

ISSUE 2 MARCH 2018



Small Angles

In this issue:

**IN MEMORY OF ALLAN
BRUNTON-REED**

**KASI MALAYSIA AND
SEAWAYS ANNOUNCE
PARTNERSHIP**

WOMEN IN TOWAGE

**UNDERSTANDING HSEQ
AND COMPLIANCE IN THE
TOWAGE INDUSTRY**

INDUSTRY NEWS

SeaWays Global magazine for Tugmasters



The 25th International **Tug, Salvage & OSV Convention and Exhibition**

“...the world’s largest gathering of
tug, towage, salvage and OSV experts”

**Parc Chanot Convention Centre,
Marseille, France
25-29 June 2018**

Visit www.tugandosv.com
if you are interested in attending the event
as a delegate or taking space in the exhibition

ITS 2018 Secretariat, The ABR Company Limited
ABR House, Prospect Place, Trowbridge, BA14 8QA, UK
Tel: +44 (0)1225 868821 Fax: +44 (0)1225 868831
Email: info@tugandosv.com
Website: www.tugandosv.com



MARSEILLE

SMALL ANGLES

TABLE OF CONTENTS

- 04** EDITOR'S NOTE
- 05** IN MEMORY OF ALLAN BRUNTON-REED
- 07** KASI MALAYSIA SDN BHD AND SEAWAYS ANNOUNCE PARTNERSHIP
- 10** UNDERSTANDING HSEQ AND COMPLIANCE IN TOWAGE INDUSTRY
- 12** INDUSTRY SURVEY
- 15** WOMEN IN TOWAGE
- 20** INDUSTRY NEWS

Small Angles Magazine
Published by SeaWays Global
For more information:
marketing@seawaysglobal.com

SeaWays Global is a world-class tug master and pilot training provider focused on delivering bespoke and comprehensive training solutions for our customers.

Our clients are offered a full range of services which cover everything from simulation-based and live on-board trainings to eLearning modules and additional services.





Editor's Note

Welcome to the second edition of the Small Angles Magazine!

Tug master training is evolving. We're seeing more tug masters in the simulator which is a recognition of the value the training can deliver to a business. We believe training matters. In this issue we will discuss tools needed to excel in our profession.

This collection of articles will share some insights on the industry, best practices to perform at your best, provide guidance on what to look for in a training and how to ensure that training delivers the performance improvements that it should. We would love to hear your thoughts about the points of views shared in the magazine.

Hope you enjoy the magazine.

Steve & Neil



**THE HONOURABLE COMPANY
OF MASTER MARINERS**

The Honourable Company of Master Mariners

Formed in 1926, we are a City of London Livery Company with membership open to British and Commonwealth Master Mariners, from both the Merchant and Royal Navies, and to others with a strong association with the maritime industry in general.

For further information, please contact The Clerk:
HQS Wellington, Temple Stairs, Victoria
Embankment

London WC2R 2PN

www.hcmm.org.uk Tel: 020 7836 8179

Email: info@hcmm.org.uk



IN MEMORY OF ALLAN BRUNTON- REED 1946 - 2017

It is not often when someone's star sets and the last flash of life extinguishes that it can be said their light when bright lit the world around them.

Allan achieved what most hope for but few achieve.....to leave a meaningful legacy.

Indeed over some 50 years through his magazines, of late the Tug & OSV, and industry leading conferences; Tug, Salvage & OSV and the biannual Tugology, Allan achieved significant influence on the professional development of the towage industry.

Allan's ability to make everyone welcome and special was testament to him being the epitome of the English gentlemen, enhanced with an extraordinary memory for people's names and personal details. His genuine warmth and caring was tangible.

An insight to Allan's commitment to the towage industry was when in 2009 Steve Sandy and I conceptualised the formation of the International Tugmaster's Association (ITS). To gain acceptance, buy-in and to fast-track its development I organised a meeting at Allan's office at Ford Farm to request assistance in establishing and promoting the ITS.

In hand a wish list of 9 items I arrived for the meeting after a 5 hour cross country drive with my family in the worst snow conditions in 35 years. In truth optimistically I was hoping to come away with a commitment from Allan to assist with 2 or maybe 3 items from the list.

We left after being made most welcomed, including a scrumptious lunch with all the ITS team at the local pub, with not only all 9 items agreed but with Allan having added 2 more key elements I hadn't thought of.

Again, testament to the quality of the man and his genuine commitment to our industry.

When I suggested to Capt Henk Hensen there was an important need in the towage industry for a book focused on Tug Stability for Tugmasters it was Allan through his publishing company ABR who supported this limited publication run so that tugmasters could benefit and be safe by understanding the uniqueness of tug stability written in a manner that made it easy to understand and action.

To me this demonstrated he wasn't motivated by the mighty dollar, rather more lofty motivation. Of course these remarkable traits is exactly what make the man a legend and one of the few to achieve leaving a legacy when one's star has set.

Sincere condolences to Liz, Sally, Nicky, Garth and all the ITS Team from all of us at SeaWays; Susie, Steve, Neil and of course myself.....Arie.





