

NAVIGATOR

THE

Inspiring professionalism in marine navigators

FREE



Shiphandling

Letting the vessel do the work



A free publication by **The Nautical Institute** in association with the **Royal Institute of Navigation**



Poetry in motion

You may have your certificate of competency, but how confident do you feel to actually handle a ship in confined waters or heavy weather? Could you challenge a Master or Pilot if things didn't look quite right? For many years, members of The Nautical Institute have listed 'improving shiphhandling skills' as a top priority for their professional development. The problem is, it's not that easy to get experience – and experience is the best way to improve.

In this edition of *The Navigator* we explore some basic principles of shiphhandling and how, as an individual, you can gain experience and make the most of any opportunities to learn. The three best ways of learning are: onboard a ship in active service, using a simulator or in a manned model. Of course, learning can also be achieved by reading books, joining discussions, undergoing computer-based training or even by moving ship-shaped wooden blocks around a table top.

Probably the best way to enhance all of these training methods is to reflect upon your experiences with someone with more knowledge than you, to identify what went well and where improvements can be made. To aid this formal practice of reflecting on your experiences handling a ship, The Nautical Institute has produced an individual logbook that you might like to consider using. Recording your experiences on paper will aid your professional development, identify gaps in your knowledge and help justify the need for further mentoring and training.

On page 4 of this issue, Captain Nigel Allen uses his considerable experience as a Master, Pilot and instructor to explore an understanding of 'all the forces' affecting a ship. Question: what turns a ship? The rudder? Answer: No, it's a culmination of all the forces, internal and external around the pivot point, including the wash directed by the rudder.

In the article on page 6, Captain George Sangil explains how he values

shiphhandling skills and encourages individuals to continually develop their abilities. Of all the skills a navigator must have, being able to handle a ship well enough to manage its massive momentum with limited power and to control its movement in crowded waterways with continually changing environmental influences could be the most important.

Few people in the world will have the opportunity to handle a massive object like a ship in such a dynamic environment with such inherent risks. Good shiphhandling is a skill that navigators can be proud to achieve. It should be cherished and continually refined. If you have good shiphhandling skills, please pass these on through mentoring your fellow mariners. Never stop developing your own abilities and reflecting upon your success. After all, good shiphhandling might be the closest we mariners will ever get to achieving poetry in motion.

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202 Lambeth Road, London SE1 7LQ, UK
Tel: +44 (0)20 7928 1351 Fax: +44 (0)20 7401 2817
navigator@nautinst.org www.nautinst.org

With support from: 1 Kensington Gore, London, SW7 2AT, UK
Tel: +44 (0)20 7591 3134 Fax: +44 (0)20 7591 3131
www.rin.org.uk

Editorial committee:

Editor Emma Ward
Design Phil McAllister

For The Nautical Institute
Bridget Hogan, Lucy Budd,
Laura Nicholls, David Patraiko FNI

For the RIN Dr Andy Norris FRIN FNI

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We welcome your news, comments and opinions on the topics covered in *The Navigator*

If you would like to get in touch with us, please contact the editor, Emma Ward at navigator@nautinst.org, or look out for the LinkedIn discussion. We look forward to hearing from you.

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I am a long-term fan of *The Navigator*, since I was a deck cadet. Whenever I receive copies of your magazine, I discuss them with my fellow officers and colleagues onboard.

Your issue about piloting (issue 16) was special because when I talked about it with my deck officers, everybody said that the magazine improved their knowledge and gave them more confidence to perform their tasks during pilotage. We all enjoyed reading about individual personal experiences from Pilots.
Dante Addug, PMMA 2007, Vroon-Fil Ship Management



I would like to congratulate you on this excellent edition of *The Navigator*, especially the article *An Insider's Guide to Piloting* by Ed Verbeek. Nothing could be more useful for ship's Masters and officers than this insight into the way a Pilot thinks. It should be compulsory reading for all navigating officers.

John Simpson, AFNI

I am a 22-year-old deck cadet in my last year of maritime navigation studies at the Lithuanian Maritime Academy. I am writing from Crude Oil *M/T Cape Bellavista*, where I am gaining experience working with officers and collecting sea-going practice

months for my diploma. This is my second contract after practice on a ro-ro vessel in the Black Sea.

