

# THE NAVIGATOR

Inspiring professionalism in marine navigators

FREE



# Risk Management

Planning ahead – and staying aware



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

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## ‘As Low As Reasonably Practicable’

Taking a ship to sea is not without risks, but that is the business of shipping. The job of a good navigator is to reduce, manage, mitigate or temper those risks. Formal risk management speak often refers to reducing risk to ‘As Low As Reasonably Practicable (ALARP)’.

A ship at sea faces many risks. Navigators (and all crew) must reduce them to protect lives, the ship, its cargo, the environment and the company. Risks do not necessarily have to be feared, but they must be managed. Nearly everything in life involves an element of risk – even crossing the road – and most people are comfortable with that.

Navigation risks include, but are not limited to, collision, grounding and heavy weather, along with more general risks, such as fire, explosion, water ingress, personal injury, cargo damage etc... To assist the ship’s crew, the ISM Code mandates that the company establish

safeguards against all identified risks. The Safety Management System (SMS) is an important tool for navigators, and should always be complied with.

Risk mitigation is the very essence of bridge resource management, not only by utilising all available tools and equipment to support decision-making, but also by increasing the crewing capacity (i.e. calling the Master) to reduce risk. It has been suggested that having two maritime professionals agree on a plan of action, rather than just one increases the safety factor increases by ten times!

In his article on pages four and five, Captain Szymanski identifies four key risk management techniques he calls the four Ts – Take, Temper, Terminate and Transfer. He places high importance on the involvement of ‘people’ within risk management and building up trust within teams. He also raises one of the most important aspects of team development

aimed at reducing risk that I know of – to smile!

Captain Elsayed focuses on the need for ‘dynamic risk assessment’ in his article on pages six and seven. The SMS and passage plan both offer excellent tools for ‘anticipating’ risk, but navigators must never stop there. They must remain alert and vigilant to new and developing risk. It is the role of the professional navigator to maintain situational awareness, always try to identify risk and have a ready toolbox for reducing or mitigating that risk.

No one person can identify and deal with all risks alone. Work with your fellow navigators and crew to identify and reduce risk for the sake of everyone’s life, the safety of the ship, protection of the environment and the prosperity of your company. Sharing ideas is always worthwhile, so please enjoy reading this issue of *The Navigator* and discuss your thoughts with other professionals.

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## Learning all the time

Risk management should be a continuous process – and there's always something more to learn to help you do it better. Here are a few suggestions – but let us know yours!

Throughout this issue of *The Navigator*, you'll read how important it is to keep managing risk – it's not something you do once at the beginning of the voyage and then stop! In the same way, it's important to keep learning and looking for new ways to expand your knowledge, of risk management and more. There are some great resources that can help you do this:

### MARS

The Nautical Institute's MARS Lessons Learned takes reports from investigative services – and readers – worldwide and condenses them into a quick read with some lessons learned, rather like our Watch Out! page. They're a great basis for safety meetings or further discussion. Find them at <https://www.nautinst.org/technical-resources/mars.html>

### P&I Clubs

P&I Clubs often have great risk management resources written specifically with seafarers in mind – it's in their interest to keep ships safe, after all! Some of them may be in paper on the bridge, but it's worth looking to see what's online, too.

### Podcasts

If you learn better by listening, <https://maritimesafetyinnovationlab.org/recommended-podcasts/> has a list of recommended podcasts that cover all kinds of topics – you're sure to find something interesting there.

### Videos

While we focus mainly on navigating the ship (the clue's in the name!) one of the riskiest parts of the voyage can be getting in and out of the berth. The IHMA's 'Missing Link' videos have some great advice on mooring. Find them at [https://www.youtube.com/watch?v=uk\\_pLrX5Ye4](https://www.youtube.com/watch?v=uk_pLrX5Ye4)

**What's your safety go to? If there anything you've found particularly helpful, we'd love to hear about it!**

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# The four Ts of risk management

Risk management is an important skill for everyone to learn, especially young navigators. **Captain Kuba Szymanski**, Secretary General of InterManager, outlines his professional approach to risk, gained from a lifetime of maritime experience

**T**oday's world seem to be very risk averse. No doubt, you have been brought up in an environment where you have heard phrases like: "Don't do that! Be careful!

