

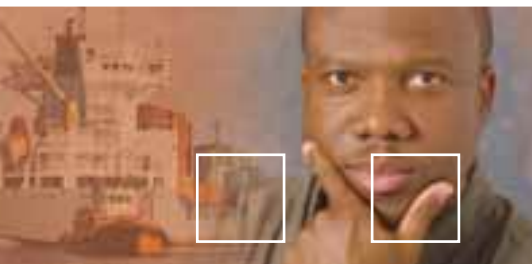


The International Maritime Human Element Bulletin

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Alert!



One hand for the ship ... and one for yourself

There is much documentary evidence to suggest that slips, trips and falls account for a high percentage of occupational accidents onboard ship.

This is not surprising, given the environment in which those who work aboard ships operate: a floating platform that is susceptible to pitching and rolling movements; wet and slippery deck surfaces; cavernous (and often poorly illuminated) compartments and tank spaces; high masts, funnels and bulkheads; moving objects such as cranes, derricks, davits and hatch covers; and the presence of a variety of oils and greases.

The shipowner/shipmanager has a duty to ensure that the hazards that can be faced by those who work aboard ships are reduced to a level that is 'as low as reasonably practical'. Yet, many a seafarer has a tale to tell of some design weakness that has led someone to fall or trip. And, there are a number of accident reports which tell of a crewmember, stevedore or shipyard worker who has fallen from a mast, ladder or platform.

It is so easy to attribute such accidents to 'human error' either due to a lapse in procedure, or 'poor housekeeping' poorly maintained PPE, a failure to read a warning notice, or simply because that person has not applied the adage of 'one hand for the ship and one for yourself'. But, perhaps had a little more thought been given to 'designing out' these hazards at the design stage, then some of them may not have occurred.

There can, of course, be flaws in the best of design solutions, some of which cannot be detected until the build stage, or even after the ship has entered service. It is nevertheless important that

potential hazards should be identified during design. This is where the operational experience of the seafarers and the expert knowledge of a Human Factors specialist, both at the design stage and during build, can be exploited to spot the various hazards that can bring about slips, trips and falls.

The shipowner/manager should also bear in mind that these design solutions must be kept under review throughout the lifecycle of the ship.

But, there is not a 'design' solution for every single hazard. It is therefore important that those who are working aboard ship comply with appropriate safety regulations and codes of safe working practices, follow the correct procedures, and wear the appropriate PPE.

They should take 'seaman-like measures' to ensure their own safety and the safety of others by, for example: cleaning up spills as soon as they occur; avoiding the need for trailing wires and cables; not leaving stores, equipment and garbage lying around the decks; properly securing the ship for sea; rigging temporary guardrails around openings in the deck; ensuring that gangways are properly secured and are fitted with safety nets; rigging upper deck safety lines in rough weather; and providing extra lighting when needed.

Safety information should be provided through bulletins, safety alerts and posters; regular safety inspections should identify slip, trip and fall hazards; 'unavoidable' hazards should be clearly marked and warning signs posted; and regular safety training should be conducted.

Whatever, the adage of 'one hand for the ship and one for yourself' will still apply!



Through the **Alert!** Project, we seek to represent the views of all sectors of the maritime industry – contributions for the Bulletin, letters to the editor and articles and papers for the website database are always welcome.

The Editor

Alert!

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2 Matters of perception

Dr Nicholas Bailey, Lloyd's Register Educational Trust Research Unit, Seafarers International Research Centre (SIRC) Cardiff University

The hazards faced by those who work aboard ship are many. These may be due to the particular operations being undertaken or simply from living and working aboard a moving platform. Even with the introduction of ISM and procedures to manage risk, people continue to get hurt aboard ships.

To try and better understand the situation the Lloyd's Register Educational Trust Research Unit at Cardiff University has been undertaking research into safety and perceptions of risk. From our investigations, we found that seafarers and managers perceived 'working in a hot environment' overall to be the most likely cause of injury. Less surprisingly, this was very closely followed by 'handling, lifting or carrying' and 'slips, trips and falls'. This raises the question, if everyone is aware of such risks, why do incidents still occur?

