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Introduction

This booklet contains a collection of loss prevention materials relating to navigational accidents, training and other issues which have been published by Gard over the last five years. The compilation may be used for individual studies, as parts of training schemes, or as individual topics in safety meeting or education.

There is a growing concern within the industry about the increase in navigational claims. The pattern seems to be a steady number of claims per ship but the severity of each claim increases every year. In the last 4 years alone, Gard has seen a doubling in the value of the claims paid as a result of navigational errors. Navigational incidents represent approximately 40 per cent of the numbers of all claims and 50 per cent of the costs.

There is a human error behind the majority of navigational claims. The occasional technical failure, normally resulting in limited damage to piers and ships’ sides are rare and not of major concern. Human error is the cause behind at least 80 per cent of all navigational accidents. This figure seems to be the generally agreed industry wide.

Several factors have been pointed out as possible reasons for the increasing number of human error incidents:

- Integrated and complicated bridge systems
- High traffic density
- High commercial pressure
- Larger and faster ships
- Reduced manning
- Increased administrative tasks on board
- Increased number of inspections
- Fatigue
- Lack of experience
- Lack of competence
- Poor decision making

The discussion about these factors will continue as long as ships ply the seas but there are some areas that need to be addressed by ship operators to improve the performance of the shipping industry:

Education, training and crew selection is paramount to obtain and keep high quality crew. Lack of positive corrective action is a common direct cause of accidents.

Situational awareness is a term used to describe what is missing within the bridge team when this happens. To achieve such awareness it is necessary to conduct teamwork and communication training.

The human being is the only intelligent barrier in our systems and only the crew can halt the current development and protect the value of ships, cargo and environment.

Disclaimer

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Loss of anchors and chain

Gard has noted an increase in cases of lost anchors. The Club experiences about one case per 200 ships per year and class societies experience about twice as many: one anchor lost per 100 ships a year.

Most Gard cases involving lost anchors are P&I-related. More and more port authorities require that lost anchors be removed from the sea bed, so these cases become “wreck removal” operations. There are fewer cases related to hull and machinery insurance, as the value of the lost anchor and chain is normally lower than the applicable deductibles.

The weakest link
Gard has looked at the technical reasons behind loss of anchors, and noted that anchors may be lost due to breakage of a common chain link, joining shackle, swivel, anchor shackle or crown shackle, and also through breakage of the anchor itself. One or both flukes may break and, surprisingly, also the solid anchor shank.

“A chain is only as strong as its weakest link” is an old saying, and when a part of the chain breaks it may be due to wear and corrosion or to over-stressing of that part. Class societies require anchors and chain to be ranged in dry-dock every five years and that is the time to pay attention to every part of the chain. Gard’s advice to vessels’ masters and superintendents is to take an active part in the inspection, and not just to leave it to the yard and the class surveyor. Class societies will require the common chain links to be measured at the ends, where they are most worn, and allow a reduction of up to 12 per cent of the diameter.

Second-hand chains are on offer in the market, but one should not buy them without a certificate of quality. Consult the class society. One should also be aware that chains and anchors have been offered with false class certificates. The low price may be an indicator.

In addition to reduction by wear and corrosion, one of the common problems of anchor chain is loose or lost studs. The studs are there to keep the sides of the common links apart during pulling, to avoid that the chain “kinks”, and they also add weight to the chain. If a stud is lost, the strength of the link is severely reduced. It is common to see loose studs being welded up, but one should be very careful in doing so. The class society should always be consulted, the amount of welding should be limited, and the link should be both pre-heated and slowly cooled down afterwards. In many cases it would be better to scrap the length of chain or to replace a single link by a joining shackle.

An anchor chain is composed of lengths of 15 fathoms (27.5 metres) joined by kenter shackles, as well as a “fore-runner” next to the anchor. It is relatively rare for a swivel or a kenter shackle to break, but if a worn chain has to be replaced, the “fore-runner”, consisting of swivel, large link and joining shackles, should also be renewed. The spile pin, i.e., the conical pin locking the kenter shackle parts together, is important. It is hammered in and sealed by a lead pellet, and this has to be done in a proper way. Be sure to buy only quality goods with proper certificates.

Lost spile pins
The pin of the anchor shackle (D-shackle), which links the “fore-runner” to the crown shackle of the anchor, is sealed in the same way as for kenter shackles. There have been several cases where a chain in good condition comes up without the anchor and without the pin of the anchor shackle. The spile pin, securing the main pin of the shackle, seems to fall out relatively often, and Gard’s investigation saw two reasons for that. One is found at the shipyard where the chain was fitted. The conical shape of the spile pin must match the

Anchor windlass and chain stopper. Photo courtesy of Aker Pusnes AS.
hole in the shackle parts perfectly, so this is a question of quality at the manufacturers. Sealing the hole of the spile pin used to be done in the shipyard by hammering in a lead pellet with a special tool, but today this is sometimes done by pouring melted lead into the hole. That lead may shrink during cooling, and needs a hammering to serve its purpose. That is not always done.

The other reason for lost spile pins is found on board. Most anchors, if not all, will hammer within the hawse pipe while on voyage in heavy seas. The repeated hammering may at times loosen the spile pin of the anchor shackle and cause it to fall out. The anchors should be secured as tightly as possible by tensioners or turnbuckles/lashing wire, etc., to reduce anchor movements on voyage.

Breakage
If parts of an anchor break, there are good reasons to suspect defects of the cast metal, like inclusions and fissures, but it can also be caused by uncontrolled dropping of the anchor on a rocky seabed. Gard has also seen some anchor shanks breaking off, and that has been a surprise. Normally one would expect a chain link to part under strain long before the anchor shank. Examinations of the remaining part of the broken shanks have revealed a brittle metal structure, caused by insufficient annealing at the makers’. The anchor shank and anchor crown are made of cast steel, which requires a long heat treatment after casting. The manufacturers may have speeded up the production, cut time and temperatures needed for heat treatment, and that may not have been discovered by the authorities involved in testing and certification. If an anchor shank breaks, Gard recommends sending the remaining part to a test facility and comparing the results with the certificate.

Operational circumstances
As for operational circumstances when anchors are lost, some happen during normal anchoring, if one is not able to control the speed of the drop by the windlass brake, or if the anchor is dropped while the vessel is still moving forward. Anchors and chains may also be lost when anchoring in an area exposed to bad weather, if the vessel starts drifting. In such situations, there
is of course also a risk of losing the vessel, or causing collisions, which have happened more than once. A vessel dragging its anchor also risks causing damage to pipelines and cables on the seabed, a very expensive affair. Anchors have also been lost when anchoring in too deep water and when attempting to stop a vessel as a last resort in a black-out situation.

Gard also has some cases of anchors dropping out while at sea, obviously a result of inadequate securing. If an anchor drops out while the vessel is under way, it has overcome the chain-stopper, the lashing-wire/tensioning arrangements and the windlass brake, or these have not been correctly engaged. If an anchor has dropped out while at sea, this would normally be felt by a smaller vessel’s behaviour, such as loss of speed or tendency to steer to the side of the anchor. However, Gard has experienced cases where the personnel on the bridge blames a loss of speed on the conditions of waves and winds, or the lack of efficiency of the engine, instead of going forward to check the securing of the anchors. Approaching ports or shallow passages with an anchor in tow can become very expensive if cables and pipelines on the seabed are pulled off or damaged.

The efficiency of the windlass brake is extremely important, and worn brake band linings should be replaced without delay. Also, be aware that when the lining is worn, this makes the band more “roomy” and a full braking force will not be obtained by tightening the brake spindle alone. On large windlasses there is an arrangement at the lower part, to adjust the brake band. Service people working for a windlass manufacturer report that this is hardly ever done by the crew. It is just a case of reading the maintenance booklet and acting accordingly to obtain a better braking efficiency.

Class rules
The rules regarding specifications of anchoring equipment are established by the class societies. It is important to be aware that these requirements are minimum requirements, and also to be aware of assumptions made in the calculations used. Class societies stress that anchoring equipment is only intended for temporary mooring of a vessel, within a harbour or a sheltered area, when awaiting berth, tide, etc. It is also underlined that the equipment is not designed to hold a ship off a fully exposed coast in bad weather or to stop a vessel from drifting. The class rules will only require the vessel to have an anchoring equipment designed to hold the vessel in good holding ground, and are based on the assumption that a scope of chain cable between 6 and 10 is used. Such a scope, being the ratio between the length of chain paid out and the water depth, is just not obtainable for large ships in some of the deeper designated anchorages. With these limitations in mind, and the type of incidents mentioned above, it becomes apparent that some masters may at times put too much trust in their vessel’s anchoring equipment, and that they should be more proactive and put out to sea more often when the weather deteriorates.

The full text of the rules for anchoring equipment can be found at the IACS website at www.iacs.org.uk/document/public/Publications/Unified_requirements/PDF/UR_A_pdf148.PDF. Gard has addressed these rules in Loss Prevention Circular No. 12-10, which can be found at www.gard.no.
Ports and places of refuge in South Africa
By Alan Reid and Mike Heads,
P&I Associates (Pty) Ltd, Durban, South Africa

The subject of ports and places of refuge around the world has steadily become a topic of much debate among various interest groups, especially after the breaking of the PRESTIGE off the coast of Spain.

No doubt when the PRESTIGE accident occurred there were several issues at stake regarding what should be done with the vessel and what steps should be taken by the various authorities. After the incident some experts argued that if the vessel had been taken into a port or place of refuge the resultant oil spill could have been controlled. This is not the first time that such a debate has occurred, since the issue is highly sensitive. The PRESTIGE case, however, does illustrate the need for a sensible approach when dealing with ships in difficulty. In the case of the MSC Napoli, a decision had to be taken on what to do with the vessel after she developed a crack, and it was decided that a beached landing would be the best solution in order to limit and control the damage to the environment.

It is against this background that South Africa has looked at its contingency plans in order to deal with ships in difficulty and what it should do if faced with any of the above scenarios.

South Africa is surrounded by 2,798 km of coastline that splits the Atlantic and Pacific Oceans. At certain times of the year this length of coastline can be one of the most dangerous stretches of coastline in the world, especially when one takes the weather, currents and rugged rocks into account. It is for these very reasons, that it is important to have a plan in place and to be aware of the options available to the country in order to deal with potential ecological catastrophes should one ever arise. The coastline is littered with wrecks stretching back hundreds of years and, therefore, the next maritime casualty could be imminent.