Stop doing this!" over and over again.

That's all very well, but this approach is not really sustainable. Shipping has been around for many, many years and what I really like about our industry is the fact that we all learn from each other. We have all had to work our way up. It would be wrong to say that we have never made mistakes or errors during our training. However, hopefully, we have all learned a great deal from them.

In the next few minutes of your reading I will try to put across the argument for actively taking risks. However, I don't suggest doing so in the absence of any experience or forethought. This is not about risk with no questions asked! Rather, I would urge you to consider any risks you are facing in the light of the rich and diverse experience that humanity has learned by taking similar courses of action in the past, along with the inspiration you yourself have doubtless gained from your own career and team interactions.



## The four T's

There are many theories regarding risk. One that I have been using and observing during my professional life is based around four Ts.

Some people love risk. They often **take** a risk just as it comes, with no attempt to reduce its impact or change its outcome. This is an extremely dangerous approach. I cannot imagine any of you making your way to where you are today by following this approach, no questions asked.

Most of us prefer to **temper** risks by taking action to mitigate against their more worrying implications. This is what I like to do personally, and have done in probably 80% of my time at sea.

In addition, there are situations where the risk cannot be **tempered** and remains far too great for our appetite. In such cases, it could be preferable to **terminate** the activity, or **transfer** it to someone else who knows how to deal with it, or to another time when it is less likely to cause us serious problems.

## Tempering before taking

So, what helps us **temper** risks to make them more palatable before we **take** them? Here are three key areas:

### Education

Schools spend large amounts of time trying to educate us about the surrounding world: what is healthy, what is beneficial and what is excellent for us human beings. Great schools expose us to a wide range of teachings to allow us to build up our own practical knowledge.

After school, we then take a step up. We attend maritime colleges that focus on specific sea-based risks; educating us about them but now also providing tools that help us to deal with them and mitigate against unwanted outcomes. For example, when we are preparing to climb any height onboard ship, we are taught to ensure that the ladder is properly secured, conditions allow safe access, and the area is well lit – all to make sure an accident does not happen.

However, should any of these measures fail, we also gear up for the consequences of the accident. We make sure that any negative implications are minimised by wearing PPE and using a harness and

securing it so it can protect us effectively, should we lose footage. These two approaches allow us to **temper** the risk being taken by addressing the likelihood of an accident and working to reduce the severity of any consequences arising from it.

### Organisational arrangements

The organisation employing us sets out the procedures, rules, regulations, codes and best practices to use when dealing with specific risks. This is what your ship manager, your senior officers and you yourself are doing by following correct safety protocol and, maybe more importantly, by checking and cross-checking your work and that of your colleagues.

## IT TAKES A BRAVE INDIVIDUAL TO SUGGEST TERMINATING A RISK AND THIS IS WHERE REAL HEROES CAN SHOW THEIR COURAGE AND VALUE

It would be really great if your company could create an atmosphere on board that empowers you to suggest improvements every time you test existing procedures, run through checklists and discover anything something amiss, or which could be done better. This would allow everyone onboard to benefit from your input and your experience of being an individual “on the shop floor.”

### People

For me, people are the most important ingredient of risk management. Imagine a football team of people who have never played together. How likely are they to win? They may try not to lose, but that's not the same. In my opinion, a ship's crew is like a football team. We perform far better when we know and trust each other. Without trust, interaction between human beings can grow very restricted.

Here's something you can do to help build trust among the team. After your watch, stay for five or ten minutes to talk to a fellow officer. Express interest in their life

and try to find out what makes them tick. See what you have in common and work out how you can help each other succeed in your respective roles and responsibilities. Speak to people during coffee breaks and actively participate in discussions and social events. A well-gelled team is far more likely to look after each other than an unfamiliar one. This will translate to better performance and, in the context of risk management, a safer ship.

