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Standard Safety

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The Standard
for service and security

Standard Club

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Introduction

Welcome to a new edition of Standard Safety!

This edition looks at a number of different ways in which human error can cause issues on board ships and gives advice for minimising this risk.

In this edition

Ineffective training

ECDIS assisted grounding is a known issue and has been the topic of a previous Standard Safety Special Edition, but The Standard Club still receives a number of queries from members regarding the required training for ECDIS operators under ISM and STCW. This is especially pressing at the moment, as cargo ships constructed before 1 July 2013 that are sized between 20,000gt and 50,000gt will need to comply with ECDIS regulations not later than the first safety equipment survey on or after 1 July 2017. Richard Bell explains the differences between the two types of training required and how certain flag states interpret these differently.

Lack of navigational competence

Navigational competence across the industry is still a concern. As a result, The Standard Club has assisted the Nautical Institute with the development of guidelines for carrying out navigation assessments. These are published in the book *Navigational Assessments*, which is now available for purchase from the Nautical Institute's website. The second article in this edition of the bulletin explains the need for onboard navigation assessments as an alternative means of assessing navigation competence. Even with modern high-tech equipment, the operator remains human and can make errors. Proper training and monitoring are required to prevent tragic incidents.

Complacency during routine tasks

Complacency of crew is often cited as a causative factor of marine incidents, especially when carrying out routine tasks. Andrew Russ discusses two case studies where safety procedures were not followed and the seafarer involved was severely injured. He follows up by giving advice on simple steps that can be taken to prevent these accidents.

Incidents can also be avoided by taking proper actions following a near-miss. The Standard Club has been working with the Confidential Hazardous Incident Reporting Programme (CHIRP) for well over a year now and a number of useful videos have been produced featuring a wide variety of case studies and lessons learnt. Maritime Feedback Bulletin #6 was recently released, which discusses pilot boarding arrangements, embarkation ladders and working aloft. We encourage all our members to watch and distribute the videos to their crews, as they provide excellent material for discussion during the ship's safety committee meetings.

Neglect of personal wellbeing

Seafarers are not only responsible for the safety of the ship, but also their own safety. The Standard Club's enhanced Pre-Employment Medical Examination scheme or PEME has been in place since September 2015 to help seafarers identify their own health needs. We recently completed an analysis of the scheme to identify the most common reasons for failing the enhanced examination and which positions or departments fair better in the results. The statistics and analysis are discussed in this update. Hernias have been identified as a particular risk for seafarers, so The Standard Club's medical partner, Medical Rescue International, gives advice on detection and prevention.

The non-human elements

Not all incidents are caused by human error. Richard Bell looks at the risks to consider when complying with charterers' instructions to allow the ship to touch bottom during cargo operations (NAABSA), and Capt. Akshat Arora's article concludes the series on the MARPOL Annexes with information about how shipowners can comply with the stricter regulations relating to sulphur emissions under Annex VI.

We hope you will enjoy reading this Standard Safety.

The images in this publication were produced with the kind assistance of the officers and crew of the *Miss Benedetta*.

ECDIS use on board ship

ECDIS can provide navigators with high levels of situational awareness, which should reduce the number of collisions. However, this is not always the case. This article explores why.

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Introduction

The advantages of ECDIS assisted navigation can only be realised if operators are properly trained and provided with procedures relating to its use. The requirement for generic training courses is well known in the industry, but this is not sufficient. As this article will demonstrate, operators should be trained on their own specific system and companies should develop guidelines relating to ECDIS use and settings management, to ensure the required safety outcomes.

All ECDISs work the same way... don't they?

Whilst common standards exist for ECDIS (principally embodied in MSC.232 (82) *Adoption of the revised performance standards for electronic chart display and information systems*), these standards focus on general requirements, leaving details of how the ECDIS accomplishes these requirements to the manufacturer. This has resulted in wide variations between ECDIS brands, meaning that officers trained on one model of ECDIS will not necessarily be able to safely use another model.

A good example is the way in which various ECDIS brands satisfy 11.4.15.1 of MSC.232 (82), which concerns the use of lines of position (LOPs) on ECDIS. LOPs enable the ECDIS to be used in the event of a Global Navigation Satellite System (GNSS) failure; it also allows operators to monitor the accuracy of GNSS using ranges and bearings.

Different ECDIS models use different means to generate LOPs, including:

- pre-selected reference points
- drag and drop functions
- click and assign functions.

An unfamiliar navigator may not be able to generate LOPs, making fixing impossible.

This problem extends to nearly every function on ECDIS. Different models have very different menu structures, aesthetics and terminology, meaning a user without specific training would struggle to competently navigate their ship. In recognition of the importance of this issue, port state inspectors have included checks on the knowledge of crews in their activities.

Obligations

Regulatory

The obligations regarding familiarisation training for shipowners derive from two distinct sources: the ISM Code and STCW 2010.

The ISM Code sections on familiarisation highlight the need to familiarise new staff and staff assigned to new roles with their duties, if their duties relate to safety and protection of the environment. The relevant sections are 6.3 and 6.5.

STCW 2010 I/14 1.5 states that it is the responsibility of the company to ensure that:

'seafarers, on being assigned to any of its ships, are familiarized with their specific duties and with all ship arrangements, installations, equipment, procedures and ship characteristics that are relevant to their routine or emergency duties'.

Such requirements extend to ECDIS, meaning that shipowners must make proper provisions to ensure that their officers are familiarised with the type of ECDIS they will be operating when serving on board ship.

Flag state
The approach of flag states to the issue of familiarisation varies. It is therefore important for shipowners to understand their own flag state's requirements for ECDIS familiarisation. Two flag states that have differing approaches are the UK's Maritime Coastguard Agency (MCA) and the Australian Maritime Safety Agency (AMSA). These are compared below.

UK-MCA
The MCA's policy towards familiarisation training is contained in Marine Information Note (MIN) 503 (M). This MIN 503 replaced MIN 442 and details the familiarisation training requirements for UK flagged vessels:

- The training must relate to the make and model of the equipment fitted on board the ship they are currently serving.
- It reminds owners and operators of their obligations/responsibilities for ship-specific training and the need to comply with the requirements for ship-specific training.
- MIN 503 does not make specific reference to what types of training will be accepted by the MCA to meet the requirements for familiarisation.