A sensible and commercial approach
To deal with the scenario of a ship in difficulty, the South African government has passed legislation and approved the appointment of the South African Maritime Safety Authority (SAMSA) to consider their options, together with other local marine experts, on the procedures to follow should a vessel run into trouble.

South Africa has adopted a very sensible and commercial approach to the issue of ships in difficulty and the need to have ports and places of refuge available for a vessel in case of an emergency. There are places of refuge available in South Africa for deep draft vessels, together with certain ports, provided certain requirements can be met.

There are three possible places of refuge on the South African coast:
1. St Helena Bay - a deep water bay but exposed to the wind from the northwest
2. False Bay - very good area that offers much protection
3. Algoa Bay - good shelter only from the west

In addition, there are eight commercial ports in South Africa: Saldanha Bay, Cape Town, Mossel Bay, Port Elizabeth, Coega, East London, Durban and Richards Bay.

Anchoring a vessel at will is illegal
A shipowner or master can not simply anchor a vessel along the South African coastline at their own will. Various pieces of legislation have been passed to prevent this:
- The Marine Traffic Act, Act 2 of 1981;
- South African Maritime Safety Authority Act, Act 5 of 1998;
- Merchant Shipping (Maritime Security) Regulations 2004, which incorporate Regulation X 1-2/9 of SOLAS (ISPS);
- Marine Pollution (Control and Civil Liability) Act, Act 6 of 1981;
- Wreck and Salvage Act, Act 94 of 1996;
- Merchant Shipping Act, Act 57 of 1951 (as amended);

The Marine Traffic Act deals with a vessel entering and departing from international waters and states that there are regulations regarding the immobilising, laying up, stopping or anchoring outside harbours or fishing harbours. It is an offence under the Act for any vessel to lay up on the South African coastline without the necessary permission. Permission to lay up a vessel must be given by the relevant minister through SAMSA, who may demand, inter alia, that various conditions be met. For example, SAMSA may demand that a tug be made fast to the vessel at all times throughout the duration of the lay-up. The tug would therefore be able to move the vessel in case of an emergency. If she is made fast, then there is little delay in moving or relocating the vessel should the need arise.
**SAMSA's role**

SAMSA also has the power to demand that the master or owner of the ship post security to the satisfaction of SAMSA in an amount determined by SAMSA for the recovery of any costs incurred by SAMSA in enforcing any condition applicable to the immobilising or laying up of the ship, or in the exercise of its powers under the Act.

SAMSA have the authority to prevent a vessel coming towards the coast to seek refuge and this authority stretches to all bays and anchorage areas. Although the ports are operated by the Transnet National Ports Authority (TNPA), they will often turn to SAMSA for advice and assistance. Before a vessel can seek refuge at a place or port in South Africa, SAMSA must first give their authority, and if it is a port, then TNPA will also have to be consulted and give their approval. SAMSA will always consider the safety of life as being paramount and the Maritime Rescue Co-ordination Centre in Cape Town co-ordinates all rescue activities with the harbour master at the nearest port. The next priority is the environment. Once the above factors have been taken into account, one would then give consideration to the safety of property.

South Africa has always had an excellent approach to the subject of vessels seeking a port or place of refuge and SAMSA should be commended for their role in such matters. SAMSA have a difficult function to fulfil and it has always been our advocacy that shipowners looking to utilise South African waters as a place of refuge should act with utmost good faith when dealing with SAMSA. A failure to disclose a particular fact may lead to a vessel being barred from gaining refuge.

Where a vessel's structure has been compromised, SAMSA will want to inspect the vessel and assess the problem before granting permission for the vessel to get close to the coast.

Once permission has been granted, it may be subject to certain conditions, for example:
- The vessel may be requested to produce a valid hull and machinery insurance certificate.
- The vessel may be requested to produce a valid P&I insurance certificate of entry.
- All fuel bunkers and black oil (including contents of engine sumps) may have to be removed from the vessel.
- The vessel must be attended to by an adequately powerful salvage tug that has to be made fast.
- A salvage contractor must be appointed by owners (the contractor should be an International Salvage Union member).
- An operational plan must be prepared and approved by SAMSA.
- A suitable guarantee might be requested.

The request for valid insurance certificates is a new development and an essential one. If vessels want to make use of our coast, then owners must understand that South Africa needs to protect itself from having to incur and bear the costs of removing vessels which may eventually be abandoned by the owners. Having suitable insurance in place provides a level of protection should an unfortunate event or risk arise during the period of refuge.

Both SAMSA and TNPA recognise and accept Club letters of undertaking from IG clubs. The wording of this letter has been agreed upon with the clubs and is only a slight variation of the standard IMO wording for ports of refuge. The variation is that it incorporates South African law.

**Resources**

South Africa is fortunate to have various resources available on its coastline to assist vessels in difficulty or which may have to lay up. South Africa was the first country to recognise the need to have a tug solely for the above purpose, which resulted in the rest of the world also introducing emergency towing vessels (ETV).

Two salvage companies have offices in Cape Town with fully equipped warehouses. Resources are available to provide, inter alia, fenders and transfer hoses.

**Co-operation is paramount**

South Africa, as a coastal state, does recognise the need for vessels to seek refuge and in general will assist in this process. However, it is imperative that the requirements of the authorities are met and that the owners, the ship and their respective insurers co-operate at all times.
Limitations of a vessels’ anchoring equipment

Gard has seen an increasing number of cases involving lost anchors, and from class societies we learn that as many as one anchor per 100 ships is lost annually. The reasons for loss of anchors and chain are many, and include lack of seamanship and inadequate maintenance, but also instances of the chain and anchor breaking, leaving a question mark as to the quality of such parts as provided by the manufacturers.

In Gard, about one in 200 ships a year has an anchor related claim. Most of these are due to the loss of anchors at designated anchorages where the authorities require the lost items to be removed, thus resulting in a “wreck removal” case. The more serious and very costly cases are when a vessel starts dragging its anchor in bad weather, and where this leads to collisions with other vessels, groundings and loss of the ship, or to damage to cables and pipelines on the seabed.

Strength and limitations of anchoring equipment

The rules for anchoring equipment, the grade, length and size of chain, number and weight of the anchors, the strength of the chain stoppers and the power of the anchor windlasses and the brakes, are established by the class societies. They can be found in the rules of the individual societies, or in the unified rules of IACS, the International Association of Class Societies. It is important to be aware that these are minimum requirements, and to know the assumptions made in the calculations.

For each vessel the class society will calculate an Equipment Number by using a formula, where the displacement of the vessel, the breadth of the ship and the height from the summer load waterline to the top of the uppermost house, as well as the profile view area of the hull, superstructures and houses above the summer load waterline are included. Thus, the forces on the ship by current and wind from both the front and the sides are taken into account. The formula is based on an assumption that the speed of the current may reach 2.5 m/sec, and wind speed of 25 m/sec, which represent quite high forces, but it is also assumed that the vessel can use a scope between 6 and 10, the scope being the ratio between length of chain paid out and water depth. However, large ships at deep anchorages do not have sufficient chain onboard to reach scopes of such magnitude.

If a ship is at anchor in ballast condition, the Master should also bear in mind that wind forces acting on his ship may be much larger than the calculations have accounted for, as larger ship side areas are now exposed, while the measurements entered in the formula was taken from the summer load waterline. Vessels in ballast will also be more vulnerable if they have to move away in bad weather, as both the steering and the propulsion may be affected.

Class societies make it clear that the use of the anchoring equipment is only for the temporary mooring of a vessel, within a harbour or a sheltered area, when awaiting berth, tide, etc. It is particularly emphasized that the equipment is not designed to hold a ship off a fully exposed coast in bad weather or to stop a vessel from drifting. The anchoring equipment, as designed in accordance with the class rules, will only hold the vessel in good holding ground, while the holding power is significantly reduced in poor holding ground.

Recommendation

If a vessel is anchored in an area exposed to weather, it is necessary to have a policy as to when to leave. There have been cases when Masters have been under commercial pressure not to leave the anchorage, and disasters have happened because the Master was tempted “to wait and see until the morning”, although the weather forecast was bad. In making his decision whether to stay or to leave, the Master should also be aware of the limitations of his anchoring equipment. Some Masters may not have full knowledge of these limitations, however, they are laid down by the class societies in their rules for calculating the dimensions, weights and strengths of the anchoring equipment.

With the mentioned limitations in mind, it can be seen from cases of ships dragging anchors in bad weather that Masters have at times placed too much trust in their vessel’s anchoring equipment. Today’s weather forecasts are usually very reliable and Masters should more often choose to weigh anchors and go out to sea in time if heavy weather is forecast.

The full text of the rules for anchoring equipment can be found in the document “Requirements concerning mooring, anchoring and towing”, by searching the web pages of the International Association of Classification Societies: www.iacs.org.uk, or directly in www.iacs.org.uk/vdunifiedrequirements/ur_a_pdf148.pdf.
Communication in pilotage passage planning

Good communication between master and pilot continues to be paramount. The article “Master/pilot exchange of information”, published in Gard News issue No. 154, focused on the importance of good communication between master and pilot, a problem which was also highlighted in the articles “Pilot on board!” in Gard News issue No. 181 and “Is the pilot a part of the bridge team?” in Gard News issue No. 185. In the following article Gard News revisits the topic once again.¹

Ideally the pilot, the master and the officer of the watch (OOW) should discuss and agree on the intended passage plan in pilotage waters prior to commencing the passage. Unfortunately, this is often not done in accordance with bridge team management principles. For the master and the ship’s crew to be able to supervise the pilot’s performance, or even question the pilot’s actions, they all have to be aware of the pilot’s intentions.

Pilots prevent far more accidents than they cause. Nevertheless, when a pilot boards a vessel there may be pressure on both the pilot and the bridge team in terms of time. As a result, the passage plans of the pilot and the on-board bridge team may not be consistent with each other. There may be a lack of communication between the bridge team and the pilot regarding the intended passage, which may significantly reduce the safety of the operation.

Recent findings in incidents investigated by Gard involving pilots showed that common elements were present in most of these cases:

1. Information had not been shared by the master and the pilot.
2. There had been insufficient time for the ship’s crew to familiarise themselves with the pilot’s intended passage plan.
3. The pilot boarding ground was frequently closer to the harbour entrance compared with the charted boarding ground.

