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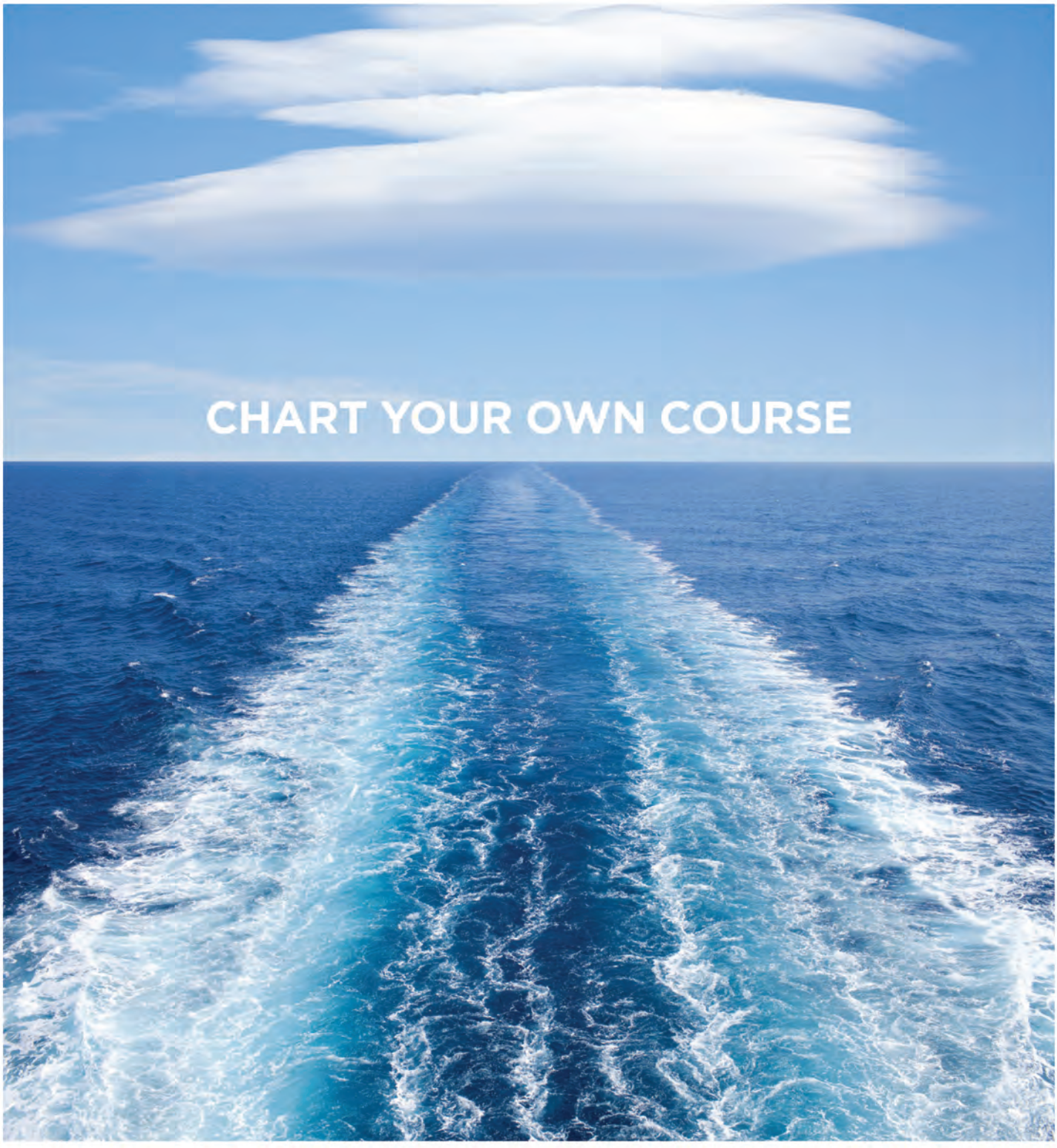
Features

ON THE COVER

The deployment of Marine Well Containment Company's Capping Stack, the centerpiece of its high tech well containment system, shows just how far the offshore oil & gas industry has come in terms of safety and environmental precautions since the infamous Macondo Incident just five years ago. The story begins on page 38.

(Photo: Courtesy Marine Well Containment Company)



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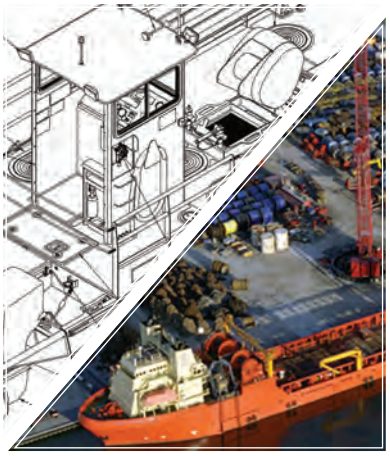

NOTE: In the March edition of MarineNews and in an online posting of the article that followed, Richard Paine's FINANCE article (page 18) referenced [OSV Day rates and utilization data] that should have been attributed to WORKBOAT magazine. We regret the omission.

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It is at times like this that bumper sticker humor comes in handy. One of my favorites has to be the infamous *"God, please let me have another oil boom – I promise not to mess this one up"* version that graced the bumpers of pickup trucks on the Gulf Coast in the late 1980's. I lived through that cataclysmic event during my 14 years in Houston. It was in 1985 that the bottom had dropped out of oil, reaching a nadir of $12 per barrel. Using the time-honored Keefe family tradition of buying high and selling low, I eventually shed a primary residence and a three-unit rental property in the Bayou City during the worst of it.

It is okay if you find yourself inclined to ask, "So what?" It's a good question. That's because the Offshore Annual of ***MarineNews*** touches upon many things; none more important than the value of lessons learned. First and foremost amongst those is the mandate to not repeat the scenario that played out on the Gulf Coast in the late 1980's. Back then, tens of thousands of workers (involuntarily) departed an industry that they had lost faith in, never to return. The void this created, even to this day, has left a generational and skills gap that quite frankly, the offshore sector hasn't yet recovered from. We simply can't afford to do that again. NOIA's Randall Luthi and IMCA's Jane Bugler touch on just a few of the reasons why. Turn the page and drill down for answers.

Safety and offshore energy are still inextricably connected. Beyond this, our expert commentators say that industry can't turn its head from this reality ever again, even if the price of oil drops to 1986 levels. The trick will be how to accomplish that goal and still remain inside those scaled back CapEx budgets. It can be done. Inside this edition, you will find out how and why.

For those readers who need real data to support the notion that the oil industry can and does make it happen on a daily basis, look no further than this month's *BY THE NUMBERS* entry, assembled by Dagmar Etkin, PhD, President and Principal Consultant at Environmental Research Consulting. Etkin, appropriately enough, examines the changing risks for offshore well blowouts in a statistical survey that sheds unique, balanced light on the real performance of the energy industry. While a catastrophic blowout scenario is a very rare event, contingency planning and preparedness, as well as technological advances in prevention will be important in the years to come. And when it comes to environmental research, nobody drills deeper than Etkin. The report starts on page 8.

Offshore Oil & Gas, Safety, Prevention, Response – and yes, oil pollution itself – all have a place in this month's edition. Furthering the first four causes while eliminating the final challenge is what the industry is all about. And, you didn't have to be selling real estate in Houston in 1987 to know that.

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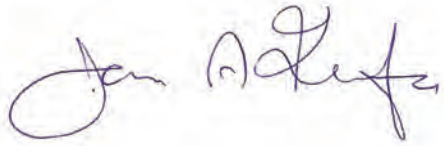

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Perspectives on the Changing Risks for Offshore Well Blowouts

In the aftermath of the Macondo MC252 well blowout in the Gulf of Mexico in April 2010, public concern about future offshore well blowouts rose significantly. This had been the first significant well blowout that had occurred in US waters since the 1969 blowout off of Santa Barbara, California. Many people born after the mid-1960s were not aware of that earlier California incident, though it was a significant precipitating factor in the establishment of the Environmental Protection Agency. The Macondo MC252 incident was 49 times the magnitude of the 1969 incident, and public awareness of the incident was enhanced by the continuing media coverage, including subsea videos of spewing oil. The questions that arose from the Macondo incident and that have continued to be voiced include:

- *Was that the biggest blowout that ever occurred?*
- *How often have blowouts occurred in the past?*
- *How likely is this to happen again? Could it be even bigger than the Macondo blowout?*
- *Where are these incidents likely to occur?*
- *Do new drilling technologies and new locations for offshore oil exploration and development increase the likelihood of a blowout?*
- *What kinds of environmental impacts would there be with another blowout? What about sensitive areas in the Arctic? Could there be more damage to Gulf of Mexico?*
- *Would it be possible to clean up that much oil if there were to be another major blowout?*
- *Can blowouts be prevented with current technologies? Can the severity of a blowout be mitigated?*

Concerns about massive well blowouts are certainly understandable and are leading government officials, industry, and the public to consider the following, with respect to regulations and industry practices:

Predicting the future of a high-impact, low-probability event is complicated. It requires an analysis of past data, provided these are available, and then making projections on the way things might be different in the future. For blowouts, this process is particularly challenging, because there have not been that many blowouts from which to derive accurate statistics. But, there have been more blowouts than most people know about. Beyond the larger incidents that have occurred (Table 1), there have been about 600 other offshore blowouts worldwide since the mid-1950s from the more than 50,000 exploratory wells that have been drilled worldwide.

Studies on this dataset have led to a number of conclusions, including that the probability of a well blowout is about 0.00241 to 0.00479, or one blowout for every 290 to 415 wells drilled. This may seem like a high probability, especially considering the rate of new exploratory wells being drilled in the Gulf of Mexico and other areas. But it is important to bear in mind that a "blowout" does

Table 1: Worldwide Largest Offshore Well Blowouts (100,000 bbl or more)

Well	Start Date	Location	Bbl Spilled	Flow Rate (bbl/day)			Duration (days)
				Peak	Average	Lowest	
Ixtoc I	6/3/1979	Campeche, Mexico	3,300,000 to 10,190,000	30,000	20,000 to 35,000	10,000	290
Macondo MC252	4/20/2010	Gulf of Mexico	2,450,000 to 4,200,000	35,900 to 60,000	28,800 to 49,400	unknown	85
Bull Run/Atwood Oceanics	1/1/1973	Dubai, UAE	2,000,000	unknown	unknown	unknown	unknown
Abkatun 91	10/1/1986	Campeche, Mexico	247,000	unknown	unknown	unknown	unknown
Montara	9/21/2009	Timor Sea, Australia	28,600 to 214,300	2,000	390 to 400	400	74
Ekofisk Bravo B-14	4/20/1977	North Sea, Norway	202,381	28,080	28,080	28,080	7
Funiwa 5	1/17/1980	Forcados, Nigeria	200,000	12,500	12,500	12,500	16
Hasbah 6	10/2/1980	Gulf, Saudi Arabia	105,000	11,667	11,667	11,667	9
Alpha Well 21 A	1/28/1969	Santa Barbara, CA	100,000	9,090	9,090	unknown	11
Iran Marine Intl.	12/1/1971	Gulf, Iran	100,000	5,000	unknown	unknown	unknown

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not necessarily result in massive release of oil. In fact, about 59% of blowouts involve no release of oil at all. And for the 41% of blowouts that do involve the release of oil to the environment, the volumes are generally very low. The term "blowout" simply refers to the loss of well control and the release of fluids, which may include water or brine, natural gas, oil, or a combination of these.

Even when oil is released during a blowout, the duration is often very short – a few minutes to hours, perhaps a couple of days at most – until natural bridging occurs. Natural bridging occurs when sediment fills in the well piping to stop the flow without any intervention. This occurs in about 84% of blowouts, particularly those with relative low pressure and flow rate. Depending on the flow rate (barrels per day), the actual volume of spillage may be quite small. In the other 16% of cases, the flow will continue until it is stopped by an intervention method, such as top kill or capping and containment, or ultimately by a relief well. Some blowouts are stopped by effective blowout preventers (BOPs) before oil is released to the environment.

In the end, the actual amount spilled depends on the flow rate of the well, which is largely dictated by the pressure characteristics of the reservoir, and the duration of flow. That duration is determined by natural bridging processes, or the timing of successful intervention. Most blowouts have ended up being very small. Less than 2% involve more than 100,000 barrels. Only 0.5% of blowouts have involved more than 1 million barrels.

Both flow rates and potential flow durations vary considerably between wells, even ones in the same region. The Macondo MC252 well had an estimated flow rate of 28,000 to 60,000 barrels per day. It flowed for 85 days before it was successfully capped and contained. But flow rates in the Gulf of Mexico could be much higher – as much as ten times as high – and durations could be more than two times as long as the Macondo incident, which could lead to a scenario with significantly more oil released.

The offshore oil exploration and production landscape is changing dramatically with new frontiers in deeper waters, deeper subsea well depths and pressures, and new locations, especially in the Arctic. And, these factors are likely to increase the probability that an individual well will have a blowout or that the daily flow rate or duration may be higher. Deep water wells (>1,000 meters) are 1.53 times more likely to result in blowouts than shallower wells. Interventions at greater depths can also present complications. Drilling in areas with unknown geological characteristics may also present unexpected challenges. The remoteness and harsh conditions of some Arctic locations complicate response and intervention strategies.

With every exploratory well drilled, the probability of well blowouts increases, particularly in deeper waters and new geologic formations. While a catastrophic blowout scenario is a very rare event, contingency planning and preparedness, as well as technological advances in prevention will be important in the years to come. That said; it is important to look at this critical and fascinating subject – BY THE NUMBERS.

Number of Well Blowouts Worldwide since 1950s: 607
Number of Exploratory Wells Drilled Worldwide: About 50,000
Number of Blowouts of 100,000 bbl or more: 10
Probability of Blowout with Oil Release: about 1 in 707 to 1 in 1,012 wells
Probability of Blowout with Oil Release in Deeper Waters: in 1 in 462 to 1 in 661 wells
Probability that Blowout will Naturally Bridge: 84%
Probability that Relief Well will be needed to ultimately stop flow: 10%
Potential Flow Rates: a few barrels per day to more than 400,000 barrels per day

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Technical Director,

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Our Offshore Annual edition of ***MarineNews*** headlines Jane Bugler, the Technical Director of the International Marine contractors Association (IMCA). Jane is a chartered chemical engineer who worked in the chemical industry for several years before joining the UK Health & Safety Executive (HSE), where she worked in a variety of roles (including work regarding pipeline regulation) before joining IMCA in 1997, when she became Technical Director. Today, Jane has overall responsibility for the extensive and varied technical program of IMCA and for liaison between IMCA and external organizations, including other trade associations such as OGP, OCIMF and IADC, as well as regulators such as PSA, HSE, and the U.S. Coast Guard.

For her part, Bugler says enthusiastically, "Anything and everything marine and technical is my passion. IMCA is a great forum for debate and leadership." Jane is IMCA's authority on technical issues, and her work includes coordination of IMCA's technical team through their own work with IMCA's committees and workgroups, drafting of guidance and briefing, review of third-party drafts, oversight of technical audits of both applicant members and those seeking recognition of certain training courses. In the absence of IMCA Chief Executive, she steps up to fill that role as necessary. IMCA is a trade association and exists for the benefit of its members across the offshore, marine and underwater engineering industry. IMCA's regional sections enable members to address issues specific to their local area and ensure the global applicability of the association's worldwide activities. IMCA was founded in 1995 through the merger of the Association of Diving Contractors (AODC) and the Dynamically Positioned Vessel Owners Association (DPVOA). This month, Jane Bugler weighs in on the offshore industry, where it is today, and what can be done to strengthen its position looking forward.

What are the biggest risks facing your member companies today?

The price of oil: the vast majority of our 1,000+ members in more than 60 countries work for the offshore oil and gas industry. Some have become involved with the offshore renewables industry, but that is not without its own problems and delays. We are, no doubt, heading to a period that will see mergers and acquisitions taking place.

Has the issue of Jones Act and the question of registered tonnage carrying goods and materials offshore U.S. Gulf of Mexico been fully resolved or is it an ongoing bone of contention?

IMCA members and their oil company clients are continuing to work with U.S. Customs and Border Protection to ensure longstanding interpretations of the Jones Act continue to be applied in a straightforward and pragmatic way.

IMCA is focusing on "maintaining safety in the current challenging environment." Has there been an uptick in offshore safety issues and/or incidents, or do you see this effort as a pre-emptive measure?

