAGE OF SHIPS WITH DETAINED SEAFARERS

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014
	18%	15%	20%	24%	18%	16%	14%	18%	23%

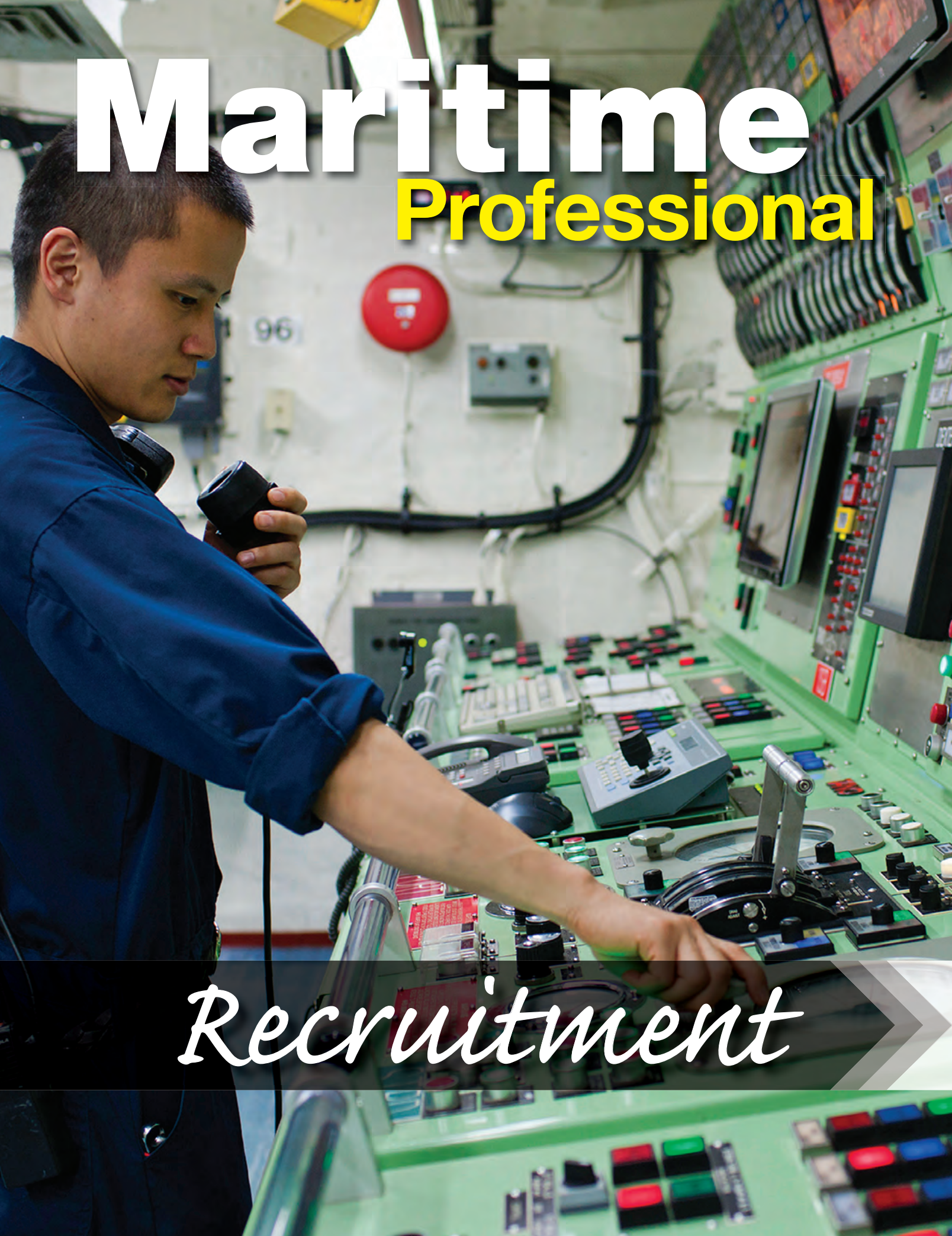




CREWMEMBER VISAS: In this year's survey, 86.4% of seafarers were denied shore leave because they lacked a valid crewmember (D or C-1/D) visa. The Convention on Facilitation of International Maritime Traffic (FAL) prohibits countries from requiring seafarers to have a visa for shore leave. The United States has ratified the FAL, but it nevertheless still requires crewmembers on merchant ships to have a visa to obtain shore leave. Ratification of the International Labour Organization's Seafarers' Identity Documents Convention (Revised), 2003 (ILO-185) would both enhance maritime security and increase seafarers' shore leave opportunities in the United States. The Convention enhances maritime security by setting international standards for seafarer identification documents that provide reliable, verifiable and internationally acceptable seafarer identification. Countries that have ratified ILO-185 are obligated to accept valid ILO-185 seafarers' identification documents in place of visas for the purposes of shore leave. The United States could comply with ILO-185 by waiving visa requirements for seafarers who have valid ILO-185 seafarers' identity documents. For security, the US could maintain its existing 96-hour pre-arrival crewmember vetting process and verify ILO-185 seafarers' identity documents supplemented by the US-VISIT program in American seaports.