I hope to continue in a tanker fleet because an officer's job here is both interesting and challenging. I can't wait to become a third officer and have more responsibilities on my shoulders.

Povilas Lubninas, M/T Cape Bellavista

For beginners like me, *The Navigator* is very helpful to understand more about the maritime world. I believe that work at sea has good prospects. You can meet and work with all kinds of people around the world. Very nice. I am trying to study hard in order to improve my career.

Yayan, Junior Officer, M/T Verity

I am second mate with an ocean-going bulk carrier, and enjoy reading what *The Navigator* publishes to promote knowledge about safety at sea. For some reason, however, I don't always get the paper version and Internet restrictions mean that we cannot reach your website. Please could you send me a digital version of *The Navigator*?

Yin Benkuan, Second Mate

Editor's note: *We would be delighted to send a digital version of The Navigator and are setting up an email distribution list for anyone else unable to access it in any other way. If you would like to be included on this list, please email us your details.*

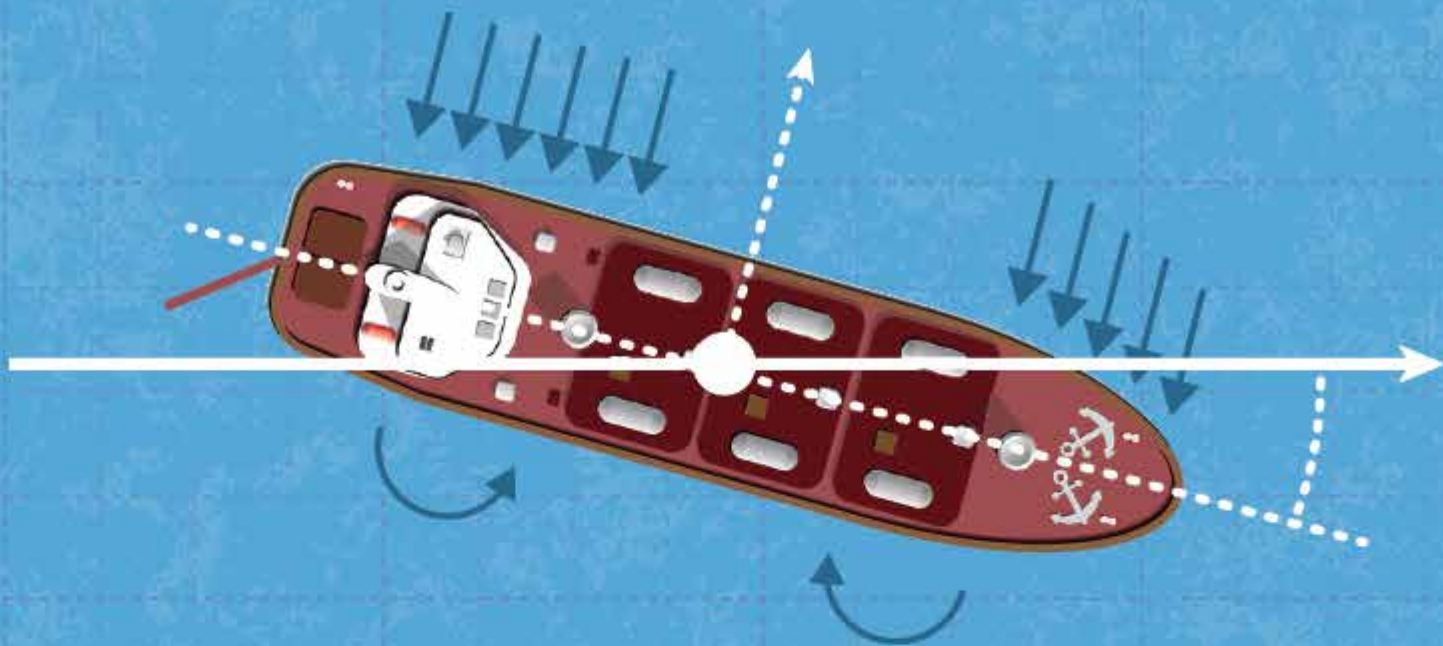


Putting *The Navigator* in the picture

We appreciate all the pictures we receive from readers for our competitions – please keep them coming! – but this one really stood out. Carlos Mauer writes "Starting my LNG contract on the right foot!"

