

THE NAVIGATOR

Inspiring professionalism in marine navigators

FREE

Shipping and the environment

Working towards greater sustainability at sea



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

sponsored by



IFAN



Welcome to a world of 'greener' shipping

For the most part, navigators who live so much of their lives at sea have great respect for the power, beauty and value of the oceans. They understand the part that they have to play in their sustainability.

We all have individual choices to make when it comes to sustainability; however, we also work within shipping companies and the wider industry – and that gives us a specific opportunity to make small but significant choices for the good of the environment. Some of us may have the opportunity to make even bigger decisions one day, such as the type of ship to build or the way we operate fleets.

In his article on page 4, Captain Jeffrey Parfitt, FNI outlines a broad picture of how a ship impacts the environment, from build to recycle. It is important for navigators to understand the wider environmental impact of their ships and how the operation of these ships can make a difference.

Captain Sajith Babu, AFNI explores how navigators must manage operations to comply and exceed compliance for sustainability. Captain Babu has observed that, on some of the ships he manages, navigators feel compliance with MARPOL is the sole responsibility of the engineers. Not so! He explains that all the crew need to take responsibility, including navigators. It is also important to recognise that environmental compliance doesn't end with MARPOL. There are many regulations including those pertaining to ballast water, actions in Particularly Sensitive Sea Areas (PSSA) and voluntary schemes, such as those to protect whales and other ocean life, to name a few. Now more than ever before, navigators face a need to continuously update their knowledge for compliance, efficiency and safety.

Operating ships to be more environmentally compliant and sustainable is a demanding endeavour that will create

much change in our industry. That change will need new understanding, education, procedures, and a professional approach. In his article on page 11, George Shaw from the Royal Institute of Navigation explores how Artificial Intelligence (AI) and Decision Support (DS) tools may be increasingly used by navigators to provide greater efficiencies and sustainability.

Many good companies provide initiatives and awards for seafarers who come up with good ideas for improvement. As you read this issue of *The Navigator*, please consider how you can remain compliant with evolving regulations, safe in the use of new technologies and innovative and empathetic in your choices on board. As always, please don't keep these thoughts to yourself. Share them with others, discuss them on board and within your companies. Seek out new opportunities that will present themselves as our industry becomes more sustainable.

INSIDE THIS ISSUE

A Nautical Institute project sponsored by



03 ALL AT SEA

Links to online resources around protecting the environment at sea



06-07 GREEN SHIPPING

Captain Sajith Babu AFNI examines environmental compliance at sea and how to stay ahead of the challenges it presents



04-05 ENVIRONMENTAL FOOTPRINT

Captain Jeffrey Parfitt FNI explores what makes up a ship's environmental footprint, shipyard to scrapyard



08 WATCH OUT

Marine Operations Superintendent, Captain Akshat Arora, Senior

Surveyor at NorthStandard looks at marine pollution risks from a P&I Club perspective

09: WHO'S NAVIGATING

Cadet Officer, R Ben Voth talks about his studies, ambitions and thoughts on what more the maritime industry could do to protect the planet

10 WAY POINT

George Shaw from the RIN examines the potential impact that AI and Decision Support tools could have on greener voyage planning

11 TAKE TEN

Ten ways in which navigators can play their part in protecting the environment at sea



200B Lambeth Road, London SE1 7JY, 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
Lucy Budd, Aly Elsayed AFNI,
David Patraiko FNI

For the RIN George Shaw FRIN

Published by

The Nautical Institute
The Navigator (Print) – ISSN 2058-6043
The Navigator (Online) – ISSN 2058-6051

Printed in the UK by

Stephens & George,
Merthyr Tydfil, UK

MISSING AN ISSUE? CATCH UP ON THE APP!

Be informed | Stay current | Upgrade your future





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.

Get the app



Join the debate on LinkedIn

<https://www.linkedin.com/groups/1107227/>

Follow us on Twitter

<https://twitter.com/NauticalInst>

We are active on Facebook

<https://www.facebook.com/thenauticalinstitute>

Watch our videos on You Tube

<https://www.youtube.com/NauticalInstitute>

You can read a digital version of *The Navigator*,

or download it in PDF format at

<http://www.nautinst.org/publications>



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

Passionate about our planet?