From left to right: Arie Nygh, SeaWays Consultants, Steve Sandy, SeaWays Global, Datuk Captain Walter J. Nair, Managing Director of KASI Group, Bo Caspersen, KASI Malaysia Sdn Bhd, Neil Sadler, SeaWays Global, Ben Nair, Executive Director of KASI Group

KASI Malaysia Sdn Bhd and SeaWays Global announce partnership



KASI Malaysia Sdn Bhd, a leading provider of integrated marine solutions, and SeaWays Global, a global leader in tugmaster and pilot training, have announced a strategic partnering agreement. With this new partnership, KASI Malaysia Sdn Bhd customers will gain access to the only tug master training program accredited by the ClassNK Classification Society.

The companies identified an opportunity to bring their complementary expertise and technologies together. Under the terms of the agreement, SeaWays Global will train tug masters and pilots through their module based training programmes.

SeaWays Global will bring their expanding library of over 40 eLearning lessons to all trainees that enrol on our courses. “We are very excited about this partnership with KASI Malaysia Sdn Bhd as we continue to help towage companies maximize the value of the tugs through competency based ClassNK accredited training. Our expansion to the Asian market is something we have been working towards for a while and we feel we have found our ideal partner with KASI Malaysia Sdn Bhd” said Steve Sandy, Managing Director, Asia, Africa and Europe.



INTERVIEW WITH CAPT. BO CASPERSEN, GENERAL MANAGER OF KASI MALAYSIA Sdn Bhd

Capt. Bo Caspersen, General Manager, KASI Malaysia Sdn Bhd Center for Maritime Simulation, kindly shared his views and perspective on the KASI Malaysia Sdn Bhd and SeaWays Global partnership and simulation-based training.

• **KASI Malaysia Sdn Bhd and SeaWays Global have announced a strategic cooperation agreement. What does this mean for your business and your clients?**

We see a need for proper tug master training in our region. Despite the huge amount of training centers in APAC, the majority have STCW training as their core business and do not offer high end training. There is only a handful that have decent tug simulators and even fewer that offer proper accredited training.



• **What to expect from this partnership?**

We expect quite a lot; next month we are signing a training deal for one of the biggest ports here for the training of all their tug masters and we will market this aggressively in the months to come. KASI Malaysia Sdn Bhd opens a new big training centre in Pacific City, Kota Kinabalu in 12 months and we already have one more full mission tug simulator planned

We understand that it takes an effort to get port operators and tug companies to appreciate and see this as an investment not just a cost. Fewer incidents, increased safety, possibility of lowering insurance premiums combined with lower fuel consumption as a result of better “driving skills” makes this a no brainer really.





• Why did you choose SeaWays Global as a partner? What was the most important for you when choosing a training provider?

I have known about SeaWays training since they started. The package they offer is the only Class accredited tug master training available. From my previous work with Transas and ClassNK I am well aware of the amount of work that has gone into refining, not only the training syllabus, but also the simulation software. The fact that the training is designed to be audited makes it attractive to local maritime authorities as well. The level of expertise and experience of all their Trainers are second to none. Without realistic ship/tug interaction, propeller wash effects, hull, skeg and nozzle influence on tug behavior etc. there would be no point in using a simulator. Plenty of players in the industry claim they have this but only Transas has taken it to the level we need. What SeaWays Global offer goes very much hand in hand with the other services KASI provides. Our core simulation business is port feasibility studies, marine traffic risk assessment and specialized training. SeaWays Global is the first of several strategic partnerships we will make to be able to offer high level products in the region.

• Why do you think the simulation-based training is important? What are the main benefits of such training for your clients and industry itself?

The use of simulators is important for several reasons: It is cheaper than training on a real tug, no fuel costs. It is “cleaner” since you don’t spend weeks burning fuel just to train basic skills and It is a lot more efficient and less time consuming than on-board training. Last but not least, It is a safe environment where you can “push” trainees at a faster rate.

In the real world, you have to deal with whatever weather or job at hand on any given day. In the simulator, everything is controlled and the training is structured specifically to uncover whether a trainee has the necessary abilities to acquire the skill set required to drive a complicated machine like e.g. an ASD tug.

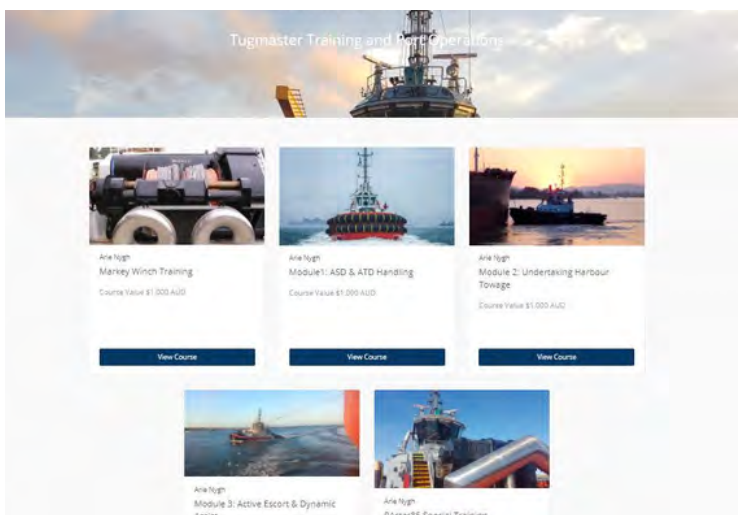
The industry have failed to invest in training, the evolution of tugs over the last 20 years has been really fast. Most National Maritime Authorities still look at tugs as just “small boats” and fail to implement mandatory training and certification. A form of ‘type rating’ should be implemented, unfortunately we still see plenty of incidents and loss of life involving tugs.