RESTRICTIONS TO THE VESSEL: The survey identified many reasons for detention on board. Three seafarers on one ship denied shore leave by CBP because the seafarers did not understand some of the questions asked by CBP during their interview. As many as 67 seafarers – notably including 19 Americans – were denied shore leave by terminal restrictions. In truth, the numbers of seafarers being denied shore leave by terminal restrictions is likely under-reported because some terminals did not allow terminal access to SCI chaplains. At least four ports reported restrictions at terminals within their port.

Founded in 1834, the Seamen's Church Institute of New York & New Jersey is the largest, most comprehensive mariners' agency in North America. Annually, chaplains visit thousands of vessels in U.S ports, along 2,200 miles of America's inland waterways and into the Gulf of Mexico. Every year, SCI provides training to 1,600 mariners via simulator facilities in Houston, TX and Paducah, KY. The Institute and its attorneys are recognized as leading advocates for merchant mariners. Download the complete survey results at http://smschur.ch/shoreleave2014


Maritime
Professional
Recruitment

Five Minutes with

Francis W. Cunningham

Deputy Director CIVMAR Manpower & Personnel, Military Sealift Command

The process to find, train and retain top quality personnel for duty ashore and afloat is the number one challenge for maritime organizations globally. Military Sealift Command, one of the premiere employers in this industry, is no exception. Frank Cunningham, MSC's Deputy Director CIVMAR Manpower & Personnel, shares his insights with MarPro on accomplishing the mission.

By Greg Trauthwein

Maritime leaders cite 'finding and keeping qualified talent' as their top challenge. Is this the same for MSC, and if so, what is your strategy to find and keep the people you want?

Yes, we have similar challenge particularly in the engineering and deck officer positions. These are very skilled and talented individuals, thus are highly desirable in the market place. MSC offers long careers and pays very well as well as excellent job security and benefits. Our overall retention rate is 93%, however in the officer positions this is more like 90%. So we work hard to over recruit at the officer entry level positions and train individuals to move up quickly.

When 'selling' MSC careers to prospective mariners, what would you say are the organization's best qualities and drawing power?

MSC offers a variety of ships, a career, job security and the best benefits any employer can offer. We currently operate 52 civil service mariner-crewed ships of multiple types and classes. This allows individuals to learn different engineering plants, ship operations and grow in their career. MSC vessels operate worldwide and stay in port much longer than commercial ships. This allows mariners to go ashore and actually see the world.

Give us a quick snapshot of the make-up of MSC mariners.

MSC currently employs approximately 5,500 civil service mariners. (The supplied graphic to the right provides numbers and demographics.)

How many of your officers emanate from the U.S. state and federal maritime academies?

Approximately 80%; we have about 900 officers.

What's your retention rate? On deck? In the engineroom? Officers vs. crew? What can you do to improve those numbers and performance?

Retention overall is 93%, lower in the officer rankings (90%). We are working more on improved strategies in the officer ratings as these are critical to operating the ships safely. Working with individuals to assign them to desired vessels, work on new ship construction projects, and more training opportunities. Timely reliefs is the most crucial area we work to ensure individual get home for family events and well-earned vacation. This is challenging in peak seasons such as summer and holidays but one of required areas to improve on.

Rapid advancement of one's license has always been a hallmark of MSC service. Is that still the case?

Absolutely. It is one of our selling features.

The breadth and diversity of your fleet - from range instrumentation to tankers to general cargo and myriad other platforms - gives MSC the ability to draw from a wide range of specialty mariners. Once in service, do mariners have good opportunities to move from one sector to another?

Yes, we encourage that in the beginning of one's career but find after time individuals center to their desired ship class and we respect that as best we can. Ships are becoming more specialized and require more training per ship class so it is not as easy to move from one class to another, yet we still work hard to place an individual where they want to be.

The MSC recapitalization program has greatly modernized the fleet in terms of what it was just two decades ago. What's the average age of your tonnage now?

We have quite a range. T-AO class is 25 years plus. The T-AKE class is new and under 10, and the JHSV and MLP variant classes are under construction. We have some former Navy vessels (AS, AFSB(I)) that are closer to 40.