The problem is it is not enough to simply be aware that something may cause harm. All behaviour is performed by individuals in a particular place and

context. As research has shown, people behave differently depending upon the circumstances and how they see the situation. For instance, our research showed that factors like an individual's position in the company (on the ship) and nationality tends to influence the way in which they view different risk factors; with different ranks, nationalities being more aware of, sensitive to, certain risks than others. This presumably relates to their personal experience, education and a range of other social and cultural factors.

Equally important however is the particular situation at the time. For instance, if someone is feeling pressured or rushed, then this may influence how they see the situation and how they behave; be it a captain in poor visibility trying to make a tide or a rating suddenly told that the pilot ladder needs to be placed on the other side of the ship. The result can be imprudent rushing and a focus on the need to get things done. It is at this point that rules and procedures

tend to be forgotten, and slips and trips occur. Even if not under immediate direct pressure, if someone is worried about getting a bad report or keeping their job, then they are less likely to challenge or question an instruction and may equally be more inclined to take risks to get jobs done.

It could be argued that there will always be individuals who manage to hit themselves when using hammers, slip on wet decks when in a hurry or otherwise injure themselves. But surely, if the workplace can be made safer through improved design, the implementation of appropriate procedures or improved awareness and understanding, that can only be to the good?

For further information about SIRC and the LRETRU go to: www.sirc.cf.ac.uk

Perceptions of risk in the maritime industry: Downloadable from: www.he-alert.org/documents/published/he00690.pdf; www.he-alert.org/documents/published/he00670.pdf

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What's new...

New International Medical Guide for Ships

A new edition of the International Medical Guide for Ships has been published by the World Health Organization (WHO). The new Guide upholds a key principle of the Maritime Labour Convention, 2006: to ensure that seafarers are given health protection and medical care no less favourable than that which is generally available to workers ashore, including prompt access to the necessary medicines, medical equipment and facilities for diagnosis and treatment and to medical information and expertise.

For further information go to: www.who.int/publications/en/

Paris MOU and Tokyo MoU reports on Concentrated Inspection Campaign on ISM Code compliance

The Maritime Authorities of the Paris MoU and the Tokyo MoU have reported the results of their concentrated inspection campaigns which focused on compliance with the ISM Code.

Of 9521 vessels inspected during the period 1 September to 30 November 2007, 284 were detained as a direct result of the campaign. Both groups report that the ISM system is starting to work onboard ships and that shipowners and crews understand the system and implement it. For further information go to: www.parismou.org or www.tokyo-mou.org

Working Together for Safety on Board

The International Transport Workers' Federation (ITF) has rolled out a new onboard safety film. The 20 minute multi-language DVD has been designed to support and equip onboard safety representatives and is being distributed by ITF inspectors as well as being offered to ship operators to show on their vessels. Called *Working Together for Safety on Board*, the DVD sets out the safety structure laid out by the ISM Code and ILO Maritime Labour Convention, and the role of the on-vessel safety representative within it. It is aimed at seafarers of all ranks and comes with a number of language options as standard.

For further information go to: www.itfglobal.org

Using good design practice to reduce slip, trip and fall accidents

Nicolas MERY, Bureau Veritas Marine, Risk Sustainability and the Human Element section
Dr. Marc LASSAGNE, Arts et Metiers Paristech
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Slips, trips and falls (STFs) are the leading causes of injuries for personnel working onboard commercial ships, sometimes even resulting in death. In addition to their human cost, STFs can also lead to significant expenses for shipowners, P&I clubs and insurance companies. Reducing their occurrence is therefore of paramount importance.

Bureau Veritas (BV) has developed guidelines to improve ship design by taking STF prevention into account as early as possible in the process. The later STFs are addressed in the design process, the higher the cost of their prevention will be. BV also wishes to reduce the STF risks that its own surveyors are exposed to when inspecting vessels by fostering better practices in shipbuilding with regards to the prevention of STFs.