There are a lot of resources out there to help look after our planet – both at sea and on shore. Here are a few we found interesting. Take a look and see what inspires you.

If you spot any broken links, or would like to suggest resources that we have not included here, please do get in touch!

Whale Strike Webinar

Seafarers take great joy from sharing the oceans with marine life. Despite our best efforts, strikes on marine mammals such as whales and dolphins continue – but there are ways to prevent them. Watch our webinar at bit.ly/4321Ypc

Check out this whale reporting app from IWDG: <https://iwdg.ie/iwdg-reporting-app/>

United Nations Clean Seas Campaign

Nearly 11 million tonnes of unnecessary single-use plastic end up in the ocean every year. The United Nations Environment Programme's Clean Seas Campaign aims to turn this round. Find out more at: bit.ly/3Ws1MM2

Sustainable Shipping Initiative

Pick up some great advice, tips and insights into how to create and maintain a sustainable and successful shipping industry. Learn how industry leaders are seeking to drive change through collaborative working and sustainability initiatives.

<https://www.sustainableshipping.org>

The Nautical Institute's Green Curriculum Position Paper

Introducing new fuels is a major challenge for the shipping community. Find out why it is so important that seafarers are trained in their use at bit.ly/3ojdAUx

Day of the Seafarer

This year, IMO's Day of the Seafarer on 25 June celebrates the role of seafarers in protecting the marine environment. Theme. Seafarers are invited to share a picture of the marine environment, using the hashtag #oceansworthprotecting. We know many Navigator readers are talented photographers – we look forward to seeing your photos! For more information, visit bit.ly/45qy10X

With thanks to our supporters

If you are interested in becoming an Affiliate Partner and joining an elite group of companies supporting maritime safety worldwide, visit <https://bit.ly/2XJl85z> for more information.



What is the environmental footprint of a ship?

The Nautical Institute's Head of Safety and Environment, **Captain Jeffrey Parfitt, FNI** looks at how our environmental awareness has changed over the years, and what makes up a ship's environmental footprint, shipyard to scrapyard

According to the Organisation for Economic Co-operation and Development (OECD), around 90% of the world's traded goods are transported by sea, enabling us to enjoy the essentials of living, as well as the more exclusive luxuries on offer. However, global shipping is also responsible for almost 3% of all greenhouse gases (GHG). While sea transport is infinitely more environmentally sound than air transport, it still needs to clean up its act.

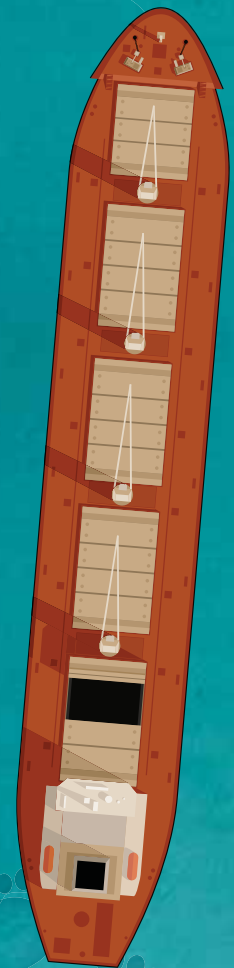
By adopting an environmentally forward thinking philosophy, ship owners and operators can assist in making our planet a better place to live for everybody - and navigators have a role to play in that.

Welcome to the Fourth Industrial Revolution

We are now in the fourth industrial revolution. This term is often bandied about, but what exactly does it mean? Previous industrial revolutions have brought a

seismic change to society. Steam engines transformed the world and we went from sail to engine power. We ushered in new innovations, such as electricity and changes in modern transport. Then came advances in science and mass production, followed by the huge technological expansion – all of these accompanied by social change. Now, we are looking at the next wave of seismic changes, in the form of artificial intelligence and green energy.

Thinking back to my early days at sea, the changes from how we were back then to how we are now are quite astonishing. Back in the mid 1970's, life at sea hadn't really changed much for at least 50 years. We were still navigating with sextants, wind-up chronometers (listening to a daily time signal on the BBC) and log tables – there were no calculators. Some of the ships were from the 1950's and were derivatives of vessels from the 1940's, such as T3 tankers (they were good fun though!). Radar



targets were hand-plotted and it wasn't uncommon for a passing ship mid-ocean to request an update on their position.