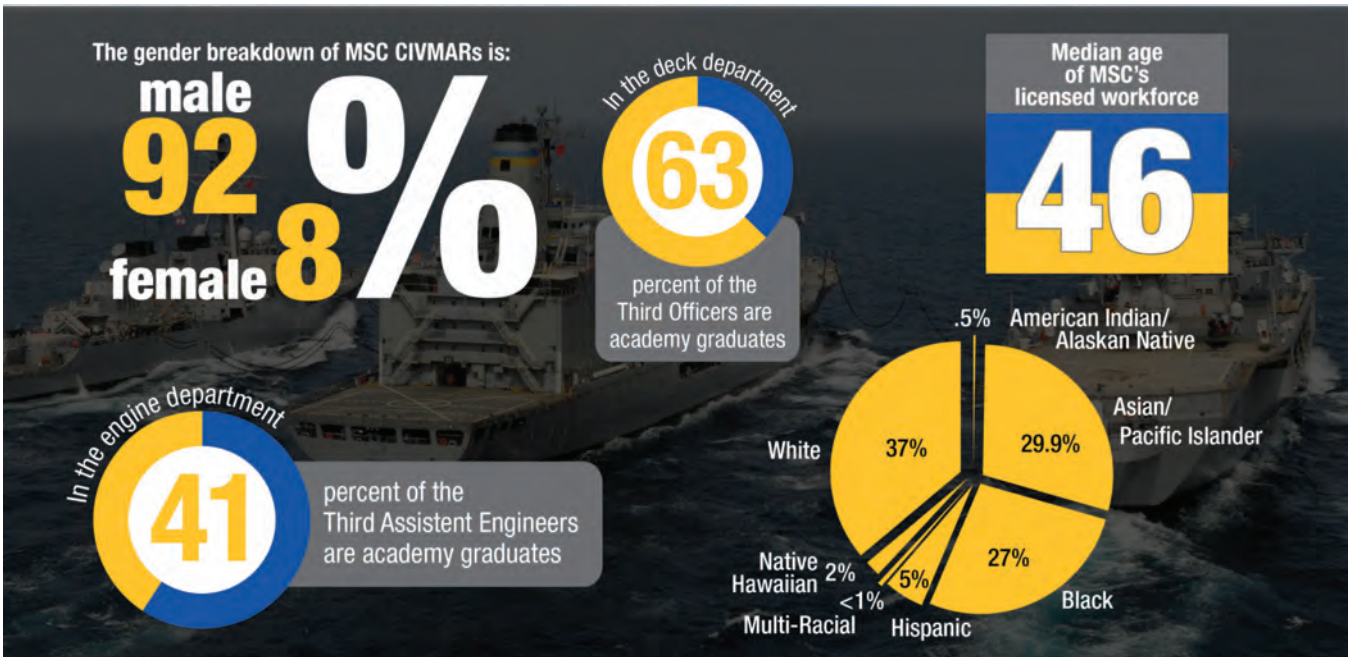
Better amenities for afloat crew seems to be picking up significant steam across many sectors, from internet access to more modern accommodations and more "shore side" benefits. Is this the case at MSC, and if so can you illustrate some specific example of how MSC has made its vessels more appealing to potential crew.

The accommodations and internet access has improved greatly on MSC vessels as well. Most crew members have their own room or two to a room. The newer ships have all new gym equipment, TV's and refrigerators in the room and are more spacious than the older vessels. We have upgraded our internet capability and doubled the speed on all ships.

Today's mariners deal with a number of challenges related to increased regulatory and training pressures. Where does MSC get involved in helping mariners in the never-ending process of keeping current; medically, professionally and in terms of regulatory requirements?

MSC is probably a leader in this category. We arrange and pay for all training requirements, reimburse for credentials and provide subsistence and quarters while in training. Training is best arranged prior to or just after vacation or when a ship is in a shipyard. All logistics are coordinated with our training division. MSC provides training and we contract out to commercial facilities. MSC operates training centers on east coast, west coast for firefighting and damage control. MSC also operates an UNREP training facility on the east coast and a JHSV simulator where we are certified for high speed craft endorsement.

Military Sealift Command by the Numbers / **People**



Since the 1980s, MSC has taken on an increasing role in its sealift responsibilities, especially where civilians are taking on more roles/billets formerly filled by uniformed naval personnel. Do you see this trend increasing?

Yes, we have several ships with hybrid crew structures in which CIVMARs operates the USS vessel but uniformed Sailors perform the mission. This has potential for growth as it is a savings to the U.S. Navy while also returning more sailors to the war fighting ships.

Is there economy of scale for the government and taxpayers in a more compact but highly versatile civilian crew?

In comparison to a large USS Navy crew, yes. We operate the ship with more experienced merchant mariners and maintain the vessel more to commercial standards. Both allow for savings.

Where and in what sectors does the typical MSC mariner/officer get additional career opportunities than a mariner serving in purely commercial service?

Continuing their career in the US government. CIVMARS are federal employees and can work for NAVSEA, MSC, MARAD etc., adding to their years of service toward retirement.

Who is the ideal MSC mariner? What would they possess in qualities that would best present a positive asset for the organization, the sealift effort and the nation, in general?

An individual with high professional and ethical standards and as you said " the mariner who wants to ship out and move up quickly".

As Deputy Director for Manpower and Afloat Personnel, part of your daily efforts are likely spent ensuring that MSC mariners have the skills and tools to properly do their jobs. Where in the scope of MSC employment do STCW requirements intersect, parallel and perhaps augment the goals of the organization?

STCW standards are more parallel to the goals of the organization than anything else. Some of the recent changes were training frequencies and standards we were already performing. The medical changes are closer to the higher medical standards we already had. There are some new changes such as engine room management and leadership training that we had not formalized and will now augment our goals.