This is very much pre-emptive. We publish annual safety statistics, and encourage members to send us information on incidents for our safety flashes, and are certainly not seeing any upturn in incidents or safety issues. Indeed, we are seeing members eager to maintain high safety standards.

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You've talked about the need to look at developing solutions that are "fit for purpose, but not necessarily gold plated." That sounds good, but what does it mean? Give us a garden variety example of that in operation today.

I was recently at a conference in Stavanger where this was much discussed. Engineers like, indeed thrive on, improving solutions. However, it is important that their improvements do not add cost. There was discussion in Stavanger about solutions being "good enough." Those words it seemed had an almost negative connotation, we have to understand that "good enough" means that it does the job, it's fit for purpose, it does not need further improving, we are looking for cost effective solutions. We have our contracts workshop coming up soon, and no doubt so-called 'gold-plating' will be on the agenda. The words of introduction to the event spell out our position: "The event will look at the contractual allocation of risk in a difficult market - from the perspective of contractors and insurance brokers seeking a fairer apportionment of risk as a means of reducing contractual uncertainty and duplicative insurance costs inherent in current EPIC contracting models." Realism is the name of the game.

IMCA prides itself on adding value; not cost. Give us another example of that metric in play.

All our guidance is aimed at adding value and not cost – the last thing we want to recommend in guidance is adding to operating costs. Working on behalf of our members through our contracts group, we aim to ensure that we help IMCA members give value at realistic cost levels. As an aside, all of our guidance documents can, of course, be downloaded free of charge by members and non-members alike.

In the last big oil downturn, occurring in the mid-1980's, the offshore and oil industries shed so many employees so fast that many, if most, never came back, once things turned around. What do you see happening this time?

It's really too early to tell; in a tight market, though, it is inevitable that people leave the industry. One thing that IMCA is doing is looking at ROV (remotely operated vehicle) training – there may be a downturn now, but there is always a need to look to the future. Standardization of training globally will certainly bring benefits to the industry.

With over 1,000 member companies in more than 60 countries, IMCA says it is well-placed to take the 'temperature' of this vital part of the supply chain. In what areas are you benchmarking performance, and what do you see?

We don't run benchmarking exercises, but members of the technical team at IMCA (my team comprises a Technical Manager and up to eight Technical Advisers) travel the globe, attending our regional section meetings (we have five regional sections), holding niche workshops and generally working with members in their part of the world. While there we listen and learn.

IMCA strives to "champion better regulations and enhance operational integrity." Talk a bit about the regulations you hope to influence, and how you intend to do just that.

The news, carried by your own publication, that the International Maritime Organization (IMO) has agreed to use the International Marine Contractors Association (IMCA) proposals as the basis for the review of the IMO Guidelines for vessels with dynamic positioning (DP) systems (MSC/Circ.645), is just one case in point. Taking an active part in other IMO discussions remains crucial and is a service to our entire membership. So, too, do relationships with other key organizations, for example the U.S. Coast Guard – we are providing feedback on their proposals for new regulations on DP systems and an update of the rules for Commercial Diving Operations. We continue to monitor activity on the regulatory front and put forward view and suggestions. By means of maintaining good working relationships with regulatory bodies, we can bring our influence to bear. Recently appointed regional directors in Asia, and Australia and New Zealand help us in those areas; and we look forward to making more similar appointments in key oil provinces around the globe.

Has the current dip in oil pricing impacted IMCA's membership roles in a similar way?

We are happy to report that we certainly haven't seen a sizeable dip. We do expect some consolidation thanks to mergers and acquisitions, but we are still seeing inquiries about membership, for there is no doubt that in difficult times, trade association membership can be a financial help, as member companies can get on with day-to-day business and rely on the trade association to monitor and respond to consultations on new regulations and other similar moves.

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The need to ensure that safety levels remain high despite a lower oil price is easier said than accomplished. IMCA also says that changing behavior will be the key to that effort. This involves – in your words – people, efficiency, logistics and planning, standardization and simplification. Name one place where this approach has worked well.

The adoption globally of the IMCA competence assessment framework has been invaluable – or so we are told by companies and their clients. A competent workforce is a safer and more efficient workforce, and what's more, it has a knock-on effect with clients implementing their own competency schemes.

In the UK, regulators are concerned about the drop in oil prices that, in the past, this has led to deterioration in structures and cutbacks on maintenance. Has this manifested itself just yet or are we too early in the 'oil crunch?'

It is too early to tell, but we must remember that the offshore industry is heavily regulated and monitored, so any drop in quality of maintenance would most certainly be picked up quickly. Member companies are heavily involved with IRM (inspection, repair and maintenance) contracts.

We are almost five years on to the anniversary of the Macondo Deepwater blowout. Compare today's offshore oil industry – in terms of safety, standards & preparedness – to that which existed on the day of the tragic casualty.

The U.S. new regulatory regime has been implemented and is looking at key issues – such as DP, for example. In the U.S., the introduction of Safety and Environmental Management Systems (SEMS) has had a knock on effect for IMCA members, particularly via the contractor management requirements, where once again the IMCA competence frameworks and guidance have proved a useful tool for demonstrating compliance.

The cutting of the UK Petroleum Revenue Tax (PRT) from 50% to 35% to support production in older fields is helpful. And the reduction of the supplementary charge for oil companies from 30% to 20% will also free up some capital. Similar moves are being considered elsewhere. Will they be enough to bridge the gap between solvency and disaster?

This is really an oil company issue. However, IMCA members have experience of rising costs and lowering investment in oil and gas from previous oil price slumps. However, the key really is how contractors respond to oil price recovery. Reduction of the workforce and the layup of vessels can be the easiest choice to reduce costs, sometimes followed by the sale of assets. Members are cognizant of the fact that the retention of necessary skill sets and assets during this market downturn can, for those who ride the storm, create a position whereby they can quickly take full advantage of any market recovery.

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DNV GL Tackles Safety through Standards

New classification rules for U.S. fishing vessels address safety issues through collaboration, new rules and an eye towards economy.

By Joar Bengaard

The commercial fishing industry fatality rate is 30 times higher than the average of other US industries. According to an analysis of commercial fishing fatalities for the period 2000 – 2009 conducted by the Alaska Pacific Regional Office of the National Institute for Occupational Safety and Health (NIOSH), vessel disasters account for 51 percent of fatalities, with the top two initiating events cited as flooding (25 percent) and instability (16 percent). Studies carried out by the U.S. Coast Guard show similar results, and add fire as the second leading cause of vessel loss.

Some specific cases include:

F/V KATMAI: A 1987 built, 92 foot fishing vessel sank in the North Pacific on October 22, 2009. Four crew members were rescued while seven lives were lost. Flooding was observed in the lazarette and in the engine room, the vessel lost steering and developed a list, which ultimately led to the vessel capsizing and sinking.

F/V LADY MARY: A 1969 built (modified 2001), 71 ft. fishing vessel sank in the Atlantic off the New Jersey coast on March 24, 2009. Only one crew member was rescued, the remaining six were lost. The surviving crew member did not witness the events leading to the vessel sinking, but the investigation report assumes that the lazarette was flooded with progressive loss of freeboard and buoyancy.

F/V COSTA & CORVO: A 1977 built, 71 foot fishing vessel sank in the North Atlantic on Georges Bank east of Nantucket Massachusetts on November 13, 2008. Three crew members were rescued, while one was lost. The investigation indicated heavy nets on deck resulted in a sudden loss of stability and progressive flooding, which led to the vessel capsizing and sinking.

F/V ALASKA RANGER: A 1973 built (converted 1989) 179 foot fishing/fish processing vessel sank in the Bering Sea March 22, 2008. 42 persons were rescued, while five were lost. The vessel's steering gear room was flooded, and other adjacent spaces including engine room quickly experienced progressive flooding, leading to the loss of the vessel.

All of these incidents were tragic casualties, resulting in loss of life. The marine accident reports, as compiled by the U.S. Coast Guard, identify the types of accidents similar to the statistics: Flooding, capsizing, sinking and other accidents including fires. Leading up to these events are several underlying problems such as leakage, progressive flooding, lack of watertight integrity, equipment failure, and possible design flaws. And, maintenance of the original standard is not always documented or verified by regular examinations.

Managing Risk Effectively

Classification addresses these risks: Setting technical standards, approving plans according to rules, supervising compliance during construction, and verifying that these standards are maintained also throughout the life of the vessel.

There is no question that good procedures for safe operation and associated training are effective means for reducing the number of casualties. At the same time, in a majority of cases, the vessel itself – the platform – is critical for survival of those on board. Good design, strong hulls, reliability and availability of critical systems are crucial. Classification is an integral element of this in the maritime industry.

Photo: Vik-Sandvik AS

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With this in view, U.S. legislation requires that all new fishing vessels of at least 50 feet overall in length are to be built and maintained to classification rules. DNV GL is the only classification society to develop rules specifically for the US domestic fishing fleet, addressing how fishing vessels are designed, built and maintained for safety.

The objective for DNV GL's rules is to manage the main risks. We also know that cost effective solutions are critical for a fishing vessel, so a clear priority has been to make sure the classification process is as effective and practical as possible, yet at the same time achieving all-important safety objectives.

With this in mind, DNV GL has developed rules specific for US fishing vessels, coordinated from the company's US headquarters in Houston, Texas. Simplification and optimization of the new rules has been done in consultation with industry, looking at the entire process: Design, approval, sourcing of equipment, surveys at yards during construction and subsequently onboard the vessel, with an eye on achieving safety goals for the fishing vessel and its crew, as well as maintaining efficient operations. This collaboration with the industry will continue, and the rules are now available for download and use.

Weighing Costs and Benefits

Building to class, and maintaining to class standards means that some parts of the vessel will meet a higher standard than might be the norm in the industry. This increased safety carries a cost, which DNV GL has attempted to minimize by concentrating on the most critical elements. This investment may however also lead to significant benefits, in addition to potentially saving lives and reducing accidents. Such benefits could include:

- ***Increased resale value, both considering the initial higher standard and documented maintenance of that standard through the classification system.***
- ***Better terms from underwriters, through better risk management.***
- ***Better terms from banks, finance institutions and mortgage companies.***

To help the industry with these changes, the US fishing vessel rules are simplified in scope compared to traditional classification rules, and the fees reflect this simplified scope. The rules allow for extensive use of "Industry Standard" materials and equipment, but class certification may still be required for some critical equipment. All mandatory U.S. Coast Guard requirements must be met. Although the rules are primarily intended for steel vessels, aluminum or GRP may be used for vessels of less than 79 feet.

The domestic class certificate is valid for 5 years, with annual surveys and a dry-docking at the end of the 5th year. In some cases, surveys could be adjusted to correspond to seasonal fishing schedules, and could even be partly based on owner's inspection, subject to approval and class oversight. Commercial fishing will always be a dangerous profession. That said; hazards and risks will undoubtedly be reduced with the broad adoption of classification rules, such as those developed by DNV GL.

Access the DNV GL rules at:
www.dnvusa.com/usfishingvessel
Access USCG Marine Accident Reports at:
www.uscg.mil/hq/cg5/cg545/casrep.asp

Joar Bengaard *was employed by DNV (DNV GL) for more than 40 years in both technical and managerial positions in Norway, Japan, Korea and the US. After retiring two years ago, he has been retained as a consultant, as project manager for the US fishing vessel classification rules.*
*He can be reached at: **Joar.Bengaard@dnvgl.com***

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Offshore Workboat Fire Safety

A Novec 1230 gas suppression system provides a unique, Class-compliant and effective margin of safety for an offshore dive support vessel.

By Andrew Wright

Despite the recent drop in oil prices, the marine sector remains extremely busy supporting the oil industry, and this will always remain the case. The squeeze on contractual pricing and labor is a recent issue caused by that drop in oil prices. Fortunately, the sector is led by legislation in the form of IMO/SOLAS regulations and respective Flag State requirements which are controlled by regulatory authorities such as DNV, Lloyds, ABS and UKAS, all of which requires a robust service sector that can attend to those needs when they arise.

No matter what the price of oil is, the need for safety and fire protection won't go away. And, those requirements can change as a function of external audits and/or internal decisions to increase, supplement or upgrade existing systems on workboats already in service. Such was the case on a recent assignment carried out by UK-based fire equipment specialist Oteac. A dive support vessel which serves the North Sea oil and gas sector needed an upgraded fire suppression system. Oteac was contracted to install new systems in areas designated by the vessel to be in need of additional protection, as well as replacement of some outdated FM200 systems.

In total, the dive boat needed 14 systems, as identified by internal audits and Safety Inspections conducted by Subsea7. From these internal processes, it was decided to enhance the vessel's existing systems and other areas which also required coverage. Beyond this, it was decided that, viewing the original suppression systems, issues with ozone depletion and possible toxic discharge on the vessel would be harmful to the crew. The change to the NOVEC type system was determined to be a safer and environmentally better option; in other words, a non-toxic alternative, if discharged.

Novec 1230

The refit process was a major job, involving the installation of 14 Novec 1230 gas suppression systems in DNV designated areas of risk on the vessel. The Novec 1230 system was selected because it is a user friendly and environmentally friendly medium for such suppression systems. Novec 1230, manufactured by 3M, is a unique fire extinguishing agent. Among the Clean Agents, it has the lowest atmospheric lifetime of 5 days. It is stored as a liquid, which makes it easier for transport, and also features a "zero ozone depletion potential." As with other clean agents, it is an excellent choice for computer rooms, electrical control rooms, storage areas, and any high value area.

Novec is calculated to discharge within 10 seconds, and is normally calculated at a 4.2% concentration.

It is stored in containers as a low pressure fluid which, when discharged, transforms into colorless and odorless gas. Unlike other fluid extinguishing agents, however, it can be used with complete confidence to suppress fires involving electronic equipment. Once discharged, the agent can be dispersed through natural ventilation, leaving no residue to damage sensitive equipment.


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"Preliminary drawings were presented for each area of risk on the vessel to DNV for approval. Specifications had to be met for everything from stainless steel pipework to pipe runs, valves and nozzles. Upon completion, a fully witnessed function test was required by DNV before giving acceptance certification. In fact, no gaseous system in the marine sector can proceed unless this route is followed."

It is also non-conductive and non-corrosive.

Installations have a footprint similar to that of chemically-based clean agent systems and Novec 1230 fluid additionally has the advantage of having the lowest level of design concentration and the highest safety margin of any viable Halon 1301 or chemical alternative. That said and while certain HFCs (hyrdrofluorocarbons) and inert gases are used at design concentrations that are below the NOAEL (No Observed Adverse Effect Level) with safety margins from 7%, no other Halon alternative comes anywhere close to the Novec 1230 safety margin.

This is important because a fire on a vessel typically involves varied materials, rather than just combustibles which are common in land-based fires, these often require higher suppressant concentration levels. As the volume of the space on a ship is often difficult to calculate accurately – due to the complexity of the machinery – the installation's designer will include more agent than the volume requires.

The Refit

On this refit install, the vessel's electricians completed the interface between the Suppression System panel and vessels alarm system. A simple pressure switch within the panel was the connection point. Once that was accomplished, however, Oteac electricians commissioned the entire system, including the interface between system and vessel alarm. The scope of work included vessel surveys, DNV consultation and documentary approvals, manufacturer's specification to DNV/Ships wheel standards, system cylinder installation in each area of risk and ensuring appropriate means of discharge and the fitting of alarm and high pressure stainless steel pipe work to activate or discharge the medium.

Preliminary drawings were presented for each area of risk on the vessel to DNV for approval. Specifications had to be met for everything from stainless steel pipework to pipe runs, valves and nozzles. Upon completion, a fully witnessed function test was required by DNV before giving acceptance certification. In fact, no gaseous system in the marine sector can proceed unless this route is followed. Once certified, the vessel was certificated and sent on its way back into service.

Flexibility and versatility were essential to address all issues that arose on the job, taking on additional stainless steel pipe installation which originally was not a quoted specification. The installation started in a dry dock in October and was completed on schedule in January, ultimately involving minimal disruption to the client's operational activities.

Safety is King

No matter what the prevailing economic conditions, safety at sea – and especially in the oil and gas sector – will always trump finance. Changing regulations and risk profiles can and do mean that new and better will be required. In this instance, the client and its technical advisors recognized the requirement for additional and upgraded protection on board. Oteac made that decision a little easier with a time-efficient and price-competitive package that fulfilled those needs, without significantly impacting the vessel's operational schedule. It's a safe bet that you can do the same.