We welcome your news, comments and opinions on the topics covered in *The Navigator*. We reserve the right to edit letters for space reasons if necessary. Views expressed by letter contributors do not necessarily reflect those held by The Nautical Institute

Find us on social media and let us know what you think **#NautInst**



Let the ship do the work

Captain Nigel Allen FNI is a Master, Pilot and instructor with years of shiphandling experience around the world. He shares a few thoughts on the basic principles behind what is a deceptively complex art to master

Some of the best shiphandlers I have seen and worked with are the ones who appear to do the least. They let the ship do the work for them and only intervene when the ship departs from their 'planned track'. In other words, if the ship has some way and you do nothing, it will continue to travel under its own inertia, sometimes quite some distance, before eventually coming to a stop. So, by controlling the speed and having enough inertia the ship can get to the berth without too much interference.

Having a plan is crucial to success. Anticipating how the ship will behave will help you to carry out that plan. It is important to remember that, when berthing a ship, the faster you go, the longer the manoeuvre will take.

When a manoeuvre goes wrong, it is common for shiphandlers to look back

at their last order to figure out the reason for the problem. However, almost always, things had been going wrong for some time beforehand, manifesting itself in the vessel hitting the jetty. Invariably, too much speed or a poor approach will be to blame. Going slowly and methodically tends to ensure better results. A calm, measured approach will instill confidence in the bridge team and get you in the correct position more quickly and with far less drama.

Knowledge is power

STCW makes the presumption that you will learn from others. However, this means that you are limited to the extent of their knowledge. Many shiphandlers who appear to know what they are doing cannot explain the procedure to others often due to their own lack of formal shiphandling training. I have seen many Masters berthing their own

ships and, whilst they got there safely, it was apparent that they didn't fully understand the principles of shiphandling and so were making hard work of it.

Principles of shiphandling

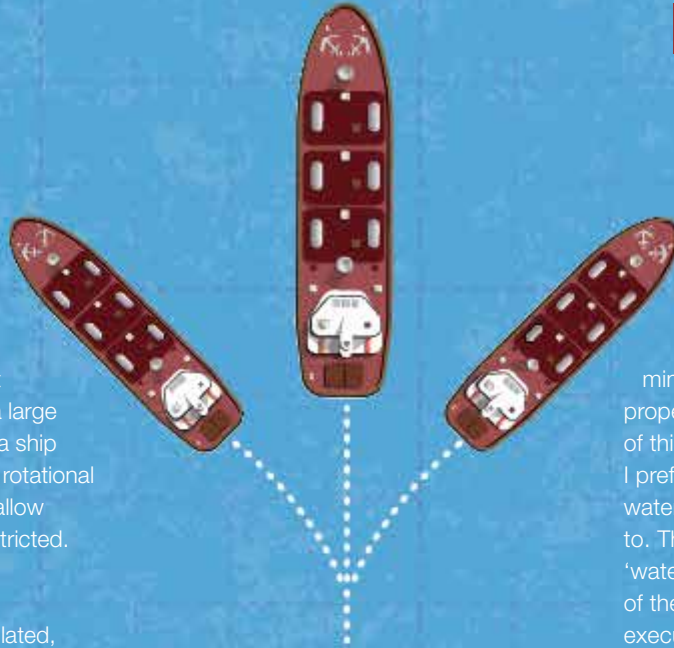
So, what makes a ship turn? Sounds like it should be an easy question: the rudder! However, it is not that simple. What actually causes the hull to turn is the water pressure around the hull and the difference between the pressure to port and starboard. By using the rudder, we can control this pressure differential and steer the ship. We can see that effect in practice by looking at a directionally unstable ship. A ship is considered directionally unstable if, when 20° per minute RoT is achieved with starboard rudder, and the rudder is put amidships, the RoT continues to increase. That's not just the rudder! Something else is going on.

The rudder is a very efficient device that acts like a servo system, controlling a large and heavy ship at relatively slow speeds. We often take the rudder for granted, but it is remarkable that such a small flap can control such a large object at slow speeds. Fortunately, a ship only needs a small force to develop rotational inertia in water. However, in very shallow water this effect can be severely restricted.