Military Sealift Command by the Numbers / **Ships**

MSC actively recruits for a wide variety of aboard and onshore positions.

RECRUITER PROFILE

Cunningham

Deputy Director CIVMAR Manpower & Personnel, Military Sealift Command

Francis W. (Frank) Cunningham is Deputy Director of CIVMAR Manpower and Personnel for the U.S. Navy's Military Sealift Command. He is responsible for all crewing and training requirements for Military Sealift Command's government owned/government operated vessels. At the time of his accession to the position in June 2011, his responsibilities encompassed the recruiting, labor relations and human resources servicing for a workforce of federal civil service mariners, numbering 5,500, who crew 50 Navy ships worldwide.

A native of Boston, Mass., Cunningham graduated from the Boston Latin School in 1985. He went on to earn his bachelor's degree in science from the United States Merchant Marine Academy, Kings Point, N.Y. in 1989. He also received his U.S Coast Guard issued merchant mariners' license as 3rd assistant engineer at that time. In 2001 Cunningham earned a master's degree in business administration from Duke University's Fuqua School of Business.

MILITARY SEALIFT COMMAND

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For the inaugural insertion of *Maritime Professional Recruiter* MarPro sought and delivers insights from one of the leading maritime recruiters in the United States and the world, the Military Sealift Command, with a workforce that consists of more than 9,500 people worldwide, most of whom serve at sea. In fact, about 80% of its people serve at sea, aboard non-combatant Navy ships, as civil service mariners (CIVMARs) who are federal employees. The remainder includes commercial mariners, civil service personnel ashore and active duty and reserve military personnel. All MSC ships, unlike other U.S. Navy ships, are crewed by civilian mariners.

A Storied History

During World War II, four separate government agencies controlled sea transportation. In 1949, the Military Sea Transportation Service became the single managing agency for the Department of Defense's ocean transportation needs. The command assumed responsibility for providing sealift and ocean transportation for all military services as well as for other government agencies. Only nine months after its creation, MSTS responded to the challenge of the Korean War. On July 6, 1950, 11 days after the initial invasion of South Korea by North Korean troops, MSTS transported the 24th Infantry Division and its equipment from Japan to Pusan, South Korea, for duty. During the Vietnam War, MSTS was renamed Military Sealift Command. Between 1965 and 1969, MSC transported nearly 54 million tons of combat equipment and supplies and nearly 8 million tons of fuel to Vietnam. MSC ships also transported troops to Vietnam, which marked the last use of MSC troop ships.

During the first Persian Gulf War's Operations Desert Shield and Desert Storm, MSC ships delivered more than 12 million tons of wheeled and tracked vehicles, helicopters, ammunition, dry cargo, fuel and other supplies and equipment during the war. At the height of the war, MSC managed more than 230 government-owned and chartered ships.

As of January 2013, MSC ships delivered more than 25.7 billion gallons of fuel and moved 126.2 million square feet of combat equipment and supplies to U.S. and coalition forces engaged in operations supporting Iraq and Afghanistan.

The Military Sealift Command Fleet at a Glance

For the latest on the depth and breadth of the Military Sealift Command fleet, visit: **http://www.msc.navy.mil/inventory/**

Combat Logistics

The ships of our Navy's Combat Logistics Force (CLF) are the supply lines to U.S. Navy surface combatant ships at sea. They provide fuel, food, ordnance, spare parts, mail and other critical supplies enabling the fleet to remain at sea, on station and combat ready for extended periods of time. CLF began in 1972 as the Naval Fleet Auxiliary Force after tests demonstrated that civil service crews could maximize effectiveness and cost efficiency in operating the Navy's fleet support ships. Fleet oiler USNS Taluga became the first ship to transfer to MSC, which now operates all Navy supply vessels.

Currently, all Navy CLF ships are government owned and crewed by civil service mariners, experienced maritime professionals sailing as Navy civilians under MSC. Until September 2013, certain ships also maintain a small contingent of uniformed Navy personnel aboard for operations support, supply coordination and helicopter operations. Supplies are moved from CLF ships to combatant ships by several processes known collectively as underway replenishment (UNREP).

Special Mission

The Special Mission program has approximately 24 ships that provide operating platforms and services for a wide variety of U.S. military and other U.S. government missions. The diversity in this category includes submarines and special warfare support ships, oceanographic survey ships, missile range instrumentation ships, as well as the Sea-based X-band

Military Sealift Command is a workforce of more than 9,500 people worldwide, most of whom serve at sea. In fact, about 80% of its people serve at sea, aboard non-combatant Navy ships, as civil service mariners (CIVMARs) who are federal employees.

radar platform, known as SBX-1, which is part of the U.S. Ballistic Missile Defense System.