With the technological explosion came daylight radar displays, ECDIS, GPS, dynamic positioning, automation, power management, satellite communication, variable pitch propellers, etc. – advances that you probably take for granted.

However, the fundamental method of propulsion hasn't changed – power-driven vessels still require either steam or diesel engines to turn the large fan and that currently needs fossil fuels. Further, ship construction has become increasingly reliant upon less environmentally-friendly materials that do not break down over time. Plastics and synthetic oils in particular are increasingly used in precision engineering.

Green shipping

So what does the future look like for green shipping? We already know that the IMO has set a target to cut GHG emissions from ships by 50% by 2050. However, it is anticipated that the IMO will make a further announcement this summer that may see this target revised to 100% by 2050 – across the whole lifecycle of the ship, not just what comes out of the funnel. We need to take a more holistic viewpoint and look at a ship's carbon footprint, shipyard to scrapyard – cradle to grave.

In the shipyard

There is really no such thing as a zero-emission ship – unless we can return to the age of sail with wooden vessels and equipment and rigging made of iron and natural fibres. But we can do better than we are doing now. Ship owners need to consider a strategy that mitigates emissions through the vessel's entire life, from construction to recycling. This involves compiling a Life Cycle Assessment (LCA) that would include such elements as: steel production, welding, cutting, blasting, transport of materials, coating and anodes. From such an assessment, all phases of the vessel's life can be assessed, and the total cost of ownership and the vessel's projected carbon footprint estimated.

You may ask – yet another book? We already have so many operational environmental log books to maintain on board: Oil Record Books, Emission Record Book, Cargo Record Book (Noxious liquid substances in bulk), Ballast Water Record Book, Biofouling Record Book, MARPOL Seal Logs and Garbage Record Books. However, an LCA is compiled before the vessel is built.

WE NEED TO TAKE A MORE HOLISTIC VIEWPOINT AND LOOK AT A SHIP'S CARBON FOOTPRINT, SHIPYARD TO SCRAPYARD - CRADLE TO GRAVE

In operation

There are new technologies being developed to improve environmental and economic benefits. Improvements on ship design inevitably follow, such as hull form and propeller/rudder efficiency. Fuel consumption is high on the priority list, with new greener alternative fuelled ships starting to be built and software monitoring programmes to gauge emissions. The two 'front runners' in alternative fuels are currently methanol and ammonia. Such fuels bring huge savings to GHG emissions, although they are not completely emission-free. "Air lubrication" is an interesting concept using a layer of air covering the hull surface to reduce resistance – this is particularly applicable to high-speed vessels.

Recycling: The Green Passport

Many of you will have heard of a ship's "Green Passport". This is a document listing all the potentially hazardous materials utilised on board the vessel, in its construction, equipment and systems [IMO resolution A.962 (23) IMO Guidelines on Ship Recycling 05/12/03]. It is granted to a ship when it is built and accompanies the ship throughout its operational life. Successive owners are required to record

any changes, to maintain the accuracy of the document. Finally, the document is delivered along with the ship to the recycling facility, so that recyclers know what is on board and how to handle it appropriately.

Apart from the usual ship particulars, the inventory of potentially hazardous materials should include location, as well as approximate quantity and volume.

Particularly Sensitive Sea Areas (PSSAs)

All these considerations steer us on into the world of practical operations and toward Particularly Sensitive Sea Areas (PSSAs). What are they?

A PSSA is an area that needs special protection through action by IMO because of its significance for recognised ecological, socio-economic or scientific reasons and which may be vulnerable to damage by international maritime activities [IMO.org].

In other words, your vessel may not be allowed to navigate within these areas and / or special attention should be paid to any restrictions, which may involve SOx emissions or type of cargo carried and local reporting requirements. There are currently 14 designated PSSAs, including Australia's Great Barrier Reef and the Archipelago of Sabana-Camaguey in Cuba.

This brings us full circle to my earlier comment on times past. Back in the day, we merrily cruised around throwing everything "over the wall" from general garbage to tank washing slops, including crude oil wax sludge manually dug out from VLCC tank bottoms, regardless of location and ignorant of any impact to the environment (as well as the impact to our own health and safety!). Thankfully, those days are permanently over and we are more aware.