The first step was an analysis of the design of means of access onboard for inspection (as in IMO and IACS recommendations), maintenance and operations. A specific methodology was developed so that means of access should be designed to fit the physical capabilities of the seafarers and surveyors who will

use them, and to capture feedback from seafarers and surveyors who use them to improve future designs. Involving the users in the design process is a well-known but not so often applied principle of ergonomics preventing suitability issues between the human-machine interfaces and their operators.

Surveyors were interviewed and questionnaires were used to get their feedback about the way they assess the occupational risks associated with the means of access they use. The surveyors were also asked to suggest ideas for the improvement of the means of access. Next, an anthropometric analysis was carried out to determine the various structural dimensions required for a safe design of the means of access.

This analysis consisted of fitting the means of access to both the physical dimensions of the users and the task they have to carry out (e.g. climbing up a ladder wearing a boiler suit and breathing apparatus). A systematic analysis of the most important means of access (ladders, stair ladders, horizontal and vertical openings, and walkways) was performed. Some of the



best practices that have been proposed by the seafarers as well as some of those sometimes encountered onboard commercial vessels were also analysed.

BV is about to publish a guidance note addressed to the various stakeholders involved in ship design, particularly shipyards and shipowners, which will significantly reduce the risk of STFs.

The next step in BV's strategy for the mitigation of occupational accidents is the development of a set of ergonomics-based guidelines for the design, layout and arrangement of machinery spaces.

For further information contact: risk_engineering_research@bureauveritas.com



'Ships are inherently dangerous places'

Mat Spencer
Health, Safety, Environment, & Quality Manager
Wilhelmsen Lines Car Carriers

Crews who are familiar with their surroundings throughout the ship continue to suffer injuries from slips, trips and falls. Perhaps this is an extension of the problem regularly highlighted in accident investigation reports - complacency not just in watch keeping terms but in general behaviour around the ship.

There is a plethora of advice and guidance from various sources, yet slips, trips and falls still occur. In the majority of instances the literature details how to assess and mitigate the risks, create safe systems of work, monitor and review performance and complete the loop. All good HSEQ stuff - but is this really effective or good enough, such that the number of slips, trips and falls will decrease?

New builds can inherit existing ergonomic issues. A series of sister ships may have few changes approved as the costs may be deemed prohibitive, but at what personal cost to the crew and to the company? From

the outset of design and construction, consideration should be given to past events and occurrences. Input from shore managers can provide statistical data, and practical experiences from the end user can be recorded and considered. But, does it really happen and why do we seem to re-invent the wheel every time?

Human behaviour is by far the most important factor and the most challenging to get right. We can have the highest quality procedures and risk assessments known to man but if they are gathering dust on a shelf in the ship's office, and without a positive and inclusive attitude across the whole company, a reduction in the number of slips, trips and falls will never be achieved.

The belief in any Safety Management System (SMS) must come from the highest positions in the company and crews must be able to experience that for themselves,

by personal interaction, not just from email addresses issuing instructions. A better understanding must be imparted through quality training and regular refreshment of that training in a varied and non monotonous way.

Shore managers need to spend time with crews, forming professional relationships and empowering them to have a belief and a definite contribution to the safety aspects that they are affected by every day. Explanation and education of the reasons for checking and auditing is a part of the improvement process from which they will benefit. Without this personal, face to face relationship there can be little chance of any SMS being fully understood or complied with.

It's all about getting out and about with crews, leading by example and instilling belief and inclusion instead of letting apathy and complacency prevail.