Prepositioning

MSC's Prepositioning Program is an essential element in the U.S. military's readiness strategy. Afloat prepositioning strategically places military equipment and supplies aboard ships located in key ocean areas to ensure rapid availability during a major theater war, a humanitarian operation or other contingency. MSC's 26 prepositioning ships support the Army, Navy, Air Force, Marine Corps and Defense Logistics Agency. Prepositioning ships provide quick and efficient movement of military gear between operating areas without reliance on other nations' transportation networks. These ships give U.S. regional combatant commanders the assurance that they will have what they need to quickly respond in a crisis - anywhere, anytime. During a contingency, troops are flown into a theater of operations to rapidly employ the cargo from these ships.

Many of MSC's prepositioning ships are able to discharge liquid, containerized or motorized cargo both pier side or while anchored offshore by using floating hoses and shallow-draft watercraft, called lighterage, that are carried aboard. This allows cargo to be ferried to shore in areas where ports are non-existent or in poor condition and gives the nation's military forces the ability to operate in both developed and undeveloped areas of the world.

Prepositioning ships include a combination of U.S. government-owned ships, chartered U.S. - flagged ships and ships activated from the Maritime Administration's Ready Reserve Force. All prepositioning ships are operated by U.S. civilian mariners who work for ship operating companies under contract to the federal government.

A CAREER @

MSC

MSC offers many career opportunities both ashore and afloat. As part of its workforce, it employs more than 5,500 civil service mariners; federal government employees who crew and sail many non-combatant Navy ships. MSC is an equal opportunity employer.

• Ashore

For job opportunities at MSC, visit the official federal jobs site:
https://www.usajobs.gov/

Be sure to include all of the information and documents required as listed in the announcement or your resume will not be forwarded for consideration. MSC does not accept applications directly. Additionally, the Department of the Navy Human Resources web site provides additional information on a variety of topics, including job opportunities, training courses, benefits and Equal Employment Opportunity:
http://www.donhr.navy.mil/

• Afloat - Take Command of Your Career

For information on becoming a CIVMAR, visit:
www.sealiftcommand.com

Find more information on Military Sealift Command at:
http://www.msc.navy.mil/

While most active ships in MSC's Prepositioning Program strategically place combat gear at sea, there are other ships, including:

- The Mobile Landing Platform, a new class of ships designed to serve as a mobile sea-base option that provides our Navy fleet with a critical access infrastructure supporting the flexible deployment of forces and supplies
- An offshore petroleum distribution system ship that can deliver fuel from up to eight miles offshore; and
- Two aviation logistics support ships that are activated as needed from reduced operating status to provide at-sea maintenance for Marine Corps fixed- and rotary-wing aircraft

Service Support

MSC's Service Support Program ships provide our Navy with towing, rescue and salvage, submarine support, and cable laying and repair services, as well as a command and control platform and floating medical facilities. The program also includes our Navy's first designated interim afloat forward staging base, USS Ponce (AFSB(I) 15).

All ships in the program are government owned and operated by civil service mariners (CIVMARs), experienced maritime professionals sailing as Navy civilians under MSC. Several ships have hybrid crews of CIVMARs and uniformed Navy personnel working under the leadership of a U.S. Navy captain. This crewing structure allows the ships to maintain their commissioned status.

Sealift

MSC's Sealift Program provides high-quality, efficient and cost-effective ocean transportation for the Department of Defense and other federal agencies during peacetime and war. More than 90 percent of U.S. war fighters' equipment and supplies travels by sea. The program manages a mix of government-owned and long-term-chartered dry cargo ships and tankers, as well as additional short-term or voyage-chartered ships. By DOD policy, MSC must first look to the U.S - flagged market to meet its sealift requirements.

Government-owned ships are used only when suitable U.S.-flagged commercial ships are unavailable.

In this category, the Joint High-Speed Vessels are the Navy's new ship class, designed for rapid, intra-theater transport of troops and military equipment.

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Home Grown Talent

Newport News' Apprentice School seeks to go beyond training workers, it seeks to build leaders.

By Eric Haun

The Apprentice School at Huntington Ingalls Industries' (HII) Newport News Shipbuilding division offers an invaluable educational and career opportunity for those seeking a profession in shipbuilding, but the school's benefits also extend much further than that. Within the HII business, the company uses the program to groom its apprentices for leadership roles within its managerial and corporate ladder.

Students accepted into The Apprentice School in Newport News, Virginia enter tuition-free apprenticeships that provide an opportunity to earn college credit, receive competitive pay and benefits and, most importantly, learn a useful trade on which to build a career. Upon commencement, Apprentice School graduates are highly skilled workers prepared to further impel Newport News's tradition in building world-leading naval vessels.

Perhaps just as important to the training aspect of this story is the radically different place that HII finds itself – in comparison to many of its peers – especially in terms of its efforts to recruit, train and retain talent in the highly competitive shipyard game. Amidst countless stories lamenting the dearth of qualified craftsmen on the U.S. Gulf Coast, the HII formula produces a different result, with literally thousands of desirable candidates literally banging on the door to get in on the action. How HII accomplishes all of this just might surprise you. After discovering how, you probably won't wonder why.