Forces management

Some control forces can be manipulated, such as the rudder, engines, thrusters, anchors and tugs, while other control forces and unseen forces, such as wind, current, cannot be controlled. Still others – squat and interaction – can be managed if their effects are properly understood.

The effect of wind on a ship can be calculated if we know the lateral area and check that the control forces we have under our control are adequate for the circumstances. As wind speed doubles, its force quadruples, so a strong gust of wind can easily overwhelm your control forces. Unstable wind conditions associated with low pressure can easily double the geostrophic wind speed. Generally, a maximum practical wind speed for tugs is around 33 knots (17m/s). Beyond this limit it won't take much to lose control of the ship.



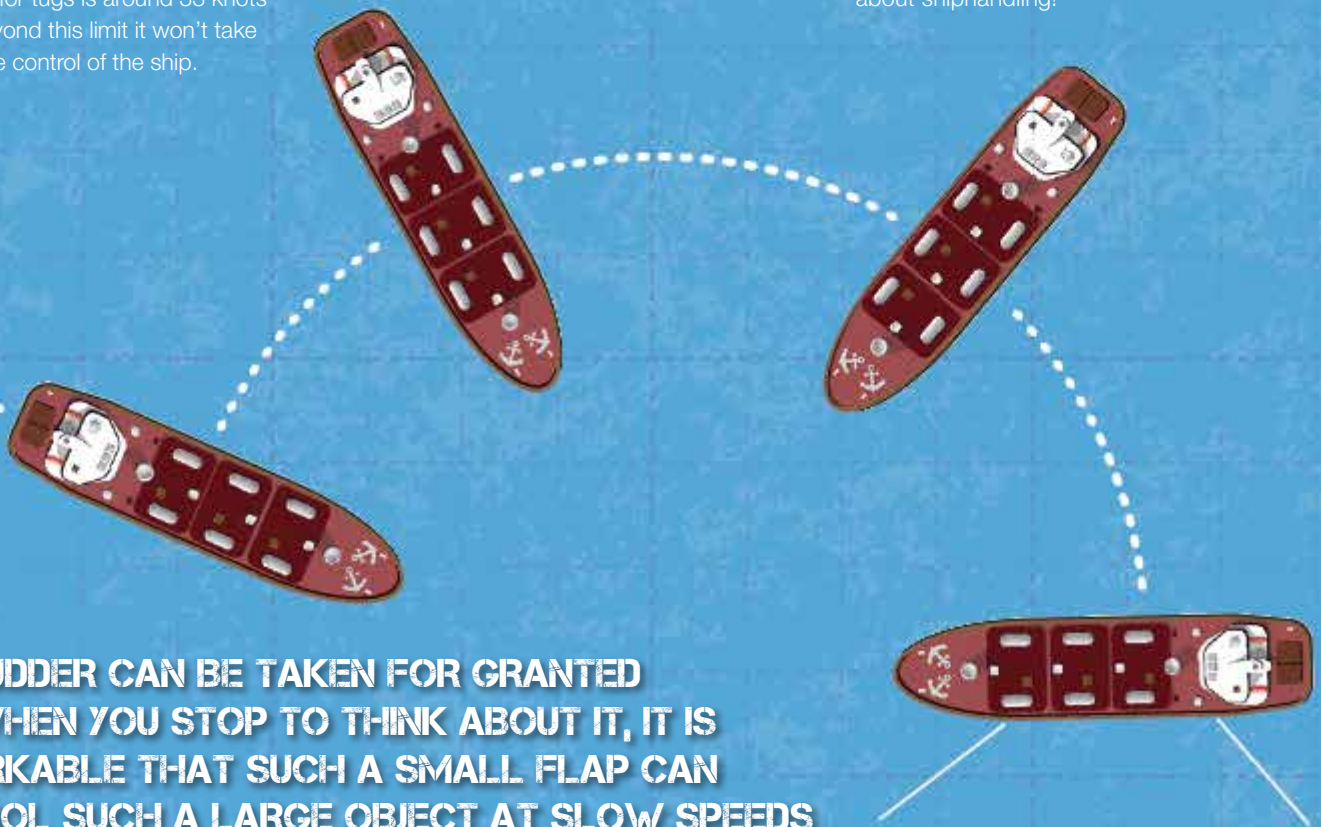
THERE IS ALWAYS SOMETHING NEW TO LEARN ABOUT THE COMPLEX ART OF SHIPHANDLING

Shiphandling or water handling?