## Terminating and transferring

So, while I urge you again not to shy away from taking risks, make sure that they are properly **tempered** first. Also, don't forget that if the risk seems insurmountable, you still have two other methods to consider – **terminate** it or **transfer** it.

Termination – calling off an activity – may seem simple at first glance, but it can actually be very difficult to achieve. You can feel huge pressure from the limited time available to act, as well as from the potential reaction from peers and the worry that others might think you are a failure.

However, if the three **tempering** elements mentioned above – education, organisation and people – have not made you feel happy and comfortable about taking on the risk in question, then you must flag it up and express your concerns right away. This is the first signal that the risk needs to be **terminated**. It needn't be terminated for ever; just perhaps until extra resources are assigned or adequate experience or training has been gained. It takes a brave individual to suggest terminating a risk and this is where real heroes can show their courage and value.

Alternatively, the best way forward may be accepting the fact that a particular risk needs to be **transferred**. This could mean being passed to others to perform – for example, by calling the Master. Or it could benefit from being rescheduled transferred to another, more suitable time. For example: completing hot work during dry docking; painting the ship when at anchor; or correcting charts when in port and not at sea. Again, there is no shame in this as safety must be paramount at all times.

May the four Ts keep you safe in your voyages and career.

# Delving into dynamic risk assessment

For navigators on the bridge, one of the most valuable tools in the moment is the ability to carry out a dynamic risk assessment. **Captain Aly Elsayed AFNI**, Senior Technical Adviser, The Nautical Institute, looks into how this works in practice, and why it is such an effective tool

There are several different methods and tools to help us assess risk, each one suitable for different circumstances. These might include quantitative, generic, site-specific and dynamic risk assessments, among others. You can find out more about all of these in the the UK MCA's Code of Safe Working Practices for Merchant Seafarers (COWSP). For navigators on the bridge, one of the most valuable tools in the moment is the ability to carry out a dynamic risk assessment.

Knowing how and when to use the different methods of risk assessment is a fundamental part of a seafarer's job. OOWs are especially encouraged to assess risks on the spot. Dynamic risk assessment is one of the methods used to assess developing and changing circumstances. It is also known as Personal Assessment of Risk. According to COSWP: "This is an informal assessment of day-to-day risks carried out as you are going about your work and life in general. It is a technique used to ensure that we perform

even the most mundane of tasks without getting hurt. It is used to always maintain awareness of our environment and aid in the identification and control of immediate hazards as we go about our work. Use of personal assessment of risk should be developed and encouraged."

## Is it safe to continue?

Dynamic risk assessments are all about taking a few minutes to step back, look at the job to be done, consider what could go wrong and how that might happen. Finally, you must work out what steps you can personally take to avoid any incident, or any close quarter situation which could crop up.

As the work gets under way, you should monitor the worksite for any change in conditions that might alter the hazards and controls in place. If there is any doubt or concern, you must call for assistance, stop the work while you re-assess the controls and, if necessary, re-plan and re-assess the task.

Should you need to make significant changes to mitigate the risk, there are

a number of questions that you should ask yourself:

- > is the original risk assessment still valid?
- > should I try to deal with the situation?
- > is it safe to continue?

## Putting theory into practice

Let's say an OOW is taking over the watch while the ship is facing rough weather. According to the ISM code, the company is required to provide a written risk assessment that considers the site location, environment and people doing the work before establishing safeguards against all identified risks. However, in a real-life situation, it's not always possible for the OOW to prepare for every single potential risk, nor assess them simultaneously. Therefore, a dynamic risk assessment becomes crucial – one which can be carried out before or while an activity is underway. In this case, that means a series of actions to be undertaken as you take over the watch, and then as it continues.



You need to consider risks both internally and externally. For example, it's recommended that the OOW makes an early round inside the bridge and around it, as far as it's safe to do. While doing this, always bear in mind things that could potentially go wrong and how. One example could be spotting loose items which might slide or fall about and cause distraction or harm. If you spot such an item, immediately consider the most appropriate steps to reduce the risks arising from this situation and take action to secure the items safely.