ECDIS

In many areas pilots use their own electronic chart systems, displaying the passage on a laptop or similar device that they bring with them on board and connect to the vessel’s AIS pilot plug. Use of such aids to navigation, if combined with reduced planning and bad communication between bridge team and pilot, further reduces the ability of the OOW to monitor the pilot’s intentions regarding the vessel’s track, changes of course and to question any decisions made by the pilot.

Nowadays most vessels are equipped with ECDIS or ECS as aids to navigation and support to conventional paper chart navigation.² When the passage is properly represented in these electronic systems, it is possible to enable a number of automatic alarms, which add to the safety of navigation. However, for these safety barriers to be effective, the passage plan must be properly agreed between vessel and pilot.

In some areas pilots send passage plans or passage planning information for a particular port to vessels in advance. This proactive communication enables the vessel’s bridge team to prepare and enter the expected passage in the on-board systems prior to the arrival of the pilot, including activating the safety settings on the vessel’s ECDIS/ECS. When the pilot arrives on board, the bridge team is already aware of his main intentions and should be able to quickly discuss and agree on the passage plan, including any possible deviations from the original plan.

However, this should not replace the all-important master-pilot exchange of information.

Given the technology available today, the transmission of intended passage planning information in advance of the vessel’s arrival by the pilot, pilotage authority or other responsible body through a simple e-mail would significantly add to safe navigation and would assist the pilot in becoming a more integral part of the bridge team.

This becomes even more important with the impending implementation of full ECDIS regulation. And why not also use emails to send the waypoint details in advance?

Advance information leaves only minor technicalities to be discussed or confirmed at the time of pilot boarding and ensures that the bridge team’s full attention can be immediately directed towards navigation.

This is probably the way forward: communication of the pilot’s intended passage plan in advance of the actual operation, which would facilitate input of the plan in the ship’s anti-grounding monitor system, the ECDIS. This would also allow the bridge team to familiarise themselves with the intended passage plan and be in a better position to monitor the pilot’s actions.

Footnotes

¹ See also the article “Harbour towage and pilotage”, elsewhere in this issue of Gard News.
² See article “ECDIS - Charting the future of navigation” elsewhere in this issue of Gard News.
Harbour towage and pilotage
By Yves Beeckman, Marine Superintendent, URS, Antwerp.

It is generally assumed that tug operations are routine for ships’ crews and that mooring parties will handle them efficiently and swiftly. As a result, master-pilot exchanges do not usually address this issue. However, in order to ensure effective harbour towage operations, it is essential that the relevant information is exchanged between the master and the pilot beforehand, so that the mooring parties can be called to their stations in time, fully briefed on the details of the operation. Daily experience in a harbour towage department shows that, unfortunately, the number of less-skilled mooring parties is on the increase. This lack of skill may result in delays in securing a tug, putting time pressure on the crew and thereby increasing the risk of personal injury or of the vessel sailing in unsafe conditions, for instance in dense traffic, before the tug is ready.

Exchange information beforehand
The tug information can be exchanged during the voyage under the pilot’s advice, as opposed to being exchanged at the time of pilot boarding, when there are other navigational priorities to be addressed. At the start of the towing operation the parties should all be at their mooring stations in good time and have the heaving lines ready at the correct/required position. The master should discuss the ETA at the rendezvous point and ensure that he musters the crew on time, allowing for the distances to the mooring stations to be covered in time, without the need to run. If the operation is to take place at night, the crew should have ample time to wake up and prepare for the period out there, possibly in adverse weather conditions.

Information required to be passed from pilot to master
Due to the different types and sizes of tugs, there are many different types of harbour towage manoeuvres, so the master should find out the following details from the pilot in order to pass them on to his crew:
- ship’s lines or tug line
- type of tow wire (steel, synthetic, size, indication of their size)
- method of getting the tow wire on board or the ship’s lines to the tug. (most commonly for tug’s lines: thin heaving line from the vessel to pick up a larger size messenger rope from the tug, which can be led to the warping drum of a winch in order to heave on board the tow wire. When using ships’ ropes, the other option is to lower a ship’s rope or send it over with a heaving line. Most tugs will, however, not take a lowered line when underway), only when departing from the berth
- position for passing over the heaving line (throw from the ship’s shoulder, which fairlead the heaving line should be taken through)
- maximum speed for securing the tug, so the bridge team can monitor
- bollard pull of the tug(s)
- VHF channels to be used for working with the tugs

Information required to be passed from master to pilot
The master should provide the following information to the pilot:
- SWL of the mooring / towing equipment
- Which fairleads are suitable for securing the tugs. If they are off centre and only one tug is to be used, this must be specifically brought to the attention of the pilot.
- Pushing point strength, if known. If no pushing points are indicated on the hull, but the ship has a reinforced belt all around, it is important to convey this fact to the tug master.

What the crew should know
The officer in charge must ensure that the mooring party knows which bollard(s) will be used for the tug(s), how the messenger line will be led towards the warping drum and how the tow wire will be stopped off in order to allow the strain to be taken off the messenger line and the soft eye to be put over the bollard. They should also be aware of the releasing procedure.

In order to avoid disruption, if there has been a crew change, the new crew should familiarise themselves with the mooring equipment before taking their stations for the first time.

Regular meetings should be held to remind the crew of the risks of handling tow wires and to discuss the procedures.

During the operation
The commands used by the officer in charge should be clear and well understood by the deckhands; standard terminology may be developed, subject to the ship’s working language.

The crew should wear leather working gloves or gloves made from equivalent materials when handling a tow wire, never cotton gloves. Very loose work clothing should also be avoided. Overalls should be tight, especially around the wrists and ankles.

Many serious personal injury incidents in mooring areas involve parting lines. It is therefore important to note that a “snapback zone” exists when a mooring line is under tension. Crews should take that into account during operations and it may be a good idea to indicate these areas permanently on the deck. As soon as the tug is secured, all crew stand back from the snapback zones. Crew members should also be warned to beware of hands and fingers: sudden jerks in the tow wire while taking the line on board or releasing the tug can easily lead to personal injury.

The officer in charge must always be in visual contact with the tug during securing up, so he can exchange hand signals with the tug crew, which is usually better than trying to handle a walkie-talkie VHF in windy conditions.

There are ships in which the bulwarks are so high that the tug crew can not see anybody on the (forecastle) deck of the vessel, or anything that goes on there. In such conditions, it is absolutely essential to have one person in a specific location for signalling visually to the tug. The crew should always signal to the tug when the tow wire is secured and the tug can safely start applying power. Status of the tow wire should also be confirmed to the master (secured, in the water, propeller cleared).

Only a suitably weighted heaving line should be used. Monkey’s fists should not have additional weight,
but a heaving line should not be thrown without a monkey’s fist. The latter may be blown away and may be impossible to get across to the tug. The crew should have a second heaving line ready to throw in case the first one should end up in the water. The ship’s crew should always warn the tug crew before sending the heaving line across. The crew should never use a thick messenger line to throw to the tug, instead of a normal heaving line: the weight of the line coming down may injure the tug crew, it is also more difficult to tie two messenger lines together (a rope messenger line will typically be a three strand polypropylene rope of 24mm diameter).

A tow wire should never be grabbed from below, but always from above. If the wire has to be released quickly in an emergency, it is always easier to just release your grip on the wire and let gravity do the work than to pull your fingers away from underneath the wire. The messenger line must never be disconnected from the tow wire. As an alternative, after securing the wire over the bollard, the shackle can be disconnected from the soft eye, as a “running” shackle. This provides a means to give sufficient power to the tow wire to create enough slack so that the soft eye can be lifted easily from the bollard. If this is not done, the shackle connecting the messenger line to the tow wire should not be allowed to become jammed between the bollard and the tow wire. This would cause a sharp bend in the tow wire under load, which might cause it to snap. The tow wire should never be stopped by simply putting it on deck and standing on it; the wire is too heavy and you may be thrown off your feet or dragged along. Very serious injuries will result in most cases. The crew should also beware of “snaking” messenger lines when they are released and run out. They could seriously hurt someone upon impact.

Normally, the bow tug will have no problems when the tow wire is released in one go; the tug will be moving away from the vessel and there will be little risk of the tow wire ending up in the tug’s propellers. However, the crew should always try to obtain confirmation from the tug of how they want this done. The stern tow wire must always be released in a controlled way (slacked away by means of the messenger line, in co-ordination with the tug crew). When you let it go in one motion, it will most probably end up in the tug’s propellers.

Tug emergency “let go” procedures
Tugs working on a towing winch have a “let go” system. The ship’s crew does not have to do anything to disconnect the wire; that will be done by the tug master. He will set his winch drum free and let the wire run out, until it breaks from its securing bolt on the winch drum, while he manoeuvres his tug to safety.

However, this leaves the ship’s crew with a problem: the vessel will be trailing up to 140m of steel wire, which has to be recovered from the water before the tug can make a new approach (to secure up with its spare towing wire). When making speed through the water, this will be a difficult job for the mooring party, because once the messenger line is entirely on board or on the warping drum, it will be much more difficult, probably even impossible, to wind the remaining towing wire in on the warping drum. In this case, a stopper must be used, and a (second) messenger line tied to the towing wire further down the line, and then winding the wire on board can be resumed. This process may have to be repeated a considerable number of times. It will probably be necessary, if conditions allow, for the vessel to reduce speed. This is a dangerous operation and great care must be taken when carrying it out.

Footnotes
1 Towing wires typically have the following dimensions: for 45 ton bollard pull: 42mm diameter, for 65 ton bollard pull: 48mm diameter, for 80 ton bollard pull: 54mm diameter.
ECDIS - Charting the future of navigation

An Electronic Chart Display and Information System displays a ship’s position on electronic nautical charts in real time with very little effort on the part of the navigator, and is generally hailed to be an invention set to revolutionise and vastly improve the safety of navigation.

Amendments to the International Convention for Safety of Life at Sea (SOLAS) Chapter V, Regulation 19 (V/19) make the carriage of an Electronic Chart Display and Information System (ECDIS) mandatory for ships flying the flag of contracting states. The amendment will come into force on 1st January 2011.