The benefits for our clients are obvious but in the maritime industry it is always hard to sell non-mandatory training. Mariners need so many certificates that the non-mandatory ones are always at the bottom of the pile on any Superintendent’s desk.



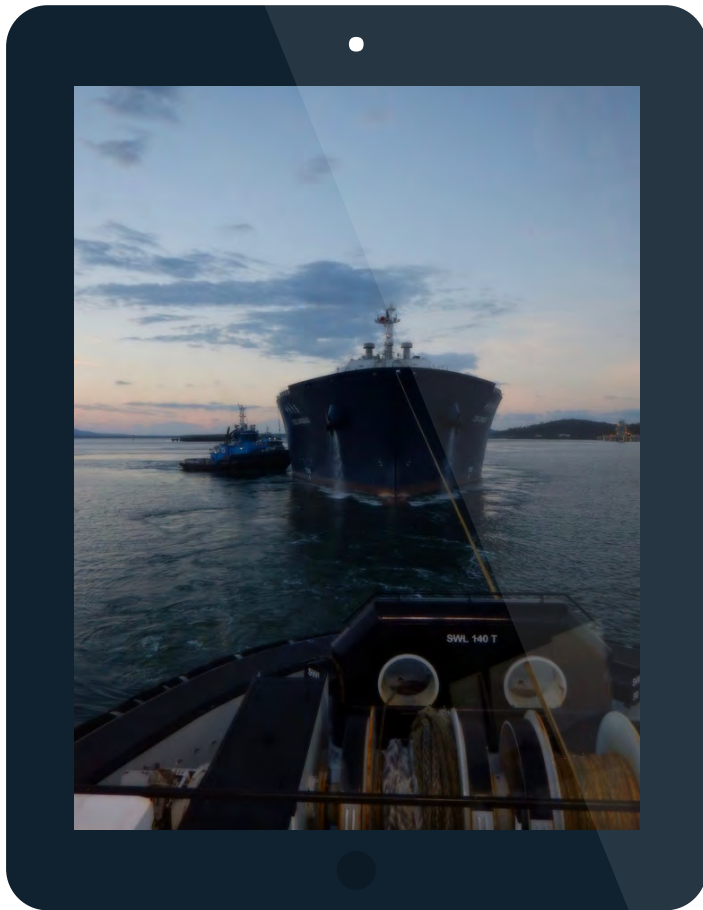
Understanding HSEQ and Compliance in the Towage Industry

Article by Arie Nygh,
SeaWays Consultants



For quite some time I have been concerned about the lack of knowledge regarding occupational Health, Safety, Environment & Quality Assurance (HSEQ) in the towage sector by masters, superintendents and operational managers. Traditionally many of our personnel are recruited from the fishing industry, white-boat industry or off the deck. Hence their formal training and subsequent understanding of the laws, regulations and rules pertaining to HSEQ and the need for not only compliance but as importantly proof of compliance in a lot of cases is not what it needs to be.

Furthermore, not everyone has a clear understanding of what the IMO, Classification Society and Flag State roles are and how they interface along with the myriad of various Acts (Marine Act, OH&S Act, Ports & Harbours Act etc.), conventions (SOLAS, MARPOL, STCW, ISPS, MLC etc.) and industry governing organisations (ISO, BIMCO, OCIMF etc.). The operation of tugs within a port and sometimes mine site environment means that the risks, including compliance risk, associated are beyond the knowledge-base of most masters, chiefs, or managers in the towage sector.



In an effort to address this issue SeaWays has teamed up with Marine Certification Solutions (Capt. Jeff Hinnrichsen - who is the most knowledgeable person I know on this topic) to develop a series of eLearning lessons covering all aspects of what a master, superintendent and marine manager should know to be compliant and to manage their risks within the towage industry.

I initiated the development of these lessons, as I believe the knowledge-base and understanding of personnel in the towage sector of marine industry, particularly those who have not gone through a “Blue Water” type academic training/qualification program, is lacking. Consequently individuals and indeed companies are potentially left confused, ignorant and indeed legally exposed in a world that is more and more being driven by regulation, legislation and litigation.

Jeff and I have been working on this project for near a year now to tailor the training to the needs of the sector. With regards to the course cost, we have endeavoured to find a balance between value for money for the client and fair reward for the considerable work and expertise in developing these eLearning lessons.

We have structured the lessons to offer best value to my clients; the lessons are undertaken online via a series of learning modules in the employee’s own time. There is a multi-choice assessment process that ensures the lessons are actually undertaken and the knowledge has been gained. On completion of the assessment a Certificate of Achievement for the individual is produced so that there is proof of learning for them and their company.