Andrew Wright *serves as Oteac's General Manager and has spent the last 29 working years in the fire and safety Industry. Prior to working at Oteac he built up his knowledge of the fire and safety sector though roles within various fire protection companies.*

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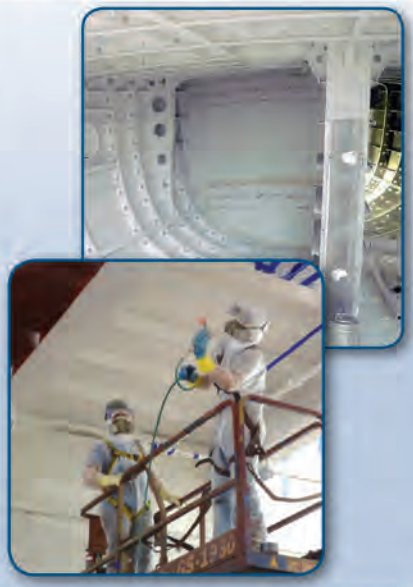

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Suppression of Random Drug Test Results:

A bad and unnecessary decision.

By Lee Seham

Last September, an Administrative Law Judge (ALJ) unsettled much of the U.S. maritime industry when he dismissed with prejudice a U.S. Coast Guard (USCG) action to revoke a Merchant Mariner's Credential (MMC) despite his finding that the mariner's urine had tested positive for cocaine. The case is referred to as USCG v. Hopper, SR-2014-14. The ALJ's rationale for restoring a known cocaine user to commercial service was that the USCG failed to prove that the employer's drug testing consortium had randomly selected the mariner using a "scientifically suitable method."

American Maritime Safety, Inc. (AMS) considered the Hopper outcome to be a bad decision, both because it imposes harsh evidentiary consequences on the USCG for errors the agency did not commit and because it imposes an unsustainable burden on the maritime employer. If the decision is not reversed on appeal, AMS recommends that the USCG create a certified products list (CPL) of random selection software for the purpose of resolving technical disputes as to whether a mariner was randomly selected by a scientifically suitable method.

While we may wince at the prospect, the enlightened among us understand the policy reasons behind suppressing the use of evidence that has been unlawfully obtained. When an agent of the government has acted in excess of its authority, forbidding that agent to use the fruits of its ill-gotten gains is the means by which we discourage future violations. Yes, we don't want to live in a police state. But, we also don't want known cocaine users to return to performing safety sensitive functions without the benefit of rehabilitation. In Hopper, the apparent conflict was resolved in favor of the suppression of evidence and in derogation of maritime safety. AMS submits that there was no conflict to resolve.

It is well established that, when private employers engage in government-mandated drug testing, they are performing Fourth Amendment searches. When such an employer violates federally-mandated testing parameters, it stands to reason that prohibiting the employer's use of resulting evidence is a legitimate means of discouraging future violations. In this instance, however, the ALJ did not suppress the employer's use of the evidence; he suppressed the USCG's use of the evidence. Depriving the USCG of this evidence does not effectively discourage unconstitutional behavior since the USCG never engaged in such conduct in the first place. Perversely enough, the primary impact of the suppression of evidence in this case is that maritime safety has been compromised.

This common sense argument has been recognized by the United States Supreme Court, which held that the exclusionary rule did not prohibit the Internal Revenue Service (IRS) from using evidence that was illegally seized by local police. The Court logically concluded that the societal costs of excluding important evidence from the IRS proceedings outweighed the deterrent effect on illegal searches in which the IRS had played no role (United States v. Janis, 428 U.S. 433, 454 (1976). This rationale applies with still greater force to the facts of the Hopper case. If the USCG did no wrong, then no good is accomplished by compromising its enforcement action and maritime safety as a whole.

This is not to say that the maritime employer in the Hopper matter did wrong. The employer belonged to a consortium that utilized a recognized random software program. The ALJ did not find fault with the program per se, but rather with the inability of the consortium employees to testify concerning the mathematical formula underlying the program. In our view, that is akin to the IRS faulting a taxpayer for not being able to explain how his Texas Instruments calculator operates.

AMS's ability to address the scientific suitability issue has been facilitated by its employment of a software developer, with an advanced degree in mathematics, who provides the requisite testimony in USCG proceedings. AMS also performs random simulations confirming that its software program performs in accordance with statistically acceptable limits. AMS, however, was originally chartered by heavily-unionized maritime operators who expected near-constant legal challenges to drug test results. It is our position that the regulations should not – and do not – impose this level of evidentiary burden on the maritime employer.

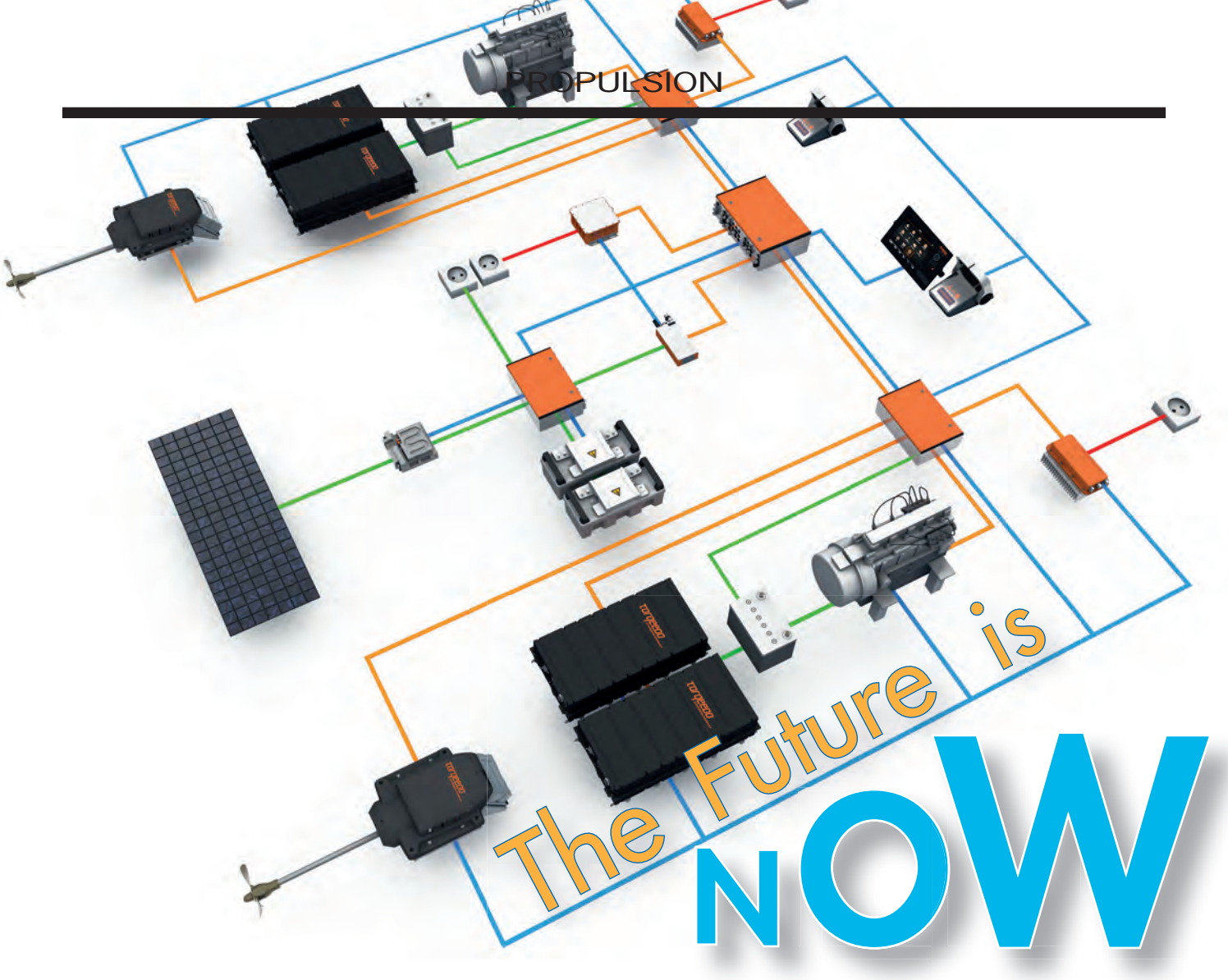
In the airline industry context, federal courts have rejected the idea that an employee could evade the consequences of a positive drug test based on an employer's initial failure to produce evidence of randomness. Rather, these cases have held that the burden is on the employee to provide an initial showing that an element of human intervention existed in the selection process. In Drake v. Delta Air Lines, Inc., 2005 U.S. Dist. LEXIS 14789 (E.D.N.Y. 2005), court jury instructions required that airline employee prove by a preponderance of evidence that the airline's selection of the employee for drug testing was not random, aff'd 216 Fed. Appx. 95 (2d Cir.

2007). In Northington v. Warden, 113 F.3d 1246, 1997 WL 242255, at *2 (10th Cir. 1997), the burden of proof shifts to the government only after the employee has "offered some evidence raising a genuine factual dispute as to randomness of the tests …"

A maritime employer should no more be expected to explain the mathematical formula underlying a commercially accepted random software program, than explain the forensic acceptability of gas chromatography/mass spectrometry as a testing methodology. The federal government has ordained the acceptance of this methodology.

Significantly, the USCG has effectively decreased the evidentiary burden on maritime employers by adopting a CPL of acceptable alcohol-testing devices. As a general rule, maritime employers are not required to prove the bona fides of these devices, but only that they operated these devices in accordance with the manufacturers' instructions. If the USCG is unsuccessful in reversing the Hopper decision, AMS urges the USCG to develop and publish a CPL for random selection software products so that maritime employers are released from the extraordinary burden of having a mathematics expert on staff to explain the logarithms underlying their software.

Lee Seham *is the President and General Counsel of American Maritime Safety, Inc. He graduated from Amherst College and received his law degree from NYU Law School. Mr. Seham has negotiated testing protocols and harassment prevention programs for a wide range of clients engaged in the airline, maritime and sports industries. These include Norwegian Cruise Line, Maersk Line Limited, Air Portugal, the Allied Pilots Association and the NBA Referees.*



Hybrid Marine Power & Propulsion Systems for Workboats isn't farfetched. In fact, it may be essential.

By John Haynes

In 2015, two significant developments are going to make many operators, owners and builders of professional vessels consider hybrid marine power. The new emissions laws – here and abroad – and the incentives for high technology manufacturers to invest in developing highly efficient batteries are the primary drivers. That said; dramatically reducing pollution in both water and air could be the most significant impetus for change in the maritime sector since coal and steam gave way to fuel oil. Emissions from fossil fuels come at a price. Beyond this reality, professional mariners know the legislation relating to marine pollution (MARPOL) plus the serious financial implications of getting it wrong.

Fuel and Power for Shipping is Changing

The maritime sector tends to avoid change, but the blue water shipping community could not ignore the emissions regulations that came into force on January 1st 2015. This may appear a mundane issue but consider the implications as certain types of vessels are banned from entering ports around the world simply because of their diesel exhaust emissions.

The diesel in ships tanks is now so light and highly treated that navies are able to run their RHIBs and boats on diesel from the mother vessel. While conventional oil based fuels remain the main fuel option for most in service vessels, Liquid Natural Gas (LNG) is now a proven and viable fuel solution for ship propulsion (in some sec-

tors). If LNG does not fit their needs, ship operators will consider installing hybrid power systems alongside of their diesel engines. Separately, innovative energy solutions have so far been largely been ignored in the sub IMO (sub 80 feet) workboat sector, primarily because these methods are viewed negatively as part of a complicated and costly compliance process.

Diesel/electric systems have been used in large ships and submarines for many years, but these are not hybrid systems. The diesel/electric vessel uses its engines to connect directly to an electrical generator. The power in the system is then transferred electrically to the propeller shaft via motor controller and electric motor. The system may have multiple generators and multiple motors. By strict definition, this is not a hybrid, as there is no storage of electric energy.

Serial and Parallel Hybrid Power Systems

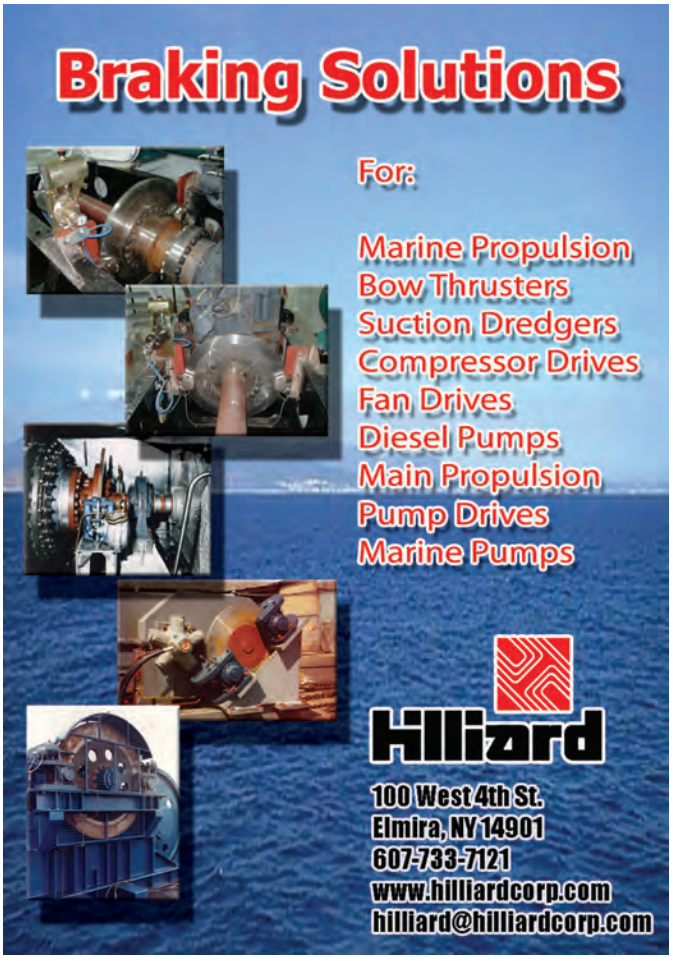
There are two main types of hybrid system. A serial hybrid, where the engine in the system only powers a generator and is not mechanically connected to the propeller shaft is one version. The other involves a parallel hybrid, where the engine is mechanically connected along with an electric 'machine' that can operate as both propulsion motor and a generator. The reduced electric propulsion, generator and battery demands of a parallel system substantially reduce the cost compared to a serial system. Parallel systems are more likely to win initial market acceptance because of a perceived greater reliability, as the 'trusted' diesel engine is still connected to the propeller shaft with the electric propulsion adding a redundant system.

Until recently, it was not been possible to transfer such systems successfully to smaller craft. A European Union funded project called HYMAR (High efficiency hybrid drive trains for small and medium sized marine craft) set out to develop an optimized hybrid system. The conclusion at the end of stage one was that the initial focus on 'serial hybrid' systems had been misplaced, and that the project's objectives would be better met by 'parallel hybrid' systems. HYMAR then developed a parallel hybrid system that has been installed, tested and validated on marine craft. HYMAR has also built a comprehensive energy management module and graphical user interface to control the energy

('The Explorer' is a SWASH (Small Waterplane Area Single Hull) pilot boat with a hybrid drive system from Siemens.

Courtesy: Abeking & Rasmussen AG

flows of an entire craft. The optimized hybrid system developed during the project offers three major advantages. They include no detectable emissions, no discernible noise and a substantial reduction in fuel consumption.



Hybrid Power in the Workboat Sector

Industry is entering a period of rapid change and commercial opportunity in the hybrid marine market. Owners and operators can now consider various hybrid systems with marine applications. DNV-GL USA, for example, recently stated that, "energy storage is an exciting new technology, but the offshore E&P sector of the oil and gas industry has yet to truly take advantage of it. Tugboats, workboats and OSVs are particularly suitable for hybridization." Benefits include improvements in energy reliability, increased fuel efficiency, lifecycle cost reductions and reduced emissions.

Battery powered electric motors have been available on small craft for many years. But until recently electric outboard motors had been mainly under 10hp for small fishing boats, tenders and kayaks. The main obstacles to overcome before scaling up had been battery technology and the high initial cost of procurement. Deep Blue is an electric drive system that has been industrially developed and manufactured by the German company Torqeedo, using high-tech components. The system is available as 40hp and 80hp inboard or outboard versions.

The next generation of cells and batteries are key technology developments that are making marine hybrid systems potentially viable. Battery chemistry such as Lithium-ion offer impressive power solutions and the business case is starting to fit for commercial operators. Since there is no single system that fits every application, it is important to work with manufacturers that have flexibility in cell manufacturing and offer scalable solutions. New factories with fully automated processes ensure consistently high quality cells and quality control of the entire battery management system.