As a ship displaces water, which is not compressible, we need to think about how the water will shift as the ship passes through it, bearing in mind that water will be squirted out by the propeller, thrusters and tug wash. Instead of thinking about how I can move the ship, I prefer to think about how I can shift the water to make the ship go where I want it to. This aspect of the task could be called 'waterhandling' and is an important part of the considerations when planning and executing a manoeuvre.

For aspiring junior officers, watching the Pilot is a great first step in gaining confidence in your ability to call the correct orders. Go one step further and in your head pretend that you are issuing the orders and see if what you are thinking reflects what the Pilot is actually doing - I remember doing this and it gave me confidence to follow a career in shiphandling.

From talking to many Pilots and shiphandlers around the world, it generally takes around ten years for them to feel fully confident to travel anywhere in their district with any ship. Even then, it is healthy to have an open mind to learning more. With twenty years experience, I'm still learning about shiphandling!



THE RUDDER CAN BE TAKEN FOR GRANTED BUT, WHEN YOU STOP TO THINK ABOUT IT, IT IS REMARKABLE THAT SUCH A SMALL FLAP CAN CONTROL SUCH A LARGE OBJECT AT SLOW SPEEDS

Learning how to get it right

Captain George Sangil, a Master Mariner from the Philippine Center for Advanced Maritime Simulation And Training, Inc. explains how the right experience, mentoring and training are crucial to success in shiphandling



In seafaring, competency is the foundation of everything we achieve in terms of safety, security and efficient shipping operations. One of the most essential skills for achieving competency as a ship's officer is establishing proficiency in ship manoeuvring and handling. This is a skill seen by many as not only the most important, but also the most difficult to attain.

Exceptional seafarers know that factual knowledge and an understanding of the conceptual requirements of shiphandling is not enough. There is no substitute for experience. Fortunately, the chance to practise shiphandling skills is now more accessible than ever before, thanks to the advent of shipboard-like training environments. A great way to translate factual knowledge into practical applications is to use simulators; even while onboard an actual ship!

Learning by doing is how I train people in shiphandling. Allowing them to mimic the techniques that I have demonstrated, whenever it is safe to do so, is how they get to experience multiple tasks under my responsibility. These can vary from picking up a Pilot and manoeuvring in an anchorage to docking and un-docking and handling the vessel in heavy weather, to name just a few.

If the tasks at hand are not suitable for officers to do on the spot, it is important to take time wherever possible to teach them about the art of shiphandling through mentoring, including the deck cadets.

I believe each and every one of my officers deserves to possess this skill. Also, if I am ever indisposed, I will have the peace of mind of knowing that I have ample numbers of deck officers to back me up. By training and putting my trust in these officers, they can develop the kind of confidence that will take them to the highest levels of their chosen profession.

Whenever a ship's safe navigation is threatened, e.g. when needing to avoid other watercraft, it is important to be resourceful by using all available means at your disposal (such as the ship's whistle, fog horn, helm, Aldis lamp and main engine as necessary). When in doubt, it is never harmful to call a colleague to assist, even if you have been given full autonomy during a watchkeeping shift.

Competence in action

The very first time an officer swings the ship to pick up a Pilot can be one of the most terrifying situations one can encounter.

I see to it that the officer is supervised, either directly or indirectly. One time, I put my Second Mate to the test and had him bring the vessel to the pilot station without me on the bridge. Initially, he called me on the radio to ask for suggestions on what he should do. I told him to use his common sense in dealing with the situation (without him knowing that I was all the time observing how he was handling the vessel

EACH AND EVERY SHIP'S OFFICER DESERVES TO POSSESS THE SKILL OF SHIPHANDLING. IT IS ONE OF THE MOST IMPORTANT SKILLS THERE IS - AND THERE IS NO SUBSTITUTE FOR EXPERIENCE.

from my porthole.) He did pretty well making the right decisions by himself, although if he had taken the wrong actions, I would have taken over. He really felt proud about what he was able to do and appreciative of the confidence that he gained under me.

There was also an instance when I allowed the deck cadet to manoeuvre the vessel (under my supervision) inside the anchorage to drop anchor. He was able to do it safely and in accordance with my expectations.