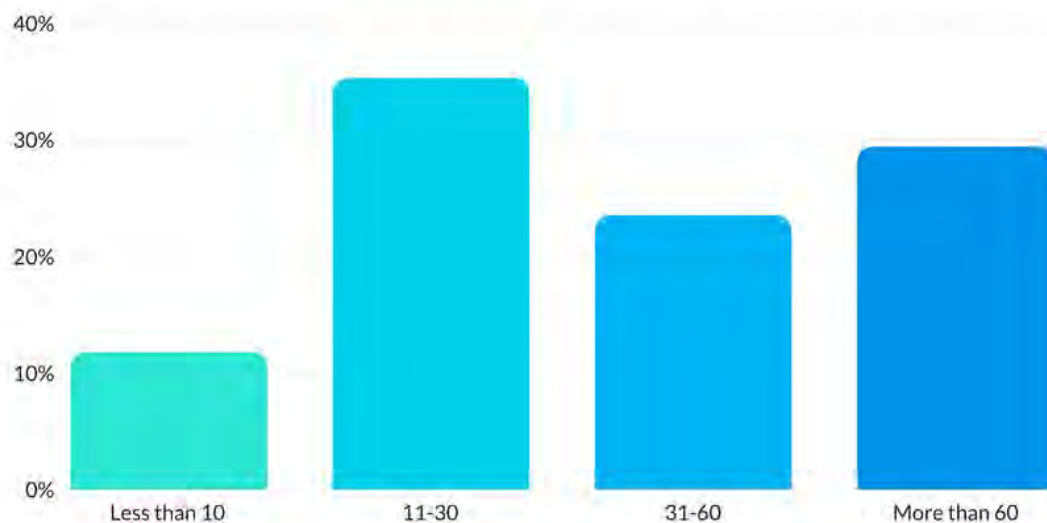
Initially the eLearning is pertinent to the Australian towage sector requirements and we will progressively develop the courses specific to other major regions such as NZ, USA, UK, Europe, Asia, Canada and Middle East etc. This said 95% of the content covers all regions. If a company requires us to, we can also further develop the lesson modules to have company specific elements added; for example, understanding Singapore Flag requirements for tugs on the Australian coast.

The bottom line; in a worst case scenario a master or manager can find themselves in court defending charges, separate to those leveled at their employer, that have significant penalties, including fines in the hundreds of thousands of dollars and or imprisonment. I ask you, "how can you ensure compliance if you do not know what you have to be compliant to"?

For more information visit our eLearning website at www.schoolways.thinkific.com

SeaWays Global Survey Results

Please estimate the number of towage/pilotage operations you undertake per month.



Major challenges for tugmasters/pilots in day-to-day work:

Severe weather conditions and narrow space to operate

Ships with a big bow flare, and uncooperative ship crew when it comes to pulling the tug line

Fatigue

Providing the necessary training for the constant evolvement of our job

Operational pressure to complete maintenance while time on the water has been increased due to a reduction in tug crews by port operator

Vessel traffic

Communications, weather and ageing tonnage

Understanding the calls given by the pilot and giving him the response and action that he requires. Working with foreign crews also creates it's challenges.

SeaWays Global Survey Results

What do you think about the autonomous unmanned tugboats. Does it have a possible future?

I think the job is too complicated to be carried out by an autonomous unmanned tug , too many variables eg wind ,tide other vessels lines getting jammed , buried

It has no future as,tug is operated physically

Let's hope not

NO

I can't see how this could work

Autonomous tugs won't pay the mortgage

Maybe? If technology is that good could the simulators we train on be linked to a real tug? It would be a safe option as no human would be onboard the tug. However no level of automation will prevent mechanical breakdown or the quick response a human can give to fix the problem.

It has a possible future, combined with manned tugs

Sounds like a disaster waiting to happen.

YES

Probably in some ports

Possibly in some operations

I think this is madness. A pilot needs action at a split second. Port Emergencies are critical for operators to act as a split second and make the call to what is required... No future here in Port Hedland anyway

How can safety be improved during day-to-day operations?

Good communication, feedback and training

Constant human assessment and learning.
Adhering to best practice.

Modern tonnage.

Enough rest and awareness of fatigue

Continuous Training Competency
Checks to ensure that Masters and Crew are running to the best of their capability and are all operating to a set standard

Knowledge Training

Calm the weather down ..

Remove smart phones from the bridge

Secure lines of communication apart from VHF channels

More industry generally sharing reports on incidents, near misses, concerns, learnings etc etc.

If we keep on remembering safety first in every thing we do

Experienced tug crews onboard at all times.

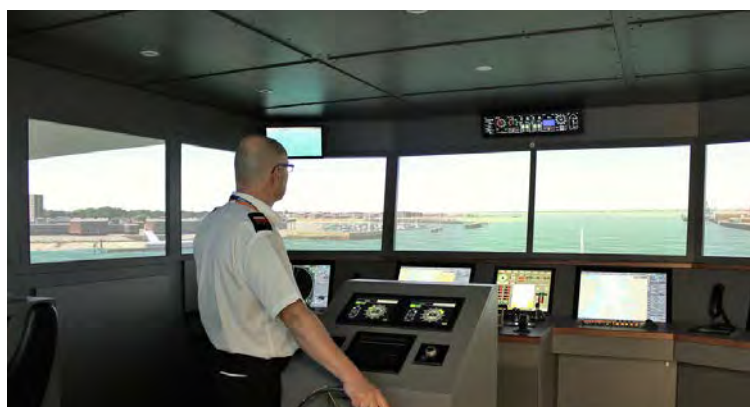
New!