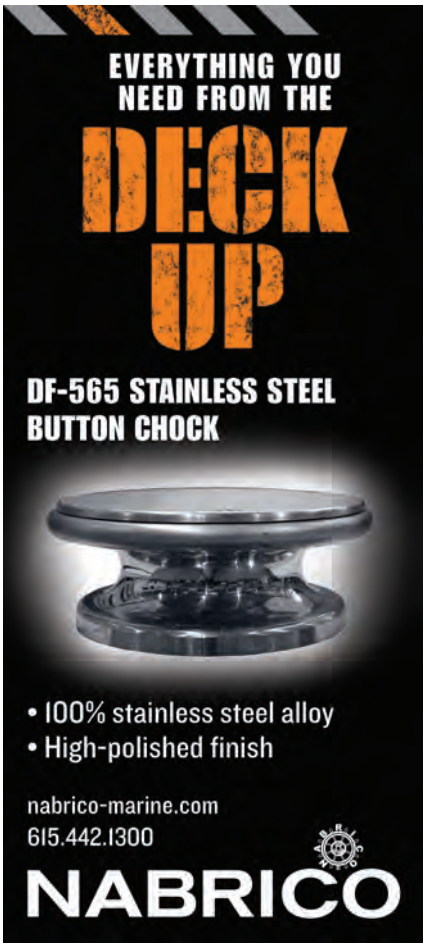
Michigan-based XALT Energy offer several variants of High Energy, High Power, and Ultra Hi-Power cells. Robert Young, Technical Lead for Marine Applications at XALT Energy, told MarineNews, "our team of engineers have worked to the highest standards developing electric and hybrid energy solutions for the US and global automotive sector. XALT Energy not only has the necessary knowledge, but also the experience of taking high voltage battery projects from concept through production into the finished system.'

Integrating High Voltage Battery Systems on Boats

Battery banks require space and as they not usually replacing another component this can be an issue for smaller craft. Beyond this, naval architects require additional weight to be low and central for most designs of small craft. Once the onboard space and footprint are allocated, battery designers and engineers need to consider issues specific to marine applications. These include shock and vibration when a boat is underway plus the challenges of installing high voltage systems in enclosed spaces. Although modern batteries are expected to have a long life, they need to be carefully positioned to enable access for inspection. And, integration needs to consider on board safety plans and risk management for the crew, passengers and critical systems.

Cost / Benefit implications will start with the initial purchase of the system then work out payback period based on the life cycle of the vessel and life cycle of the hybrid power system. Once a system is defined projections and audits can be based on engine management data linked to work cycles. Hybrid systems are infinitely scalable which enables owners to specify what they are trying to achieve over a period of time or an entire fleet.

When studying vessel work cycles, it is relatively straightforward to make a decision for new builds on whether to go for all electric or a diesel / electric hybrid system. For example, a ferry operating over a short route with a long stopover each end could offer the perfect work cycle for 'electric only' with a land based charging system. Other issues, such as the cost of downtime and structural alterations affect viability calculations for retrofit of in-service craft.



"Certain maritime sectors are potentially well suited to 'hybrid' diesel / electric systems. These include wind farm support vessels (WFSV) and pilot boats that have relatively consistent duty cycles, often running seven days a week to drop off or collect technicians and pilots."

Hybrid Systems and 'The Hour of Power'

Certain maritime sectors are potentially well suited to 'hybrid' diesel / electric systems. These include wind farm support vessels (WFSV) and pilot boats that have relatively consistent duty cycles, often running seven days a week to drop off or collect technicians and pilots. Indentifying the viability of hybrid diesel / electric power for offshore wind farm support vessels (WFSV) is an interesting project that links green energy on board with renewable energy from the environment. Hooking up to offshore wind farm turbines may even provide charging options.

The first objective is to focus on the sub IMO (sub 80 feet) workboat, pilot boat and patrol craft sectors to investigate the engineering and systems integration required to bring together viable and sustainable solutions. With vessel life cycles of over 20 years, naval architects and builders of new craft will offer designs that have space and access routes to enable retrofit of hybrid installations. Speed limits in harbors and channel approaches at beginning and end of daily transits may mean that 'The Hour of Power' is all that is required for the electric part of the cycle.

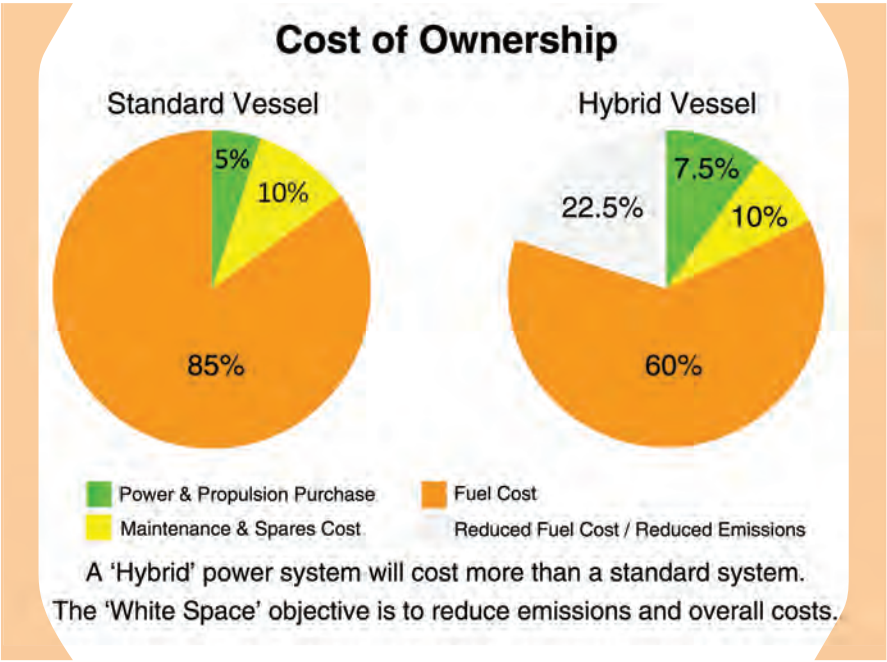
Hybrid Power & Propulsion System Providers

BAE Systems is a provider of hybrid propulsion systems with technical experience in hybrid technology for land based applications. Today, the firm aims to partner with manufacturers of marine diesel engines to provide complete propulsion and auxiliary power systems to increase the operating efficiency and performance of a vessel, while reducing fuel costs and emissions.

ZF Marine offers a range of hybrid-ready transmissions and propulsion for larger fast craft applications. The design is based on a unique 'Power Take In' (PTI) configuration, allowing highest flexibility for customizing installations. These transmissions can be integrated into hybrid propulsion systems for all types of fast craft, from coast guard vessels to fast offshore supply vessels.

Still another firm, Siemens, has extensive experience of hybrid and electric technology for various modes of transport. Siemens offers both series and parallel hybrid systems for the commercial marine market and supplies all components related to the electrical propulsion system including the drives, generators, inverters, filters, and control system, plus step up gearboxes to attach the generator to diesel motors.

Integration of all products will be crucial and because of that, a new career path in shipyards for 'Hybrid System Integrators' will emerge. These will be individuals and teams that have a holistic approach to engineering and many will need to be qualified high voltage technicians. When integrating hybrid systems, a shipyard will



need to identify which competencies are required. To warranty the system, the yard will also need to define who signs off the installation and the components on handover. Manufacturer's liability is a commercial reality that can be hidden behind factory recalls on land, but at sea, a single point of failure will reflect on all OEM,s in the hybrid power system.

Legislation, Standards ... & Partnerships, too

Various legislation and standards have implications for end-user organizations, boat builders and equipment manufacturers. As cells, batteries, power generation and storage evolve, it is important to address misconceptions and myths to enable progress. For example, Lithium Ion has been part of our lives in non-marine sectors for many years as the battery power behind electric cars, city busses, smart phones, tablets, laptops and cameras. Besides how to present performance metrics, it will be essential to identify whether current standards from land based applications are valid. An environment with electricity, water and damp enclosed spaces requires specific testing and sea trial standards. A new ISO standard for high voltage DC propulsion systems and comprehensive energy management in maritime environments will be relevant.

Power and propulsion systems that are designed and built for professional or commercial operations need to run hard, often for long hours in adverse sea conditions. Users must be able to rely on these systems at all times. In certain situations failure is not an option – the engineering must not break. Professional boat operators around the world have learned that power and performance are relevant, but reliability and durability are important factors for all types of engine and propulsion.

Ultimately, the Hybrid community will need to engage with diesel engine manufacturers. New high tech companies entering the market will want (and need) to leverage existing relationships that diesel engine OEM's have with end-users, boat builders and standards agencies. The importance of an international service, spares and support network will add confidence to procurement and life cycle maintenance decisions.

If the marine industry wants to move forward quickly, it will have to build partnerships that seamlessly bring together technologies. That's because, ultimately, hybrid marine will not tolerate inferior parts. All components will need to be built to the highest industry standards and designed to integrate globally across multiple platforms. The future is now, and hybrid propulsion for workboats is here.

shock MITIGATION

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Weathering the Storm

Vessels are stacked as Gulf oil operators retrench and day rates fall.

By Susan Buchanan

Courtesy Fleet Operators

In the Gulf of Mexico, vessels serving offshore oil-and-gas exploration and production are being stacked or idled as the rig count there declines. Oil companies are retrenching while crude prices remain weak, with smaller operators and the shallow-water sector scaling back the most. As the situation unfolds, ***MarineNews*** asked David Barousse, general manager at Fleet Operators, Inc., a marine transportation firm in Morgan City, La., for his take on today's predicament and what the future holds. The 40-year-old company owns and operates utility and supply vessels used in offshore exploration, production and construction. It also provides crew quarters. And, all of it – like the rest of the offshore support industry – is impacted by today's market situation.

Oil and oilfield-service operators pare down

"As 2015 budgets rolled out, every company I can think of announced cuts in capital expenditures because of the drop in oil prices since last summer," Barousse said. "Chevron announced a 13-percent cut, Exxon a 12-percent cut and ConocoPhillips a 20-percent cut. These are all multiple, billion-dollar reductions that impact a wide range of service companies, including vessel operators."

"Information about our main client segment – the privately-held exploration and production companies, operating in and beyond the Inner Continental Shelf – isn't as publicly available as the major oil-company announcements," he said. Louisiana's Inner Continental Shelf extends three miles from the coast. "But their response to lower oil prices has been the same, just on a slightly smaller scale," he said. "We've seen significant reductions in their oil-and-gas production operations. I haven't heard anything about actual cuts in output, however."

Large, deepwater operators typically have bigger pockets than shallow water players, and can maintain production during oil price declines. On the other hand, says Barousse, "Deepwater projects take a great deal of planning – more than shallow water operations, Equipment is more specialized, and these projects are technically complex. Deepwater operators typically have stronger cash flows because of their diversified, worldwide portfolios. They can keep moving forward with plans during a downturn in product prices." That's because, while Gulf offshore wells are usually expensive to drill, they can at the same time have long production lives.

In 2014's last quarter, three deepwater projects by Stone Energy, Chevron and Murphy Oil began in mature fields in the Gulf, according to the Energy Information Administration (EIA). More new, deep projects are slated to become operational in the Gulf this year. Nonetheless, on March 18, results of the feds' Gulf lease sale--which was mostly for deepwater--were smaller than recent sales, with just $583 million in winning bids coming from 42 companies.

Gulf rig count shrinks

Louisiana's Gulf drilling provides most of the nation's offshore oil. Before the recent downturn in crude prices, the Gulf rig count had rebounded from its weak, post-BP-spill level. This winter, the rig count shrank again, however. In its weekly release on April 6, Gulf rigs were down by 4 to 29, and that was well below the 60 recorded last summer, Houston-based oilfield-services firm Baker Hughes said. Beyond this, and in January, the number of U.S. rigs searching offshore and onshore for oil and gas dipped. The national count suffered its seventeenth straight decline in the week ended April 2. All U.S. rigs engaged in exploration and production totaled 1,028 by the end of that week. That was down by 20 from the prior week and was the lowest in nearly six years. U.S. oil rigs fell to the lowest levels since early 2011, and those seeking natural gas were the weakest since 1987.

These declines in the rig count, of course, hurt demand for energy services, including drilling, completion and production from providers like Dubai- and Houston-based Halliburton Co. This winter, oil-service companies Schlumberger Ltd. in Houston; Halliburton; Baker Hughes; and Ireland's Weatherford International, with an office in Houston, each announced thousands of layoffs, including many for Gulf personnel. By February, the four companies together had said more than 22,000 workers would be laid off, with many of them in the United States.

Halliburton and Baker Hughes, meanwhile, are preparing to merge, probably by the end of this year.

Day rates for OSVs slide

"Depending on a boat's size, we've seen up to a 30 percent drop in day rates for the Gulf's larger offshore supply vessels," Barousse said. "For our production vessels working on the inner shelf, the rates have declined by up to 10 percent. They typically work on a much smaller margin than OSVs do."

A day rate is the cost of a vessel for 24 hours. "Day rates include the vessel and the U.S. Coast Guard-required crew," Barousse said. "The makeup of the required crew depends on the vessel's type. Fuel, lube, catering and additional crew for specific operations, such as cooks, riggers and cargo handlers, are separate from the day rate," he said. Insurance is needed to hire a vessel. "Before you get to the point of charging a day rate, insurance requirements are worked out in the contract," Barousse said.


Delmar shore facility at Port Fourchon.

Courtesy of Delmar

Vessel demand along the Gulf, which was good in 2014, and also during the first half of this year, has slowed. "A quick ride down Bayou Lafourche towards Port Fourchon paints the current picture of idle vessels and crews fairly quickly," Barousse said. "We're seeing vessel operators of all sizes having to stack boats because of a lack of work and the day-rate drop. We're even seeing deepwater service vessels getting stacked, and that's been a hot market over the past few years."

"Generally, when a boat's stacked, the majority of the crew is sent home at no pay until work resumes," he said. "Some crew members can fit into work schedules of vessels that remain in service. But pay cuts are typically made across the board to adjust to the lower day rates." Gulf inland demand for boats has slowed too. "In addition to offshore, the inland vessel market has been hit hard by capital-expenditure declines and rig layoffs," Barousse said.

Slowdown has a ripple effect

Port Fourchon in Louisiana's Terrebonne Parish is the main terminal serving the Gulf's offshore oil-and-gas. Over 400 vessels operate from the port a day, Port Fourchon executive director Chett Chiasson said in early April. "But because of sustained low oil prices, it's no secret that oil-and-gas operators are reducing the number of vessels they're using for offshore service," he said. "Along with less activity comes less need for services, and that trickles down to affect the entire service sector."

Estimates are that 15,000 people or less work in the offshore Gulf. But they're highly paid, and the ripple effect on Louisiana from those jobs, combined with spending by oil companies, is significant. The multiplier effect of offshore oil-and-gas jobs on the state's economy is about 3.6, according to Loren Scott, Louisiana State University emeritus economics professor, in his last assessment in 2013.

How have weak oil prices impacted boatyards? "I assume Gulf shipyards are seeing a decline in new construction, new orders for OSVs, and also in repairs as vessel operators try to get through this slow period," Barousse said.

Oil workers, vessel owners all watch crude prices

Needless to say, workers along the Gulf keep an eye on oil and gas prices. "Everyone in the offshore industry hopes prices will stabilize and start to recover," Barousse said. "Oil companies quickly tighten their spending when cash flow slows. Operators' budgets are set for 2015 so we know this year will be tough in the offshore Gulf. But once oil prices bottom, some of those budgets could be adjusted." Adjustments will certainly occur if crude oil rebounds, he said. That's because oil companies have to continually reinvest to maintain production levels.

"Listening to oil market experts can be tough because they don't necessarily agree on what the future holds," Barousse said. Excess oil supplies and the U.S. dollar's strength have exerted pressure on crude prices. And then, because of onshore fracking, U.S. oil production is at a more than 40-year high.

"Middle East turmoil can be a market game changer but it's never predictable," he said. "Saudi Arabia's strategy of keeping production unchanged has been a major, oil-price driver." In March, however, Saudi output reached a 12-year high.

"Saudi production can affect prices more than, say, a nuclear deal with Iran, removing sanctions on Iran, or air attacks on Yemen," Barousse said. The Saudis are the

"...because of sustained low oil prices, it's no secret that oil-and-gas operators are reducing the number of vessels they're using for offshore service. Along with less activity comes less need for services, and that trickles down to affect the entire service sector."