The following ships must be fitted with ECDIS if engaged in international voyages:
- passenger ships of 500 GT or upwards constructed on or after 1st July 2012;
- tankers of 3,000 GT or upwards constructed on or after 1st July 2012;
- cargo ships, other than tankers, of 10,000 GT or upwards constructed on or after 1st July 2013;
- cargo ships, other than tankers, of 3,000 GT or upwards but less than 10,000 GT constructed on or after 1st July 2014;
- passenger ships of 500 GT or upwards constructed before 1st July 2012 must be fitted not later than the first survey on or after 1st July 2014;
- tankers of 3,000 GT or upwards constructed before 1st July 2012 must be fitted not later than the first survey on or after 1st July 2015;
- cargo ships, other than tankers, of 50,000 GT or upwards constructed before 1st July 2013 must be fitted not later than the first survey on or after 1st July 2016;
- cargo ships, other than tankers, of 20,000 GT or upwards but less than 50,000 GT constructed before 1st July 2013 must be fitted not later than the first survey on or after 1st July 2017;
- cargo ships, other than tankers, of 10,000 GT or upwards but less than 20,000 GT constructed before 1st July 2013 must be fitted not later than the first survey on or after 1st July 2018.

As can be seen from the above, ECDIS will become mandatory for certain new ships on delivery. Existing ships not fitted with ECDIS will be required to retrofit the equipment “at the first survey”, in accordance with the applicable schedule above. Although the “first survey” may not coincide with dry-docking, owners should be aware that substantial work could be involved in retrofitting this equipment, which could take the ship out of service. IMO has recommended that consideration should therefore be given to carrying out the necessary modifications in dry dock before the mandatory implementation date. The agreement of the ship’s flag administration would be required to postpone retrofitting beyond this date.

Existing ships that will be permanently taken out of service within two years of the applicable implementation date may be exempt from its application.

The mandatory carriage of ECDIS already applies to high-speed craft built after 2008, with the requirement applying from 2010 to high-speed craft built before 2008.

Chart carriage requirements
From 1st January 2011 carriage of ECDIS will be accepted as compliance with the carriage of nautical charts requirement in SOLAS V/19, paragraph 2.1.4, as long as the ECDIS meets the latest IMO performance standards and the ship has in place a back-up system as required by IMO and the flag state. An electronic chart display system that does not meet IMO ECDIS requirements is called an ECS, and does not fulfil the SOLAS chart carriage requirement.

In order to comply with chart carriage requirements ECDIS can only use SOLAS-approved charts (official charts). To meet SOLAS requirements the chart must be issued by or on the authority of a government, a hydrographic office authorised by a contracting state or another relevant institution so authorised. Electronic Navigation Chart (ENC) is the database used with ECDIS. ENCs are vector charts, issued officially by or on the authority of a state, authorised hydrographic office or other relevant government institution and is designed to meet the requirements of marine navigation. An ENC meets the standards set by the International Hydrographic Organization (IHO) and uses a data format defined by IHO, known as S-57.

Although ENCs are available for most frequently used routes and ports, it may be some time before ENCs cover all navigational areas, especially more remote parts of the world. If ENCs are not available for a certain area, ECDIS may be operated in Raster Chart Display System (RCDS) mode. The RCDS mode uses Raster Navigation Charts (RNCs), which are digital copies of paper charts and are issued officially. The use of RNCs requires the approval of the flag state, and the vessel is also required to carry an approved portfolio of charts (APC), for use together with RNCs.

Regular updates are available for ENCs and RNCs. This information is normally available in digital format, but manual updating is also possible. Manual updates would normally be emergency updates which may be provided by way of warnings using systems like Navtex or Marine Notices. Remote updating may also be a possibility. It is of extreme importance that the performance of the ECDIS is not compromised during installation of updates.

If an ECDIS uses unofficial charts, it no longer complies with SOLAS requirements, and enjoys the same status as an ECS. ECDIS will provide a continuous warning if the chart in use has not been issued officially.

Limitations
In addition to alarms and alerts generated by ECDIS to indicate system malfunctions, ECDIS provides automatic route checking in the planning stage and automatic alarms and alerts to respond to set parameters during the route planning and monitoring stages. Irrespective of the chart on display, ECDIS will generate alerts with reference to the largest scale available of the relevant chart. However, as the ECDIS automatic alarm function is lost when it is operated in the RCDS mode, it is recommended that a corresponding paper chart is used for ensuring that the best situational

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errors or discrepancies which would have been noticed if watch-keeping guidelines and bridge management procedures were correctly adhered to. Such lapses have often led to accidents that should have been avoided. The human should be in control at all times.

Training

ECDIS is a very useful navigation tool, but does not replace the navigator. ECDIS is designed to make navigation safer and to reduce the workload on navigators by replacing paper charts with an electronic system capable of useful automatic functions. However, the efficiency and usefulness of the equipment is defined by the operating skill of the navigator, his understanding of the information displayed, his appreciation and management of any shortcomings of the equipment and his ability to make optimum use of the information in order to ensure safe navigation. This can only be achieved by proper training.

ISM and STCW make it incumbent on the owner/operator of the vessel to ensure that their navigating officers are adequately trained to ensure safe operation of their ships. There are many sources of ECDIS training, such as maritime colleges, specialist flag state-approved training centres, courses run by the manufacturers of the equipment, etc. As functionality and operational controls of equipment may vary considerably depending on the make and model of the ECDIS, training should be not only generic but also specific to the equipment to be used, and of a structure that recognises the complexity of the equipment. It is quite normal for port state inspectors to check that the ship’s personnel are adequately trained to perform their duties; navigating officers using ECDIS will need to provide the inspector with satisfactory evidence of such training. Certificate of successful completion of the ECDIS course should be government-approved.

The above amendments to SOLAS have been introduced on the back of results of studies carried out by various organisations. A DNV technical report1 indicated that the use of ECDIS may reduce grounding frequency by 11 per cent to 38 per cent. This was based on the actual current and near-future ENC coverage at the time the report was issued. One would hope that with continuing improvement in ENC coverage a high reduction in groundings will be seen. One would also hope that with proper training the human-machine interface would operate at levels high enough to achieve results far better than predicted.

Footnotes

1 As set out in regulation V/19, Paragraph 2.10.  
2 In the EU, ECDIS compliance with the latest IMO performance standards is denoted by a label on the equipment comprising a wheel. In addition, the label will denote the International Electrotechnical Commission (IEC) standard to which the equipment is approved. IEC is an independent approval required by flag states; the standard for ECDIS is IEC 61174.  
3 As defined by SOLAS V Regulation 2.2.  
Anchoring within Malaysian waters off Singapore

Earlier this year we addressed the problems of anchoring in congested areas off Singapore. In this circular we address the problems encountered when anchoring within Malaysian waters off Singapore. So far, three vessels covered by Gard have been arrested and fined for not having notified Malaysian authorities of their arrival and anchoring outside the outer port limits of Tanjun Pelepas and Johor ports and for non-payment of light dues.

It is well known that there are no “international waters” outside Singapore waters; ships are either in Singapore, Malaysia or Indonesia. When anchoring off Malaysia, it should be borne in mind that Malaysian territorial waters extend 12 nautical miles from the baseline, if not limited by other State boundaries.

Amendments to The Merchant Shipping Ordinance 1952

Section 491B of the Malaysian Merchant Shipping Ordinance 1952 stipulates which ships must notify the Director of Marine of activities within Malaysian waters. The Director may impose terms and conditions including fees on the activities permitted. The owner, master or agent of the ship may be found guilty of an offence, as well as risking a fine of MYR 100,000 or imprisonment for up to two years, for contravening the ordinance.

The Marine Department of Malaysia has recently amended the Merchant Shipping Ordinance to also include vessels engaged in activities such as:

- Laying up
- Welding and other hot works
- Anchoring in non-anchorage areas
- Any form of underwater operations

The Marine Department of Malaysia advises that notification to the Director of Marine can be made at the nearest port office during normal working hours. As for the payment of Light Dues, this is regulated by Act 250, Federation Light Dues Act 1953, which states that “every ship which in the course of a voyage enters any port or place within Peninsular Malaysia, other than ships exempted, shall pay light dues as prescribed.”

Risk of fines

It should be noted that once vessels have been arrested for non-payment of light dues, it can be rather expensive to obtain their release. A rate of Registered Net Tonnage x MYR 0.20 X 10 has been levied as a penalty. Authorities may request a bond of MYR 50,000 issued by a local registered bank, prior to releasing the vessel. The Marine Department appears to prefer to deal with a local registered shipping agent rather than with a P&I Club representative, and will only accept a Letter of Undertaking from shipping agents while waiting for security guarantees to be issued by a bank, which may take up to five working days.

Recommendations

Fines for non-payment of harbour dues etc. are not covered by Gard Rule 47 and are therefore outside the P&I cover. Our advice to Members and clients entering Malaysian Territorial Waters is to arrange for notification of arrival and the payment of dues through a Malaysian shipping agent.

Footnotes

1 Gard Loss Prevention Circular No. 11-09: Dangerous anchoring in the Singapore area.
3 MYR = Malaysian Ringgit.
6 Additional information can be found at Marine Department Malaysia www.marine.gov.my/
Dangerous anchoring in the Singapore area

The Maritime and Port Authorities of Singapore (MPA) recently called a meeting with representatives of the P&I Clubs to discuss particular problems of dangerous anchoring in the Singapore area.

Vessels not anchoring within Singapore port limits are, for commercial reasons, opting to anchor in outer port limit areas (OPL). The East and West OPL areas used for anchoring are, however, rather narrow spaces situated between the port limits and the traffic separation scheme (TSS) through the Singapore Strait. These areas are becoming very congested, being popular with owners for the purposes of bunkering, taking supplies, change of crew, repairs or just waiting for cargo operations. Due to the congestion, some anchored vessels are straying into the TSS, and are thus violating the International Regulations for the Prevention of Collisions at Sea (COLREG). The MPA states that vessels in breach of COLREG Rule 10 (g) by anchoring in the TSS are being reported to their respective flag administrations. It appears from the vessels having been reported, that Singapore authorities also seem to report vessels anchored in Precautionary Areas for being in breach of COLREG.

When it comes to bunkering at Singapore, and the tendency to bunker in OPL areas, it should be noted that the risks factors concerning both bunker quality and quantity have been considered higher in OPL areas than from suppliers operating within the much more regulated port limits. There are also two bunker anchorages in the western sector of the Singapore Port, located conveniently close to the TSS, where vessels of 20,000 GT and above, staying less than 24 hours, may take bunkers at reduced port dues. Vessels other than gas tankers and chemical tankers, with a draft of 11.5 meters or less, may also be exempted from compulsory pilotage at these bunkering stations.