Mitigating slip, trip and fall hazards

Design

- Accessible anchorages for scaffolding and fall arrest systems
- Adequate handrails on bulkheads and platforms
- Adequate lighting
- Anti slip deck surfaces
- Arrangements for barriers
- Avoid vertical ladders as primary means of escape
- Climber safety rails
- Collapsible masts for maintenance of equipment
- Control panels and displays at ground level instead of at heights
- Deck and other edge protection
- Design to minimize need to go aloft
- D-hole connectors in tanks
- Employ the operational experience of seafarers
- High coefficient of friction treads for ladders
- Ladders and access points to be away from edges or protected by guard rails
- Ladders and safety rails built into systems
- Long life coatings and extended maintenance periods for confined spaces
- Make stairs uniform throughout the vessel
- Personal fall arrest systems
- Place sensors and controls outside tanks
- Provide bolt down guards for unguarded openings
- Provide for rough weather lifelines on upper decks
- Provide handrail extensions that can be collapsed when hatches are closed
- Provide secure handrails at tops of ladders
- Replacement of scaffolding with mobile lifts where feasible
- Robotic inspection devices for fuel tanks
- Safe means to raise tools and equipment to elevated work platforms
- Seek advice from Human Factors specialist
- Stowage for loose objects
- Walkthrough of traffic and escape routes



Slips, trips and falls account for the majority of occupational accidents aboard ship. This feature lists some of the hazards that can be faced, and offers some ideas as to how to mitigate them. Wherever possible, the aim should be to 'design out' these hazards. Any such design solutions must be kept under review throughout the lifecycle of the ship.

In service

- Clean up spills
- Comply with Codes of safe working practices
- Conduct regular safety briefings
- Conduct regular safety inspections
- Conduct regular safety training
- Conduct table top exercises of lessons learned
- Do not leave equipment, stores lying around the decks
- Ensure proper stowage of stores & equipment
- Erect safety rails
- Follow safety procedures
- Follow the principle of 'one hand for the ship and one for yourself'
- Mark unavoidable tripping hazards
- Post safety notices
- Provide extra lighting when needed
- Rig upper deck safety lines in rough weather
- Use personal fall arrester systems
- Wear correct personal protective equipment (PPE)
- Wear lifejackets when working in the vicinity of ship's side
- Wear safety harness when aloft



Falls

- Corroded ladders
- Deck Openings and Edges
- Inadequate anchorages or tie off points for fall arrest gear
- Improperly secured gangways
- Inadequate guardrails in confined spaces, tanks & voids
- Inadequate scaffolding
- Inattention
- Lack of guardrails, chain or man ropes at hatch openings
- Loss of balance
- Poor illumination
- Poor ladder or handrail design
- Poor traction
- Removed engine room plates
- Shaky ladder or a ladder with slippery or broken rungs
- Slippery surfaces
- Striking by moving equipment
- Uneven surfaces
- Unguarded openings
- Unguarded ladders or platforms
- Unstable work surfaces
- Vertical unprotected ladders
- Working over the side or aloft

Build

- Employ the operational experience of seafarers
- Seek advice from Human Factors specialist
- Ensure unguarded openings are properly guarded
- Ensure gangways are properly secured
- Ensure all handrails are secure
- Ensure ladders (portable or fixed) are properly secured
- Ensure scaffolding is properly secured and guardrails fitted
- Post safety & warning notices
- Mark all tripping hazards
- Conduct regular safety inspections
- Wear correct personal protective equipment (PPE)



Slips

- Inappropriate footwear
- Inattention
- Loose/unanchored/unattached rugs & mats
- Oil & grease
- Polished deck surfaces
- Wet or slippery decks
- Worn non skid areas

Hazards

Trips

- Loose fittings on stairs
- Carrying of stores/equipment obscuring view
- Changes of deck level
- Cleats, bitts, pad eyes and other fittings at deck level
- Door sills
- Frayed rugs/carpets
- Inadequate handholds
- Inadequate slip resistance
- Inappropriate footwear
- Inattention
- Insufficient illumination,
- Loose or no handrails or stair rails
- Miscellaneous rubbish around decks, eg plastic bags
- Sloping decks
- Smoke/steam obscuring view
- Trailing wires and cables and hoses
- Uneven surface or steps
- Unmarked deck fittings