– Dave Barousse, general manager at Fleet Operators, Inc.Construction and Chief Naval Architect

top producer in the Organization of Petroleum Exporting Countries (OPEC), and the group has continued to churn out oil at a steady rate even though European demand has eased. Crude oil prices in New York hovered at $52 a barrel in early April, down from $102 last August.

Offshore industry will rebound longer term

"Looking at oil futures, the months further out suggest some price optimism," Barousse offered. "The offshore oil industry and vessel owners will continue riding the price ups-and-downs, and will adjust accordingly. This, of course, can be hard. A lot of great people in the industry are negatively affected by a slowdown of this magnitude."

Anyone who lived through the previous oil crunch in the mid-1980's, however, has to be hoping that ultimately, this downturn proves to be nowhere near as significant or long-lasting. By 1990, tens of thousands of oil workers and their offshore marine support counterparts had left the industry, never to return. This time, the oil and marine business arguably can't afford that type of exodus. That's because marine support for oil & gas is more than just vessels. Many of those boats idled today will have to crewed tomorrow, and as the old saying goes, "When the tide comes in, all the boats float." In the meantime, for the oil support vessel operators and their crews, the long term rebound can't come soon enough.

__Susan Buchanan__ is a New Orleans-based business writer, specializing in energy, maritime matters, agriculture, the environment and construction. She holds a master's degree from Cornell University in agricultural economics and an undergraduate degree from the University of Pennsylvania.

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Five Years on from Macondo

An interview with NOIA's Randall Luthi provides unique perspective on where the offshore energy business has been, where it is now, and where it could be headed next.

By Joseph Keefe

It is a predictable but at the same time, an important anniversary to examine: five years beyond the Deepwater Horizon oil spill, which began on 20 April 2010 on the BP-owned, Transocean-operated Macondo Prospect in the Gulf of Mexico. Widely considered to be the largest accidental marine oil spill in the history of the energy industry, oil flowed from the sea floor for 87 days until capped in mid-July. The environmental impact is well documented, the ultimate impact of the incident on the offshore and oil industries today has been profound, lasting and without a doubt, it made the offshore business safer.

Randall Luthi, President of the National Ocean Industries Association (NOIA), a Washington-based advocacy group dedicated, among other things, to the safe development of offshore energy, sat down with MarineNews in April to look back, and then ahead at what might come next. His perspective, reflective of the more than 300 NOIA member companies providing environmental safeguards, equipment supply, gas transmission, navigation, research and technology, shipping and shipbuilding to the offshore industry, gives an idea as to where we are and what's been done to get us there.

Exploration & Development

Today, 85 percent of the OCS remains shuttered to exploration and development, including the entire Atlantic Coast, Pacific Coast, and the Eastern Gulf of Mexico. Despite efforts to change that reality, Luthi says that nothing has changed, explaining, "We are currently in the 2012-2017 program. That has no additional areas open. What Interior did was release the draft proposed program for the 2017 to 2022 five-year program. In that, there is at least possibility of studying the southeast Atlantic for 2021. That's great news. It's at least made it through the Interior's review process. We want to make sure that Interior does not drop this as a potential lease sale."

NOIA's other concerns include the 50-mile barrier (shore to offshore) that Luthi says has no real scientific reason to it. What it does do is make the initial leases far more expensive to develop. And then more expensive to get the oil, should you find any, from offshore to shore.

The southeast Atlantic region, says Luthi, hasn't been looked at for about 30 years. "We really don't know what's there. We have old seismic data which indicates there could be something, and there might be great resources inside that 50 mile buffer, but we'll never know because we don't

have the option to look, because of the buffer," he insists, adding, "Beyond this, that sale is a long ways away – 2021. We would actually suggest that they have two sales and one earlier than 2021." But, that's unlikely to happen. Still, Luthi says, "We need to be able to move faster on that."

The Arctic

The latest Arctic rules put forth by the Obama Administration are based in part on some of the problems that Shell had in the transportation of one of its drill rigs. But, says, Luthi, Shell has learned from those events and has taken advantage of that new knowledge, adding, "Arctic conditions really aren't 'frontier' conditions. Canada and Norway have been operating in these conditions for years and we can take that knowledge and apply that to Northern Alaska – there shouldn't need to be a whole lot of new regulations. The regulations are out there, we know what they are, but the reality is that they likely won't be finalized until after this year's drilling season. So, Shell is proceeding on the basis that they will be able to finish those wells that they started years ago." Beyond this, most companies aren't basing their decisions on what the market price is right now; they are taking the long view.

The Environment – well containment systems

Five years out from Macondo, industry is far more ready for the next 'big' event, should it come to that. To complement the surface response, industry has invested in two deepwater containment systems designed to handle up to 100,000 barrels of liquids and up to 200 million cubic feet of gas a day in depths down to 10,000 feet. Two companies – the Marine Well Containment Company and HWCG LLC (formerly Helix Well Containment Group) – are providing this service, where previously, there had been none. With equipment positioned strategically along the U.S. Gulf Coast, this means that today, instead of a case of months to cap a spill, it'll be days or perhaps a week.

Marine Well Containment Company (MWCC) is an independent company with headquarters in Houston, Texas. In July 2010, Shell, Chevron, ConocoPhillips and ExxonMobil committed to providing a new containment response capability for the U.S. Gulf of Mexico. Today, the company has 10 member companies and represents unprecedented industry collaboration.

MWCC's Containment System can cap or cap and flow a deepwater well control incident in deep water. The system includes two Modular Capture Vessels (MCVs), which can each capture up to 50,000 barrels of liquid per day, three capping stacks, enhanced subsea equipment and additional ancillary equipment. The MWCC Containment System, developed in cooperation with regulators from the Bureau of Safety and Environmental Enforcement (BSEE) and the U.S. Coast Guard, not only safeguards the U.S. Gulf of Mexico but allows new permits to be issued.

Similarly, HWCG is a consortium of 16 deepwater operators in the Gulf of Mexico who share the common goal of expanding capabilities to quickly and comprehensively respond to a subsea incident to protect people, property and the environment. All members contribute to a robust Mutual Aid program, creating a shared pool of assets, personnel, and technical resources for use during an incident. The membership reflects a diverse group of global offshore operators, representing about half of oil and gas operators in the Gulf of Mexico.

Rigs to Reef

Capping wells isn't the only place where environmental progress is being made. NOIA has been involved with the 'rigs to reef' program almost since its inception and has been one of its biggest supporters. The program was intended, in part, to help rig owners being pressured by the federal government in the wake of Macondo. The government felt that the idle iron was not being moved off the ocean bed quickly enough. But, says, Randall Luthi, what that federal pressure did at the same time was put quite a bulge in the process.

"That's because companies were evaluating what structures to leave in place and which ones to remove, or to be towed to a reef site or partially left in place. But, when they applied for the permits, they found that they needed two federal permits and one state permit before you could actually enter the rigs to reef program. It took so long to get those permits that the stakeholders were running out of time. And so, rather than put the structure into the rigs to reef program, industry players were simply forced to take it out," Luthi told MarineNews.

Ultimately, that resulted in unhappy commercial and recreational fishermen who come out to where there had once been a great place to fish and no longer was there a structure there. Luthi adds, "This disconcerted them, so we participated – along with BSEE, BOEM and state agencies with industry – in a couple of workshops in the last couple of years and the permits are being moved more quickly and states are giving permission more quickly."

Nevertheless, structures toppled because of a storm are unlikely to be allowed to be left in place. Luthi believes that a scientific assessment would best determine if the structure is or is not a safety hazard. Also impacting the program is

"Arctic conditions really aren't 'frontier' conditions. Canada and Norway have been operating in these conditions for years and we can take that knowledge and apply that to Northern Alaska – there shouldn't need to be a whole lot of new regulations."

– Randall Luthi, President of the National Ocean Industries Association

MWCC's Containment System can cap or cap and flow a deepwater well control incident in deep water.

that sometimes, scrap value is quite high, and some companies prefer to take the structure apart, bring it in and sell it. But, Luthi adds, "It's a good program and we support it. We hope more companies will decide to participate."

Real Change: Real Effort, Real Proof

Randall Luthi insists that the past five years have brought much change. He says, "The industry – oil and gas – has always been concerned about safety. But, I think Macondo made the industry refocus and re-emphasize the importance of safety, from top to bottom. So, what it did do is help industry refocus on a true culture of safety. It's always been important, but now, it is first and foremost on everyone's mind." Luthi adds that the change isn't all talk – there are metrics to back it all up.

The Presidential Oil Spill Commission's follow-up report, for example, offers that the offshore energy industry is safer than it was at the time of Macondo. Luthi also adds that a very interesting and valuable collaboration between federal regulators and the industry has evolved as the new regulations have come out. He explains, "I think there's been a lot better communication between industry on what works and what does not work. On the industry side alone, the Center for Offshore Safety was stood up. This is a group of dedicated individuals whose sole mission to ensure that offshore energy is developed safely while at the same time be on the cutting edge of technology. They are working hard to make sure that the audits that are now required by the federal regulators are performed correctly." Also according to NOIA, industry is trying to establish a relationship with those in academia with the Offshore Energy Safety Institute. This is a collaboration of industry, federal and university officials and they are just now start-

Courtesy: Sunam Suwim

ing to get their feet under them, but the concept is that this group will eventually identify areas that might need additional research. "As we look to the future in deeper waters, as we see higher pressures, higher temperatures and make sure that these things are done safely, this will be an important part of that effort," adds Luthi.

Federal Regs: too much, just right, or not enough?

Randall Luthi says the answer is all three, actually. "You'll hear all three, as it continues to be tested out. For some things, it's just too early to tell. For instance, the safety and environmental management systems (SEMS) are now just beginning to be audited and see how well they work. So I think have a period of time to get everyone up to speed, as much as industry and yes, the federal government would like them to be." And, all the regulations that were spawned from the Macondo well accident aren't yet out. The release of the blowout preventer and well containment regulations are still pending, for example. Luthi cautions, "We have to see what those rules entail before making judgments on them. One thing is for sure: it takes a lot more time and paperwork to get the permits processed through the permitting agency. It's a tough balance there, you know, is it really safer or are we just pushing more paper? As we go forward, industry will continue to voice its concern as well as its support for these regulations. We'll begin to see how they work better in the future."

Lessons Learned & Crude Oil Export

The decision to export oil is inextricably tied to a robust exploration and production program here at home. At least, that's how Randall Luthi couches the conversation. "I think we have to look at it carefully. If the United States has a good energy policy that assures that we have a robust exploration program, we'll have the ability to have excess oil to export. Part of that is the offshore world and that's why the Atlantic sale is so important. And, if we can open up more of the OCS it would be a great thing for our economy and our energy situation."

It's also helpful, says Luthi, to look back at what happened in the mid-1980's when the last 'oil crunch' took its toll on the offshore industry. There are lessons to be learned, but, he adds, it doesn't make the current situation any easier to overcome. "That's always a difficult situation because it is such a market driven business, he said, continuing, "One of the things that changed is that it takes fewer people to produce the same amount of oil and gas as it did 10 to 15 years ago, simply because of technology. So the new technology will help to reduce the numbers that need to be laid off and hopefully everyone realizes that it is a cyclical situation. It will be interesting because the United States is in a very different situation than it was in the 1980's. In the 1980's, and once things started to pick up, it was OPEC that was bringing a lot of the oil back onto the market and we came m ore and more dependent on foreign energy. This time, we (the United States) are in a position to do that and we will."

Today, less than 50 percent of the oil we use today is imported and our primary trading partner in that regard is Canada – not OPEC. Luthi says that will make all the difference. "Once we have a reliable and steady exploration and production policy in place here, then oil should be used as a commodity. It's like food or grain – if you have enough, it should be traded and exported – but you need to make sure that you keep the supply up here at home."

Gladding-Hearn Wins Three Vessel Contract from Circle Line

Gladding-Hearn Shipbuilding, Duclos Corporation, has begun construction of the first of three new sightseeing vessels for Circle Line Sightseeing Cruises, Inc., in New York City. A keel-laying ceremony at the Somerset-Mass., shipyard in January, was held in commemoration of the Circle Line's 70th anniversary year. The new boat order follows the shipyard's delivery of three sister ships for the company in 2009. Delivery of the first new vessel is scheduled for 2016. Like the earlier vessels, the new 600-passenger all-steel vessel, designed by DeJong and Lebet, measures 165 feet in length and features a 34-foot beam. With a top speed of 14 knots, the vessel will be powered by twin Cummins QSK-38M1 diesel engines, delivering a total of 2600 hp and connected to ZF W3355 gear boxes, spinning 60-inch, 5-bladed bronze propellers. For dockside maneuvering, the vessel is equipped with a 125 hp Wesmar bow thruster, powered by an electric motor. Two 140 kW generators will supply the ship's service power. The vessel will carry 8,200 gallons of fuel and 4,000 gallons of potable water.

MetalCraft's Oil Recovery Boat

MetalCraft Marine has delivered a new oil recovery boat to Imperial Oil. This unique workboat is designed and intended to perform a myriad of duties for its oil company customer, including carriage of passengers back and forth to a dredge, carriage of generator fuel, spare parts, and the layout of anchor patterns for the dredge and to assist moving the dredge – using its high horsepower engines – around the inland pond. Given its intended operation in harsh Canadian winters, an on-board automatic winterization system for unmanned overnight storage is fitted and the vessel is designed to operate at -40 C. A 6,000 lb hydraulic A frame for anchor retrieval/deployment is also provided. Additional features include a double continuous welded first 1/3 of structure vessel built to IACS rules with 50 percent of the vessel's bottom plate increased to 9/16" thick to support beach loading and an ice belt protects the vessel's sides. A floating wheelhouse to dampen sound is fitted, and that wheelhouse hinges onto the foredeck for shipping.

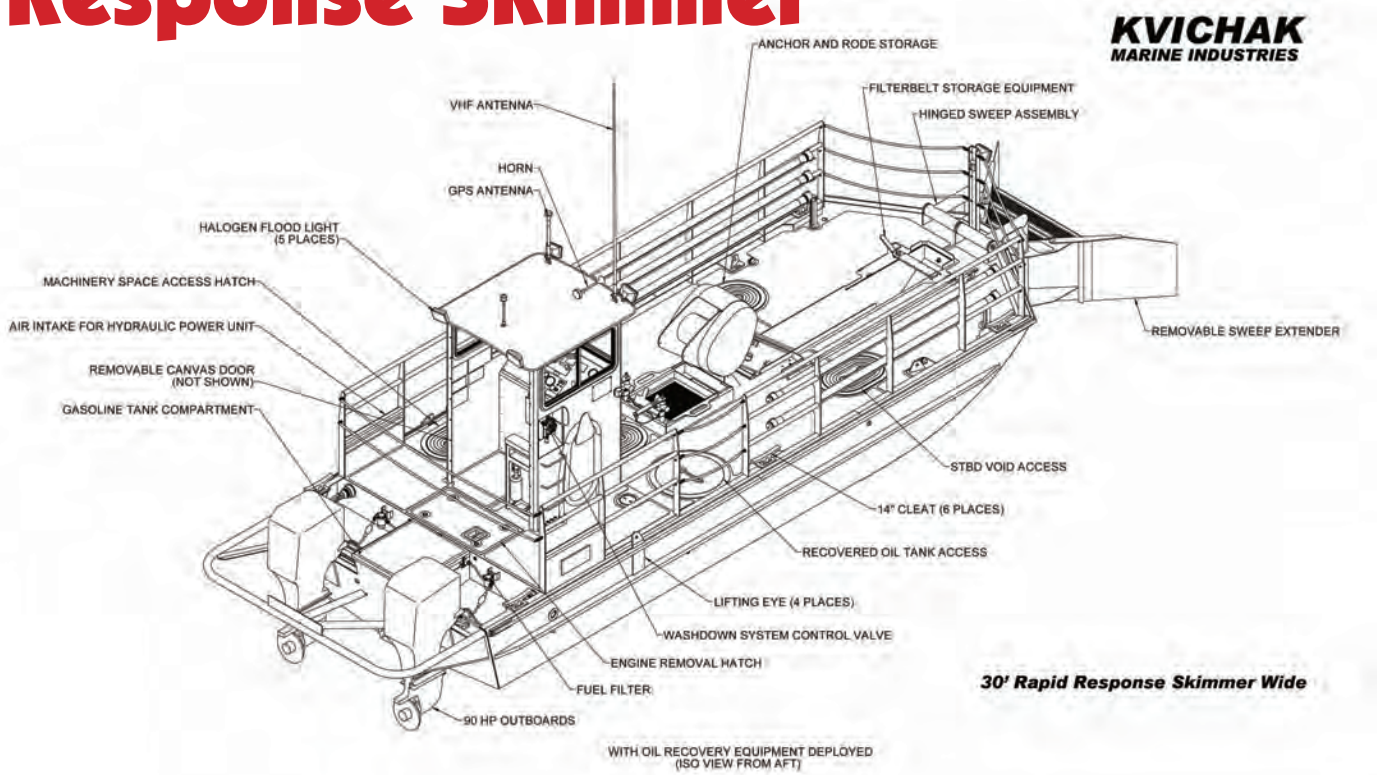
Oil Recovery Boat at a Glance ...