Nowadays, people are being educated to be more aware of humanity's global impact on our fragile planet from an early age. As such, it is incumbent upon the next generation to challenge and improve upon current practice and, in so doing, reverse the damage already inflicted by previous generations and restore nature to its balance.

The mission is yours to accept.

Green shipping: the compliance challenge

Captain Sajith Babu AFNI is a member of The NI Younger Members' Council and works as a Marine Operations Superintendent with a ship management company based in Singapore. In this article, he explores the issues and challenges around environmental compliance at sea and examines the knowledge and skills required to stay ahead



There is a general feeling that MARPOL Annex VI, which regulates emissions from ships, is the responsibility of the engineering officers, and there is nothing much that the navigating officer on watch needs to be aware of. However, this is an issue that everyone must take an interest in, and responsibility for, whatever their role on board.

Ship Masters will be all too aware of the enormous number of emails between the ship managers/owners and the Classification societies aimed at getting the vessel fully compliant with the CII norms governing carbon carbon efficiency. Here, too, navigation and passage planning has a part to play.

Let's take a look four key areas that have been identified as contributing to a ship's environmental impact. Each one needs to be monitored on a regular case-by-case basis by the navigating officers on board ship:

> Ship speed optimisation

Vessels running at maximum rpm will burn considerably higher amounts of fuel than vessels running at a more economical speed. The consumption of fuel is not always proportionate to the increase in engine rpm. Ship owners and operators are urging vessels to run at economical speeds more than ever these days, in order to save fuel and (indirectly) achieve stated CII targets.

> Weather routing

Weather routing has been something that must be checked prior to the start of a voyage for a very long time now. Previously it was just the Master and navigating officers who carried out this task. Today, however, most of the major ship operators employ third-party weather routing services to assist the vessel in avoiding heavy weather and helping its crew to plan economical and safe routes.

> Just-in-time arrival

It is a common sight nowadays to see vessel owners and operators advising vessels to arrive just in time at the next destination. Most vessels are advised by their owners/operators to economise and get there just one or two hours prior to the given cut-off time, rather than arriving earlier and waiting at anchor. This also cuts down on emissions while waiting.

> Ballast optimisation

This is a relatively new approach and is currently being implemented and monitored by most ship owners. Updates to loadicator software include a ballast optimisation

Alphabet soup

> **MARPOL Annex VI** is a section of the International Convention for the Prevention of Pollution from Ships, 1973, regulating air pollution from ships. Among other things, it sets limits on sulphur oxide (SO_x) and nitrogen oxide (NO_x) emissions from ship exhausts.

> **Emissions Control Areas (ECAs)** are areas where ships are subject to particularly strict controls on the fuel they can use/the emissions they produce.

> **Energy Efficiency Existing Ship Index (EEXI)** calculates the efficiency of the ship design.

> **Carbon Intensity Indicator (CII)** calculates how efficiently a ship operates and gives it a rating. If it is too low, the ship will need to implement an SEEMP.

> **Ship Efficiency Energy Management Plan (SEEMP)** is a package of measures designed to make a ship more efficient.

feature that calculates the most suitable condition for a vessel for the upcoming voyage, which leads to fuel savings, once again indirectly achieving compliance with CII norms.

Knowledge and skills

Navigating officers also play a major role during fuel changeovers prior to entering ECA areas. First, the senior engineering officers carry out fuel consumption calculations to determine exactly how much time is required for an effective change over. Following discussion with the bridge team, the optimal position for the start of changeover is decided. This is important, because even with the correct fuel on board, a mistimed or improperly executed changeover will result in violations within the ECA.

Re-skilling, upskilling

Navigating officers play just as much of a role in achieving environmental compliance, decarbonisation goals and greener shipping as engineering officers. Adapting to these new regulations also requires upskilling. Shipboard officers must be agile and innovative with a broader thought process to take advantage of the digital technology.

As alternate fuels gain traction, shipboard officers will also need to gain knowledge about how they work and what advantages

they offer, irrespective on the type of ship they are currently on. Crew working on board any vessel that uses methanol or ammonia as fuel will need to be aware of the specific hazards and safety protocols related to them. Shipboard officers will also need to understand how these fuels affect equipment operation and maintenance, and any potential limitations in their operation.