The MPA has also pointed to several instances of damage to subsea cables by incorrect anchoring and has alerted the P&I Clubs to this problem. When a vessel is anchoring too close to charted cables and pipelines, the owners of the cables/pipelines are informed of the vessel’s particulars, to enable them to make a claim against the vessel, should any damage occur. OPL is a “loose” term, but the Eastern OPL is considered bound to the north by Johore Port limits and to the south by the westbound TSS. It should be noted that this 5 mile long area is very narrow and there are several submarine cables running the length of it.

We have also been advised that the MPA is in discussion with Malaysian and Indonesian port authorities, in order to reach an agreement for vessels anchoring in the TSS, or damaging subsea cables and pipelines, to be penalised by the State having jurisdiction over the area.

The problem of congestion of vessels off Singapore is not easy to solve, but there is always the possibility of seeking designated anchorages inside Singapore port limits. Vessels should not anchor in the TSS or Precautionary Areas, and care should be taken not to anchor too close to subsea cables and pipelines. Claims for damage caused by anchoring in way of cables and pipelines, or by dragging anchors across such equipment are very costly to the Club.

There have been a number of contact damages between ships at anchor in OPL areas during recent months, mostly in the East area. For anchoring in congested areas, full alertness is required and anchoring at night should be avoided if possible. In locations such as the congested Singapore OPLs, wind and tidal currents must be considered; an anchor watch should be kept at all times and the engine at the ready. For the time being, when anchoring off Singapore, the key message is extreme caution.

For further information on anchoring in general please see the following Gard publications:
- Gard News 193 What if... ? - Planning for the unexpected before an emergency develops
- Gard News 177 Anchoring - Getting into a safe haven or into a potential disaster?
- Gard Loss Prevention Circular No. 14-08: Anchoring and deteriorating weather conditions
Damage to fixed objects when manoeuvring in confined waters

Gard has recently seen a noticeable increase in cases involving significant contact damage to fixed objects by vessels manoeuvring in confined waters, mostly within port. Fixed objects include berths, docks, locks and shore side equipment such as cranes. The contact damage has resulted in some very large claims for the repair and/or loss of use of such objects. Outlined below are five of the most common factors, in Gard’s experience in cases involving contact damage to fixed objects in confined waters.1 These incidents also risk harming people and the environment (e.g. pollution from breached oil tanks), and the ship itself is often left with expensive repairs and loss of trading time.

1. Prevailing and forecast conditions not properly assessed
The cumulative effect of wind, sea, current and tidal conditions on the ship may not have been fully appreciated. As a result of the above factors the vessel can experience difficulties in manoeuvring in a controlled fashion and within safe parameters. Insufficient allowance has been made for the forces acting on the ship. These can easily turn out to be greater than expected and beyond the capabilities of the ship and, due to the unforeseen effects of the prevailing and/or forecast conditions, insufficient tugs would have been employed to handle the vessel. There are instances where manoeuvrings in confined waters should be deferred until conditions have improved. This also includes cases of reduced visibility.

2. Unfamiliarity with the ship’s manoeuvrability
A pilot will know the local waters best, however, the master is more familiar with his vessel’s manoeuvrability. Due to the rotation of crew, familiarity with the ship’s own manoeuvring systems can be lacking, and, as technology and computerisation is becoming ever more prevalent, training may be needed to ensure that crew members are familiar with the vessel’s systems.2 It is important to include information as to the vessel’s manoeuvrability in the master/pilot information exchange before the commencement of the pilotage.3 The effect of changes in the vessel’s draft, trim and windage characteristics must also be taken into consideration when discussing the vessel’s manoeuvrability.

3. No agreed manoeuvring plan
Just how the vessel will manoeuvre when in close proximity to fixed objects is often not planned and/or agreed in advance within the bridge team and/or with the pilot.4 This not only concerns the location that the vessel is proceeding to/from, but also other fixed objects which the vessel will pass within critical close proximity. Often, insufficient time is invested in advance to consider how the vessel can be expected to behave, given its manoeuvring characteristics and the prevailing conditions. The closest points of approach are often not calculated as are critical bearings, transits and ranges to assist in determining the limits of the safe manoeuvring parameters.

4. Poorly executed manoeuvre
Even the best ship handlers occasionally get it wrong, although it is perhaps surprising how very wrong in some cases. Excessive speed is a common factor as is pilot error and the bridge team can be reluctant to intervene when the pilot is clearly making mistakes.

5. Communication with tugs, terminals and mooring crews leading to misunderstandings has also been a contributory factor. Even where a manoeuvring plan is agreed, prevailing circumstances can require the plan to be changed and there may be little time to react to new situations. In particular, changes in wind conditions and the movements of other vessels often create problems. In a number of cases it appears that aborting the manoeuvre to try again has not been considered or has been left too late.

5. Loss of manoeuvring capability
The loss of engines, propulsion, steering, or thrusters is, perhaps surprisingly, a less common factor than those mentioned above. There are instances where such a loss has occurred immediately before/after manoeuvring systems have been, or are due to be, repaired or overhauled.

Unfortunately, during these periods of increased risk, additional precautions appear not to have been taken. Pre-sailing and pre-arrival checks on manoeuvring systems are important, especially after a long ocean passage or stationary period. Less obvious factors involve squat and/or interaction. Although a loss of manoeuvring capability will inevitably make contact avoidance more difficult, exercises and drills can be used to test back-up systems, including use of the ship’s anchors. Having something in reserve is important, but being able to put that reserve to effective use is equally important.

Recommendation
It is better to abort the manoeuvre and make a second attempt than to fail on the first. During drills, exercises and tests of equipment prior to arrival, the Master should ensure that the crew is able to respond at any time to an emergency situation related to manoeuvring. Tasks should be properly defined and assigned to qualified personnel, and the Master should ensure that the company procedures are fully understood by everybody involved. Effective and clear communication is important. The Master should closely monitor the manoeuvres and should not hesitate to comment, give advice, or even abort an approach if he is uncomfortable with the situation.
“What if...?” – Planning for the unexpected before an emergency develops

We plan very well for situations which we know will cause us problems. The situations which we tend not to plan for very well, and which therefore catch us by surprise, are those where the potential for harm has not been foreseen or is considered too remote.

Things could have been different for over 1,500 people who lost their lives in that incident if the master and officers of the TITANIC had asked themselves (amongst other things): “what if the ice has progressed further south so as to affect our intended course?”

In today’s busy world, especially on ships, there is little time to stop and think about potential problems, to ask “what if…”? There are response plans and checklists available for emergency situations which have the clear potential to cause the crew and ship harm – for example, steering gear failure and fire. However, many serious incidents start life when there is no emergency as such, and develop into emergencies because the potential for harm has not been foreseen or has been considered too remote. Instead of asking ourselves “what if…?” we tend to persuade ourselves that something bad will not happen. In the wider context, asking “what if…?” is very much a part of situational awareness. The development of bridge resource management has done much to address deficiencies in situational awareness, by stressing the importance of a team approach. However, if the members of a team are too preoccupied with tasks at hand, or other human factors (such as fatigue) are at play, there will be a much greater chance of potential emergencies (or “what if…?”) not being considered at all.

What if...? - The weather
There is a lot of current debate about climate change and storms which are more severe or sudden than forecast. Claims experience, however, suggests that in many cases the crew simply simply being overlooked, even during periods when at anchor.

What if...? - Risk of collision
Asking “what if...?” where there is a risk of collision should be natural for the bridge watch-keeper. Unfortunately,

1 See article “Pilot error survey” in Gard News issue No.186
2 See article “Pilot on the bridge – Role, authority and responsibility” in Gard News issue No.160.
3 “Rubicon – The point of no return”.

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the growing number of navigational accidents suggests that this is not the case. In a recent incident it was fortunate that both crews escaped unharmed and that there was minimal pollution. However, one of the vessels was badly damaged and foundered, requiring an expensive salvage operation of ship and cargo. The incident is described in Image 1, below.

In Image 1 the two vessels are seen approaching each other in a routing scheme. Vessel A is heading south and vessel B is heading north-east. Both are roughly following the route as depicted by purple wavy lines, which meet south-east of a buoy marking the westerly edge of the route. The intention of vessel A was to alter to starboard at the buoy to follow route X as opposed to route Y. Unfortunately, vessel B was not sure which route vessel A intended to follow. As the vessels closed, vessel A altered course to starboard as intended and very shortly after that vessel B altered course to port. The incident resulted in insurance claims totalling in excess of USD 20 million and perhaps it could have been avoided had the bridge team on vessel B asked themselves “what if vessel A intends to alter to starboard to route X rather than carrying straight on to follow route Y?” and the bridge team on vessel A asked themselves “what if my intentions (in terms of which route I intend to take) are unclear?” The investigation into the incident concluded that neither vessel made timely contact with the other to arrange for a safe passage.

The above collision was one in which both vessels had plenty of time to react, but that may not always be the case. In another collision case investigated by the Danish authorities, the vessels were passing on reciprocal courses in a one mile wide deep water route. One of the vessels suffered a steering failure at the moment of passing and even the double hull of the other vessel, a tanker, could not prevent a large spill of fuel oil from one of her cargo tanks. What could the tanker have possibly done? The investigation report concluded that a contributing factor was the decision of both vessels to use the route, when there was a note on chart saying that the route should only be used by ships which, because of their draft, are unable to safely navigate outside. By using the route, the closest point of approach (CPA) between the vessels was considerably less than if they had used the recommended direction of traffic flow and the available time for evasive action considerably reduced.

**What if …? - Repairs at sea**

If recent media reports are to be believed, many incidents today involve damage to engines, often on board new ships, indicating that machinery systems are not becoming more reliable. Any vessel with an engine problem, especially a new and expensive one close to the shore, generates a certain level of concern. Even vessels that at first find themselves far off land in no immediate danger can end up perilously close when repairs do not progress as expected. In some cases repairs carried out by crew are unsuccessful and external assistance is called in to save the day. In others assistance is not called for or does not arrive in time and vessels find themselves in trouble. A classic example of the latter was featured in an article in Gard News issue No. 181 in a case where the chief engineer’s optimism as to when repairs would be successfully completed was shared by the master for too long. When the master finally sought external assistance there were no vessels or tugs available in the area that could possibly reach the vessel in time. The vessel grounded and became a total loss, luckily without loss of life.