In addition, while you will be continuously monitoring the ship's movement and bearing as the OOW, it's good practice to also focus on whether the vessel's course and speed have been adjusted as necessary (on the Master's orders) to minimise any adverse effects of heavy weather. If not, are any changes required significant enough to warrant calling the Master, reassessing the situation with them and re-planning the task or route as necessary?

## THE TWO VITAL ELEMENTS IN CONDUCTING A DYNAMIC RISK ANALYSIS ARE AWARENESS AND SKILL. TOGETHER, THEY ALLOW YOU TO RECOGNISE WHEN IT IS TIME TO ASK "IS IT SAFE TO CONTINUE?"

### Awareness and skill

The two vital elements in conducting a dynamic risk analysis are awareness and skill. Together, they allow you to recognise when it is time to ask "Is it safe to continue?" and to decide that "We need to re-assess the task". In the example of the rough weather situation given above, the OOW needs to continually monitor the force/direction of the wind; the direction/height of the waves and the ship's movements (heave, sway, surge, roll, pitch and yaw). They must then use this information to assess how the current situation will affect the safety of the personnel in different locations around

the ship, such as the deck, engine room or galley. Any concerns or doubts about anyone's safety must be reported to the Master immediately. The OOW should also alert the crew when the ship's heading is going to change, and provide details about how that will affect its movements and any routine work, such as painting on one side.

Dynamic risk assessment is an informal method that helps OOWs stay vigilant. It supports the wider goal of maintaining situational awareness to ensure effective bridge operations and navigational safety.

In addition, dynamic risk assessment can:

- > encourage the OOW to continually assess and reassess the situation in relation to bridge operations and voyage planning
- > help provide information in advance.
- > help identify potential or existing problems during the voyage
- > improve perception – giving a more accurate mental picture of reality
- > support the application of a systematic problem-solving method.

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

# How rapidly developing risks led to ship grounding

## What happened?

A containership set off on its journey with a pilot on the bridge, along with the Master and the rest of the bridge team. After a time, the Master left to get dinner, while the pilot remained on the bridge along with a third officer, deck cadet and an able seaman at the helm. A passage plan was in place – but when the vessel passed a charted waypoint which required a turn, no order was given – and no turn was made. The ship continued on its previous heading, left the channel, and quickly ran aground.

## Why did it happen?

The pilot was relying solely on his portable pilot unit (PPU) to navigate. Moments before the grounding took place, he had exited the active navigation function on his device to view a previous transit. He had been distracted from assessing the passage plan and associated risks by making five separate phone calls that took up more than an hour of his time collectively, and by starting to draft an email immediately before the grounding occurred.

There were no mechanical faults or equipment failures. The pilot and bridge team did not take into account the fact that risks can happen, and situations change, very rapidly while at sea, or make the most of the risk management measures that were already in place, including the passage plan and BRM procedures. The whole team must remain alert for such changes and react to mitigate against potential risks as soon as they become apparent.

## What changes have been made?

- > The report recommended reviewing policies around the use of mobile phones and other portable electronic devices on the bridge. In particular, it emphasised the dangers of fixating on electronic devices or relying too heavily on one piece of equipment while navigating or carrying out safety-related functions.
- > Vessel owners and operators were also urged to promote the importance of effective communications between the Master, bridge team and pilot.

You can find the full report at [EverForwardGrounding\\_ROI\\_Redacted.pdf \(uscg.mil\)](#)

**THE PILOT AND BRIDGE TEAM DID NOT TAKE INTO ACCOUNT THE FACT THAT RISKS CAN HAPPEN, AND SITUATIONS CHANGE, VERY RAPIDLY WHILE AT SEA**





# Passage planning and positive thinking

Second officer Rudolph Clark Garaygay discusses the value of embracing the positive and the importance of active communication

## What do you like best about working at sea?

Aside from the beautiful sunsets, seeing the world for free and good compensation onboard, I would say it is the life-long lessons that I have learned and the wonderful camaraderie from the people I have worked with throughout my entire career.