The Program

Since its founding in 1919, The Apprentice School has produced more than 9,800 graduates who are skilled in various aspects of the shipbuilding trade, the vast majority of which have landed careers within the shipbuilding field – mostly at the Newport News yard, although graduates are not required to stay within the HII group. Currently, about 13.5% of Newport News Shipbuilding's 23,700 employees are Apprentice School graduates.

Apprenticeships last anywhere from four to eight years, depending on the chosen curriculum, which could be one of 19 specially tailored shipbuilding disciplines with eight optional advanced programs of study. These careers include coatings specialist, electrician, maintenance electrician, heating and air conditioning, heavy metal fabricator, insulator, machinist, millwright, molder, nondestructive tester, outside machinist, patternmaker, pipefitter, rigger, sheet metal worker, shipfitter, welder, welding equipment repair and other advanced disciplines such as shipyard operations, cost estimator, dimensional control technician, marine designer, molding and simulation program analyst, nuclear test technician, production planner and marine engineer.

Apprentices work a regular 40-hour week and are paid for all work, including time spent in academic classes. Beyond this, they attend classes two full days a week and spend the other three days in labs gaining hands-on technical instruction and experience. The curriculum encompasses on-the-job training with a strong foundation in shipbuilding discipline theory. In total, each apprentice completes at least 1,000 hours of coursework in the Trade Related Education Curriculum (TREC) and World Class Shipbuilder Curriculum (WCSC).

Through partnerships with Thomas Nelson Community College, Tidewater Community College and most recently, Old Dominion University, the school's academic program provides an opportunity to earn associate degrees in business administration, engineering and engineering technology and bachelor's degrees in mechanical or electrical engineering.

The Apprentice School's fulltime academic instructors create classroom experiences to prepare apprentices for work in their shipbuilding trades, to continue their education in one of the school's advanced programs and to further their education through Newport News Shipbuilding's Educational Assistance Program, through courses in business, communications, drafting, mathematics, physics and ship construction. Additionally, more than 70 craft instructors (who are all Apprentice School graduates) pitch in to assist in the development of core leadership principles and craftsmanship essential for a successful shipbuilding career, help trainees to develop targeted skill sets, document the apprentices' development and provide regular evaluations.

High-tech Facilities

Due to the unique nature and high specificity of the apprenticeships, The Apprentice School and its leadership are structured within Newport News Shipbuilding, which designs, builds and maintains some of the most complex and technologically advanced nuclear and nonnuclear ships for the U.S. Navy and Coast Guard and provides after-market services for military ships around the globe. And because The Apprentice school is located on-site at Newport News Shipbuilding, the school has access to state-of-the-art facilities that range from traditional classrooms to 2.5 miles of waterfront production facilities on the James River, including one of the Western Hemisphere's largest dry docks and cranes, one of the world's

photo by John Whalen

premier machine shops and steel fabrication facilities, extensive sheet metal and wood working shops, a complete motor rebuild and repair shop, a complete propulsion shaft repair facility with capacity up to 65 tons, high-capacity pump and valve repair and calibration facilities and a full range of laboratory services.

In December 2013, The Apprentice School opened a new 92,000-square-foot facility as part of a development project pioneering the revitalization of the downtown Newport News area in partnership with the City of Newport News, the Commonwealth of Virginia, Armada Hoffler Holding Co. and Huntington Ingalls Industries. The modern facility houses classrooms, computer labs, a naval architect and marine engineering room, physics lab, various offices, a conference room, student center and even a gymnasium. Notably, the school has three NCAA Division III athletic programs.

Leadership 101

Though the program serves as an excellent career builder for professionals seeking entrance into various spaces within the shipbuilding field, the school also helps foster leadership within the HII company. Among Apprentice School alumni are three of the group's current vice presidents, along with countless other leaders in managerial and directorial positions throughout the group, including about 55% of the yard's production management team.

"The Apprentice School is considered to be the leadership academy for our company, and others refer to us as the backbone of our company," explained Everett Jordan, a 1977 Apprentice School shipfitter alumnus and now the school's educational director. "Our charter is to take young men and women and develop them in terms of craftsmanship, scholarship and leadership so that they will integrate into our leadership team and help to run our business for the next several decades."

photo by Chris Oxley

Everett Jordan (far left) unveils a sculpture at the entrance to the new school on Friday, Dec. 6, 2013. The 2,300-pound sculpture was cast by Eastern Shore artist David H. Turner.

Photo by Ricky Thompson

Everett Jordan speaks with Hampton and Poquoson teachers Oct. 10, during a tour of the shipyard as part of the Career Pathways Program.