AMSA
The AMSA's requirements for familiarisation training are more specific and include:

- the responsibility of the master to verify that the OOWs are competent in the use of ECDIS
- the areas of training that should be included for familiarisation
- a ban of 'trickle-down training' and the definition of this term
- a definition of the instructor qualifications required to provide familiarisation training, which may also include a manufacturer's computer-based training package.

Such variations make it crucial for shipowners to be fully conversant with their flag state's requirements to ensure compliance.

Ensuring compliance

Practical tips on familiarisation training
Using the same model of ECDIS throughout a fleet will greatly simplify the issue of familiarisation training. The Nautical Institute's Industry Recommendations for ECDIS Familiarisation is a useful guide to the items that should be included in familiarisation training and can be used as a framework for bespoke onboard familiarisation procedures.

Companies should research all of the options available to ensure that they source a familiarisation training package that is right for them and acceptable to their flag state. Such options include:

- computer-based training either on DVD or the internet
- manufacturer's training course complemented by onboard familiarisation
- onboard training conducted by manufacturers
- onboard training conducted by appropriately certificated company staff (train the trainer courses).

ECDIS procedures
Companies should develop guidelines relating to ECDIS use and settings management. Without guidelines, variations in ECDIS use will occur within a fleet and it is inevitable that some of these variations will be unsafe.

Investigations of groundings involving ECDIS often involve:

- incorrect safety depth/ contour settings
- inadequate anti-grounding settings
- inadequate display settings
- incorrect chart scale being used.

Such deficiencies indicate that the operator was not competent or that the procedures for ECDIS were inadequate/poorly enforced.

ECDIS procedures should be decided by a suitably qualified mariner within a company, ie somebody fulfilling the role of a 'subject matter expert'. Methodically working through each of the functions and settings in an ECDIS manual until each is fully understood is the best way to gain subject matter expertise. This requires 'hands on' time with the appropriate model of ECDIS. When this process is complete, a full understanding of the capabilities and limitations of the selected model will have been gained. A company's subject matter expert can then develop its ECDIS procedures/policy. This policy should complement existing arrangements and ensure that a uniform standard of ECDIS navigation is maintained throughout a fleet.

ECDIS procedures should be created for different navigation stages, including:

1. pre-departure
2. pre-arrival
3. passage monitoring
4. loss of GNSS or other sensor
5. failure of an ECDIS system
6. transition from ENC to RNC.

Example ECDIS procedure: pre-departure
This procedure should ensure that when the vessel departs the berth, the ECDIS is properly set up and ready to use for navigation. The requirement to set up ECDIS equipment should be added to the existing pre-departure checklist and a second detailed list of required ECDIS settings provided. Once these settings have been applied, many of them will remain unchanged for the duration of a voyage. The ECDIS settings/features below should be considered pre-departure. This list is not exhaustive and is dependent on the model of ECDIS used.

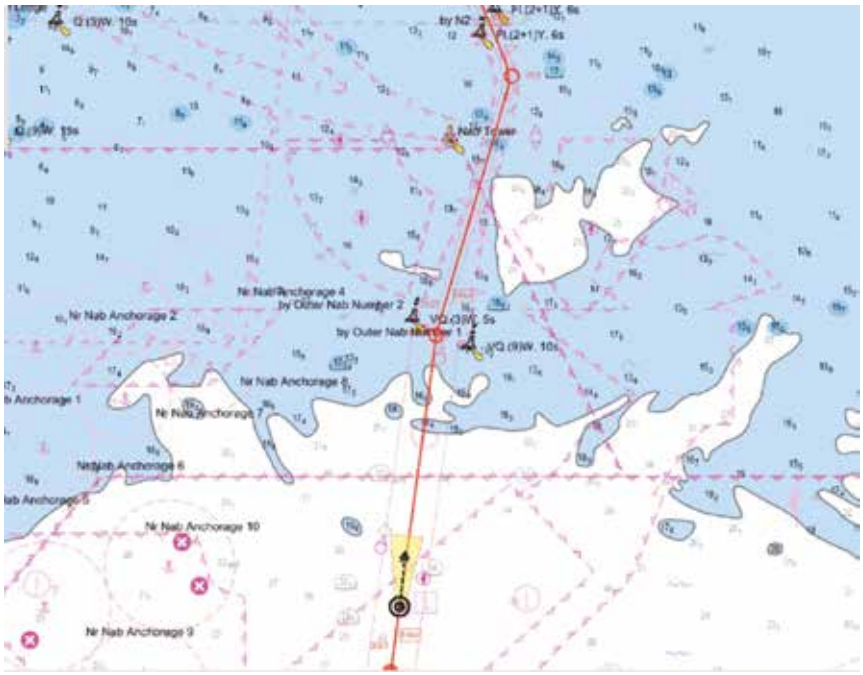
- Safety depth and contour values
- Depth shades
- Buoyage types: simplified or traditional
- Palette: night or day
- 1:1 or compilation scale to be selected
- Docking/berthing mode if applicable
- ENCs required for the voyage installed and available, and updated
- Sensor selection is correct:
  - Gyro
  - GNSS
  - Log
- Appropriate route is available and selected
- Anti-grounding function is activated:
  - Appropriate distance ahead
  - Appropriate width and angle
- Chart notes are displayed for the voyage
- Parallel indexes are displayed for the voyage
- Chart maps are displayed for the voyages
- Overlays are selected:
  - Automatic identification system
  - Radar image overlay
  - Admiralty information overlay
- Primary and secondary past track selection
- Chart display settings:
  - Pre-saved group is selected or settings as per list
- Vector length

A note on chart display settings
One of the most common complaints about ECDIS is that it does not contain the same information as a paper chart. If an ENC is missing information, it is often due to the operator's chart display settings being inadequate. When deciding on chart display settings, there are several things to consider:

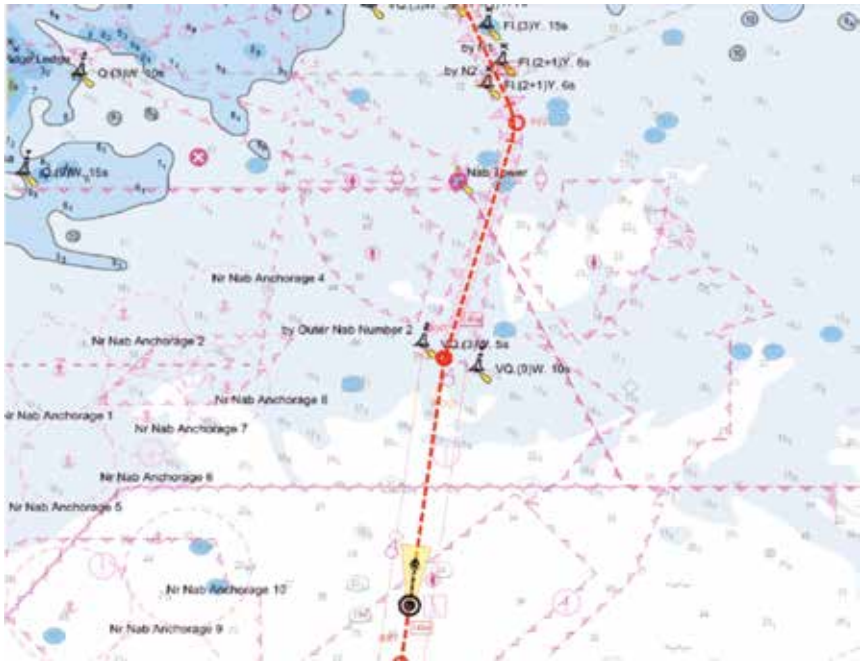
1. Always start from the standard display and add more layers.
2. Some ECDISs have the capability to save chart display settings; this means that multiple configurations can be saved for different situations.
3. A good rule of thumb is to add chart features until the ENC has a similar level of detail as a paper chart.
4. Many mariners consider an ENC displaying 'All' chart features (sometimes referred to as All Other) to be too cluttered. However, great care should be taken when deciding which chart features to omit to ensure that important information isn't left off the display.
5. Operators who use specified chart display settings will quickly learn to identify when incorrect settings have been applied and can challenge the user or correct the mistake.

Great care should be taken when deciding which chart features to omit to ensure that important information isn't left off the display.

The decisions regarding ECDIS set-up and 'chart display settings' should be determined centrally, by a subject matter expert who has weighed up the implications and determined how best to ensure navigation safety. One of the strengths of ECDIS is that once the 'ideal settings' have been determined for a particular model, these settings can be employed on board all vessels operating the same model. These defined settings enable a master to identify when incorrect settings have been applied, allowing for the enforcement of standards.



In the screen shot above, the safety contour is set at 20 metres, which is too high a value for the vessel's draft. Because of this, it is not clear to the operator where safe water is located. The vessel must also cross its safety contour during its passage, which will generate an alarm.



In this screen shot, the safety contour is set at the correct value of 10 metres. The safe water can now be easily determined and the vessel will not need to cross a safety contour.

Here, the operator of the ECDIS has prepared the ENC and selected settings to navigate safely, with enough relevant information.

The screen shot above is of 'Standard Display'. Whilst the buoys are visible and safe water can be determined, there are few geographic features, no names on the buoys and no soundings to enable monitoring of depth under the keel. Most mariners would consider this level of ENC chart features inadequate for navigation.

At the club, we have seen screen shots taken post incident which have a similar level of detail to 'Standard Display'.

Conclusion

ECDIS is now firmly established as a navigation aid within the industry, but it will only be mastered when it is fully embraced. Embracing ECDIS will enable an organisation to know its strengths and weaknesses. Organisations that base their decisions relating to ECDIS on research and sound principles will be able to get the most out of their equipment and take steps to mitigate the risks associated with its use.

The Standard Club has addressed the issue of ECDIS-related groundings in its Standard Safety Special Edition on ECDIS-assisted grounding. This is available on our website.

ECDIS images kindly supplied by Warsash Maritime Academy:

- **Steve Window, Head of Bridge Simulation WMA**
- **John Saunders, Senior Lecturer WMA**

Navigation risk assessments

This article discusses the use of navigation risk assessments to assess the competence and experience of navigating officers.

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Introduction

Whilst it is widely acknowledged that The International Convention on Standards of Training, Certification and Watchkeeping (STCW) has improved the average standard of competence of deck officers within the maritime industry, many accidents still occur due to lack of competence, negligence and other human factors. The concept of STCW is a good one and the content is sound, but a gap exists somewhere between its intentions and its application. This gap results in allisions, collisions and groundings.

Identifying trends

The European Maritime Safety Agency's statistics for the years 2011 to 2015 indicate that navigation casualties made up 50% of all ship casualties recorded in that reporting period. Of these navigation casualties, 36% were contact incidents, 33% were groundings/strandings and 31% were collisions. All of these incidents occurred in spite of the training and certification of the officers involved and the procedures designed to prevent them.

The Standard Club is a firm promoter of navigation risk assessments (NRA) as an alternative means for the assessment of navigation competence. This is based on the realisation that there are few reliable substitutes for the close observation of deck officers during routine operations. The aim of a navigation risk assessment is to obtain a real insight into the abilities and attitudes of the deck officers on board a given ship. Combining the data from the club's claims with the qualitative information gathered during our own NRAs has revealed the following trends:

- Busy traffic separation schemes followed by pilotage waters are the areas of greatest danger.
- Master/pilot exchanges are often weak and defeat the purpose of having them.
- Manning levels on the bridge during critical phases often fall below safe levels.
- Monitoring the vessel's position by all available means is not routine on many bridges.
- Over-reliance on GNSS/ECDIS is commonplace.
- This over-reliance is compounded by neglecting to use visual fixing and parallel indexing techniques.
- SMS mandated checks are often neglected, a common example being gyro compass checks.
- Checklists are often completed ineffectively, suggesting that there is a tick box culture.

In every instance where one of these deficiencies was observed, the officer was properly certified and worked within the confines of an approved safety management system. Two key themes exist within these deficiencies: a failure to follow an established procedure and a failure to maintain best navigation practice. It is not clear why officers disobey known safety procedures, or why their navigation standards fall short of best practice. One question that needs to be answered is whether the deck officers are merely being complacent or are unable to maintain best practices. What is clear however is that compliance with STCW standards alone does not guarantee that an officer will be a competent officer of the watch (OOW).