We're happy to announce launch of the new courses for maritime pilots. For more information, please check our website: www.seawaysglobal.com



Maritime Pilot Azimuth Propulsion

This course provides trainees with a better understanding of azimuth systems and teaches them to drive the tug in cruise and port manoeuvring modes more effectively.



Effective Use of Tugs for Pilots

The SeaWays Global workshop for pilots is designed to gather pilots from around the world to discuss the current utilisation of tugs within various ports and develop alternative solutions to enable a safer and more cost effective towage operations.

All Courses:



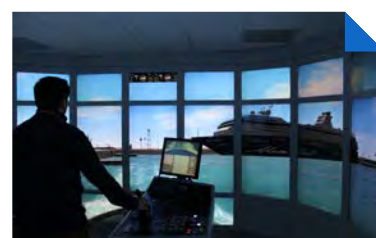
Module 1 ASD-ATD Tug Handling



Module 2 ASD-ATD Harbour Towage



Module 1 & 2 ASD-ATD Tug Handling and Harbour Towage



Module 3 Active Escort and Ship Assist



Live onboard and bespoke training on request



WOMEN IN TOWAGE

In this interview Amber Thomson, Mate/Trainee tug master of Port Hedland WA shares her experience in the towage industry with us.

Could you please introduce yourself and comment a bit more about your maritime background?

Hi, my name is Amber Thomson, I am 34 and have been in the marine industry for 12 years. I started my maritime career with work experience on my old man's Tuna boat long lining out of Geraldton where I also continued to complete my trade/apprenticeship I then left Geraldton to travel overseas where I travelled all over for a few years. On my return to Australia I returned to the maritime industry and started working in the remote Kimberly region of Western Australia (W.A.) where I spent 5 years learning the remote tidal region and loving absolutely every bit of it.

My time working in the Kimberly saw me progress from coxswain's level to Master <24. I then decided to move my maritime career towards the offshore/Inshore industry and this is where I spend the next 4.5 years. I have enjoyed working inshore and offshore and I have worked on a variety of vessels from multicats, crew transfers, DP vessels and tugs continually learning new skills from different mentors throughout the years.

Today, I reside and work in Port Hedland WA . Where I am now a partner with 360 towage and salvage that sub contracts to Rivtow Marine. We currently manage two of BHP's New built RAStar85 tugs conducting harbour towage in the port of Port Hedland. My position is a Mate/Trainee tug master which I have been for the past 24 months.



How long have you been involved in the towage industry?

I have been involved full time in the harbour towage industry for the last two years here in Port Hedland. Prior to Port Hedland I worked in and around Dampier Port, Exmouth, Scott reef and Barrow Island on Crew transfers, multicat's, DP vessel, tug and barge configurations, seismic survey works and cargo ops to ships.

What were your impressions when you took the helm for the first time?

The first time I took the helm on a vessel I knew right then it was the new career path I wanted to pursue. I'm a person who thrives on challenge and I knew straight away this industry would provide a life time full of challenge and growth for me.

Why did you choose seaways as a training provider?

I chose SeaWays because the current masters and mentors within our partnership had previously completed the training program and it had come highly recommended by many masters who had completed all 3 modules. During my career I had heard that it was one of the best training providers for ASD tug handling and towage operations. So, I booked in and completed the training program for my own personal growth and skill set to help me in my progression and to give me a good understanding not only of the tugs capability's during advanced towage operations but to understand the theory behind how and why the tug reacts under my control.



What was the most important for you when choosing the training provider?

It is an accepted training provider for our client and the structured training required.

What is your daily routine?

My daily routine has me starting work on the Crew Transfer Vessel at 0540 to transfer to the tug after which we conduct a crew change/handover with our 12 hr opposite shift personnel. We then commence our day with a prestart and toolbox meeting.

We can do anywhere between 1-5 ship movements in a day usually around 3 but pending the positions allocated and the tides. In between towage we conduct regular maintenance on the tug and complete emergency drills when required. I work a 4 week on 4 week off roster, working day shift from 0600-1800<tel:0600-1800> for 2 weeks and then night shift 1800-0600<tel:1800-0600> for two weeks.

Tell us about your most memorable stories from your experience as a mariner?

Gee there are so many amazing memories I couldn't narrow it down to a few.

Probably my first cyclone as a crew member relocating down the coast of WA and having to anchor up in the Monty bello's and hide out sitting through the weather from a cyclone near by we had to hang off the pick waiting for it to pass, constantly taking watches it was so windy and we were swinging around we had lightening hit the vessel which caused all radio communication to fail so couldn't get weather updates that was a pretty intense long three days.

I have seen some pretty amazing things and shared some great sunsets, fishing and adventures through the Kimberly and diving the rowley shoals.

So many memories have been made for me on the water and some of the best and strongest friendships I have ever made have been made living with crew for long stints on swing away at work.