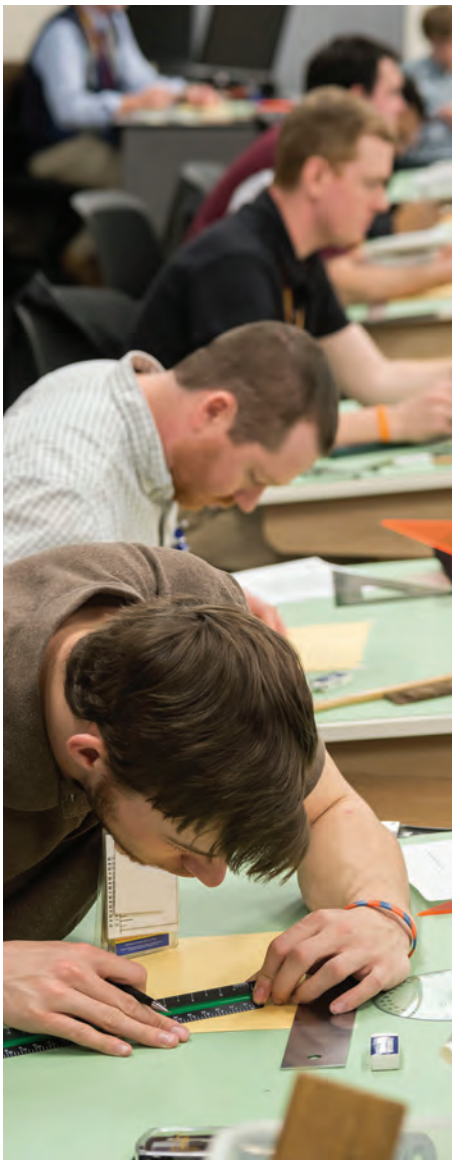

Photo by Chris Oxley

Graduates of file out of the Worship Center at Liberty Baptist Church following commencement exercises on Saturday, March 1, 2014

Photo by Ricky Thompson

Everett Jordan, The Apprentice School's Educational Director

Jordan continued, "A lot of folks find it very difficult to believe that we invest in our students the way that we do yet don't require any service commitment once they graduate. We feel strongly that if we can't create an environment where our graduates are engaged, energized and excited to work at our company with limitless promotional opportunities and career advancements, then we really don't want to force someone to stay if they're not inclined. Being a large company like we are, there are untold numbers of promotional opportunities that are posted every week in a company like ours. Our apprentices very quickly integrate into our leadership team and some 240 different job capacities."

As such, demand to enter the program is high, and the school has become very selective. The Apprentice School anticipates upwards of 6,000 applicants in 2014, while only 230 will be accepted. The school's current student body of roughly 825 students is comprised of apprentices from 24 states, while slightly more than half are from Virginia's tidewater region. The school seeks applicants with strong leadership qualities, academic records, community service, etc. – similar criteria to most colleges and universities – and characteristics that HII deems necessary for the development of skilled leaders.

In real practice, Newport News Shipbuilding typically attracts a mix of skilled and unskilled labor, hiring between 1,500 and 2,000 employees annually with better than 85% remaining employed at the end of their first year. Internal training systems are deployed so that unskilled workers can progress to an entry journeyman level over a three- year period. The Apprentice School, on the other hand, hires approximately 220 apprentices annually who enter apprenticeships ranging from four to eight years in length. During their apprenticeship, students are exposed to extensive leadership development generally culminating in graduates entering into salary jobs or management positions throughout Newport News Shipbuilding. Ten years after graduation, 82% remain at NNS.

"We grow our own from within," Jordan said. "The leadership of our company really appreciates the contributions the school makes in terms of producing outstanding graduates who stay with the company and make a career with the company." For those employees and companies on the outside looking in, it is a model worth studying. Better still; one worth duplicating elsewhere.

Eric Haun is a NYC-based journalist, web editor of MarineLink.com and contributor to Maritime Reporter & Engineering News, Maritime Professional, Marine News and Marine Technology Reporter.

BY THE NUMBERS

Maritime Training & Employment Numbers

Today's red hot maritime markets – especially on this side of the pond – are being fueled by a super-charged combination of domestic energy production, an increase in the number of hulls being turned out by the nation's shipyards, and robust salary structures. Those variables are also driving an insatiable thirst for qualified maritime professionals and licensed mariners, in particular. Hence, it should come as no surprise that America's maritime academies are experiencing boom times, record enrollments, and – *something you won't see in the graph to the right* – a marked increase in the number of students migrating ***back*** to the license track curricula. The most telling statistic, perhaps, is the 1,593 graduates who stepped out into the work place from the class of 2013. That number is up 307 students from just six years ago, or a whopping 24 percent. Beyond this, it represents a headcount leap of 160 or 11 percent more than the running six year average. But that's only half the story.

24%

In 2013 1,593 graduates stepped out from the U.S. Maritime Academies and into the work place. That number is up 307 students – a whopping 24 percent – from just six years ago.

At the Massachusetts Maritime Academy, today's incoming frosh and rising sophomore classes are not only larger than ever before, but both are also much more heavily weighted towards the license-track program. Indeed, 64 percent of these students are choosing the license track versus a six year average of just 44 percent at the storied academy. Those robust rebounding numbers, although a far cry from the school's almost 100 percent license track numbers from the 1980's, reflect the demand for mariners everywhere. And, although the 2014 graduation numbers were not yet being released as we went to press, the trend can be seen across the full breadth of the nation's maritime training institutions. Also not reflected in the table above is Mass. Maritime's total regiment numbers for the coming school year. Topping out at almost 1,400 students, the numbers produce an average class size of 350, of which 224 graduates annually will potentially walk up a gangway just weeks after graduation. In fact, four of the seven schools recorded record high graduation numbers in 2013, and all reached their high water marks within the last two years.