Raw material

Deck officers must combine the skills learnt during formal classroom instruction with practical experience and intuition. An OOW must be able to collate data from disparate sources and convert it into actionable information. This process must sometimes occur quickly and under intense pressure. Whilst skills such as these can be learnt and improved upon, some people are simply not suited to this role. Recent collisions in coastal waters have occurred because both bridge teams failed to take action, which appears to indicate that some deck officers lack the ability to perform their role under pressure.

The industry should ask itself whether its methods of training and promotion are sufficient to weed out officers who fall short of such requirements.

The Standard Club promotes the use of close observation of officers in an operational setting to ensure they can be effective in all circumstances. There are other ways, including:

- simulation courses which feature carefully structured scenarios designed to test the seafarers' practical skills and adherence to procedures
- promotion systems which emphasise the ability to fulfil the role rather than the level of certification alone. Such systems could include the close observation of officers during a probationary period
- analysis of the VDR data after the ship has passed through a confined/dangerous area such as the Singapore Strait
- reporting and assessment methods which also include the assessment of an officer's confidence, initiative and ability to make decisions under pressure. This would be in addition to the traditional methods of evaluating officers, such as their ability to complete day-to-day tasks
- the promotion of a just culture within the organisation which encourages near-miss reports to be made and seniors to be challenged without repercussions, allowing weak team members to be identified and addressed
- an ongoing assessment by officers of their peers to watch for actions or omissions that could result in a dangerous situation and to report such issues.

Two key themes are apparent when observing deficiencies in routine operations:

- a failure to follow an established procedure
- a failure to maintain best navigation practice.

Conclusion

The maritime industry has made great strides in its pursuit of safety in the last 30 years. Despite these achievements, it still falls short. Advanced equipment and systems have provided measurable successes, but these elements are frequently undermined by poor human performance. If the maritime industry wishes to compete with the aviation industry's safety record, it must solve the human as well as the technical problems it faces.

NAABSA

The Standard Club regularly receives queries regarding NAABSA, its implications for cover and what to consider when putting it into practice.

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What is NAABSA?

NAABSA is an abbreviation for the term:

'Not always afloat but safely aground'

It refers to the practice whereby ships visiting a particular port lie safely aground at low water, rather than remaining afloat with under-keel clearance throughout their visit.

What can go wrong?

Whilst NAABSA is a common occurrence for some ships, there are still risks associated with the operation. For example, damage can happen when the quality of the seabed is right for NAABSA (flat, soft consistency), but there is debris on the seabed. An excellent example of such a claim was the *Charlotte C*, which suffered damage to her hull due to a submerged obstruction that was judged to have probably been a steel coil (steel coils were regularly loaded at the berth). In this case, the port operator was found liable for failing in its duty to keep the allocated berth free from obstructions.

The quality of information relating to the seabed will vary from port to port. In the case of the *Charlotte C*, the master was unaware of the presence of the obstruction and the hazard it posed to the ship. The responsibility to mitigate these hazards may vary depending on the ownership of the jetty. In circumstances where a jetty is privately owned, the responsibility for ensuring that the seabed remains suitable for NAABSA operations may lie with the private owner.

However, it is the member's responsibility to ensure that its vessel is technically suitable to lay aground prior to conducting NAABSA (if never previously attempted).

Mitigation of risk

BIMCO has developed NAABSA charterparty wordings, which may be obtained from its website. BIMCO's approach is to avoid free-standing clauses and instead provide wording that can be added to the berthing provisions in an existing charterparty. Its wordings include the following points:

- the right for charterers to request the ship to lie safely aground for the purposes of loading/discharging operations, subject to the owner's approval
- a qualification addressing the scope of the owner's approval, in the form of an obligation for charterers to confirm in writing that ships using a particular berth can do so safely, ie without suffering damage
- the requirement for charterers to indemnify owners for any loss, damage, costs or expenses, etc that may result from the ship lying aground.

For full details, visit the BIMCO NAABSA charter-party wording page.

Practical advice for masters:

- **Ensure that all navigation charts are up to date.**
- **Ensure that the ship has adequate tidal information in the form of tide tables, etc. This information can be obtained from local sources such as agents if it is not carried on board.**
- **Obtain as much knowledge about the port as possible, prior to arrival.**
- **Check soundings of double-bottom tanks at the times of grounding and refloating.**
- **Engineers to ensure there is no damage to the rudder. This includes checking the bearings distances at the first opportunity.**
- **Check operation of the rudder and rudder angles visually after refloating.**
- **Ensure steering gear is not running when aground.**
- **Be aware of possibility of listing caused by the seabed being not uniformly level.**
- **Include pilots and harbour authorities. Information required by the master includes (but is not limited to):**
  - **the permitted draft whilst alongside**
  - **nature of the seabed at the exact berth the ship will be visiting**
  - **details of any obstructions that may pose a hazard to the ship**
  - **loading and discharge rates of the facilities that will be visited**
  - **the strength of the bollards at the berth.**

Conclusion

For many shipowners/operators NAABSA can seem an unnatural operation, when one considers the time and effort devoted to trying to prevent the vessel from making contact with the seabed during normal operations. However, like all maritime activities, the hazards can be mitigated with a proper assessment of the risks and thorough preparation. The master must consider the state of the vessel, local tidal conditions and the hazards presented by the seabed in the vicinity of the berth, including the age and accuracy of the local survey data, to ensure success.

Safety awareness whilst performing routine tasks

Over recent years, many changes have taken place in the workplace to increase the safety awareness of both employers and employees. However, incidents still occur, due to crew complacency and error.

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The impact of ISM

The introduction of ISM in 1994 into the maritime industry has increased safety standards immeasurably. Companies have effectively implemented the key objectives of ISM to increase safety on board ships, notably:

- the implementation of safe working practices and working environment
- the establishment of suitable safeguards against identified potential risks
- a proactive approach to the continuous improvement of the safety management skills of personnel, including emergency response plans for both safety and environmental protection.