Model: Kearl Lake - SL Landing Craft 45	Hull Number: 607	Displacement: 10,909 KG
Engines: (2) Cummins 6.7 L 424 HP	Delivered: April 2015	Jets: (2) Ultra Jet 305
Bollard Pull: 7000 lbs	LOA: 13.30m	Horsepower: 850 HP
Carrying Capacity: 20,000 lbs	BOA: 4.85m	Speed: 34 kts.

RIBCRAFT Delivers Boat to Decatur Police Department

RIBCRAFT last month announced the delivery of a specialized RIBCRAFT 7.8 for patrol and enforcement operations to the City of Decatur, Alabama. The 25' purpose built mission specific RIB will be used by the Decatur Police Department for tactical operations and on water patrols. Featuring a center console with a front bench seat, leaning post, custom aft seating and tow post, the 7.8 provides a large open deck to offer the versatility needed to support the Department's operational requirements. Equipped with twin Yamaha 150HP engines, the RIB can safely reach speeds in excess of 50 mph. Decatur's 7.8 also features CBRN capabilities (Chemical, Biological, Radiological, and Nuclear) for an advanced defense strategy. The CBRN detection sensor allows the department to take protective measures in situations where any of these four hazards are present.

The Ever-Evolving Rapid Response Skimmer



Kvichak's Rapid Response Skimmers (RRS) are perhaps best known for their use by the U.S. Navy, but the design of these robust and well-designed units has evolved over time and today boasts placement in virtually every major spill organization.

By Joseph Keefe

When, just this past October, Kvichak Marine won a U.S. Navy contract for 12 30-foot Rapid Response Skimmers (RRS) for delivery over the next 18 months, with options for up to 30 additional skimmers to be delivered through 2019, that wasn't necessarily earthshaking news. That's because the aluminum Kvichak RRS is already the Navy's tier one response asset. The new craft will supplement the Navy's current fleet of over 85 units in operation in Navy ports worldwide since 1994. The big story, then, is why the Navy – and industry – keeps coming back for more.

With over 20 years of continuous production and development, the Kvichak RRS is a proven asset, fitted with patented technology, and boasts an exceptional record for safety, performance and durability. For its part, Kvichak – an aluminum boat builder for over 33 years – has been building skimmer boats since 1995 and has contracted for 100 to the U.S. Navy. But, the boats are anything but cookie cutter hulls and equipment. Responding to customer inquiries and requests, the RRS has evolved many times to arrive at what it looks like today. Looking deeper, the reasons for those changes become much more evident.

Today's RRS Skimmer

Ross Hendrick, Pollution Control Products Division General Manager at Seattle-based Kvichak Marine Industries, told MarineNews in April, "The primary mission of the Kvichak RRS is the removal of light refined oils – diesel and jet fuel, for example – from the water surface in harbors and protected waters. When in government service, the vessels work in concert with the other Navy Oil Spill Response boats and various boom arrangement schemes. The RRS

collects and then transports recovered oil to an offload location." He added, "As presently configured, the RRS is fully operational in up to 3 foot significant wave height and is able to survive in up to 7 foot waves. Beyond this, it is capable of operating in all weather conditions, with ambient air temperatures ranging from 0 to 105 degrees F, and in water temperatures ranging from 28 to 95 degrees F."

The rapid-response, shallow-water capable craft is ideally suited for use on oil spills in waterways, bays and harbors. The all-aluminum vessel is 30'-3" long, with a beam of 9'-8", a draft of 2'-6", and is easily trailerable. Powered by twin 90hp outboards, the RRS has a response speed of up to 17 knots and features an enclosed two person pilothouse for operator comfort.

Adaptable to a variety of marine spill scenarios, this highly specialized vessel works well in many recovery configurations, from free skimming through towed-boom applications, and is able to recover a very wide range of spills from light sheens to very viscous weathered oil products. The skimmer's oil recovery system includes a KVICHAK/MARCO Cl-1 Filterbelt oil skimming module, a KVICHAK/MARCO U-040 Capsulpump offload system with 50' hose, and a recovered oil capacity of over 1,200 gallons. The recovered oil tank configuration allows segregation of small volume spills to simplify post-spill decontamination. Onboard hydraulic power is supplied by an under-deck diesel HPU.

The key piece of equipment fitted onto the Kvichak RRS is the proprietary Filter Belt technology, which Kvichak acquired from Marko in 2004. The Filter Belt consists of a mesh belt, effective in any range of oil – crude / diesel / sheen – and this oil skimming system has been thoroughly tested and demonstrated to support a minimum Throughput Efficiency of 65%, a minimum Recovery Efficiency of 60%, and a minimum Recovery Rate of 6.5 gpm using ASTM Standard F 631-93 encountering a 1mm slick thickness of with Diesel Fuel Marine (DFM) and JP-5 at towed speeds of 0.5 – 2.5 knots, in calm and protected water surface conditions.

Always Evolving, Constantly innovating

The only constant in Kvichak's history of producing reliable skimmers has, interestingly enough, been change. Over time, Hendrick told ***MarineNews***, the firm listened to its customers and, when warranted, the initial design has been improved for all the right reasons. Just 8 foot in beam in the beginning, the Navy wanted a slightly large, more stable platform, and so Kvichak stretched the hull's width to 9 feet – 8 inches. The boat's length has remained the same. Utilizing gasoline powered engines, today's version is also faster, employing larger engines.

Another subtle change included – at the customer's request – the separation of the engines from the boat's hydraulics. Today's more stable RRS platform Also incorporates skimming capability of 1,300 gallons into 3 tanks, a opposed to the initial system which could collect just 1,000 gallons, into one tank. The U.S. Navy's NAVSEA (acquisition) team also asked about adding an auxiliary battery and the raising of the diesel intakes in case of bad weather. This was done. Today's RRS vessels employ two 90 HP outboards. Hendrick explains, "Depending on the customer; Honda, Yamaha, Mercury, and/or Suzuki engines can all be used. This is typically driven by who the closest local supplier is and the aftermarket service they can provide.

By the Numbers, Over the Years

• *Generation I Skimmers, 1995:* Kvichak wins a Navy contract for 29 each 28' long x 8' wide Rapid Response Skimmers (RRS) for the US Navy. The skimmers are based on modifications to a well proven design in production in various configurations since the 1980's and featuring the "Kvichak/Marco Filterbelt," a belt type oil recovery system with an outstanding reputation for real world oil recovery performance, quality and durability. The skimmers feature all aluminum construction, 1,000 gallon storage capacity and Mercruiser I/O (gasoline) propulsion. The skimmers are extensively tested by the Navy and exceed all performance and technical requirements. A total of 31 of these units were delivered from 1995 to 1997, significantly improving the Navy's spill response capability in the US and overseas.

• *Generation II Skimmers, 1997: K*vichak upgrades the vessel's propulsion to Volvo I/O (diesel fuel) engine propulsion, improving safety, reliability and performance. A total 26 units were delivered from 1997 to 2005.

"The primary mission of the Kvichak RRS is the removal of light refined oils – diesel and jet fuel, for example – from the water surface in harbors and protected waters. When in government service, the vessels work in concert with the other Navy Oil Spill Response boats and various boom arrangement schemes. The RRS collects and then transports recovered oil to an offload location."

– Ross Hendrick, Pollution Control Products Division General Manager at Seattle-based Kvichak Marine Industries

• *Generation III Skimmers, 2005:* This was the first major redesign of the RRS, changing propulsion from single Volvo I/O to twin 70hp outboard motors, and adding a diesel hydraulic power unit under deck, improving speed and maneuverability while also improving recovery system performance. A total of 11 of these units were delivered from 2005 to 2010.

• *Generation IV Skimmers, 2010 – Present:* A second major redesign of the unit widened the skimmer by 20 inches to 9'-8" and involved upgrading the propulsion to twin 90hp outboard motors, increasing the size of the operator cabin, and increasing recovered oil storage capacity from 1,000 to 1,300 gallons. Beyond this and because of the improvements in stability, the skimmer can now safely accommodate up to 10 personnel for training purposes. 16 units were delivered from 2010 to 2014 and currently, 15 units are currently under construction for delivery in 2015.

Kvichak's RRS: A World of Opportunities

Apart from its very important U.S. Government customer, Kvichak's RRS output has some very familiar commercial names, as well. A similar version of the RRS was constructed for BP in the immediate wake of the Macondo Gulf of Mexico disaster. That (first) unit was actually delivered on the day the well was finally capped. But, BP isn't Kvichak's only commercial customer. Hendrick explains, "Our skimmers are in the inventory of all major US response organizations and are very well regarded. For the Macondo spill, in an effort to be prepared for nearshore oil, BP and Kvichak negotiated for an initial order of 15 skimmers after discussions and vetting of our product with several national spill response organizations. Soon after the initial order, BP increased the order quantity by 26 units to a total of 41 skimmers, but working together we agreed to an option to equitably cancel undelivered skimmers in case the full quantity was not needed."

BP asked Kvichak and all of their equipment vendors to increase production capacity and expedite deliveries. And, this was done. Hendrick explains, "We were ahead on several unrelated projects in process, so working with our customers, all pulling on the same rope, we put those other projects on temporary hold and switched our full production capacity to skimmers only. When we got into full swing on skimmers, our production level was 3 to 4 skimmers per week including utilization of several fabrication subcontractors." Ultimately, the dispersant was very effective and oil was largely kept from the shoreline, so working with BP, Kvichak ended production at a total of 29 units delivered.

After the response effort went into shutdown mode, BP began the process of disposing of massive amounts of supplies and equipment purchased, including the skimmers. The Marine Spill Response Corporation (MSRC) purchased 10 units and spread them around the US to augment their response capabilities. Elastec/American Marine, Kvichak's international marketing partner for their skimmer line, purchased 5 units for resale. Several smaller response organizations purchased one or two units. And, most people were probably unaware that BP generously donated one unit to the National Spill Control School in Corpus Christi, TX, and reassigned the remainder to BP operations overseas (Europe and South America).

In the summer of 2015, it is clear that there is an abundance of oil spill response equipment on the market, and for that matter, in inventory worldwide. Still, when it comes time order to order the next piece of equipment, Kvichak's RRS is a proven asset that transcends the test of time, global boundaries, and the forward march of technology. In other words: the ultimate workboat.

Optimizing Efficiency Requires Measurement of True Output

Binsfield Engineering's TorqueTrak telemetry instruments measure torque, RPM's and power data.

Binsfeld Engineering specializes in transmitting sensor signals from rotating machinery and has been designing wireless, noncontact data transmission systems since 1974. Today, its TorqueTrak telemetry instruments are commonly used to measure true mechanical Torque & Power on rotating propeller shafts in all types of ships and marine craft. Specialized data acquisition hardware and software from business partner, OpDAQ Systems, allows the logging, display and analysis of the torque, RPM and power (Hp or kW) measurement data. Binsfield counts as many as 15 major engine OEM's – representing virtually the entire spectrum of marine propulsion – as well as the U.S. Navy and Coast Guard and myriad shipyards as customers. The reasons why are now obvious enough.

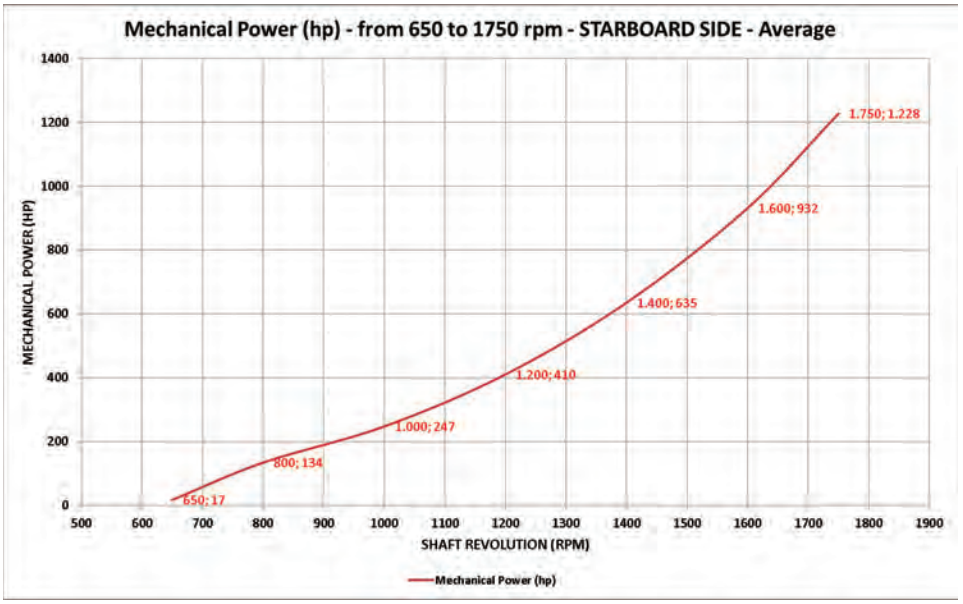
Why do I need to measure torque and power?

In today's world of increased emissions regulations and high-priced bunkers, marine operators need to leverage every advantage possible in order to maximize the bottom line. For starters, measuring true mechanical Torque and Power on rotating shafts allows users to optimize fuel efficiency by first verifying the true power output of the engine(s) and then comparing the fuel input to Engine Power Output, as well as to Vessel Speed. Continuously monitoring the material load on conveyor equipment, as indicated by the Torque on the drive shaft allows the user to speed up or slow down the process accordingly; even stop the process altogether in the case of a material jam, before any damage can occur to the equipment. For example, using the TorqueTrak Revolution output signal to sound an alarm and/or shut down the equipment when the load exceeds the safe limit can save money, headaches and unnecessary repair bills. The TorqueTrak monitoring solution also provides diagnostics that defines just how much mechanical Power (Hp or kW) is truly needed to accomplish a task. And, in terms of Preventive Maintenance, TorqueTrak diagnoses and eliminates torsional vibration conditions that, if left unchecked, will result in premature fatigue and/or failure of the equipment.

Installation & Logistics

All instruments feature sophisticated 14-bit signal processing for a very accurate and reliable data signal. Calibration is done off-the-shaft. The TorqueTrak system is suitable for any size shaft and any torque/power level, and is mounted externally to the propeller shaft. Engine/shaft disassembly are not required. Vessel operators can use TortqueTrak instrumentation as a temporary, sea-trial measure, or as a permanent Installation, for continuous monitoring and control of Torque, RPM and Power data. In most cases, Binsfield can respond to requests with delivery lead time of 2 weeks or less and for permanent installations, just 6 weeks. The basic application is to measure true mechanical torque on a rotating propeller shaft during sea trial or maintenance. On twin-prop ships, measure torque on both propeller shafts simultaneously using two TorqueTrak 10K systems. In this way, users can easily determine whether the two engines are putting out rated power and, just as importantly, whether they're properly balanced.

The TorqueTrak Revolution is a permanently installed instrument for continuous monitoring and control. One of the primary application objectives aboard marine vessels is to Optimize Power Efficiency – to maximize the Power-Output per Fuel-Input ratio. The TorqueTrak Revolution provides continuous dynamic measurement and data output for Torque, RPM & Power on the propeller shafts. This "Power" data can be compared real-time to fuel consumption, ship speed, heading, weather conditions and other variables giving you the "Power Efficiency" information needed to make decisions. Daily and monthly reports showing average shaft Power compared to fuel consumption, ship speed and distance traveled can be made and the software runs on a common laptop or PC. The Torque signal can also be used as a High Torque monitor/alarm, indicating a jammed propeller, for example. The TorqueTrak Revolution system features Inductive Power and Inductive Data Transfer - there are no mechanical wear surfaces, so long-term reliable operation should be expected.