Changes and challenges

In recent years, people have become increasingly aware of the environmental impact of shipping. This is largely due to the steady enforcement of legal regulations, both locally and internationally. Strict enforcement of these regulations has also led to a reduction in the number of shipping incidents over the past decade.

If the fuel does not meet low sulphur requirements, for example, port state or flag state authorities may require its de-bunkering and replacement and a deviation from the intended route, which can all cause delays and additional costs. MARPOL violations may also result in hefty fines against the vessel.

It is not surprising that seafarers sometimes feel penalised, even when they believe that they are doing their best in challenging circumstances. The fear of being punished or held liable for incidents in which other stakeholders, including bunker suppliers, are often partly to blame, can also be very real.

Not only does this impact adversely on morale on board, but there are possible health and safety implications to consider when working out how to support seafarers in fulfilling the requirements.

Responsible ship managers and operators have developed standard procedures for ship staff to follow to ensure that international regulations are met, and to avoid the risk of being penalised or fined. Never overlook or ignore the safe working procedures and protocols – they are put in place for your protection.

The wider picture

It is evident that the maritime community, and society as a whole, is benefitting hugely from seafarers' commitment to environmental compliance and the MARPOL regulations at sea.

What's next, then? Just as we have accepted, changed and trained ourselves in dealing with the ever-evolving MARPOL regulations ranging from Annex I to Annex V, now it is time to do the same for Annex V and beyond. The challenge goes on.

WATCHOUT

A P&I Guide to Preventing Pollution at Sea

Captain Akshat Arora, Senior Surveyor at NorthStandard, examines the risk to the marine environment posed by pollution from a P&I point of view, and how ships can play their part in preventing them from happening

The marine environment is vital to the health of our planet, and pollution from ships could potentially pose severe and long-lasting effects. Over the last five decades, the International Maritime Organization (IMO) has prioritised the preservation of the marine environment by minimising the risk of pollution caused by ships, whether accidental or from routine operations.

The International Convention for the Prevention of Pollution from Ships (MARPOL) was adopted by IMO in 1973 and was subsequently amended by the 1978 protocol. However, it was only in 1983 that the combined conventions entered into force.

Over the years, the scope of the MARPOL Convention has significantly expanded through a total of six annexes, addressing the prevention of pollution by oil, chemicals, other harmful substances carried by sea in packaged form, garbage, sewage, air pollution and emissions from ships. Certain sea areas within most of these annexes are designated as “special areas” where a higher level of protection is required.

MARPOL is the primary regulation that deals with the prevention of pollution by ships. Other conventions address risks to the marine environment, such as control of harmful anti-fouling systems on ships (AFS Convention), prevention of the spread of invasive aquatic organisms carried by ships’ ballast water (BWM Convention), and the environmentally sound recycling of ships (Hong Kong Convention), to name a few.

Pollution incidents and P&I Clubs

Pollution incidents can potentially result in significant financial losses for shipowners. Therefore, liabilities in respect of pollution have become one of the most important areas of P&I (Protection and Indemnity) Club cover, both in terms of the amounts paid and the coverage needed.

From a P&I Club perspective, other than in cases of purely accidental escape or discharge of a pollutant, cover for pollution fines and associated expenses is only available on a discretionary basis. For a discharge to be accidental, there should be no intention to cause the discharge. Generally, there is no recovery in the event of any personal act, gross negligence or wilful misconduct.

To have any prospect of receiving money to cover damages from the Club, the shipowner would need to satisfy the board that all reasonable steps had been taken to avoid the event. This is a difficult test to meet and involves detailed scrutiny of the circumstances of the offence, as well as an assessment of the environmental policies and procedures in place.