## Where do you see yourself five years? Ten?

Whenever I need to achieve something, I always say to myself, "What you think, you become." I always believe in myself and embrace positivity in life. So, I can see myself five years from now working as a Chief Officer and then, in ten years becoming a Master.

## What do you think are the most important things to include in a navigation risk assessment?

There are three important things that I consider important to include in a risk assessment:

- > Equipment failure – all navigational equipment is prone to malfunction, and the ability to respond rapidly to any mishaps must be the priority of the bridge team; there must always be a back-up plan ready and all navigation officers must be familiar with the actions and decisions that need to happen to avoid critical damage.
- > Active communication – in order to develop situational awareness among the bridge team, there must be a proactive approach to communications, especially when navigating under pilotage in congested or shallow waters. Lack of communication can lead to dangers like grounding and collision.

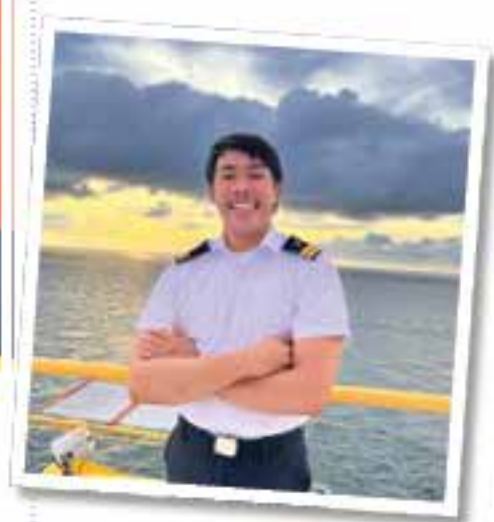


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**Studies:** BSc. Marine Transportation at John B. Lacson Foundation Maritime University, Philippines

**WHENEVER I NEED TO ACHIEVE SOMETHING, I ALWAYS SAY TO MYSELF, "WHAT YOU THINK, YOU BECOME." I ALWAYS BELIEVE IN MYSELF**



> Passage plan appraisal – one of the most critical stages in preparing a passage plan is appraisal. All information about the entire navigation, from port to port, must be collected and used to plan accordingly.

## Which risk management resources do you find most helpful in your work?

As the Navigation Officer in charge onboard, I always use passage plan appraisal and navigation with restricted under-keel clearance (UKC). We all have different safety management systems and, specifically, we also have different risk management resources that our company requires us to observe.

Despite this, there is only one goal we all need to meet – ensuring our own safety and that of our navigation. Hazards are everywhere, but with proper planning and thorough risk assessments, we can eliminate, control and avoid many uncertain incidents onboard.

## Navigational data risk: a question of integrity

George Shaw from the Royal Institute of Navigation looks at how seafarers can balance accuracy and integrity in positioning

Risk evaluation for safe navigation is underpinned by mariners' awareness of positioning data quality, allowing them to maintain situational awareness and avoid hazards. Good positioning is characterised by accuracy, availability, continuity over an operation and integrity. Appreciation of position accuracy is inherent in good seamanship, but integrity is harder to assess. Yet integrity is crucial as it alerts the seafarer to the possibility of misleading information.

### What is integrity?

Integrity is the measure of the (generally small) likelihood of position errors that are unacceptably large but which do not raise an alarm – what you might call 'hidden errors'. It is critical for risk assessment and forms the basis for positioning uncertainty, bridge alerts and appropriate data use in digital services (e.g. under-keel clearance). Accuracy and integrity are interdependent, and must be carefully balanced to meet the seafarer's needs in increasingly complex sea spaces.

Vessels principally use GPS navigation, which is accurate to within a few metres. Regional space-based augmentation systems (SBAS) or differential GPS beacons can improve accuracy to one to two metres, providing integrity warnings if the GPS service malfunctions. However, existing SBAS systems have been designed specifically for aviation. There is currently no service integrity 'guarantee' for GPS maritime positioning

Electronic position data is extremely precise, even when in error, and is very

compelling when portrayed on ECDIS without any alarm. This invokes a false sense of security if integrity is poor. The use of multi-constellation GNSS capability (including Galileo, Glonass or Beidou) should enhance accuracy, availability and continuity of positioning, but makes questions of integrity even more complex.