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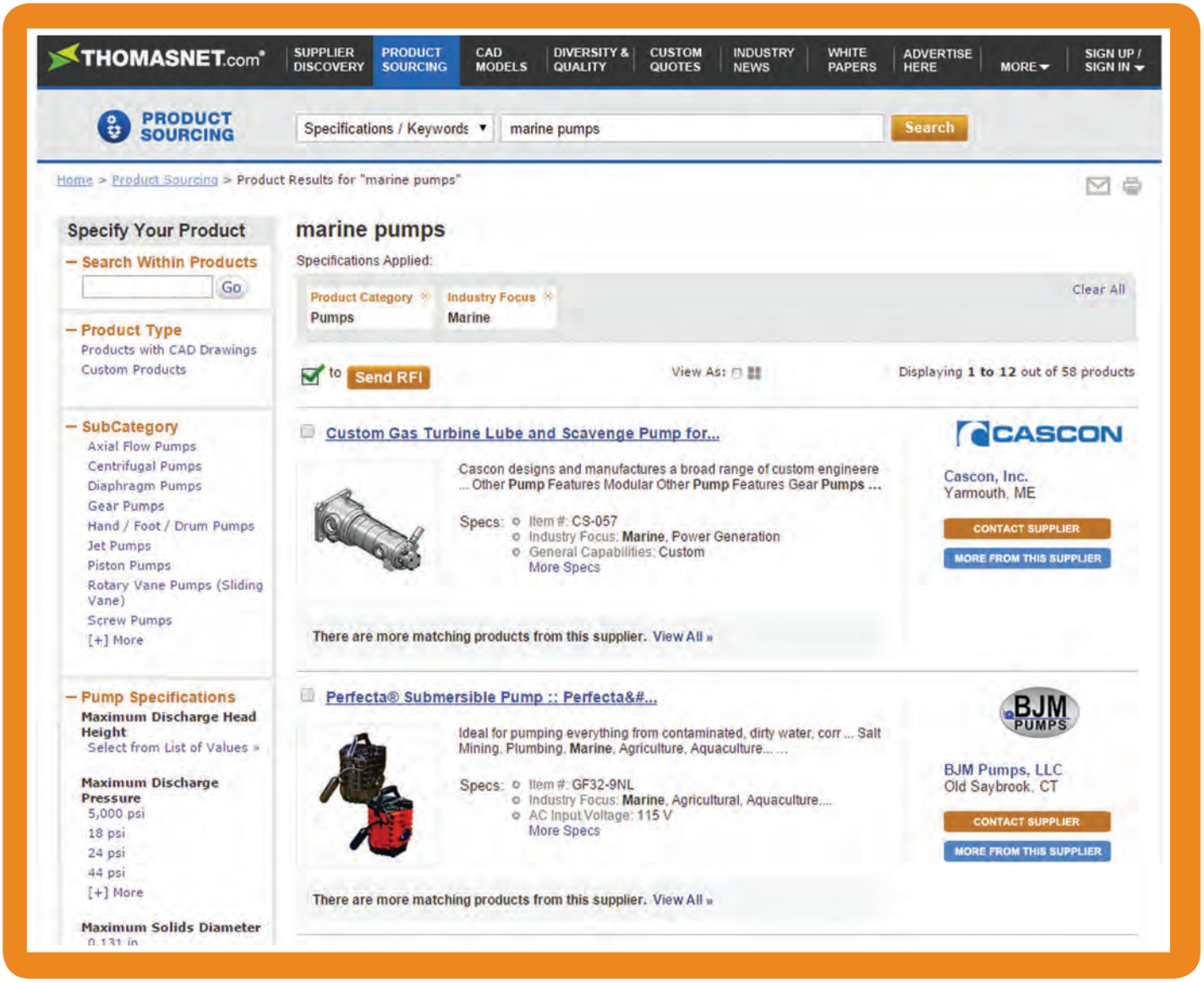

Building relationships with reliable, high-quality suppliers is critical to the success of boat operators, naval architects, engineers and others in the marine industry. Having suppliers 'on deck' whose products meet shipbuilding and repair requirements is part of that equation. When marine equipment inevitably fails or reaches the end of its service life, maintenance personnel need to know where to turn for quick replacements. That's where ThomasNet.com comes in.

ThomasNet.com is a free supplier discovery and product sourcing platform. Its predecessor, the Thomas Register of American Manufacturers, began publishing in 1914. The 34-volume buying guide, known in some circles as the 'Green Books,' was affectionately referred to as the "bible" for some engineers. Offering detailed information on hundreds of thousands of manufacturers and their products, the Thomas Register, like everyone else, has migrated to the net. Today, it

is known as ThomasNet.com. The site is indexed into 67,000 supplier categories and features millions of industrial parts.

The backbone of ThomasNet.com is a huge database of over 700,000 North American manufacturers, distributors and service providers. The platform has several applications and productivity tools to make users' jobs easier. For shipbuilding and repair professionals, the sections entitled Supplier Discovery, Product Sourcing and Custom Quotes will be especially helpful.

Supplier Discovery

Supplier Discovery is an application that allows buyers and engineers to quickly come up with a shortlist of viable suppliers. A search box lets users define all important qualifiers from the start, such as product/service category, location, ownership type (for meeting diversity requirements), certifications (ISO, ANSI, etc.) and company type. Suppliers have in-depth profiles on ThomasNet.com, with information on their capabilities, equipment, product lines, brand names carried, demographics, certifications, product news, and more. Many offer videos, which give engineers a chance to see these suppliers' facilities. This content helps users narrow their shortlists and decide which companies to contact for bids. In fact, they can even send Requests for Proposals (RFPs) right from ThomasNet.com.

Product Sourcing

When a technician needs to replace a flange that's failed, or an engineer needs new mounting brackets, they can turn to ThomasNet.com's Product Sourcing application. Users can find more than 100 million items here, including raw materials, equipment, MRO (maintenance, repair and operations) supplies and finished products. These are featured in line item detail and can be sourced by multiple specifications. Some products come with user manuals, which can be a real help when making repairs. Other listings are accompanied by "exploded view" diagrams to help engineers ensure that a part will meet their exact needs. For example, a search for marine pumps turned up 58 different products to choose from. Narrowing the search by pump type (axial flow, centrifugal, etc.) and a variety of other qualifiers like maximum discharge pressure, casting design and mounting type helps the user zero in on exactly what they are looking for.

Through the Product Sourcing application, users have access to millions of downloadable 2-D and 3-D CAD drawings and models. These provide engineers with proof that the parts they're considering will fit into the products they're designing. Engineers can download the models from ThomasNet.com and insert them directly into their designs, since their underlying technology is compatible with virtually all CAD systems. They can also e-mail the drawings and specifications to colleagues.

Custom Quotes

Often, shipbuilders need custom parts and have to turn to a job shop to provide them. ThomasNet.com's Custom Quotes application makes it easy to find local shops that provide welding, cutting, finishing, fabricating and other services. Engineers can submit RFQs to ThomasNet.com's team of engineers, who will recommend up to five qualified shops.

As a one-stop-platform, ThomasNet.com offers a wealth of resources for users in the marine industry. To learn more, potential users can sign up for ThomasNet Onsite. A free, customized training service, available on premise or via webinar, can introduce users to all services and help them solve their sourcing challenges. www.ThomasNet.com

Chesapeake Shipbuilding Launches Fort Schuyler Tugboat for Vane Brothers

Who says U.S. yards can't successfully build in series, on time, and with great quality? Certainly not Vane Brothers Towing. That's because Chesapeake Shipbuilding, Salisbury, MD, has successfully launched yet another tugboat for Vane Brothers of Baltimore, MD. In this case, the tugboat, named Fort Schuyler, is the eleventh tug that Chesapeake Shipbuilding has built for Vane line Bunkering under the terms of a 14 vessel contract over the course of the last 6 years. The new tugboat, nearly identical to the previous 10 tugboats built by the shipbuilder for Vane Brothers, measures 90 feet in length with a 32 foot beam and is notably equipped with twin Caterpillar 3512 main engines, producing a robust, combined 3,000 horsepower. A single drum JonRie hydraulic towing winch stands out on the vessel's capable on deck array of equipment.

Each Chesapeake Shipbuilding tugboat is built in a controlled indoor environment, before being moved and launched into Maryland's Wicomico River. Beyond this, Chesapeake Shipbuilding has recently made significant upgrades to its shipyard to increase its production capacity and efficiency, including adding two large hull fabrication buildings. The upgrades include acquisition of additional land (critical to any successful and efficient shipbuilding apron layout) and the investment in additional, high-tech automated equipment. These facilities are at the heart of what makes the yard's repeat business and series-build capabilities arguably second-to-none in today's marine markets. Indeed, at least two additional tugboats of identical construction are now under construction for the same customer, with deliveries scheduled for delivery in 2015 and 2016. Separately, the busy yard currently has five ocean-going tugs and two 305-foot cruise vessels under construction. The shipyard specializes in the design and construction of passenger vessels, tugboats, ferry boats and other workboats.

www.chesapeakeshipbuilding.com

Fort Schuyler at a Glance ...

3000 HP Tug for Ocean Service	ABS Load Line	Main Engines: (2) Caterpillar 3512C Tier III
Marine Gears: Twin Disc 5600	Length Overall: 94'-0"	Generators (2): John Deere 6068 , 99 Kw
Engine Controls: Twin Disc	Molded Beam: 32'-0"	Electronics: Rhodes Electronics, Houma, LA
Towing Winch: JonRie	Design Draft: 11'-6"	Joiner System: Custom Ship Interiors


Moore


Downing


Ronayne


Stokes


Rose


Weitzmann


Loomis


Nestel


Jenkins


Ley


Doyle

Port of Cleveland Announces Officers

Chris Ronayne has been named as board chair of the Cleveland-Cuyahoga County Port Authority. The Board also elected **Diane Downing** as Vice Chair and **Anthony Moore** as Secretary. Ms. Downing serves as Senior Vice President, Director of Corporate Affairs for The Huntington National Bank and has been on the Board since 2013. Mr. Moore is a retired partner from Jones Day, has been on the Board since 2008, and previously served as the Board Secretary from 2011 until 2013.

SSI Expands to Meet Growth

Thomas Stokes and **Jason Rose** have joined ShipConstructor. Stokes is SSI's new software trainer. He brings over eight years of design experience using ShipConstructor software and is an accomplished marine structural designer. Rose, SSI's newest sales account executive, previously promoted Dassault's product line.

Weitzmann is Managing Director of Voith Turbo's Power, Oil & Gas Division

Cornelius Weitzmann has been appointed as Managing Director of the Power, Oil & Gas business division at Voith Turbo GmbH & Co. Weitzmann initially joined strategic planning at Voith in 2007 and in 2009, he became Managing Director at Voith Paper Inc. in Appleton, Wisconsin, USA. In 2011, he was appointed President of Fabric & Roll Systems EMEA. The Division also includes the well-known Voith Marine Technology, with systems such as the Voith Schneider Propeller or the innovative Voith Linear Jet.

W&O Realigns Leadership

Fred Loomis has been appointed as Vice President of Technical Sales, and **Todd Nestel** will serve as Vice President of Engineered Solutions at W&O. Loomis, a Massachusetts Maritime Academy graduate, will be responsible for overseeing W&O's involvement with technical projects in North America and Europe. Loomis has been with W&O for 17 years was a tugboat captain prior to joining W&O. Nestel will lead the engineered solutions and marketing team. Nestel, a U.S. Merchant Marine Academy graduate, has been with W&O for over three years, and previously worked at Drew Marine and Drew Industrial in various sales and sales management roles.

Jenkins Elected Chairman of Coast Guard Foundation

William E. Jenkins has assumed the role of chairman of the Coast Guard Foundation, a non-profit organization committed to the education and welfare of Coast Guard members and their families. Joining the Foundation's board in 2009, Jenkins served as treasurer and vice-chairman prior to being elected board chair. Jenkins is a director on the Board of American Bureau of Shipping, Inc., a trustee of Webb Institute, and was president and CEO of ExxonMobil affiliates providing worldwide shipping and marine transportation when he retired from ExxonMobil in 2012. Jenkins holds master's degrees in finance and safety management from the University of Arizona and a bachelor's degree from Northern Arizona University.

WAGO Introduces Transportation Industry Manager

Brian Ley has been named Industry Manager – Transportation at WAGO after an extensive career in technical and operations management, engineering and consulting. In addition to a Bachelor of Science in Electrical Engineering and Lean Six Sigma certification Brian is also an active member of the American Public Transportation Association (APTA).

U.S. Senate Confirms FMC Commissioner Doyle to Another Term

William P. Doyle has been con-

TITAN Salvage

Haycock

Kunkle

EBDG Gulf Coast Office Welcomes Three New Hires

Kaysen

Reid

Sutherlin

Senior Naval Architect **David Kaysen**, Marine Engineer **Trygve Reid** and Marine Engineer **Rex Sutherlin** have all joined Elliott Bay Design Group's (EBDG) Gulf Coast Office. Kaysen brings over 25 years of Naval Architecture experience to his position at EBDG. He earned a BS in Engineering Science from the Rensselaer Polytechnic Institute, and a Master of Science in Ocean Engineering from the Stevens Institute of Technology. Reid brings two decades' of experience in Naval Architecture and Marine Engineering, with expertise in structural design, vessel design and modification, stability analysis and production support engineering. Sutherlin has worked with commercial and military shipboard systems design. His areas of expertise include fire protection and fire detection systems, as well as auxiliary piping systems.

firmed to another term in office as a Federal Maritime Commissioner on the evening of March 23, 2015. William Doyle was originally confirmed by the Senate on January 1, 2013 to fill the unexpired term of former Commissioner Joseph Brennan. On January 30, 2014, President Obama reappointed Mr. Doyle for a term expiring June 30, 2018. Doyle is a Coast Guard licensed engineer and from 2011 to 2013, the Commissioner served as the chief of staff for the Marine Engineers' Beneficial Association (MEBA). He is a graduate of the Massachusetts Maritime Academy and earned a J.D. from Widener University School of Law.

Trelleborg Appoints Regional U.S. President

Paul Welling has been named Trelleborg's U.S. region's new president. Following his success as Regional Director for the Middle East and Africa, in which he won Trelleborg the largest ever contract for fender systems, Paul has moved over to take on the president's role in the U.S. to establish the company's new manufacturing and business development facility in Berryville, Virginia. Welling, who has worked for Trelleborg's marine operation for nearly 10 years, will head up the company's new facility in Berryville, VA.

TITAN Salvage Wins ISU Meritorious Service Award

Crowley Maritime Corp.'s Houston-based subsidiary TITAN Salvage and Italian engineering partner Micoperi were recently honored with the International Salvage Union (ISU) Meritorious Service Award during the organization's Associate Members' Day Conference in London. The award was presented by ISU President Leendert Muller in recognition of TITAN and Micoperi's outstanding service to the salvage industry during the successful execution of the largest single maritime wreck removal project ever to be undertaken, the Costa Concordia. The ship salvage was the largest, most technically demanding project of its kind in history and was carried out in full public view from the island.

Direct ChassisLink Names Haycock CMO

Jeremy Haycock has been appointed as Senior Vice President and Chief Marketing Officer at Direct Chassislink, effective April 15, 2015. Jeremy will have responsibility for DCLI's commercial team, growth of the business and development of new products. Prior to joining DCLI, Jeremy was the CEO and President of DAMCO North America, and before that, enjoyed a long career with the Maersk organization in the marine and logistics sectors.

Hirschmann (PAT) names Senior QA Engineer

Jim Kunkle has joined Hirschmann Automation and Control as Sr. Quality Assurance Engineer. In his new position, Kunkle will manage the

NOAA


Zukunft

Quality Department at Hirschmann's Chambersburg, PA facility. Kunkle has more than a decade of experience that includes U.S. Navy service. He is a graduate of the University of Phoenix where he graduated with honors.

NOAA plans increased 2015 Arctic nautical charting operations

As commercial shipping traffic increases in the Arctic, NOAA is taking major steps to update nautical charts in the region. NOAA's Office of Coast Survey will use data collected by two of its own ships, Rainier and Fairweather, as well as the U.S. Coast Guard cutter Healy and a private sector hydrographic contractor to cover nearly 12,000 nautical miles in the Arctic for use in updating its navigational charts.

The NOAA-led Arctic marine corridor project will work with the Coast Guard to assess the safety of a potential Arctic shipping route from Unimak Island, the largest of the Aleutian Islands, through the Bering Strait to the Chukchi Sea, as proposed in the USCG Port Access Route Study for the region. The Coast Guard will continue to take public comments prior to making a final decision on the proposed route.