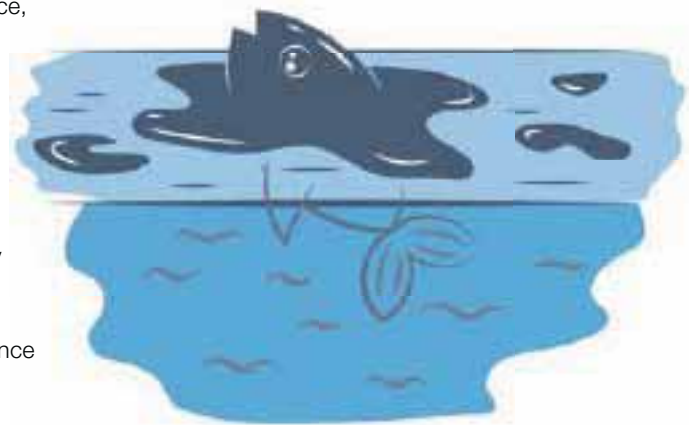
Best practice checklist

The most effective way to reduce risk in this area is by employing operational best practices that:

- > place MARPOL compliance as the highest priority,

- > establish a ‘zero pollution’ and ‘no blame’ culture with open reporting of illegal practices,
- > ensure proper training is conducted on MARPOL requirements,
- > confirm that everyone, both on board and ashore, is aware of the serious implications related to the falsification of records and MARPOL violations,
- > implement procedures/guidance on equipment control, tamper-proof measures, periodic testing, inspection and maintenance regimes, and
- > ascertain that this is regularly verified during internal audits and inspections.

POLLUTION HAS BECOME ONE OF THE MOST IMPORTANT AREAS OF P&I (PROTECTION AND INDEMNITY) CLUB COVER



Wherever the winds take me

For Officer Cadet R Ben Voth, the Covid-19 pandemic was a prompt for a change of career. Now, he loves life at sea and has many ideas about how the maritime industry could do more to protect the world around us

What drew you to becoming an officer cadet?

I knew above all that I wanted to pursue a career at sea after completing my higher education. I was studying at a community college when Covid-19 hit. At that point, I realised that I wasn't happy and that I needed a change. I came across the California State University Maritime Academy and decided to change course – I have loved it ever since.

What have you enjoyed most about your studies so far? What has been most challenging?

I have enjoyed the hands-on learning components of my studies. It's been a lot

Name: R. Ben Voth

Studying at: California State University Maritime Academy

Current position: Officer Cadet

of fun getting to put my hands to the helm or the chipping hammer and just going at it! I have found terrestrial and celestial navigation to be the most challenging part by far. For me, they have both felt like learning a new language.

Where do you see yourself in five years' time?

Wherever the winds take me; I haven't

thought that far ahead yet. I aim to become captain someday.

What could the maritime industry be doing better to help protect the planet?

Besides the big-ticket items of continuing to invest in alternative fuels and emission-efficient systems, the maritime industry needs to become better at marine stewardship. This includes doing things like ensuring waste and trash is correctly disposed of or recycled on board and ashore, properly dismantling and disposing of retired vessels and fighting illegal, unreported and unregulated fishing. Above all, we must all do our part to reduce pollution and protect the environment.

ABOVE ALL, WE MUST ALL DO OUR PART TO REDUCE POLLUTION AND PROTECT THE ENVIRONMENT



Artificial Intelligence and the quest for greener navigation

George Shaw from the Royal Institute of Navigation examines the potential for using Artificial Intelligence and Decision Support tools to inform greener voyage planning and positioning

Effective voyage planning is becoming increasingly challenging. This is at least partly thanks to widespread efforts in the maritime industry to reduce emissions and increase efficiency. Green navigation options may also be affected in the future by more complex maritime environments. Ironically, many of the complicating factors are the result of moves towards greater environmental awareness, such as the navigational restrictions around Particularly Sensitive Sea Areas (PSSAs) and the growing number of offshore wind farms (OWF) in busy sea areas. We might even see routes shifting seasonally to take account of whale migration patterns, for example.

The cumulative effect of all these factors may radically impact sustainable voyage planning. In selecting the plan and *en-route* amendments, having access to trustworthy, up-to-date information in real-time will be essential.

Advances in AI

Huge advances in Artificial Intelligence (AI) are highly topical as they become more widely available with the launch of facilities such as ChatGPT and Bard. In future, AI-based tools could aid the mariner by instantly analysing and updating options for greener and more efficient voyage plans. Similar AI capabilities could predict the cumulative effects of planned navigation restrictions on

vessels' future traffic patterns, emissions and efficiency, supporting marine spatial planning and integration.