Maintain

- Retrofit fall arrest systems, climber safety rails etc
- Review adequacy of lighting
- Renew anti slip deck surfaces
- Repair deck and other edge protection
- Renew friction treads for ladders
- Replace corroded/broken ladders & handrails
- Retrofit bolt down guards for unguarded openings
- Ensure unguarded openings are properly guarded
- Ensure gangways are properly secured
- Ensure all handrails are secure
- Ensure ladders (portable or fixed) are properly secured
- Ensure scaffolding is properly secured and guardrails fitted
- Post safety & warning notices
- Mark all tripping hazards
- Conduct regular safety inspections





Slips, Trips and Falls - preventable mishaps

Steve Geiger
Safety Manager, US Naval Safety Center

Slips, trips and falls are some of the top triggers for mishaps for the United States Navy. Here are three examples of this type of preventable mishap: Imagine a young Sailor walking down the upper vehicle ramp of a Navy amphibious ship. He loses his footing and slips. In an attempt to catch himself, he lacerates his hand, requiring seven stitches and fourteen days of light duty. Was he a clumsy? No, he just failed to use the safety chain hand rail to give him additional balance while transiting down the ramp.

Now picture a seaman losing his footing while carrying a heavy load down a ladder. The seaman could have asked for assistance, or the size of the load could have been broken into smaller parts to ensure a safer transit down the ladder.

Our third and final example is a classic - water on the deck. In this case, a group of Sailors are mopping the deck near a ladder heading down to a lower deck. Our individual proceeds

through the cleaning area and down the ladder. Not only did he tick off the guys who were cleaning, but the bottom of his boots got wet and he slipped and fell down the ladder. There are a couple of problems here. The cleaners should have posted warning signs about the wet deck, and of course, our victim should not have walked through the pooled water.

In each of these cases it wasn't a design problem or clumsiness on the part of the individual, but rather a lack of hazard awareness and risk management. This makes sense, because approximately 90 percent of mishaps are caused by human error.

The United States Navy is combating this type of mishap by equipping its personnel with the tools and knowledge to reduce or manage their risk through a program called Operational Risk Management (ORM). Each of these slips, trips and falls could have been avoided had the individuals applied the principles of

risk management. Sailors are taught to ask themselves questions such as, what are the hazards associated with walking down the vehicle ramp, carrying a load down a ladder, or walking through a cleaning operation.

Then they are trained to take the necessary steps to mitigate those risks. Using the safety chain as a hand rail, getting assistance to carry a load, and waiting until the cleaning was finished and the deck was dry would have eliminated a painful lesson. By recognizing the risks and taking the necessary precautions, slips, trips and falls can be significantly reduced.

For further information on the Operational Risk Management program go to:

www.safetycenter.navy.mil/orm/ORM_explanation.htm

Other useful information on slips, trips and falls can be found at:

www.safetycenter.navy.mil/acquisition/fall/default.htm and www.osha.gov/SLTC/etools/shipyards/index.html

Designing out slips, trips and falls is not new, difficult or expensive

Brian Sherwood Jones, Process Contracting Limited

At a Nautical Institute conference thirty years ago, the ergonomist Donald Anderson presented 'a slide show of horrors, of which all would have been condemned out of hand by other industries, but which are accepted without demur by those at sea and those responsible for the design of their ships.'

I was confronted with a dangerous ladder last week. The ship was two years old. Elsewhere, she had clever forms of fall protection and good access. Designing out slips trips and falls is not new, difficult or expensive. However, operational design is still not in the mindset as custom and practice.

The pattern of accidents has not changed over the thirty years; the hazards are well-understood. There is good guidance that has been updated recently by the American Society of Testing and Materials (ASTM).

The UK Maritime and Coastguard Agency and several P&I Clubs have produced literature, so has The Ergonomics Society. The International Association of Classification Societies (IACS) has produced two Unified Interpretations to address permanent means of access.

IMO has said that prevention of incidents from locations such as vertical ladders, ramps, walkways and work platforms is one of five key areas for ergonomics onboard ship. The International Maritime Pilots' Association (IMPAA) have produced a guide for naval architects and shipyards on the provision of pilot boarding arrangements.