Maritime SBAS services designed to support integrity for GNSS positioning solutions are not straightforward. This is because GNSS signal reception is more challenging for ships than for aircraft. Receiver Autonomous Integrity Monitoring (RAIM) automatically measures integrity and alerts users if there is a problem, but it needs improvement, specifically in adapting the methods that are being evolved for aircraft for maritime use.

### Mitigating risk

GNSS are vulnerable to interference, either naturally or via deliberate jamming and spoofing and this may cause unacceptable undetected positioning errors. Improved accuracy with SBAS or Precise Point Positioning (PPP) cannot detect or counter these effects and may even make the problem worse, as it increases trust without necessarily increasing safety. While current technology cannot provide

adequate integrity protection, seafarers must be able to mitigate navigational risk by maintaining traditional skills and frequently cross-checking different positioning sources.

Established triangulation methods are still very valuable to the navigator. A 'cocked hat' of bearings provides an intuitive 'pool of errors' for position uncertainty – although remember that if you have just three sightings, the true position is likely to lie outside the indicated area of intersection.

In future, positioning integrity would benefit from a wide variety of independent sensors, not all space-based, deployed in a 'system-of-systems' solution with maritime specific RAIM. As autonomous vessels emerge, and more and more obstacles (e.g. wind turbines) fill crowded waters, initiatives like these are growing urgent. Mariners are encouraged to insist on resilient positioning capability to provide accuracy with integrity, and advocate the necessary changes in standards and type approval for multisystem, multi-constellation bridge equipment.



# TAKE TOP 10

Risk management is a fact of life at sea – and something that all navigators must understand fully. Here are ten key points to bear in mind

## 1

### The reality of risk

Nothing in life is risk-free. The key to avoiding accidents, damage or harm is to manage the risks we face to an acceptable limit.

## 2

### Reducing the risk

Good navigators are those who can reduce the risks they come up against at sea, including the risk of collision, grounding, heavy weather, etc.

## 3

### Teamwork improves safety

Discussing risk with your fellow professionals and sharing knowledge, ideas and practical assistance can improve safety on board ship by a factor of ten.

## 4

### Check the SMS

The ISM Code requires companies to identify potential risks in the Safety Management System (SMS), making it an excellent reference guide for navigators.

## 5

### Anticipation, anticipation, anticipation...

Many risks can be anticipated; indeed, the very nature of passage planning is to anticipate risk, including traffic, weather, currents and more. Passage plans are an excellent form of risk assessment and mitigation.

## 6

### Dynamic risk assessment

Regardless of how good you and your team may be at anticipating risk, never stop checking your situational awareness and assessing risk by all available means.

## 7

### Bridge Resource Management

Proper BRM procedures are a great example of how to reduce risk by all available means, combining human intervention and the effective use of technology.

## 8

### Tools of the trade

There are many technology-based tools that can help in mitigating risk. These include not only the obvious radar and electronic charts, but advanced tools for monitoring under keel clearance (UKC), trial manoeuvres, auto target acquire and, increasingly, camera technology with augmented reality.

## 9

### Smile!

Good teamwork reduces risk – and good teamwork is based on good relations between team members. Good relations between team members are enhanced through respect, trust and a **smile**.

## 10

### Share and share alike

Reduction of risk can only happen when a risk is well understood. Work with your bridge teams and crews through training and mentoring to help everyone understand and reduce risk.

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Find more in your own language at [www.nautinst.org/NavInspire](http://www.nautinst.org/NavInspire)

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## AND THE WINNER THIS ISSUE IS...

The winner is Emiel van Driessche, a fully licensed DPO, who writes:

*Hi! I am sending this picture for the Navigator magazine 🤘 my ship is the (mighty) Simon Stevin from Jan De Nul, subsea rock installation vessel.*



Emiel van Driessche  
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