The implementation of the basic five-steps rule when approaching any task has also significantly improved the general safety culture. Companies tend to create their own individual procedures, whilst retaining the basic elements:

1. **Stop** – Think and understand what is involved in carrying out any individual task.
2. **Look** – Identify any hazards.
3. **Assess** – Identify what damage could be caused by these hazards.
4. **Manage** – Implement safety measures/ controls, ensure that all persons involved in the task understand the work scope, what hazards are present and what safety measures are in place.
5. **Safely** – Complete the task in a safe manner then assess the work process used to identify any areas of improvement considered appropriate (lessons learnt) to develop best practices.

However, whilst there is a high level of compliance with company safety procedures when performing high-profile tasks, this same safety awareness does not seem to be as prevalent when crews are completing tasks considered routine or mundane. The Standard Club believes a general complacency amongst crews leads to a loss of perception of the risks involved, leading to the bypassing of company safety procedures. Consistently following the five-steps rule for every task will help identify the hazards present and prevent potential incidents.

Case Study 1

A recent claim case, briefly described below, clearly identifies where a potential case of complacency and failure to follow company procedures whilst performing a routine maintenance task led to personal injury.

Background

A junior ranking engineer suffered second-degree burns to his arms and legs whilst attempting to tighten down the gland packing of a boiler feed water valve. The boiler was still in operation at the time and associated pipelines/systems were still pressurised. It was reported that this action had not been discussed with senior engineers, and no job-specific toolbox meeting had been held nor had the matter been identified during previous routine toolbox meetings. No risk assessment was undergone for this task.

The investigation report highlighted that the gland bridge had previously been tightened down unevenly, which had resulted in the packing material not being compressed properly allowing leakage past the valve stem/packing. As the junior engineer started to tighten down on the gland nuts, there was a substantial leakage in way of the gland bridge and valve stem. Due to restricted access, the engineer had chosen to squat around the valve, thus the resulting leakage caused extensive burns to his legs and arms.

Lessons learnt

In this particular case study, if the five-steps rule had been followed and the company's safe working practices complied with, including a toolbox meeting with risk assessment, then potential hazards would have been identified. By utilising the knowledge and experience of the senior engineers on board, the extra precautions needed would have been highlighted, which could have prevented the incident.

A proper evaluation of the task would have identified: the need for the immobilisation of the boiler unless secure/tight double-valve segregation could be assured; the need to depressurise/drain the associated pipeline/system; the requirement for appropriate PPE; and the need for an evaluation of the valve position/location in order that the safest, most suitable work position could be found to complete the task. A full risk assessment would have been created to ensure all hazards had been identified and suitable safety processes/measures put in place.

This is a prime example of complacency overruling the ship's safety culture and company procedures because the task was considered to be routine and relatively mundane.

> The lessons learnt from this case study reinforce the need for safety awareness by all seafarers whenever approaching a task however big or small it may be.

Case Study 2

Another recent claim, briefly described below, clearly identifies where failure to ensure that all equipment is regularly inspected and maintained in safe full operational status can lead to a personal injury. This case study also highlights the safety requirement to carry out a toolbox meeting prior to commencement of any task.

> A review of PSC inspection records shows that failure to maintain the full operational status of lifesaving and firefighting equipment through scheduled or routine inspections and maintenance remains one of the most frequent, repeated defects or observations recorded during PSC inspections worldwide, on all types of vessels.

Background

The incident took place during night-time cargo operations, in intermittent light rain. The ship's crew had installed portable halogen lights to assist stevedores unlashing containers and had been requested by the stevedores to relocate them as work progressed. A stevedore, instead of waiting for the ship's crew, attempted to move one light while it was still connected to the power supply. The casing of this particular light was damaged and the cable connection had a temporary taped sealing arrangement. Rain had leaked into the light resulting in the stevedore receiving an electrical shock. Fortunately, the shock was not fatal and the stevedore was released from hospital after 24 hours, but he experienced chest pains for some time afterwards. After the event, the stevedores' management company held a toolbox meeting and confirmed that its personnel would not have been expected to move any portable lighting equipment and should have waited for crew instead. The incident investigation established that there was no inspection/maintenance schedule in place for this type of equipment, only an inspection by the ship's crew prior to use.

Lessons leant

This case study highlights the importance of keeping inspection and maintenance registers on board all ships. A suitably qualified person in charge must ensure that any damaged appliances are either repaired or withdrawn from service and replaced. It is not adequate to simply rely on quick inspections prior to use by unqualified crew members.

Additionally, a toolbox meeting should be held with shore workers prior to the commencement of cargo operations to agree who is responsible for relocating the portable lights and the correct operating procedures (eg disconnection from power supply prior to moving). If that meeting had taken place in this scenario, it is reasonable to assume that the injury would not have occurred.

Conclusion

There can be no doubt that there have been significant improvements in safety awareness amongst seafarers over recent years. However, injuries are still occurring, and they are particularly prevalent when crews are carrying out routine tasks. The Standard Club believes this is mainly due to complacency overriding a seafarer's compliance with company ISM procedures. Regular, comprehensive safety training courses should highlight this issue and reinforce the necessity to follow safe working procedures at all times, however big or small the task is. By this continued emphasis on maintaining a strong safety culture and awareness on board when approaching and performing all tasks, there should be further reductions in both the frequency and severity of injuries associated with completing routine tasks.

MARPOL Annex VI – emission control measures approved and adopted during the recent MEPC meetings

MARPOL Annex VI covers regulations to control emissions from ships that present major risks to both the environment and human health. This article looks at the amendments that have been adopted recently.

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Introduction

Regulations governing emissions from ships are included under MARPOL Annex VI. In 2008, the International Maritime Organisation (IMO) adopted amendments to this Annex which enforced a gradual reduction of the sulphur content of marine fuels.

2020 global sulphur cap

The IMO's Marine Environment Protection Committee (MEPC) took several key decisions during its 70th session in October 2016 to enforce stricter air emission controls under MARPOL Annex VI. This decision was reaffirmed by MEPC during its 71st session in July 2017; and in order to guarantee consistent and effective implementation, it was agreed to include consideration on any transitional technical and safety issues in the IMO's Pollution Prevention and Response (PPR) subcommittee agenda for 2018-2019.