Some aspects of designing out need to be caught at the General Arrangement; a 'walkthrough' with the drawings or CAD (Computer Aided Design) model of operation, maintenance, inspection and evacuation routes should spot dangerous ladders, routes with dangerous shortcuts, unprotected edges etc. The exercise would require input from those who can identify such hazards, however. At the later design stage, there is a need

for considerable attention to detail; this could be simplified by embedding good practice into CAD parts libraries, but will still need operational input for an assured result. Finally, there are the important matters of applying the right non-skid coatings and contrasting paint, and providing the crew with the information they need to work the ship safely.

The ILO Maritime Labour Convention requires that seafarers live, work and train on board ship in a safe and hygienic environment. The industry is currently building ships that are 'detention-ready'. Maybe stronger enforcement will lead to changes in design practice and education.

Further information:

ASTM F1166: www.astm.org/cgi-bin/SoftCart.exe/DATABASE.CART/REDLINE_PAGES/F1166.htm?E+mystore

IACS Unified Interpretations (IU 190, 191), contained within:

www.iacs.org.uk/document/public/Publications/Unified_interpretations/PDF/IU_SC_pdf169.pdf

The Ergonomics Society Maritime Ergonomics Special Interest Group:

www.maresig.org/twiki/view/MarESIG/SlipsTripsFalls

Maritime and Coastguard Agency:

www.mcga.gov.uk/c4mca/mcga07-home/workingatsea/mcga-healthandsafety.htm

IMPAA guide for naval architects and shipyards on the provision of pilot boarding arrangements:

www.impahq.org/downloads/GuidanceforNavalArchitects.pdf



Photo: IMPAA



Root causes and countermeasures

7

Captain Masaaki Nemoto
General Manager, Marine Safety Division Mitsui O.S.K. Lines

Many years ago an AB fell down from the radar mast when he was hoisting the signal flags. The flag line became entangled on top of the radar mast so he climbed up the mast and slipped and fell to his death, onto the bridge deck. The back hoop did not help. After that, we decided to fit a fall arrester, so that if something goes wrong with crew while working aloft, the locking device running along the vertical rail would hold him.

The fall arrester is one example. The height of handrails in the engine room is another issue that we looked at several years ago, resulting from a fatality when an engineer lost consciousness during his rounds inspection and fell down from the top platform. In this particular case, the height of the handrails around the engine room was slightly lower than the engineer's centre of gravity, so we decided to raise the height of all the engine room handrails to prevent the regress of such a tragedy.

Minor troubles are inevitable, but our mission is to prevent them from developing to casualties.

In 2006, an engine room fire in a container ship broke out whilst in UMS. When the engineers rushed into the engine room a few minutes later the fire alarms activated, the engine room was already filled with thick black smoke. They could not go down to lower decks, and eventually could not identify where the fire broke out. The post-incident investigation revealed that the cooling oil supply line leading to fuel valve of a diesel generator broke. Low pressure oil flowed onto the exhaust pipe and ignited.

Being uncertain of the cause, the master ordered the fuel supply to the engine room to be cut. The engine room was shut down and CO² was injected. Initially, the engine room temperature lowered, but after several hours it increased and eventually all the crew had to evacuate the ship.

But, why did they fail to extinguish the fire? Although the chief engineer had stopped the fuel supply to the engine room manually, it turned out that the cooling oil supply to the diesel generator could only be stopped by a quick closing valve for which the actuator was on the bridge - but nobody was aware this was necessary. A substantial amount of diesel oil stowed in the service tank was directly supplied to the fire before it was known. Furthermore, a compressed air reservoir was sited in

the engine room, with a pressurised air line which ran around the engine room; a flanged gasket was damaged by the heat, and fresh air was being supplied to the fire.

But that is not all: The emergency fire pump suction was air operated; when the compressed air vessel lost pressure, the suction valve could not be opened and they could not operate the emergency fire pump - a latent design defect of which nobody was aware.