A multitude of “what if …?” questions arise and ought to be considered in such cases, quite apart from the obvious one as to when external assistance can reach the ship. For example, what if the engine fault has been wrongly diagnosed, what if the wrong spare part is on board, what if someone gets injured during the repair? A very tragic case of another vessel grounding after unsuccessful repairs was the subject of an investigation by the US authorities. The vessel found itself in extremely bad weather in a very remote part of the world and several crew members died during evacuation from the vessel. Soon after the engine failure the ship’s superintendent was called by the master and told that the vessel was in no immediate danger or close to land (she was 46 nautical miles from the closest point of land – an island). The superintendent agreed with the proposed action to repair the engine, but it soon became apparent that external assistance would be necessary. The first tug arrived some 30 hours after the engine had failed, by which time engine repairs had been stopped due to the danger posed to the crew by the extremely rough weather. A second tug arrived ten hours later, but never connected a line, and after a further three hours the first tug’s line had parted. The weather prevented other attempts to connect tow lines and, despite the use of the vessel’s anchor as she approached shallower water, she eventually grounded some 53 hours after the engine had initially failed.

It is perhaps questionable whether, in this case, a state of emergency existed at the time the engine failed, particularly given the remote location and bad weather. Either way, asking “what if …?” at that moment might have bought some extra time.

**Planning for the unexpected - Problems**

How do you plan for something you do not foresee happening? Often there is no checklist or response plan specific to each exact situation and it is impractical to produce checklists and plans for every eventuality, every “what if …?”. Indeed, checklists can be dangerous because they may omit to refer to crucial considerations specific to the circumstances. Perhaps at the end of every checklist the question “have you considered other eventualities?” should be added.

Another problem is that sometimes there may be very little time to take action, and that is particularly relevant to pilot error. However, before the pilot embarks, the plan can simply be to identify the critical aspects of
the piloting where the bridge team will have to be particularly alert. The plan can also involve reminding the whole bridge team that pilots can make mistakes and that it is therefore important for the team to be mentally alert and prepared to speak up if there is any concern over the pilot's orders. Perhaps a final consideration to a pre-pilotage plan would be whether or not to proceed with the pilotage. If, for example, the weather conditions become marginal or the master is not fully satisfied with the pilot's plan (or even his competence) he may deem it prudent to hold back and to re-assess the situation.

Many situations, such as those mentioned in the above cases, occur on ships every day and although each situation will be different, time will often permit a plan to be developed to deal with a situation from the moment it becomes real.

Planning for the unexpected - Barriers
It is important to recognise potential barriers to planning for the unexpected and, perhaps more importantly, to carrying out plans. Amongst many that could be mentioned, the following examples are given:

- Language and cultural differences – These can generate reluctance within the bridge team to speak up if there is concern in a particular situation. The piloting case involving the bulker grounding mentioned above is a good example.
- Shore staff support – Even if only perceived, a suspicion may exist on the vessel that the shore staff will not support a decision taken on the vessel, for example not to proceed with a pilotage.
- Customer satisfaction – The need to avoid upsetting a charterer by taking a longer route.
- The need for speed – To quote a recent UK investigation report on a major casualty, “speed and quick turnarounds appear to have become the focus of the industry at the expense of the safe operation of its vessels.”
- The desire to save money – For a vessel without her engines far off land one can appreciate the temptation to attempt repairs before calling in potentially expensive external assistance.

Planning for the unexpected- Solutions
Perhaps the most important solution is mental preparation. If crew members have their minds preoccupied with other things, or have persuaded themselves that something bad will not happen, then chances are that they will not consider “what if…?” scenarios and will not react properly in a developing situation. Training, exercises and drills are good opportunities to test crew reaction to scenarios that have the potential to develop into an emergency. It is also possible to encourage people to think in terms of “what if…?”. One way to do that is to give positive praise for challenging attitudes and prudent over-reaction. So if a junior officer challenges a senior officer on his choice of course he should be praised, even if the junior officer’s concern turns out to be unfounded. The junior officer should not be chasteised. If the master’s decision to take an extra tug is not wholly unreasonable, his action can be supported.

At the moment a situation does arise, which calls for a plan, it will be important to bring together minds to discuss “what if…?” scenarios. In many of the cases mentioned above, the deck officers could have had a quick brainstorming session before they found themselves in a developing situation which required them to react without a plan. In cases involving engine failure, the session would obviously involve the engineers and the value of shore staff involvement should not be underestimated, since they are likely to be less distracted by the situation itself. An agenda for a “what if…?” brainstorming session might include the following:

- situation description
- what are the main dangers/risks to the crew/vessel?
- what could change that would increase/ alter the danger/risk?
- what are the worse case scenarios?
- what is the plan?
- what is the back-up plan?
- what if …?

In a collision situation, a brainstorming session is less likely to be practical, but the officer of the watch should not be afraid to discuss potential problems with the lookout, e.g., “do you think that vessel clearly understands our intentions?”.

The investigation of near misses is worth a mention. These can be vital in terms of detecting whether any barriers exist and may provide an opportunity to do something about them before a near miss becomes an emergency which is out of control.

Conclusion
Aking “what if…?“ in a developing situation on board a ship and planning accordingly may make the difference as to whether or not that situation develops into an emergency. At the very least, it may buy the crew and
Pilot error survey

International Group of P&I Clubs reports on pilot error-related claims
The Pilotage Sub-committee of the International Group of P&I Clubs (IG) has published a report on claims over USD 100,000 involving pilot error. Information pooled by IG Clubs relating to 260 such claims has been included in the study, which covers the period from 20th February 1999 to 20th February 2004.

Important observations
The average number of incidents per year involving pilot error was 52. The frequency did not increase from year to year. The average cost of each claim over the five year period was USD 850,000. The average cost did not increase from year to year either.

Claims for damage to fixed and floating objects (FFO) involving pilot error accounted for 65 per cent of claims by number (37 claims per policy year) and 33 per cent by cost. The average cost of each claim for damage to fixed and floating objects was USD 400,000. The report recommends better training or briefing of bridge team management to operate with the pilot on board, especially in relation to passage planning.

Collisions involving pilot error accounted for 24 per cent of claims by number and 24 per cent by cost. On average there were 14 collision cases per year involving pilot error and the average cost of each case was USD 800,000. The report recommends bridge teams to keep a proper look-out and not to forget that their eyes are still the most sophisticated aid to do so.

Groundings, pollution and general average/salvage cases involving pilot error each accounted for about three per cent of the incidents by number. There were on average two incidents in each of these categories every year. Groundings accounted for 35 per cent of all incidents by cost. The average cost of each grounding involving pilot error was USD 7.85 million and of each pollution incident involving pilot error the average cost was USD 1.8 million. The report recommends better training or briefing of the bridge team management to operate with the pilot on board, with emphasis on the master/pilot exchange of information.

Groundings are the most expensive pilot error claims. They are more than four times as expensive as pollution claims and almost 20 times more expensive than FFO claims.

The IG is currently maintaining a database of pilot error incidents from 21st February 2004 to the present and thereafter.

The complete report can be downloaded from the IG website at www.igpandi.org under “News and Information”.

What happens to the pilot after a casualty?

A glimpse at pilot error from a different perspective.

When a vessel with a pilot on board is involved in an accident, the usual practice is that the pilot leaves the vessel as soon as possible, often being replaced by a new pilot. Hence, examination or questioning is avoided. The pilot is “the shipowner’s servant”, and faults or errors made by the pilot are generally covered by the shipowner’s insurance policies. Only in major casualties can one expect that the pilot will be forced to give evidence and to be cross-examined. In these cases, the normal procedure is for the pilot to demand a written letter of indemnity from the shipowner prior to any hearing.

One should therefore believe that pilots involved in casualties do not get any reproach as a consequence of their faults. However, some (or perhaps most) pilots’ associations have their own internal investigations following a casualty, although very seldom is one made aware of sanctions imposed.

In a particular recent collision case, Gard received a copy of the relevant pilots’ association’s investigation, which proved that some pilots in fact are properly sanctioned. In the case in question, the pilots’ association’s investigation concluded that the pilot was responsible for:

- wrong understanding of the distance between his vessel and the moored vessel with which it eventually collided;
- his approach was too fast;
- the timing of turning was wrong;
- other waiting vessels made him over-hasty in his operations.

Due to the above, the pilot was suspended from business for 21 days. He was degraded to a lower rank for three months, including a salary cut of USD 1,000 per month for the same period. In addition, he was forced to take navigational simulator training at his own expense.

Notwithstanding, the damage to the vessels had to be covered by the shipowner’s insurers.
Don’t fall asleep on the job
No let-up in fatigue-related casualties

Fatigue at sea is a problem which needs urgent attention.

A serious problem
There continues to be a sharp and detailed focus on seafarer fatigue. The Centre for Occupational and Health Psychology at Cardiff University in Wales has recently (November 2006) published an 87-page report into seafarer fatigue. The Nautical Institute is concentrating several of its forthcoming “Alert!” bulletins on this issue. Other industry and industry-related organisations, notably the International Transport Workers’ Federation, have carried out studies into this problem. Five years ago an article in Gard News reported on fatigue-related casualties and pointed out that all sides of the industry were expressing concern about fatigue in seafarers, especially officers. The article said that “there are signs that the fatigue problem is getting worse, not better.”

Regrettably, the answer seems to be “very little”. If anything, increased and increasing commercial pressure within the shipping industry means that companies and individuals in these companies are continually required to provide the best possible service, in the shortest time available and at the lowest cost possible. This is not to say that any or all of these objectives are, by definition, wrong or dangerous. It is, however, undeniable that cutting costs is often the easiest to achieve of these three objectives and it is sometimes the case that the greatest and possibly disproportionate emphasis is placed on the cost factor.

As mentioned in the 2002 article, it is natural for shipowners, operating in a very competitive environment, to wish to keep their operating costs to a minimum. Thus many owners will crew their ships with no more than the minimum number of people required by the Standards of Training, Certification and Watchkeeping Convention (STCW). This is perfectly legal and they are quite entitled to do so. Understandably, very few owners will, voluntarily, place themselves at what they would see as a commercial disadvantage by employing more crew than they are legally obligated to do.

Unfortunately, evidence collected in recent years by many organisations inside and outside the industry in relation to fatigue-related casualties suggests that the problem remains a serious one. Despite all the attention and publicity the problem is not going away. Indeed, with the growth in world trade and consequent expected increase in the number, size and value of ships; it is a major concern that not only are fatigue-related casualties going to be with us for the foreseeable future, but also that they are likely to increase.