A critical manoeuvring situation can arise if a ship approaches a dock too quickly. Masters can intervene effectively with the Pilot in this case, using the appropriate skills and maintaining confidence.

Observe the practices used by the different Pilots you have worked with onboard, learn from the techniques they are

employing and absorb the ones you would be comfortable with as a Master. I have always promoted the concept of 'Challenge and Response' during my command and have consistently encouraged the crew to be comfortable in challenging anything unusual or unsafe.

It is crucial to understand that anyone can be challenged, including the Captain and Pilot, both of whom are effectively part of the bridge team. Officers should be trained to voice whatever challenges they may see, never forgetting to be polite, respectful and diplomatic.

When dealing with a difficult situation, good practice is to make a logbook entry and call the Master immediately. If a ship is approaching a dock too quickly, the Master should immediately intervene by verbalising take-over of the conn (for the VDR to capture on record), immediately countermanding the Pilot's order and executing the appropriate engine and helm orders to bring the vessel to a stop.

Masters can only do this with confidence if they have trained for such scenarios via a simulated environment, manned model or in-service training. Only through these type of training exercises can the Master recognise a dangerous manoeuvre from a safe manoeuvre. Otherwise, they might hesitate to intervene until it is too late to reverse an avoidable situation.

Seeking excellence

Most importantly, teachers and students should appreciate that learning is a dialogue. Only through efficient teaching, proper application of skills and sincere mentoring can growth be attained. Admiral Grace Hopper couldn't have been more correct in saying, 'A ship in port is safe, but that's not what ships are built for.' Like the ship, you are built to be more than who you are today.

You should seek consistently for excellence in everything you do and never settle for mediocrity. With this as your mindset, you will have a sense of ownership of the great responsibility that you have to fulfil as global maritime professionals moving the world.

WATCHOUT

In this series, we take a look at maritime accident reports and the lessons that can be learned

Thrown off course by strong winds and poor planning

What happened?

A ro-ro passenger ferry was approaching a busy port in good visibility. A strong north-easterly wind was blowing and there was a southerly flowing tidal stream across the entrance to the port. Despite the Master having the con on the bridge, along with a full team of officers and ratings, the vessel collided with the breakwater at the port entrance, making heavy contact and sustaining significant damage.

The cause of the collision was established to be the result of poor communication and passage planning, as well as the disorientation of the Master, who did not plan the manoeuvre thoroughly, nor brief his team in enough detail. He also failed to allow sufficiently for the effects of the strong wind and tidal stream. As the vessel turned into the port entrance, her stern made contact with the breakwater, causing furniture and fittings to overturn, while some passengers and crew members were thrown to the floor.

Why did it happen?

- > The Master's briefing to his team was inadequate, meaning that he was unable to take full advantage of their support and monitoring of the situation.
- > The passage planning was poor and the Master became disoriented as the vessel entered port.
- > The Master failed to take into account the strong winds and tidal stream when planning his manoeuvre.

What changes have been made?

- > The ferry company has since put actions into place to avoid similar incidents in the future and improve passage planning and communication amongst its bridge officers.
- > Port control procedures and infrastructure have been increased and improved to assist Masters of vessels approaching the port entrance.

THE MASTER FAILED TO TAKE INTO ACCOUNT THE STRONG WINDS AND TIDAL STREAM WHEN PLANNING HIS MANOEUVRE

This is a summary of the main points. Want to know more? You can download the complete report from the UK MAIB at <https://tinyurl.com/navigator17>

If you find our accident reports useful, check out The Nautical Institute's Mariners' Alerting and Reporting Scheme (MARS). A fully searchable database of incident reports and lessons, updated every month. Seen a problem yourself? Email the editor at mars@nautinst.org and help others learn from your experience. All reports are confidential – we will never identify you or your ship.

Shiphandling in action

Chief Officer **Chris Lamperts** describes his career path so far and gives his thoughts on the skills needed for safe and effective shiphandling

What interested you in a career at sea?

Before being accepted into the US Merchant Marine Academy, I had my sights set on an apprenticeship with a local machinist and eventually taking over his shop and clientele. During my first year at the academy, however, my career aspirations shifted from engineering to logistics and intermodal transportation. I was still interested in engineering, but what attracted me to a career in the deck department was the dynamic nature of managing oil tanker and terminal operations. I can't think of any conventional career path that would keep my interest in a similar way.