After the event, we decided to modify the design, by changing the cooling oil to water, and retrofitting additional CCTV around the engine room to ensure no blind zone in hot areas. By reviewing the recorded video data, "where and how" can be identified in case of fire. Compressed air lines should be designed so as to be isolated from fire. All emergency fire fighting equipment must not be dependent to any outside power source.

In the same year, the stranding of a bulk carrier claimed 10 lives. Following a typhoon, which it was not thought to be getting closer and stronger so rapidly, no further weather warning was issued; but, the master observed that the wind was increasing and decided to weigh anchor to leave the waiting anchorage and take refuge. He started heaving up the anchor, but the windlass failed. It transpired that the hydraulic line was common to both the windlass and the hatch covers, and the branch line leading to the No 2 hatch cover was broken. All the hydraulic oil had escaped and the windlass was inoperable. The chief engineer set to make a clamp to repair it, but it took 5 hours, by which time the wind force had increased from Force 6 to 10 and they were unable to heave in the anchor.

The master decided to cut the anchor chain but the cable was at the bitter end and it required an oxy-acetylene gas cutter to cut the chain, which took another hour, by which time the wind had increased to Force 12 - and it was too late to manoeuvre.

There were two lessons to be learned from this incident: the need for an isolation valve in the hydraulic line between the hatch cover system and the windlass, and for the anchor cable to have a quick release at the bitter end so that one single blow with a hammer could release the chain.

Head Office was not fully aware that the ship was in such difficulties at that time.

That is the main reason why we set up a round the clock Safety Operation Support Centre, to monitor MOL's fleet, providing each ship with critical up-to-date weather and safety information. If we spot a ship likely to encounter some difficulty, we will advise the master direct, to take early countermeasures.

After these various incidents, we set up a special committee to analyse the root causes. The committee was tasked to analyse all aspects of the various accidents and to put forward countermeasures designed to improve the safety of our vessel operations.

One countermeasure that we decided to take was to reduce the workload of the master and chief engineer. Before the implementation of the ISM Code, they both had time to walk every corner of the ship, give proper advice to the staff and point out potential dangers. But after ISM and GMDSS, the volume of documentation had increased to the extent that they did not have enough time to do the proper job. There was one solution: we put an additional junior deck officer and/or junior engineer onboard, to assist with the documentation or to relieve a senior officer from watch duty.

We have introduced extended handovers for masters and chief engineers who are new to MOL. During the extended handover period for all or part of the first voyage, the successor can catch up fully and get accustomed to the vessel and its operation before taking actual command and responsibility.

We hold various types of safety seminars around the world. Safety is the common agenda, and we listen to the voice of the seafarers first. We are responsible for the overall safety of the fleet but the seafarers' feeling is essentially important for us to make right and proper decisions. These seminars also serve to refresh memories of a variety of incidents and to sharpen up safety awareness.

But, the seafarers may hesitate to say or may not be aware of something important, so we appointed a third party consultant to hear the real and honest voice of the seafarers. The independent consultation is conducted before each safety conference and we prepare the answers for the officers who attend the conferences.

Further information on MOL's safety initiatives can be found at:
www.mol.co.jp/csr-e/img/kankyo2007.pdf

Fatal Accident aboard a bulk carrier

This report of a fatal accident that occurred aboard a 93,000 grt bulk carrier, whilst on passage, highlights a number of human element issues pertaining to crew experience and supervision, and the vulnerability to the risk of falling from height particularly when the ship may be rolling and pitching.

A team of three crewmembers were carrying out maintenance work inside the forepeak tank. The Bosun and one Ordinary Seaman were working near the shipside shell while another Ordinary Seaman was assigned to sweep off the rust debris close to the outer edge of a stringer, some 5 metres away.

Two portable lights were used to illuminate the area in the vicinity of where the Bosun was working, but not where the lone Ordinary Seaman was working. The tank was empty of water and the crew had opened the manholes to ensure good ventilation; the atmosphere inside the tank had been certified safe by the Chief Officer, and power ventilation was provided.