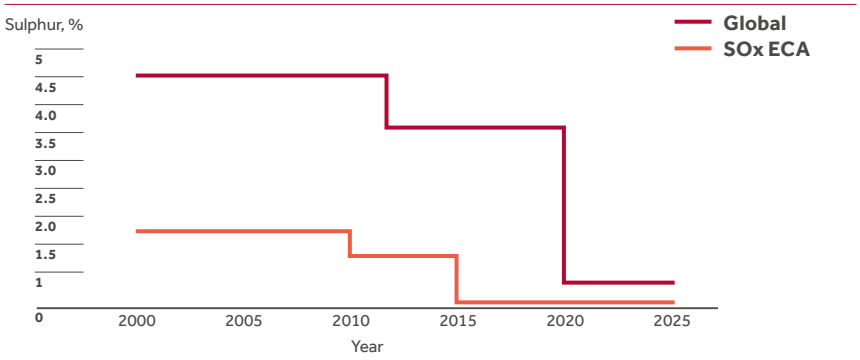
One such decision was the setting of a global sulphur cap of 0.5% on marine fuels starting from 1 January 2020. This represents a significant cut from the 3.5% m/m global limit currently in place and falls in line with the mandatory 0.5% sulphur cap for all EU waters (outside the North Sea and Baltic Sea, which are designated as Sulphur Emission Control Areas (SECAs)) in accordance with the EU Sulphur Directive adopted in 2012.

This includes the fuel used in main and auxiliary engines and boilers. The regulations provide exemptions for situations involving the safety of the ship or saving life at sea, or if a ship or its equipment is damaged.

Apart from the ship operators, the decision will also impact oil producers, refiners and bunker suppliers, which will need to ensure availability of sufficient quantities of compliant low-sulphur fuel oil. The 2020 date was subjected to a feasibility review to ensure that sufficient compliant fuel oil would be available to meet the fuel oil requirements.

Now that the 2020 date has been confirmed, it is imperative that the industry starts preparing for implementation without delay.

There is no doubt that this decision will have a profound implication for shipping economics. The purchase price of low-sulphur compliant fuel was not reviewed within the mandate of the MEPC's decision.



Implementation options for shipowners and operators

To meet the requirements, ship operators will face a choice of switching their ships to low-sulphur compliant fuel oil, retrofitting ships to use alternative fuels such as LNG/methanol or installing approved scrubber systems which will clean the emissions before they are released into the atmosphere. Decisions should be made on the basis of ship type, ship size, trading pattern and sustained fuel availability. If opting for a retrofit solution, it is also vital to consider the complexity of installation, possible off-hire and the remaining life of the ship. Some ships may instead be sent for early recycling.

Option 1 – switching ship to low-sulphur compliant fuel oil

While switching over from residual heavy fuel oil (HFO) to distillate (diesel) fuel is the simplest option, the availability of this fuel could be an issue. Even though the IMO reckoned the availability of low-sulphur fuel to be sufficient, there is no universally accepted refining method for producing a 0.5% sulphur fuel. It is expected that the market for these fuels will be fragmented. There could also be uncertainty in regards to the quality of the compliant hybrid fuels as blended products. In particular, they may not be reliably stable or may be incompatible with other fuels.

Option 2 – installing approved scrubber systems

Scrubber technology is a very popular solution and is suitable in most cases for retrofitting existing vessels as well as for new builds. It allows ships to continue burning high-sulphur fuel oil and has the potential to meet both the 0.5% and 0.1% criteria. There are two technologies available today: dry and wet systems. The wet systems are by far the most predominant.

However, for existing ships, even though no changes will have to be made to the engines or fuel treatment plant, there will be a significant upfront investment for the installation of the exhaust gas cleaning plant, and there will also be operational expenses related to increased power consumption, the need for chemical consumables and sludge handling. The return on investment can only be determined over time, with knowledge of the price differential between high-sulphur fuel oil and 0.5% sulphur bunkers.

Option 3 – retrofitting ships to use alternative fuels

Alternative fuels such as LNG and methanol are rapidly emerging as the favourable option for the shipping industry (particularly for new builds) as they significantly lower the environmental impact, eliminating SOx and PM emissions, and reducing NOx emissions by 80% and CO_2 emissions by 20%. However, this is a relatively new solution, and the supply infrastructure (bunkering facilities) is currently limited. It also involves large capital expenditure upfront, complex crew training considerations and, due to the comparatively larger fuel tanks, may mean a reduction in the cargo-carrying capacity of the ships.

Onboard verification of fuel sulphur content

It is not presently clear how the global sulphur cap will be enforced. However, MEPC 71 has tasked its Sub-Committee on Pollution Prevention and Response (PPR 5) to consider fuel sample verification procedure as a part of the 2020 low sulphur fuel implementation action plan. In current Emission Control Areas, the PSC usually checks the relevant documentation and may carry out spot sampling and analysis of fuel.

Transport Canada issued a Ship Safety Bulletin No. 08/2016 in August 2016, informing that the PSC may request a ship's fuel samples during routine inspections and will use portable analysers to check the fuel sulphur content.

Danish authorities monitor compliance by not only taking fuel samples from ships calling at Danish ports but also from the air using a 'sniffer' detector installed underneath the Great Belt Bridge.

The Paris MOU has confirmed that its concentrated inspection campaign (CIC) on MARPOL Annex VI will take place in 2018.

The MEPC-70 approved guidelines for onboard sampling for the verification of the sulphur content of the fuel oil used on board ships and subsequently issued MEPC.1/Circ.864 in December 2016.

These guidelines set out an acceptable sampling method from a designated sampling point(s) that is readily and safely accessible, downstream of the in-use fuel oil service tank and as close as safely feasible to the fuel oil combustion machinery (shielded from heated surfaces or electrical equipment), taking into account different fuel oil grades, flow-rate, temperature and pressure behind the selected sampling point.

The IMO guidelines also draw attention to the importance of only taking the fuel oil sample once a steady flow is established in the fuel oil circulating system as well as thoroughly flushing through the sampling connection with the fuel oil in use prior to drawing the sample.

Members are recommended to refer to the IMO guidelines to update their fuel oil sampling procedures to ensure that samples can be drawn safely from the ship's fuel service system when such sampling is requested by a PSC officer.

It is vital that the shipboard team is aware of the above requirements and is familiarised with the ship-specific system.