The first time I took the helm on a vessel I knew right then it was the new career path I wanted to pursue.



What is the best thing about working in the towage sector?

I really enjoy the variety, every day you work with different pilots, different ships and in various positions pending allocation from the pilot and schedulers. Not one job is ever the same they are always different in some way or another which keeps it interesting. In general what more could you ask for working on the water daily and on such amazing state of the art tugs.

Do you think men and women in the towage industry are treated equally?

Yes, I believe we are all treated equally, however the numbers are very low in the female department.

What are the main challenges you as a female mate/trainee tug master face in your job?

I have found throughout my career in the marine industry that women tend to put more added pressure on themselves because from my experience most women feel they need to prove themselves in a male dominated industry. I have worked in a male dominated industry my whole life and the biggest challenge I had in the beginning was realising I didn't have to prove myself and try twice as hard.

Also children I guess if you want or have a young family it could/would be hard to juggle work and family, however I have heard and seen this successfully done with another female tug master in the industry.

Are there any stereotypes that negatively affect women in the maritime/towage industry?

Nothing that has negatively affected me personally, everyone has completed the same studies and training so effectively we are all equal. I guess years ago females were considered not good or fit to work at sea, however times have changed now and women are encouraged to join the maritime industry.

How can we encourage female participation in the maritime industry?

I think all the women currently in the industry can be seen as role models/mentors and great examples showing that not only can women work in this industry, they can also be very successful just as equally successful as any male.

What is the best piece of advice you can offer to a young woman who is considering entering the maritime industry?

My advice would be if you are one of the few females that has the want, drive and passion to start in the maritime industry and knows instantly it's what you want to do then pursue it! I can guarantee you'll enjoy every bit. It's like anything your working hard at, you will have your good and bad days but keep working towards your goals. Listen, learn and take notes for all your colleagues willing to share experiences and knowledge. Although this is still a highly male dominated industry I can honestly say all the men and women I work with are great and very supportive it's a changing industry. Go for it!

TRAINING AVAILABLE AT



More information
on the Americas
to follow...

Transas
Academy, UK
Tug Handling &
Harbour Towing

Hudson Trident,
Nigeria
Tug Handling &
Harbour Towing

KASI, Malaysia
Tug Handling &
Harbour Towing

Broome Maritime
Simulation Centre
ASD & RotorTug
Handling

NZ MS Auckland
Tug Handling &
Harbour Towing

INDUSTRY NEWS

2018: A year of tug advancements

Article by Tug, Technology and Business

This year we will see the fruition of the innovations in tug technology and operations developed in 2017. There should also be innovations in power and performance to look forward to.

Innovative designs trump conventional tugboats

A prime example of innovative design is the first commercial Carrousel Rave tug.

Multraship Towage and Salvage's Multratug 32 harbour tug is set to commence commercial operations in the Benelux area. It combines Voith propulsion in an inline configuration with a Robert Allan-designed low-drag hull and a carrousel towing system developed by Novatug.



If Multratug 32 and its sister tug Multratug 33 successfully demonstrate their operational benefits, there could be a clamour from other tug operators to order similarly designed tugboats.

There are other tug design innovations that could also gain success, but most of these are variants of existing designs, except perhaps the powerhouse tug concept.

We highlighted this design from an independent Asian naval architect in the fourth quarter 2017 issue of Tug Technology & Business. There are applications where having a powerhouse tug and barge unit would make sense, because of the low initial capital expenditure required.

Higher power speculative newbuilding

In 2018, we will see shipyards building more speculative newbuildings with bollard pulls of more than 80 tonnes, and perhaps up to 90 tonnes as they recognise that owners need more powerful tugs. There are commercial opportunities for shipyards and owners in this growing trend.

Tugs of up to 90 tonnes bollard pull will be needed to handle the largest container ships, which have reached capacities of 22,000 TEU, and the growing number of liquefied natural gas (LNG) import and export terminals. LNG carriers cannot wait on weather and nor can tankers, thus there will be pressure on tugs to operate around the clock in some of the toughest weather and sea conditions to provide escort and ship handling services. All this leads to design innovation.

INDUSTRY NEWS

LNG versus hybrid

Other innovations around tugboat design and construction will come from owners turning to alternative fuels and energy storage devices. I expect the drive for LNG-fuelled tugs will come from those operating in LNG hubs, such as Singapore, where new tugboats are set to be introduced in 2018.



Elsewhere, there will be a drive by owners to introduce hybrid propulsion systems on newbuildings. These incorporate diesel-electric engines and battery packs, which can be combined to provide enough power during towage operations. But, during general harbour operations and idle periods tugs can be powered by batteries alone.

Hybrid propulsion technology can include electric drives, DC hubs and permanent magnet motors to drive highly efficient thrusters.

Salvage advances

With more giant-sized container ships on the world's seas, comes more risk of groundings and maritime accidents. As a few accidents in 2017 showed, a grounded 22,000 TEU container ship holds huge risks to a salvor. There is the risk that even a fleet of tugs will not be able to refloat one of these huge box ships.