Bridge Watchkeeping Safety Study
In July 2004 the UK’s Marine Accident Investigation Branch (MAIB), published a report entitled “Bridge Watchkeeping Safety Study”. The report may be found at www.maib.gov.uk/publications/safety_studies.cfm. Gard strongly recommends every shipowner and operator to read this report, especially those operating in the short sea and container trades. Based on its own investigations into many casualties around the UK coastline, the MAIB takes the view that, in certain trades at least, the minimum manning levels and required hours of rest provided for in STCW are insufficient to prevent fatigue-related casualties continuing to occur. Particular reference is made to the system of a six-hours-on/six-hours-off watch practised on

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1 Copies can be obtained from Gard. Alternatively, further information may be obtained by e-mailing the author at smithap@cardiff.ac.uk.
2 “Are we tired of hearing about fatigue-related casualties?” in Gard News issue No. 166.
many short sea vessels, where the master and chief officer – the only two deck officers on board – each stand two watches in one 24-hour period. These watches are in addition to all the other tasks which these officers have to perform. The MAIB comments that “as ships operating with just two bridge watchkeepers including the master, working in opposite watches, are likely to have fatigued OOWs, and the masters of these vessels are frequently unable to discharge all of the duties required of them, the need for more than two watchkeepers is obvious”. This view is shared by the Nautical Institute, which, in Bulletin 13 of its “Alert” magazine, says that “in these cases, the solution is simple: increase the manning to remove the master from the watchkeeping roster and consider an alternative watchkeeping pattern”. The MAIB believes that their research “illustrates that the hours of work and lookout requirements contained in STCW 95, along with the principles of safe manning, are having insufficient impact in their respective areas”.

The report contains recommendations to the Maritime and Coastguard Agency (MCA), the agency responsible for implementing the UK government’s maritime safety policy throughout the UK, to take the findings of the report to the International Maritime Organisation (IMO) with a view to reviewing the guidelines on safe manning for vessels operating a “master and mate” system and the requirements of STCW relating to a designated (and dedicated) lookout, working as an integral part of the bridge team.

Gard has seen many cases which mirror the problems identified by the MAIB. A couple of examples will suffice.

Example 1
This is the “classic” case of a solo officer of the watch (OOW) falling asleep while on watch. The vessel, a small short-sea general cargo tender, entered with Gard for P&I risks, was on a voyage from Iceland to the UK. While passing between the north of Scotland and the Orkney Islands during the early hours of the morning, a time at which the human body is perhaps most vulnerable to falling asleep, the OOW did exactly that. As a result, the vessel failed to change course and went aground on an island. The vessel sustained substantial damage to her bottom. A salvage contract, on LOF terms, with SCOPIC incorporated, was signed with a salvage company. The amount of the salvage award remains to be established or agreed, as does any cargo claim.

The vessel operated with seven crew (one more than stipulated in her Safe Manning Certificate). The master and chief officer operated a “watch-on/watch-off” system. Many of the other crew members had dual roles. The chief officer was on watch when he fell asleep. He was alone on the bridge, despite the provision within STCW that “the OOW may be the sole lookout in daylight conditions” (our emphasis). The chief officer woke up only when the vessel went aground.

Investigations indicated that the chief officer had become fatigued shortly before the incident during periods of intense work and had been unable to obtain enough proper rest before the voyage. When he fell asleep, there was nobody on the bridge to wake him up. The vessel was not fitted with a “dead man’s alarm”. Nor was she required to be.

For the reasons stated above, it is not known what the final cost of this incident will be. However, the master has been prosecuted by the UK authorities (the MCA) for breach of one section of the Merchant Shipping Act 1995 and, having pleaded guilty, he has had to pay a fine and now has a criminal record in the UK. The MCA has indicated that it also intends to bring criminal charges against the shipowners.

It is too early to say what the total financial cost will be. It is, however, likely to be significant. This ignores the human cost to the master and chief officer.

Example 2
A small (approximately 6,000 GT) container feeder vessel ran aground on an island in the Aegean Sea. This vessel had cover for loss of hire with Gard, but her P&I cover was with another Club. As in the previous example, the chief officer was the OOW and was alone on the bridge at the material time. Due to fatigue, he fell asleep, the vessel failed to change course as planned and grounded at full speed. The vessel sustained serious bottom damage. Oil from her bunker tanks was split. An LOF salvage agreement was signed with salvors. The vessel was re-floated and repaired.

The vessel was out of service for over 94 days. The bill for the repairs and costs associated therewith came to around EUR 2 million. The amount awarded to or agreed to be payable to the salvors is not yet known. Nor is the amount paid by the P&I Club for the oil pollution or for any other third party liabilities, but it is clear that the cost to owners and their various insurers arising from the chief officer’s fatigue and the lack of anyone (or anything) to alert either him or another member of the crew to the problem was substantial.

In addition, the chief officer was criminally prosecuted by the Greek authorities for causing oil pollution. He was found guilty and sentenced to 18 months in prison. The sentence was appealed and suspended. Nevertheless, he too has a criminal record.

Conclusion
Are all masters and chief officers who take a watch without being properly rested criminally negligent? No, of course they are not, but there may be many who would, from their own experience, support the conclusion that, particularly on certain trades, they are consistently overworked and are unable to obtain the hours of rest stipulated by STCW. In such circumstances, it is difficult to avoid the conclusion reached by the MAIB that, in certain trades, the requirements of STCW may not be good enough to prevent more officers falling asleep while on watch.

When one adds in the fact that, as the examples show, the OOW is often the only person on the bridge and there is no alarm which operates so as to alert either the OOW or anyone else to the fact that there is nobody navigating the vessel, one has a recipe for disaster. The examples are merely the tip of the iceberg.

If owners, insurers and legislators wish to remedy the problem, an industry-wide approach is needed. It has been shown that, where the will exists, agreement can be reached and legislation enacted quickly. The MAIB report was published in July 2004. The MCA appears to have accepted its views and recommendations, and the IMO was looking at the issues of seafarer fatigue, work and rest hours and the appropriate levels of safe and minimum manning.

The secretary general of the IMO suggested that particular attention should be paid to the levels of safe manning so as to ensure that watches and watchkeeping hours are correctly performed and observed. The International Shipping Federation, representing many of the world’s leading shipowners, reportedly called for STCW to be reviewed and brought up to date, taking into account developments in ship operation and technology since the convention came into force.

It is therefore disappointing to see reports of a recent meeting of the IMO sub-committee on STCW stating that there was apparently “a lot of opposition at that meeting, mainly on financial grounds” to amending the existing regulations. According to the reports, certain countries, which one might expect to be at the forefront of safety at sea, have opposed any tightening of the rules and in fact may be seeking changes which could well exacerbate the fatigue problem.

Fatigue at sea is a problem which continues to affect shipowners and operators, their customers, the environment, insurers and most importantly, the people on board. Gard believes it is a problem which needs urgent attention. Whether it receives it remains to be seen.
Is the pilot a part of the bridge team?

By Captain Erik Blom Master of the M/V BLACK WATCH, Fred. Olsen Cruise Lines

I have been a Captain for the last 20 years, starting in the Royal Norwegian Navy, later becoming a pilot on the Norwegian coast, until I decided to change trade and became a cruise vessel captain. Over the years I have worked on and managed a lot of bridges, some well-functioning and the odd ones not working at all.

Most readers will certainly know the purpose of a well-functioning bridge team. Hopefully gone are the days when the Captain – with a capital C – took all the decisions without discussing with anyone, and not listening to advice from others. On bigger ships the master now has a team around him on board to support him in his decisions: the bridge team.

Bridge team and its responsibilities

There are many combinations of environmental and other factors for setting different watch conditions, but as a minimum on ships with crews of more than 6-7, the bridge team (BT) consists of the master, the officer on watch (OOW) and a sailor as helmsman and lookout. With several shipping companies, especially within the cruise and oil industry, additional crew joins the BT.

The BT’s responsibility is to ensure a well-functioning Bridge Resource Management (BRM). Some of the main objectives of BRM are:

– To assist the ship master in managing the vessel's bridge team for each voyage so that personnel are rested, trained and prepared to handle any situation.
– To help bridge team members interact with and support the master and/or the pilot.

Pilot’s responsibilities

The pilot is on board to assist in navigation and manoeuvring. The exchange of information between master and pilot does not shift the responsibility for the safety of the vessel from one to the other.

Fatigue

Chapter VIII (Fitness for duty) of the STCW Convention sets limits on the hours of work and minimum rest requirements for watchkeepers.

A pilot’s work environment (irregular and lengthy working hours, working at night, unpredictable duty rosters, and travelling to and from their jobs) can significantly contribute to fatigue. Moving a large vessel in confined waters is a high-risk task and the pilot assigned to that task has a responsibility to the state, the port authority and the ship’s master.

Hopefully the answer to the above question is yes, but this comes at a price.


19Pilots are managers of high-risk
situations that require intense concentration and skill levels so that any decrease in performance can potentially lead to a catastrophe. A pilot error caused by fatigue can endanger the ship, crew, port and the environment.

Only national rules apply to pilots and they are not subject to the same regulations as the ship-board crew. I have met pilots who have been on the run for more than 36 hours without a decent nap, and I can assure you it does not bring back happy memories.

Communication
Communication can not be overrated. It is the most vital part of bridge team management. Communication with pilots and their organisation starts already during passage planning. Some countries have pages and pages with information within our planning material, and the information often ends with the statement “…failing to report … might cause x hours’ delay”. If the master/ship has not been to the port before the stress level within the BT begins to rise.

The next crucial point of contact is when the OOW uses the VHF to report to Vessel Traffic Service (VTS) or pilot station. Most stations are very friendly and helpful, but others do not reply at all when ships try to comply with the compulsory rules to report the required number of hours before arrival. The OOW has been informed via passage plan that he must get in touch with the pilot station by a specific time otherwise the ship might be delayed. If there is no reply he will continue with repeated calls on all possible means, dive back into the publications to double check the passage plan information and take the focus away from his main duty – to navigate. This in turn again increases the stress level.

Then the pilot boat is approaching. Being a former Norwegian pilot myself I know how important it is to have optimum conditions for the pilot boat when the pilot is boarding. It can look very calm down there from the bridge wing, but being in the pilot boat is a different story. Very often the pilot boat master has a specific heading he wants us to steer. Coming into the UK is a pleasure: they are always very polite using phrases such as “Please, Sir” and “Captain”. Others merely observe the formalities and make you feel ill-at-ease. This is not a good start as you are waiting for a person from that particular pilot boat to come up on the bridge expecting him/her to be a part of the bridge team.