Some time after they had started work,

another Ordinary Seaman came to assist the team. He saw the Bosun and one Ordinary Seaman but there was no sign of the other Ordinary Seaman. He was eventually found lying unconscious at the bottom of the forepeak tank some 15 metres below the working position. He was subsequently certified as dead.

The deceased was wearing a pair of safety shoes and a safety harness, although the safety belt of the safety harness had not been secured to any anchor point. His total sea experience was less than four months.

The edge of the stringer plate on which he was working was protected by guardrails, comprising of a top-rail and a mid-rail of height about 80 cm and 40 cm respectively; the report suggests that this may not have been sufficient to prevent people falling over. It adds that the vessel's pitching and rolling movements would be particularly prominent in the forepeak tank. Furthermore, the floor of the stringer plate was wet and muddy.

The report concludes that at the time of the accident, the Ordinary Seaman was working alone and no one witnessed how

he fell down to the bottom of the forepeak tank. Based on the physical findings at the scene, due to insufficient lighting and the wet and muddy floor, he was believed to have slipped and stumbled over the guardrail, falling to the bottom of the tank.

The report suggests that the Safety Management System in the ship had not been effectively implemented, particularly with regard to the requirements of the STCW Convention (in respect of the Ordinary Seaman's familiarity with shipboard equipment, operating procedures and other arrangements needed for the proper performance of his duties); and of the Code of Safe Working Practices for Merchant Seamen (in respect of the care of inexperienced crew).

Note: The purpose of this summary is to highlight some of the human element issues arising from this incident. Those who are involved in the management and operation of ships are strongly advised to read the whole report which can be downloaded from:

www.mardep.gov.hk/en/publication/pdf/mai060309_f.pdf

Reports & Studies

WHERE DO WE GO FROM HERE!

Captain S.W. Bowles FNI, MRIN
President & Principal Surveyor BowTech Maritime

Captain Bowles responds to Issue 16 of Alert!, which focused on Rogue Behaviour. He argues that the articles are symptomatic responses to ineffectual shipping management - chasing the buck, and passing the buck. He suggests that the shipping industry is lost at sea, and questions whether it is the bottom line, bureaucracy, inexperience, or an industry caught up in legalities that is at the root of the problem. He suggests that a course alteration is needed in a hurry and it should start now within the marine education system and manning agencies.

Downloadable from: www.he-alert.org/documents/published/he00705.pdf

NON-FATAL OCCUPATIONAL INJURIES RELATED TO SLIPS, TRIPS AND FALLS IN SEAFARING

Olaf C Jensen, J F L Sørensen, M L Canals, Yunping Hu, N Nikolic, A A Mozer

The aim of this study was to describe the risks involved in slip, trip and fall (STF) injuries in merchant seafaring, in order to point out areas for prevention. Based on a questionnaire study carried out in 11 countries with 6,461 participants, seafarers gave information on whether they were injured during their latest tour of duty, and whether STF preceded the injury. Of the total reported injuries 43% were STF related.

Downloadable from: www.he-alert.org/documents/published/he00710.pdf

WHAT CONSTITUTES A HUMAN FACTOR?

R J Thomson, Australian Maritime Safety Authority

It has consistently been reported in recent years that human factors account for 75-80% of marine accidents. That may (or may not) be true, but Mr Thomson argues that there is insufficient aggregated data,

either nationally or internationally to be able to have confidence in this claim. Apart from the lack of aggregated data, he asks: just what exactly are the human factors that are being held to account for marine accidents? He contends that there is little consistency in the definition of what constitutes a human factor.

Downloadable from: www.he-alert.org/documents/published/he00715.pdf

THE ISM CODE VERSUS THE STCW CONVENTION

Jan Horck, Lecturer World Maritime University

In his paper, Jan Horck questions whether ship casualties have been reduced with the introduction of the ISM Code, and whether ship detentions have been reduced because of improved knowledge and skills among ratings and officers. He examines the safety issues that he believes are still not adequately addressed in the STCW Code but are important to making the ISM Code successful.

Downloadable from: www.he-alert.org/documents/published/he00720.pdf

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