For ships not fitted with a dedicated/approved sampling point, it is recommended to check and propose a location for sampling in compliance with these guidelines and in accordance with Class rules.

The collected samples are required to be properly sealed and labelled. The sample bottles should be retained on board the ship for a period of not less than 12 months from the date of collection.

Mandatory data collection system for fuel consumption of ships

Another significant decision taken during the MEPC-70 was adopting amendments to MARPOL Annex VI, Chapter 4 for mandatory fuel oil consumption data collection and reporting. A new regulation 22A in MARPOL Annex VI was adopted, which requires ships to collect and report data on their fuel consumption, starting from 1 January 2019 (Res.MEPC.278(70)).

Under the global data collection scheme, ships of 5,000gt and above will be required to collect consumption data for each type of fuel they use as well as data regarding the energy efficiency of ships (such as distance travelled, service hours at sea and the cargo capacity for cargo ships).

The aggregated annual data will need to be submitted to the flag state in standardised format after the end of each calendar year, via a methodology to be included in the Ship Energy Efficiency Management Plan (SEEMP).

Upon verification of the submitted data, the flag states (or recognised organisations on behalf of flag states) will issue a statement of compliance to the ship. The guidelines on how the flag states will verify the reports was finalised at the MEPC-71 in July 2017 (Res.MEPC.293(71)).

Flag states will be required to subsequently submit this data to the IMO, which will maintain an anonymised ship fuel oil consumption database and produce an annual report to the MEPC summarising the data collected.

These requirements will enter into force on 1 March 2018, with the first reporting period being for the 2019 calendar year.

This requirement is in line with the EU data collection system adopted in 2015 (MRV Regulation), which applies to ships above 5,000gt, regardless of their flag, calling at EU ports from 1 January 2018 onwards.

Members will need to start developing a method for the collection of fuel oil consumption data that is most appropriate for each ship and update the SEEMPs of their ships to reflect this process.

Club cover

There is a global drive towards cleaner energy, and shipping is at the forefront. The key to environmental compliance in accordance with MARPOL lies in embracing these requirements within the core culture of the shipping company and ensuring effective implementation both on board and ashore.

Members are reminded that club cover for fines arising from breaches of low-sulphur fuel regulations and other MARPOL violations is strictly discretionary. The board is entitled to take into consideration the zero-tolerance attitude towards reimbursement of liabilities and fines for environmental offences, save in the most exceptional circumstances.

The Standard Club's PEME scheme – an update

The Standard Club's PEME scheme has now been in operation for 19 months. This article looks at the lessons learnt.

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PEME so far

The Standard Club's enhanced pre-employment medical (or PEME) scheme was developed to improve vessel safety, reduce the number of claims related to preventable illnesses and ensure that seafarers have full awareness of their own medical status.

The scheme now covers 15 clinics, conducting around 400 examinations per month. Whilst the primary aim of the scheme is to prevent seafarers from obtaining employment without their full medical status being known to the shipowner, a secondary outcome is to provide the club with data allowing greater insight into the challenges facing members and the types of conditions that render seafarers unfit. With the second year of the scheme now well under way, this article examines the scheme's first year and discusses some of the insights gained.

Lifestyle is key

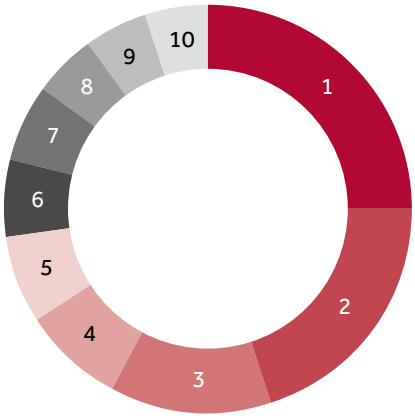
The loss prevention department has conducted an analysis of the data generated by the scheme. Of most interest were the reasons for failure and demographic trends. In the first year of the scheme 2,004 seafarers were examined and of those 128 were deemed unfit to serve at sea based on the enhanced PEME standards.

This figure equates to just over 6% of the total number of seafarers examined. The conditions that prompted the failure of these seafarers were identified and examined by Medical Rescue International.

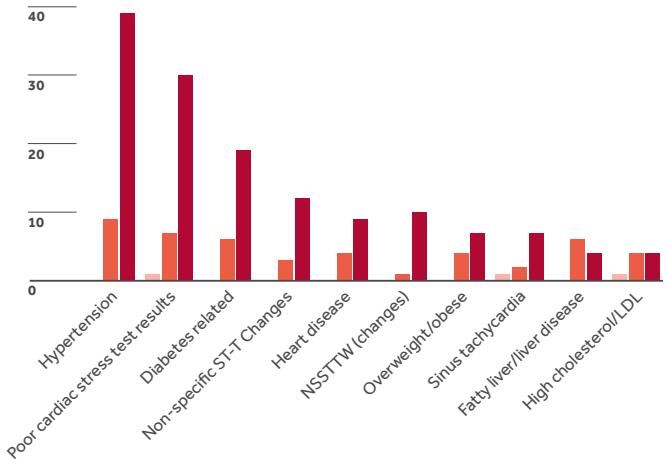
The most common causes of PEME failure were hypertension, poor cardiac stress test results and diabetes. It is commonly accepted that these conditions are linked to the diet and lifestyle of an individual. As a result, previous articles in Standard Safety have looked at how to avoid these conditions.

The data was also examined for trends relating to rank/rate and age. The analysis of age trends shows that the age 46+ group dominates nearly every category, with the exception of fatty liver/liver disease and high cholesterol/LDL. These findings indicate a clear link between age and illness risk amongst seafarers, and demonstrate the need for greater monitoring of seafarers who fall within this age category. Also, since these conditions are linked to lifestyle, they highlight the importance of current initiatives to improve and maintain the health of today's fit young seafarers so that they do not face these risks later in life.