We may also see our first maritime accident involving an LNG-fuelled ship, not necessarily an LNG carrier, but one of the growing number of commercial ships running on gas. As we highlighted in 2017, an LNG-fuelled ship would pose considerable risk and challenges to salvors if it crashed.

To counter these risks, salvage companies are likely to generate new advances, order more powerful tugs and deliver for the shipping community. If only this investment was recognised by shipowners and insurers.

A drive on tug safety

A run of accidents involving tugs and pilot boats shows there needs to be improvements in maritime safety, whether this comes from re-education of tugboat crews, changes to towage guidance, or methods of transferring pilots. Changes need to come for the safety of the towage and tugboat industry worldwide.

It is not just a regional problem. There were reports of fatal accidents from around the world in 2017. This must stop in 2018. For the safety of tugboat crews, pilots and other seafarers there needs to be a drive to improve towage and pilot transfer safety in 2018.

INDUSTRY NEWS

Five technologies to change tug operations forever

Article by Tug, Technology and Business

Editor Martyn Wingrove examined the top five emerging technologies that he considers will affect tug construction and operations in the long term.



Technology continues to change the tugboat industry, usually for the better, but up to now it has been on the mechanical side. This is all changing as IT-related technologies are emerging that should have positive impacts on the sector.

Here are the top five emerging technology trends that will have a major influence on the towage industry in the long term. These should generate operational benefits to tug owners, designers and builders in the future.

Drones

Airborne drones could be used in tugboat operations for survey and remote movement of equipment. Tug operator Kotug plans to become the first company to use drone technology to assist in towage operations. It has applied for a patent to use them to assist in ship handling operations and expects this will lead to safer and more efficient working conditions.



Kotug will test remote-controlled flying devices to connect a towline to an assisted vessel. Drones will deliver a messenger line to a predetermined location through the use of object recognition software. The tug's messenger line would then be brought to the assisted ship in a controlled process and the crew on the assisted ship would heave in the mooring line itself. This would enable the tug to sail safely beside the assisted ship instead of having to enter a dangerous zone in front of that vessel. Kotug intends to develop standard operating procedures for using drones and will run a series of tests in 2018.

Drones can also be used in salvage projects as they can be flown over maritime casualties to survey the damage and for identifying and tracking oil spillages and other pollution from maritime accidents.

Sensors can be installed on a drone to record other parameters of a spillage or of a maritime casualty that could be useful for clean-up and salvage operations. For example, these could test for gas emissions or sense a casualty's temperature before salvors move in. Larger drones could be equipped with chemical sprays for dispersing oil spillages.

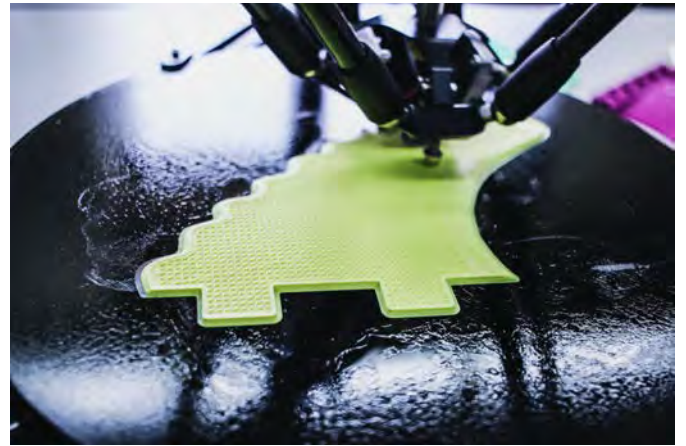
INDUSTRY NEWS

3D printing

Manufacturing companies are developing more advanced 3D printing techniques that will produce propellers and machinery that could be deployed on tugs. A future involving 3D-printed components moved a step closer to reality in Q4 2017 when a prototype propeller was completed by Rotterdam Additive Manufacturing Lab (RAMLAB).

It worked in collaboration with Damen Shipyards Group, Promarin, Autodesk and Bureau Veritas to develop a WAAMPeller, a 1,350 mm diameter propeller. This was fabricated from a nickel aluminium bronze alloy at RAMLAB using the wire arc additive manufacturing (WAAM) method, based on a Valk welding system and Autodesk software. The triple-blade structure used a Promarin design that is fitted to Damen's Stan Tug 1606 design. After its production was completed, it was milled at Autodesk's advanced manufacturing facility in Birmingham, UK, using machines with computer numerical control.

3D-printed items are built up layer by layer, which means almost any object can be produced. But the material will have different physical properties from similar objects manufactured from steel or cast materials, which is why class society Bureau Veritas has tested the properties of printed material to ensure its compliance. This first prototype WAAMPeller will be used for display purposes and planning for a second example is already underway for production this year. It should not be long before a WAAMPeller, or one similar to it, is installed on a tug.



Another Dutch additive manufacturing company, Connecting Engineering and Design (CEAD), is preparing to produce maritime products using a new continuous fibre additive manufacturing (CFAM) machine. This industrial-scale unit will be able to print with engineering plastics and continuous carbon fibre composites to produce objects and equipment for shipbuilding, yachts and workboats.