But, the positive trending brings with it another sea bag full of problems. The state maritime academies in particular are bursting at the seams, but also struggling to keep up with the unrelenting introduction of still more in the way of STCW training requirements that heap as much as an additional semester of requirements on the backs of cadets – all of which is still being crammed into a traditional four-year academic calendar. MMA Dean of students Brad Lima told *MarPro* in July, "We are already running 11+ months per year. The coming additional requirements will require us to rethink how we can package the training." Moreover, it cost as much as 25 percent more to educate a license track cadet, when the cost of a training cruise and STCW training is thrown in. Still, that's good value in today's spiraling education costs where a $100,000 MMA education immediately translates in a $70,000 job for fully 97 percent of its graduates. For example, at MMA, as much as 25% of each graduating class is typically offered employment through the Military Sealift Command – now one of the nation's largest employers of merchant seamen. *And the other schools?* They boast similar metrics. In fact, the license programs are becoming so popular that Mass. Maritime is considering a "cap" to the number of students it can accommodate in the license track, and at least one other academy has already made the move.

Good times indeed, for schools, some of which, that just 15 years ago were teetering on the brink of extinction as the U.S. merchant marine looked to be dying a similar, slow and lingering death in an increasing global world. But, today's license track cadets face significant pressure in trying to complete both a degree and obtain a license in just four years. At Mass. Maritime, the Marine Transportation (Deck) majors are the least likely (just 40%) to have all of their requirements completed on the day these heave that hat into the air. Brad Lima adds, "The STCW assessment is now more stringent than the academic standards."

64%

64 percent of students at Mass Maritime are choosing the license track versus a six year average of just 44%. Still a far cry from nearly 100% in the 1980s, but improvement.

Traditionally, the United States has front-end loaded education for their cadets and augmented that later with training and sea time. Across the pond and beyond, training and sea time was front loaded, with class work taken

afterwards. For U.S. maritime academies, and with the increasingly time-consuming STCW training, the handwriting is on the wall – they'll have to move in the direction of the international training schemes to keep up.

And that doesn't even include the so-called dynamic-positioning (DP) certifications, where at this time, simply too many gray areas color the myriad standards and protocols. At the end of the day, laments Lima, "No one has yet demonstrated that STCW has added value and/or safety with the extra training being required."

All challenges aside, we asked Dean Lima for his assessment of the current situation and an estimate of how long the 'boom' time could last – at least at the academies themselves. For his part, Lima insists, "For the next dozen years, the prospects look very good." He cited attrition from a graying workforce and the uncertainty represented by far more stringent U.S. Coast Guard medical standards that are now being applied at two year intervals, instead of the traditional five. Add in the ongoing domestic energy boom and it's not too hard to join Lima in his optimism. That's because, as the market changed and demanded products, the academies delivered. Stay tuned for what comes next.

		CMA	Maine	Mass.	Michigan	SUNY	Texas	USMMA	All	PCT. Lic.
2008	Graduates	131	169	214	30	268	263	211	1286	
	Licensed	97	86	112	30	137	42	211	715	56
	Non-Lic.	34	83	102	0	131	221	0	571	
2009	Graduates	159	152	257	19	306	250	196	1339	
	Licensed	102	102	122	19	172	40	196	753	56
	Non-Lic.	57	50	135	0	134	210	0	586	
2010	Graduates	157	182	252	21	266	274	201	1353	
	Licensed	101	125	122	21	144	55	201	769	57
	Non-Lic.	56	57	130	0	122	219	0	584	
2011	Graduates	169	210	267	30	300	261	205	1442	
	Licensed	119	136	108	29	165	65	205	827	57
	Non-Lic.	50	74	159	1	135	196	0	615	
2012	Graduates	171	156	292	27	390	328	219	1583	
	Licensed	113	93	126	25	229	56	219	861	54
	Non-Lic.	58	63	166	2	161	272	0	722	
2013	Graduates	161	132	325	41	396	337	201	1593	
	Licensed	113	73	125	41	243	63	201	859	54
	Non-Lic.	48	59	200	0	153	274	0	734	
Totals	Graduates	948	1001	1607	168	1926	1713	1219	5420	
	Licensed	645	615	715	165	1090	321	1219	3064	57
	Non-Lic.	303	386	892	3	836	1392	0	2356	
	PCT Lic.	68	61	44	98	57	19	100	57	
AVG	Graduates	158	167	268	28	321	286	206	1433	
High	No. Grads.	2012	2011	2013	2013	2013	2013	2012	2013	
PCT	Licensed	68	61	44	98	57	19	100	***	

(*) entries marked in RED show high water marks for those categories; total enrollment, average enrollment, numbers of licensed graduates, etc. CMA (California Maritime Academy).

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