What career path has led to your current position?

As well as my time as a cadet at the academy, I've served on various vessels with Chevron since 2005. My continuous service has been rewarded with some unique and valuable opportunities, including operational experience on product/chemical tankers and our crude oil lightering trade. I also undertook a shore-based assignment at Chevron's global headquarters, where I helped develop a robust competency assurance and assessment system and training courses that are in use today.

What are the greatest rewards from your life at sea?

The variability of day-to-day life at sea definitely keeps things from getting stagnant. The rigour (and occasional frustration) of having so many different roles and managing such a diverse range of operations, challenges, resources and changing environments has continued to better equip me for each evolution of my career.



Name: Chris Lamperts

Current position: Chief Officer, Chevron

Training: US Merchant Marine Academy

KNOWING HOW YOUR VESSEL TURNS... CAN MEAN THE DIFFERENCE BETWEEN SAVING THE DAY OR HAVING A BAD EXPERIENCE

How did you learn your shiphandling skills?

I've benefitted from multiple methods of learning throughout my time at sea. These include studying industry standard guidance, professional reference publications and independent online resources, as well as using full mission bridge simulation equipment and receiving one-on-one coaching and mentoring from experienced and accomplished shiphandlers. Add to that good old hands-on practice in conning the vessel in open ocean and pilotage waters under the supervision of the ship's Master or licensed Pilots.

What do you think is the most important shiphandling skill to get right?

There are many elements to shiphandling that are high on the list of importance. The one that stands out to me, however, is turning. Knowing how your vessel turns and understanding the hydrodynamic forces that embody WHY your vessel handles the way it does can mean the difference between saving the day or having a bad experience. Knowing your stopping distances also goes hand-in-hand with turning. Together, these skills define how effectively the vessel can be handled during normal, abnormal and emergency circumstances.

What have you found most difficult about it and why?

During my time in the industry, I don't think I've met two professional mariners who share the same philosophy or 'style' of shiphandling. While they may all share the same broad objectives, each individual has a different speciality, subject matter awareness or zeal for one aspect or another of their craft. This is to be expected, but when different facets of each style don't mesh well, or flat out conflict with each other, putting the puzzle together can get very challenging!



WAYPOINT

Dr Andy Norris FRIN FNI

Taking control of the ship

Dr Andy Norris, an active Fellow of The Nautical Institute and the Royal Institute of Navigation, discusses the importance of continual checks and control when handling a ship

Fundamentally, shiphandling is all about making safe and effective navigational decisions. Since a ship's manoeuvres are affected and limited by the vessel's capabilities within the immediate environment (including wind, currents and sea-state), navigational decisions must take into account how the ship will actually handle in the particular circumstances. Making the best navigational decisions requires increasingly expert shiphandling knowledge as the situation intensifies.

Scientists and naval architects fully understand the detailed physics and mathematics needed to work out how a specific vessel would behave in a given set of circumstances. However, it is not practical to try and make accurate calculations of this kind during a real-life shiphandling situation. Therefore, we rely on a well-trained shiphandler to make good judgements about what actions are needed to keep the ship safe.

These decisions must be based on a mixture of experience and the expert use of proven concepts. For example, the concept of the pivot point is very important, and the handler must have a good understanding of this, including its effective position under differing circumstances.

In close situations, primary navigational concerns are the relative position of hazards and the speed and acceleration of your own ship relative to those hazards. Close situations are particularly complex because these relative values can vary significantly along both the length and beam of own vessel. Ships are too large to be considered a 'single point' in such situations – as is true of many hazards at sea. The question, 'What is your location?' is not as easy to answer as simply giving a lat/long coordinate.

Check, check and check again

To ensure your own reaction is as good as it possibly can be, it is vitally important to keep checking the correlation of all the available information. Critical information is received from many sources, including what everyone on the bridge can see, hear and feel in terms of 'body-acceleration'. Of course, onboard electronic sensors are very important, not least those detecting changes in movement, such as rate-of-turn indicators. Information from digital and voice

radio communications is also key, as well as 'stored' digital and paper-based data, such as charted and tidal information.