CEAD expects the first CFAM prototype will be ready by the middle of this year. It will be installed in the offices of Poly Products, which produces composite products for the maritime industry. Poly Products plans to use this printer to fabricate large-scale products and prototypes and then seek customer feedback.

CEAD has also ordered a second CFAM 3D printer to be deployed in 2019 at the premises of marine engineering company Royal Roos. This has been designed for manufacturing marine products from composite materials.

INDUSTRY NEWS



Augmented reality

AR is being developed for maritime applications and has been demonstrated on ship bridges and remote operating centres to deliver different levels of information to end-users. Although tugboat wheelhouses are smaller than commercial shipping, AR could have applications to improve situation awareness for tug masters.

Information can be delivered through projections on bridge windows, perhaps to provide accurate distance to an assisted ship and other hazards. Or this information could be displayed using specially-designed spectacles. Rolls-Royce is using AR technology in its remote operating centre demonstrator in Svitzer's offices in Copenhagen, Denmark. This involves presenting additional information on the route that the tug is heading and about the nearby hazards.

Another application for AR is in training simulators. It can be combined with virtual reality and 3D visual technology to improve the simulation of real-life events. Transas already has 3D visuals in its tug training simulator and Videotel is developing virtual reality for training ship engineers. Offshore Simulator Centre (OSC) has demonstrated how simulation can be enhanced through AR at its facilities in Ålesund, Norway, which Tug Technology & Business visited in November 2017. AR tools can also be used for providing real-time analysis to towage operations and advice to vessel operators.

Smart marine ecosystems

Port operations are becoming more integrated, with tug operations being further interconnected with ship arrivals and departures and quayside activities. In the future this will become more advanced as smart ecosystems are introduced.

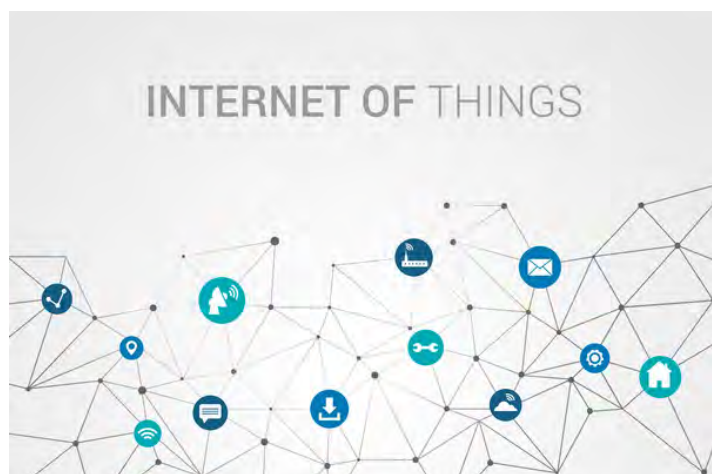
This involves more automatic management of tugs and pilots to become better optimised to the requirements of ship escort and manoeuvring in ports. Tugs will be positioned in advance of ship arrivals, which will be timed for the period when quayside facilities are available. It will mean tugs will be increasingly integrated with terminal and port operations.

Wärtsilä Marine Solutions revealed its own smart marine ecosystem vision in November 2017. It intends to orchestrate developments in e-navigation, ship and port optimisation, industry digitalisation and vessel remote management to bring this vision into reality.

One example of how a smart marine ecosystem could operate, albeit at a lower-level of automatic management, is how Panama Canal Authority is optimising tug operations through a new planning and resource management platform. This was developed by Quintiq and brought online in 2017

Panama Canal Authority uses this to improve the management of its existing tug fleet and scheduling of shipments through the expanded canal. It has seen reductions in ship waiting times, better management of ship transits and of its towage assets, pilots and line handlers.

INDUSTRY NEWS



Industrial IoT

Internet of things (IoT) is making inroads into commercial shipping for predicting failure of machinery and tracking containers. This has the potential to be extended into tugs and towage operations for condition monitoring, machinery tracking and optimised maintenance. There could be more accurate tracking of tugs and barge cargo as part of smart ports in the future.

This is all enabled when sensors and machine-to-machine communications is deployed on tug systems. Various parameters can be measured and data transmitted to a central storage server for analysis. Tug operators can use this data to produce machinery performance and condition information and predict failures.

Caterpillar Marine's asset intelligence branch has developed methods of doing this analysis from its own onboard machinery. Caterpillar asset intelligence business development manager Bert Ritscher expects operators of harbour tugs could save more than US\$230,000 in annual operating expenditure by using this analysis to "prevent equipment failures, reduce fuel costs and optimise maintenance."

He explained at a seminar in Rotterdam in November that analysis of data enables Caterpillar to identify issues, such as fuel leakages or fuel pump problems, and identify the root causes of machinery problems.

"We can avoid catastrophic engine breakdowns and safety issues," he said, adding that "crew need to trust in this data analytics and act on advice" for example to replace pumps before failure.

Continued development of IoT technology using deep learning computers and high-volume data analytics on shore will deliver greater benefits for tug operators in 2018.

There is also potential to improve cargo towage and 'pushing' in coastal and inland waterways through enhanced tracking. Tug operations could be optimised if cargo owners can track their assets, such as containers, through IoT.

Follow us for more
updates!