Coast Guard Forum Fosters Safe Arctic Maritime Activity

Citing an increasing need to ensure safety, security, and stewardship of Arctic waters, member countries of the Arctic Council gathered at U.S. Coast Guard Headquarters last month for a two-day Arctic Coast Guard Forum (ACGF) Experts Meeting. The ACGF is a cooperative initiative between nations with shared maritime interests in the Arctic. Membership includes Canada, Denmark, Finland, Iceland, Norway, Sweden, the Russian Federation, and the United States. The ACGF will be an operationally-focused organization that strengthens maritime cooperation and coordination in the Arctic. During his recent State of the Coast Guard Address, **Commandant Adm. Paul Zukunft** addressed the importance of the Coast Guard's role in the Arctic stating, "Unimpeded access and sustained presence while operating in the Arctic are vital to meet the United States Arctic Strategy. There is a new ocean opening and Coast Guard authorities mandate our presence wherever U.S. national interests require people and ships to operate."

Donjon-SMIT, LLC Relocating to Houston

Donjon-SMIT moved its company headquarters from Alexandria, VA to Houston, TX, effective April 1st. The joint venture had been headquartered in Alexandria, VA to facilitate communication with the U. S. Coast Guard as well as compliance with the new OPA 90 Salvage and Marine Firefighting (SMFF) regulations for tank and non-tank vessels. As the SMFF regulations are well established, the focus of the joint venture is now on compliance and response. The headquarters office of Donjon-SMIT will be located in the facilities of SMIT Salvage Americas in Houston, TX. Donjon-SMIT's twenty-four hour telephone contact number is 1-703-299-0081 and will not be changed.

Global Technical Services Expands Offerings of Global Diving & Salvage

Global Diving & Salvage announced the addition of Global Technical Services (GTS) to its existing core services; Marine Construction, Marine Casualty Response and Offshore Support. Joining forces with Alaska Technical, GTS is offering a wide range of Non Destructive Testing (NDT) Instruction Services to industry; including, energy companies, aviation, rail and infrastructure. Courses offered include Visual, Magnetic Particle, Dye Penetrant, Ultrasonic, Radiography, Radiographic Film Interpretation and Eddy Current. **Marty Anderson**, founded Alaska Technical Services in 2005, He began his career as an inspector in 1990 and has since acquired certifications in a variety of training and inspection procedures.

Gulf of Mexico Lease Sale Yields $539 Million for One Million Acres

The Department of the Interior's Bureau of Ocean Energy Management (BOEM) in March held an oil and gas lease sale for the Central Gulf of Mexico that drew $538,780,056 in high bids for tracts on the U.S. Outer Continental Shelf offshore Louisiana,

Anderson

St. Lawrence Seaway Corporation

Sutton

Mississippi and Alabama. A total of 42 offshore energy companies submitted 195 bids on 169 tracts, covering about 923,700 acres. Lease Sale 235 builds on the first six sales held under the Obama Administration's Outer Continental Shelf Oil and Gas Leasing Program for 2012-2017 (Five Year Program) that offered more than 60 million acres for development, garnered $2.4 billion in bid revenues and awarded 877 leases.

Seaway Opens 57th Navigation Season

The St. Lawrence Seaway Management Corporation (SLSMC), together with the U.S. Saint Lawrence Seaway Development Corporation, marked the opening of the Seaway's 57th navigation season on April 2nd, with the transit of the newly-built CWB Marquis through the St. Lambert Lock. The vessel is the first of two Equinox-class lakers ordered by Winnipeg-based grain marketer CWB that are being purpose-built for trade in the St. Lawrence Seaway. In 2014, over 12 million tons of grain moved through the Seaway. Over 227,000 jobs and $35 billion in economic activity are supported by the movement of various cargoes on the Great Lakes / Seaway System.

SLSDC Announces 2014 Pacesetter Awards

The U.S. Saint Lawrence Seaway Development Corporation (SLSDC) in March announced that seven U.S. ports in the Great Lakes St. Lawrence Seaway System are receiving the prestigious Robert J. Lewis Pacesetter Award for registering increases in international cargo tonnage shipped through their ports during the 2014 navigation season compared to the previous year. These include the Port of Indiana - Burns Harbor, the Port of Erie, the Port of Duluth-Superior, the Port of Milwaukee, the Port of Cleveland, the Port of Toledo, and the Port of Oswego. SLSDC Administrator Betty Sutton said, "Marine transportation remains a catalyst for jobs and productivity for the local economies where these ports are situated and throughout the Great Lakes region."

Sea Star Line Adds Barge to Puerto Rican Routes

Sea Star Line, LLC has added another barge to its current service package for shipments from Jacksonville to Puerto Rico. The new asset has the capacity for 320 dry units and its initial departure was set for the first week of April. In January, Sea Star Line added two barges to address increased demand in the market. The total capacity for both barges is 750 FEUs with dedicated space for 84 refrigerated containers. In October, Sea Star Line will deploy the first of two Marlin class vessels with a capacity of 3100 TEUs. Each vessel will accommodate 268 refrigerated containers with expansion capabilities to handle up to 350 refrigerated containers. The new vessels will be the world's first liquefied natural gas (LNG) powered containerships and dedicated solely to the Puerto Rico trade. Tim Nolan, President of Sea Star Line, stated: "We recognize the void left by the departure of Horizon Lines and it is Sea Star's goal to support the demands of the Puerto Rico market."

Austal Earns SCA Safety Award

Austal USA has been notified by the Shipbuilders Council of America (SCA) that it has earned the 2014 SCA Award for Improvement in Safety. According to the notification signed by Ian Bennett, SCA Manager of Government Affairs, "SCA awards this honor to shipyard members with a 10% or more year-on-year reduction of their total recordable incidents rates (TRIR)." SCA is a national trade association that represents 41 companies that own and operate over 120 shipyards, with facilities on all three U.S. coasts, the Great Lakes, the inland waterways system, Alaska and Hawaii. In 16 of the last 17 years, SCA's average TRIR has been more than 20% below the industry average. The safety data Austal provided to SCA contributed to one of SCA's lowest TRIR averages ever.

Ice Hinders Great Lakes March Ore float

Shipments of iron ore on the Great Lakes totaled an anemic 800,000 tons in March, the lowest level for the


Nolan


Weakley

month since 2010. The March ore float was also nearly 60 percent below the month's 5-year average. Heavy ice and lack of icebreaking resources on both sides of the border were the culprits. "The winter of 2014/2015 was again brutal," said James H.I. Weakley, President of Lake Carriers' Association. "The ice formations were so formidable that a number of LCA's members chose to delay getting underway rather than risk a repeat of last spring when ice caused more than $6 million in damage to the vessels." Weakley added that both U.S. and Canadian icebreakers have experienced a number of serious mechanical issues. He also called on Canada to review its icebreaking resources dedicated to the Lakes. The country used to have seven icebreakers stationed on the Lakes, but now just two are permanently assigned here.

USMRC's LNG Bunkering Course has Key Role in North American LNG

The United States Maritime Resource Center's training partner, Harvey Gulf International Marine, recently launched the PSV Harvey Energy, the first LNG-fueled vessel to enter service in North America. In March, the PSV Harvey Energy began working on charter to Shell in the Gulf of Mexico shortly after the vessel's first successful LNG bunkering operation. Middletown, R.I.-based USMRC developed the LNG bunkering safety training course for Harvey Gulf in 2014 as it prepared to launch its first dual fuel offshore supply vessel. USMRC/MSI is the first organization in the United States to offer a five-day advanced training program for personnel serving on vessels using gas fuels that have direct responsibility for the care and use of LNG fuel and the gas fuel systems.

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SeaHow's New Generation Skimmer System

New SeaHow skimmer systems can be implemented to almost any work boat over 6m in length. Skimmers are designed to collect both light and heavy oils efficiently. These features provide totally new operational efficiencies especially for near shore and coastal oil spill response. The system fosters efficient utilization of existing work boats and vessels in oil spill response.

www.seahow.net

ELASTEC Introduces 1.5 Meter BoomVane

ELASTEC'S 1.5 meter ELASTEC BoomVane is designed to quickly deploy heavier oil booms in coastal and open waters in advancing sweeping and skimming applications – with only one towing vessel. No longer limited by the length of a sweep arm, wider boom swaths can be configured with the unharnessed power of the BoomVane to tow the boom into position. BoomVane also solidly holds the swath configuration in place, maneuvered by the boat's captain.

www.elastec.com

Cleaner Eliminates Need for Multiple Solutions

The eco-friendly Oil Eater Original cleaner/degreaser is ideal for marine maintenance while eliminating the need for multiple solutions. The cleaner quickly disperses grease, oil and grime from bilges, engines and decks. Proprietary anti-corrosion chemistry guards against damaging surfaces. The cleaner is water-based, non-flammable, biodegradable and contains no acids, abrasives or petroleum solvents. It penetrates rapidly, rinses off easily, leaves no residue and will not harm fiberglass.

www.oileater.com

Sludge Management System for MSD's

Scienco/FAST introduces an easy way to deal with sludge. A standard MarineFAST Marine Sanitation Device meeting MEPC.159(55) or providing secondary treatment incorporates about one month of internal sludge storage or 3 months with larger systems. For vessels requiring a longer period, the MarineFAST BMS provides an aerobic sludge digester with long term internal storage to extend the sludge storage.

www.sciencofast.com

Successful Replacement of Lifeboat Systems

Davit manufacturer Xervo recently replaced two lifeboat systems on the Maersk Innovator while the rig was fully operational. Careful planning and innovative solutions kept costs low. Xervo's Boat-In-A-Box is a plug'n'play solution that is extremely simple to mount. The system's four legs are simply welded on the outer side of the rig. After 6 cables are hooked up, the lifeboat system is fully functional.

www.xervo.dk

Hiller Marine Products & Services

Hiller is a full service marine and commercial fire protection distributor and designer and integrator with 10 offices around the U.S. Products include Water Mist (local application and total flooding), Gaseous Agent Fire Suppression, Foam, Fire Detection Systems, Gas Detection and Portable Extinguishers. Services include Inspection, Installation & Commissioning, Recharge & Repairs, Upgrades, Fire Protection Engineering & Hazard Analysis, Hydrostatic testing and SCBA testing & certification.

www.hillercompanies.com

Ocean Safety's Kru Workwear Lifejacket

Ocean Safety's Kru Workwear lifejacket offering provides a wide choice for personnel working in commercial marine. The Kru Workwear range comprises five models, individually designed for each type of user. Each model offers a full range of buoyancies, 150, 190 and 275N, and is available in both manual and automatic inflation choices. The Kru's Riverseal fabric gives 25% more abrasion resistance than traditional lifejacket fabrics.

www.oceansafety.com

Automatic, Cost-Effective Fire Suppression

Automatic pre-engineered marine fire suppression systems from Sea-Fire provide 24/7 ensure that crew, passengers, vessel and cargo are all protected. Sea-Fire systems use 3M Novec 1230 Fire Protection Fluid that won't be impacted by legislation. Environmentally-responsible Novec 1230 won't deplete the ozone. Safe for human exposure, Novec stops the combustion process and removes heat energy until the fire cannot sustain itself.

www.sea-fire.com

Miller Expands Respiratory Protection Lineup

Miller Electric Mfg. Co. has expanded its respiratory protection portfolio with the addition of two new products. The N95 disposable respirator and expanded LPR-100 half mask respirator options join the already strong line of Powered Air Purifying Respirators (PAPRs) from Miller. The popular LPR-100 half mask respirator is a low profile reusable respirator that fits comfortably underneath a welding helmet. The N95 disposable respirator features a flame-retardant outer layer that provides crucial protection for welding operators.

www.MillerWelds.com

ESAB High Definition Welding Helmet

The ESAB Aristo Tech HD welding helmet is an auto-darkening helmet with the highest optical performance possible according to the rigorous EN 379 Standard. Professional welders will immediately notice greater clarity of the weld and increased definition of the weld pool, which helps them achieve more accurate results while reducing eye strain, especially when welding for long periods.

www.esab.com

Deck Lights for Boats

Aqua Lights are designed and engineered as the brightest and most durable LED deck lights for boats. They are built to perform in extreme environments. The LED deck floodlights from the brand aqua signal feature compact design, low profile and a weight of about 130 g. The low profile design enables a surface mount solution eliminating the need to cut a recess into a hard top.

www.glamox.com

Marine Keyboard for Demanding Jobs

NSI's 103 key backlit keyboard with integrated ergonomical trackball and scroll wheel promotes easy typing, scrolling and rolling throughout all applications, even in the harshest of marine environments. This keyboard is available with or without IEC 60945 marine certification fourth edition as required for use with ECDIS & Radar systems. This keyboard is highly suited for marine environments thanks to its robustness and ease of maintenance.

www.nsi-be.com

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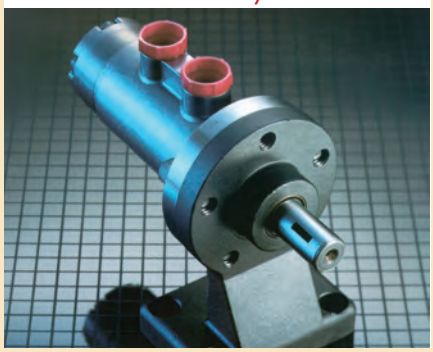
Hydraulic Motors for Undersea Tool Manipulators

Hydraulic Motors from Dayton Lamina generate 4-times more torque without gear reducers, with few moving parts, lasting longer with very little maintenance. Ideal for use in undersea tool manipulators and other workboat applications, these proven models are ideal for a wide range of applications including, conveyor drives, hose reel extraction, fan drives, pipe valve openers, and more.

www.DaytonLamina.com



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www.klubersolutions.com

Cable Tray Helix Fitting Eases Transitions

The T&B Cable Tray Helix Fittings from Thomas & Betts ease transitions between horizontal and vertical cable tray runs, especially in confined areas and near walls. It is available in left or right configurations in aluminum, pre-galvanized steel and stainless steel in 12-inch and 24-inch widths, with 6-inch side rails. They can be ordered and shipped pre-assembled and ready to install, saving substantial time by not having to configure fittings on site.

www.tnb.com

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www.dr-shrink.com

Torqeedo's Commercial-Grade Cruise Motor

Torqeedo has updated light, powerful and efficient electric outboards with a new design to meet the rugged demands of commercial users. Available in 5 hp and 8 hp equivalents, it is a reliable electric solution for workboats on lakes that limit the use of combustion motors. The engines boast a solid aluminum lower housing which protects against damage and provides increased support for the shaft.

www.torqeedo.com

Powerful Electric Pipe Bender for U.S. Ship Builder

Unison has commissioned the largest all-electric tube bending machine ever produced, at Newport News Shipbuilding. The machine is capable of generating over 265,000 lb-ft (360,000 Nm) of torque and can bend piping up to 8 inches NPS - with an outside diameter of 8.625 inches or 219.1 mm - with Schedule 80 wall thicknesses of 0.5 inch (12.7 mm).

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- **Troubleshoot and test new and existing systems, controls, circuits, and equipment.**
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- **Read and maintain electrical maintenance repair manuals and instructions.**
- **Interpret circuit diagrams for internal and external connections of electrical equipment such as controllers, circuit breakers, transformers and alarms on multiphase circuitsFollow ship board safety requirements and electrical lock out tag out procedures.**
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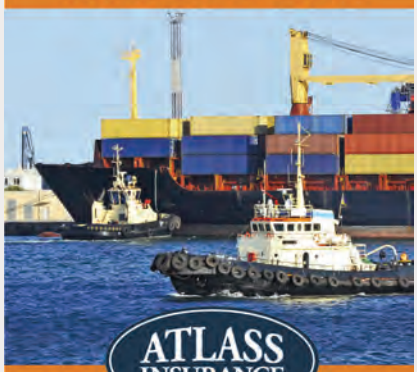

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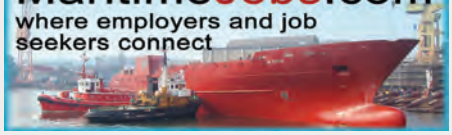

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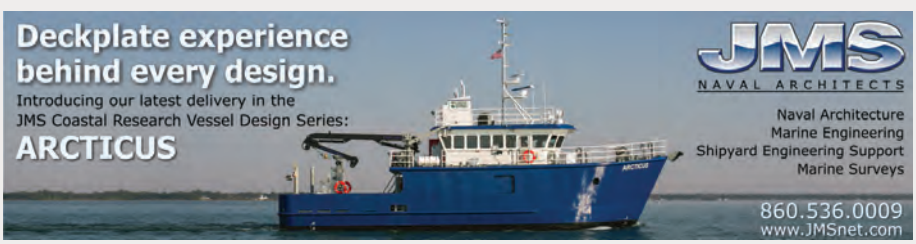

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