We have to be cautious about relying on data from any single source. However, if data from multiple sources is well correlated, your perception of the situation is far more likely to reflect reality. This will improve the validity of any manoeuvring decisions and make a successful outcome far more likely, even in the tightest conditions. Our safety at sea is dominated by the immediate position and movement of the vessel we are on, even if the degree of control that we have is limited by external conditions and the vessel's specific design.

Of course, any adjustments made to a ship's controls affecting its speed and detailed rotation must be continuously monitored against the external situation.

This allows you to refine the manoeuvring action, but it also adds to and reinforces your own knowledge as a shiphandler, and will help you when you encounter similar situations in the future.

To err is human ...

Although we have our own expectations about how other vessels involved in a manoeuvre will react, what they will actually do is a major unknown. It is not that the other vessels are being navigated badly – just that everybody occasionally makes mistakes. Even if the close-by vessel is being navigated with equal competence to your own, remember that with two ships, there is now double the possibility of human and machine errors that could affect your safety. Never assume that your own immediate response is the end of the situation. Keep alert...



TAKE 10

This issue of *The Navigator* explores the key skills and knowledge needed to become an effective shiphandler

1

Number one skill

Shiphandling skills are probably the navigator's greatest skills – both in terms of professional pride and consequences should things go wrong.

2

Practice

Shiphandling is probably one of the most difficult skills to master as it comes from practice – which is hard to find time for, or specialist training – which is costly.

3

Mentoring

Be a mentor if you can and get a mentor if you can; learning on the job is the best way of learning to handle a ship.

4

Watch and reflect

Even if you can't handle a ship yourself, watch others, such as the Master or Pilot, to learn what to do – or not to do... Taking time to reflect on what went right and what could be improved is a powerful learning tool.

5

What turns a ship?

It's not just the rudder, all forces must be used and balanced, including propulsion, environment and dynamic forces.



6

Let the ship do the work

The best shiphandlers are the ones who appear to do the least. They let the ship do the work for them.

7

Plan

Having a plan is crucial to success. Anticipating how the ship will behave will help you to carry out that plan.

8

No need for speed

When berthing a ship, the faster you go, the longer it will take.

9

Keep calm

A calm, measured approach will instil confidence in the bridge team and get you in the correct position more quickly and with far less drama.

10

Logbook

Keeping a logbook of your practice manoeuvres is invaluable. It allows you and your mentor to reflect on your success, demonstrates to others your capability, identifies gaps in your experience that may require extra training, and is a document to take professional pride in. The Nautical Institute provides specialist logbooks for shiphandling.

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#NavInspire



WIN AN IPAD

Just post a picture of you with your *Navigator* on Twitter, including the hashtag #NAVsnap, or send us a message on Facebook with your photo attached (www.facebook.com/thenauticalinstitute) and tell us the name of your ship or your college, if you have one. Let us know if you're a member of The Nautical Institute, too (everyone gets entered in the draw, whether you are a member or not!) Or send us the information in an email!

AND THE WINNER THIS ISSUE IS...

Congratulations to Tapan Bachchan, winner of our Issue 17 NavSnap competition!

Hello everyone, my name is Tapan Bachchan and I am 40, sailing as Chief Officer on tankers. I have been enjoying each and every edition as it enlightens me with various aspects of shipping in general and navigation in particular. The quality of magazine and the printing is excellent.



UPGRADE YOUR FUTURE



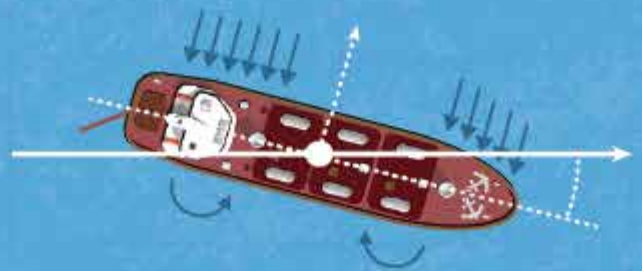
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WE'LL GET YOU THERE

KEEP YOUR LEARNING ON TRACK

The Nautical Institute *Shiphandling Logbook* is aimed at helping you to record and improve your shiphandling experience (but not at teaching you how to do it!) It identifies the manoeuvres that you need to master, and helps you logically deconstruct and reflect on what happened and why. This is where the best learning takes place.



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