Innovative AI-based aids may offer effective routing solutions to unleash greener navigation through robust Decision Support (DS) for mariners.

MARINERS SHOULD CAUTIOUSLY WELCOME AI-BASED DECISION SUPPORT, AS POTENTIALLY EMPOWERING THEM TO CARRY OUT GREENER VOYAGES SAFELY AND EFFICIENTLY

High-availability DS depends on being able to communicate large quantities of data reliably between ship and shore and in exchanges with nearby vessels. AIS is currently pushed to its limits in novel applications and can have very limited data capacity with poor integrity (being easily spoofed). Future communication needs may be met by the VHF Data Exchange System (VDES) and growth in Low Earth Orbit (LEO) satellites, e.g. OneWeb and Starlink constellations. VDES is rapidly maturing with over 30 times the data capacity of AIS and in-built data authentication. The

combined terrestrial and satellite links of VDES should offer extensive data coverage at sea when deployed from coastal stations and LEO satellites.

Robust data required

Trustworthy data for digital DS services also means the underlying data sources and sensors must be fault tolerant, and alert the mariner to any reduction in data quality. Positioning data is particularly problematic, as it is often provided by GNSS alone and with very limited integrity. AI can potentially be used to help identify rogue data.

Progress towards robust maritime service architectures has already been demonstrated by the pioneering capabilities of Sea Traffic Management (STM) and the concept of the Maritime Connectivity Platform (MCP). STM envisages a mariner-centric world, 'where all the information... is at your fingertips, updated in real-time.' MCP users would be validated against its Identity Register and have access to a portfolio of assured services. Such practical elements bring DS solutions for greener voyages much nearer to reality. Mariners should cautiously welcome AI-based DS, as potentially empowering them to carry out greener voyages safely and efficiently. DS may reduce the analysis burden, but the ultimate judgement and responsibility for decisions will always lie with the mariner.

TAKE TOP 10

Ten ways in which you can play your part in protecting the environment at sea

1

Citizens of the world

Navigators have a significant role to play as custodians of the sea. Managing compliance, exceeding minimum standards and developing practical solutions are all part of this

2

Prepare to make a difference

In the drive to make shipping more environmentally friendly and sustainable, regulations and technological solutions are developing fast. Be ready to meet these changes and excel

3

Safety first

New fuels and propulsion systems come with significant new risks. Mariners and managers need to ensure that all personnel, both on board and ashore, are familiar and competent to handle these under normal and emergency situations

4

All in it together

Compliance and sustainability is not the remit of any one department. Don't assume it is up to someone else - assess what you need to do, and how to ensure that the ship and company also follow suit

5

Above and beyond

Many areas of compliance are mandatory; however, there are even more voluntary activities that can be undertaken to help the planet and its creatures survive. What can you do to help?

6

Winning innovation

Many companies reward crew initiatives around sustainability, including recycling, greener procedures and ecological design. Explore your options

7

Common sense

Navigators should cautiously welcome AI-based decision support solutions to help them make greener voyages. However, the data needs to be correct and decisions must make sense. Question anything that doesn't seem in the best practice of seamanship

8

Share and share alike

Share your thoughts about sustainability and why compliance is important. Try to win hearts and minds on board and ashore. A willing volunteer will produce better results than someone who feels forced to act

9

Take pride

The maritime community, and society as a whole, is benefitting hugely from seafarers' commitments to the environment. Be proud of your role in this

10

Feel the love

Navigators are privileged to see and appreciate the oceans in a way that few other people on the planet do. Absorb the joys of the seas and perhaps, if you have the opportunity to work ashore, you might use that knowledge and experience to good effect

LIKE OUR TOP 10 TIPS?

Find more in your own language at www.nautinst.org/NavInspire

#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 the winner of this month's Navsnap competition Archit Kai Sumar, who sends his picture from on board LNG tanker *Green Sarita* – very appropriate for this issue focussing on the environment. We use a random number generator to pick the winner, but we think it's a great coincidence. We love seeing your photos – keep them coming!



**JUST STARTING
YOUR CAREER?**

**STAND OUT FROM
THE CROWD...**

Membership is now free for all maritime students and cadets in initial training and education!

We will even give you half-price off your first year of full membership if you choose to upgrade...

For more details visit:
nautinst.org/membership