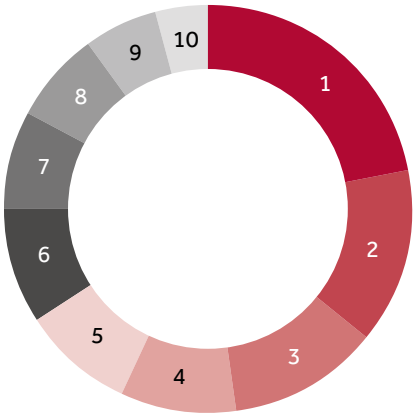
Top 10 causes of PEME failure



1	Hypertension	25%
2	Poor cardiac stress test results	20%
3	Diabetes related	13%
4	Non-specific ST-T Changes	8%
5	Heart disease	7%
6	NSSTTW (changes)	6%
7	Overweight/obese	6%
8	Sinus tachycardia	5%
9	Fatty liver/liver disease	5%
10	High cholesterol/LDL	5%



Top 10 ranks/rates PEME failures



1	Able Seaman	22%
2	Chief Cook	14%
3	Oiler	12%
4	Chief Engineer	9%
5	3rd Engineer	9%
6	Bosun	9%
7	Ordinary Seaman	8%
8	Master	7%
9	Cook	6%
10	2nd Engineer	4%

Ranks/rates/departments

When the statistics are examined for rank/rate and departmental trends, there are several interesting observations to highlight.

Firstly, able seamen account for the largest number of PEME failures, whilst chief cooks are the second largest, despite having fewer onboard numbers than some of the other rank/rate categories.

Secondly, deck officers accounted for only 7% of the total, whilst engineer officers accounted for 22%, of which 9% were chief engineers. Chief engineers, like chief cooks, are a smaller group so appear to be over-represented in the data.

Overall our PEME failure data appears to indicate trends with specific ranks and departments on board ships. At the moment, we have not established the reasons for these trends. The high proportion of engineers is worthy of investigation and we will be monitoring this trend to determine if it continues into year two.

Conclusion

The model of PEME scheme operated for this last year has proven to be highly successful, and four additional clinics have now been added to the scheme. This expansion will provide greater capacity, flexibility and freedom of choice for our members. The expanded list of clinics can be found on our website.

The scheme has proven itself to be adaptable, cost-effective and able to withstand surges in demand from members. It continues to reduce the risk of personal illness claims for participating members. Whilst we cannot place an exact figure on the number of claims prevented by the seafarers who were identified as being unfit for sea service, we can say with some certainty that their presence on board a vessel whilst unfit would have presented significant risk of a claim, repatriation or other operational disruption to our members.

Hernias – what they are and how to detect and prevent them

Hernias are dangerous, but they can be treated or prevented by taking the correct action. This article explains how to identify, treat and prevent hernias.

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What is a hernia?

Many structures of the body (including the brain) are vulnerable to herniation, although hernia most often refers to bulges in the lower torso involving the abdominal wall.

Hernias occur when the contents of a body cavity bulge outward from their normal location. Such contents may include portions of intestine or abdominal fatty tissue enclosed in a membranous lining.

While hernias are often relatively harmless, they carry risk of complication, particularly should the blood supply to the contents of the hernial sac be cut off – a so-called strangulated hernia.

What causes a hernia?

Conditions that increase the pressure of the abdominal cavity may contribute to producing a hernia (or worsening an existing hernia). Some of these include:

- obesity
- heavy lifting or any other intense straining of the abdomen
- coughing, particularly chronic (as with smokers)
- straining during a bowel movement or urination
- chronic lung disease
- pregnancy
- fluid in the abdominal cavity
- family history of hernias.

Signs and symptoms

A swollen protrusion of tissue, particularly one causing pain, may indicate a strangulated hernia, a serious condition requiring immediate medical care.

General signs and symptoms of hernia include:

- a lump in the groin or other abdominal region sometimes preceded by aching or pain
- pain increasing during coughing
- bowel obstruction, nausea and vomiting
- reddish, tender area of the abdomen
- burning sensation in the abdominal or scrotal region
- increased pain from long periods of standing up.

While some hernias resolve themselves, surgery is often required to repair the hernia.

Hernia is a general term referring to a condition that can appear in various parts of the body. The most common hernias develop somewhere in the abdomen. They are caused by a weakness in the abdominal wall, which allows a hole to develop.

Treatment

It is important to treat hernias, since they can worsen to more serious and even life-threatening medical conditions when left untreated.

Hernia surgery involves an incision at the hernial site after which the surgeon will either move the protruding contents of the hernia back into the abdominal cavity or remove the contents altogether. The latter option may be used in cases where the intestines are strangulated. Following repair, the weakened tissue that contributed to the development of the hernia will be closed and reinforced with stitching or (in the case of larger hernias) synthetic mesh.

Light activities can often be resumed within days of hospital release, but strenuous activity must be strictly avoided until healing is complete. In most cases, this requires six to eight weeks.

Prevention

Lifestyle modifications, such as exercise, diet and maintaining a constant healthy weight, can help prevent hernia formation.

Toned muscles

Since hernias form where the muscle tissues are weak, toning organ-supporting muscles, such as the abdominal muscles, can help prevent hernias.

Fibre-rich diet

Diets high in fibre-rich foods can help prevent abdominal hernias by alleviating constipation, which is one of the causes of increased internal body pressure. These include beans, lentils, vegetables, and whole grain and bran products such as cereals.

Constant, healthy weight

Maintaining a healthy body weight and BMI avoids obesity, which is one of the culprits in hernia formation. Since frequent and drastic weight fluctuations also lead to weakened muscle tissues, it is also advisable to keep a constant weight as a preventative measure. Exercise and a good diet can help maintain a constant, healthy weight.

Avoiding or managing the effects of heavy lifting

Individuals whose jobs require constant heavy lifting (or who are involved in recreational weightlifting) should consult a doctor on preventative measures to decrease the risk of hernias, since these people are constantly at risk for elevated internal pressure build-up and muscle tissue strains.

Some practical advice for prevention:

- **Warm up properly before athletic activity and exercise.**
- **Strengthen abdominal muscles with strength exercises.**
- **Rest properly after vigorous exercise, particularly lifting.**
- **Quit smoking, as coughing can contribute to hernia development.**
- **Eat a high-fibre diet to avoid constipation.**
- **Maintain a healthy weight.**
- **Incorporate some stretching and flexibility exercises into your exercise routine.**

Web alerts The Standard Club issues a variety of publications and web alerts on topical issues and club updates. Keep up to date by visiting the news section on our website www.standard-club.com

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