Eventually the pilot is on the bridge. How the master and the pilot meet and greet each other is the key to how the rest of the passage will be. The pilot has (maybe) done this passage hundreds of times and the master – not having been here before – has made his own assumptions on how the approach should be handled.

I have experienced pilots embarking at the breakwater, not giving us time to meet and greet at all, forcing me more or less to disregard the pilot as there is no time to discuss or exchange information. This is very often the case in Mediterranean ports where you only have a breakwater and a berth or two. The pilots are just there as an advanced linesman showing us where to berth. This is a very unsatisfactory situation as the pilot is not integrated with the BT and sometimes just creates clutter to the organisation.

In general the pilots are on the bridge in due time in order to allow for a thorough “handover”/information exchange. In this case the master has a vital role in making the pilot feel welcome, and the pilot needs to remember how it was coming into a new (complicated) port for the first time.

A lot of information has to be exchanged between the pilot and the master in a relatively short time, when the master normally has “the conn” and the ship is moving in confined waters (to have “the conn” is to have sole responsibility to control, or direct by order, the movements of a ship, i.e., to give proper steering and engine orders for the safe navigation of the ship).

Typically the following information is to be exchanged between the pilot and master during the approach: ship details; originating authority; manoeuvring details; propeller details; main engine details and equipment defects; berth and tug details; local weather and sea conditions; details of passage plan, including navigational hazards, abort points and emergency plans; local regulations, including VTS reporting, maximum allowable draft, etc.; ship’s agent; year built; IMO number; cargo type (IMO codes if dangerous cargo); last port; etc.

At this stage it is very important that the chemistry between the pilot and the master is good. Otherwise it might lead to dangerous situations.

The next step is transition of “the conn” from the master to the pilot. I have met pilots coming on the bridge and, without acknowledging anyone, giving the helmsman orders based on the ship’s heading when he left the pilot boat, not realising we were on the correct heading for the approach. After the exchange of information summarised above I always clearly inform my bridge team with the phrase “Pilot has the conn” and in turn my OOW and helmsman acknowledge the information: the closed loop.

The “closed loop” is a communication protocol where information is given, repeated by the receiver and normally confirmed by the issuer. This is the only way one can be sure an order is being followed and is a vital part of the bridge team management. Having observed this from all sides, it is obvious to me that you can minimise the risk of misunderstanding if the “closed loop” is working. In a Canadian study where 200 accidents were related to human error, 84 (42 per cent) involved misunderstanding between pilot and master and some could probably have been avoided if the “closed loop” protocol had been used.

Language
I have recently returned from a voyage to the French part of Canada. In the St Lawrence River ships the same size as mine always have two pilots on board taking one hour watches. As in many other countries, a new generation of pilots is being trained and in addition to the two pilots we had apprentices on board. It was too easy for them to fall back on speaking French between themselves instead of speaking English and in turn creating two “bridge teams”, which should be avoided.

Sometimes it is not possible to avoid two teams due to communication difficulties, either on the crew or on the pilot’s side. Based on my experience, most pilots speak more than good enough English, but as a pilot conning a ship heading for Mongstad oil terminal I have experienced that my helm orders had to be translated into three different languages before they were executed by the helmsman. In that situation it was difficult to establish a closed loop.

The pilot is a vital part of the bridge team
Provided a few essential premises are taken care of, the pilot is a very vital part of the bridge team.

In my opinion, fatigue, language barriers, lack of chemistry, an open loop and, last but not least, cell phone calls from the pilot’s family are threats to ships’ safety.

“Welcome on board, Mr Pilot. Coffee or tea?”
Navigation through the entrances to the Baltic Sea

This circular is based on a recent letter received from The Danish Maritime authorities highlighting the increased number of navigational accidents in Danish waters, and Gard’s own experience with similar accidents in the same area.

As members and clients are aware, IMO resolution MSC.138 (76) provides recommendations on navigation through the entrances to the Baltic Sea, namely the Great Belt (Route T) and The Sound. The recommendations include the use of pilots for certain types of ships in high traffic density waters. The purpose of IMO resolution MSC 138(76) was to provide those responsible for the operation of ships with recommendations on safe navigation through the entrances of the Baltic Sea with the objectives to ensure safety, prevent human injury or loss of life, and to avoid damage to the environment, in particular the marine environment, and to ships and their cargoes.

In a letter to the International Group of P&I Clubs, the Danish Maritime Authority has drawn the shipping industry’s attention to IMO resolution MSC.138 (76) and indicating that a number of ships are disregarding the recommendations. According to a safety study conducted by the Danish Maritime Authority, during the period from 1st January 2002 to 30th June 2005 alone, 22 ships grounded in the Great Belt and none of these ships had a pilot on board at the time.

The Danish Maritime Authority letter illustrates and emphasises that it is highly recommended to utilise the expertise and local knowledge of pilots, and that as a minimum, vessels sailing through the Great Belt or The Sound follow IMO’s recommendation on navigation through the entrance of the Baltic Sea.

Denmark has also launched a procedure whereby all vessels entering Danish waters without ordering a pilot in accordance with the IMO recommendation will be contacted in order to draw their attention to the recommendations on the use of pilots. When a ship does not comply, the master will be informed that Denmark finds it inconsistent with safe navigation practices and procedures to neglect an IMO recommendation. These ships will be reported to the maritime authority in the ship’s flag state.

The following documents are available at www.gard.no under News in the Loss Prevention section:
- The Danish Maritime Authority Letter
- IMO resolution MSC.138(76)
- Intertanko model charterparty clauses in recognition and support of IMO res MSC 138(76).

General information on Pilotage in the Baltic can be found at the Baltic Pilotage Authorities Commission website at: http://www.balticpilotage.org and http://www.pilotage.dk

Vessels to which the IMO recommendations do not apply are advised to navigate with extra caution through the entrances to the Baltic Sea, i.e. the Great Belt (Route T) and The Sound. A guide to navigation in Danish waters can be found at http://www.dma.dk/Publications/Sider/Mainpage.aspx.
Operations in extremely cold climates

Introduction
Operations in extreme cold environments are perhaps the most demanding and challenging that a vessel and her crew may experience. The extreme cold reduces the crew’s efficiency considerably. In addition, sensitive deck-mounted equipment and pipelines are often at risk of damage if precautions are not taken in time. There is also the risk that ice damage to vessels may result in oil spills.

Damage related to extreme cold and navigation in ice occurs every year. They are more frequent at the beginning of a cold period, and vessels entering such waters infrequently are more exposed than other vessels. Extreme cold causes damage to cargo, vessel equipment and injuries to the crew, while navigation in ice causes damage to the hull, propellers and/or rudder.

An article in Gard News issue No. 127 \(^1\) outlined guidelines to prevent cold weather damages to vessels and their equipment. Gard Services has also tried to obtain information based on experiences gained by shipowners operating in extreme cold environments on a frequent basis. The following list is not meant to be exhaustive, but should serve as a reminder, as temperatures in the Northern Hemisphere are again very low.

Deck mounted equipment
- Frozen pipelines are perhaps the most common damage that occurs. The pipelines should be properly drained well in advance. Do not forget fire hoses and couplings, which in some cases may become inoperative if not properly drained. Exposed piping should be insulated to prevent freezing where necessary.
- Periodically purge air lines on deck to remove water condensation.
- Fresh water piping systems are particularly at risk of freezing. Consider circulating water in the fresh water piping system.
- Deck-mounted winches and other sensitive equipment should be covered to avoid icing from freezing spray. Hydraulic equipment should also be started several hours before use, in order to achieve proper oil temperatures on hydraulic hoses before they are exposed to high pressure. In some cases it is recommended to keep the equipment going constantly. Check that the lube oil has the necessary specifications for these climates.
- Consider stowing mooring ropes and pilot ladders below deck to prevent freezing and reduce the chances of ice build up.
- If possible, ballast tanks should be filled with water with a high salinity (and consequently lower freezing point). Furthermore, to avoid freezing of the air pipes, the ballast level should be dropped. Frozen air pipes may cause severe damage both to tank structure and pumps alike.
- All spare electricity should be used

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\(^1\) “Navigation in ice – Cold weather procedures”.

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to heat the accommodation and compartments exposed to the ice and cold (fore peak, etc.). Be aware of the fire danger if industrial heaters or gas torches are used. Keep doors closed to retain the heat.

– Engine ventilators may in some cases be turned off (but remain open) to avoid freezing of sensitive equipment in the engine room.
– Ice on deck should preferably be removed with wooden ice mallets, to avoid damage to the hull paint coatings and also to prevent frozen and brittle metal from breaking. It is also recommended to keep sufficient stocks of glycol and salt to remove and prevent ice build up.
– Safety equipment should be checked frequently, including safety hand lines, if rigged. Remember the fresh water tanks in the life boats.
– Move anchors periodically in order to prevent chains and winches from freezing.
– Alterations in speed and/or course should be considered to reduce the effects of freezing spray.
– Deck and navigation lights can easily be damaged by the cold and ice, and should be checked frequently to ensure they remain in proper working order.

Cargo holds
Several types of cargo are exposed to contamination from water, and low temperatures may in some cases increase the condensation problem.

– If cargo ventilation (if installed) is used, snow and moist cold air may lead to condensation and should not be blown into the cargo holds.
– When cleaning the holds, keep the use of water to an absolute minimum. Sweep holds properly in advance of using water. Use pre-heated water whenever possible. Prevent dirty water from aggregating and freezing by removing excess water in locations where freezing could occur.

– Remove ice and snow from hatchoaming top before closing the hatches. Otherwise, this may later melt, and create leakages. Leakages may also be created by water freezing between the hatchcover panels.

Crew
– Low temperatures reduce the crew’s physical ability, effectiveness, and can impair judgement. Proper clothing is therefore essential to maintain crew safety and awareness.
– Review rotation of watches for crewmembers working in excessively cold areas to ensure exposure is kept at a minimum.
– Always brief the crew properly in advance of any operation that is not carried out on a regular basis.

Navigation in ice
– A considerable amount of information on ice conditions and navigation in ice is available on the Internet. For example:
  – Featured resources, including ice maps and alerts is collected in the Loss Prevention Spotlight on http://www.gard.no/ikbViewer/etnr_pecr-20650989
  – Local meteorological stations are more than willing to share important information when contacted. Ice charts are also received on the weather facsimile receiver.
  – Instructions from icebreakers and local authorities should be carefully followed. If you are taking shortcuts and are caught by the ice it may be difficult to receive timely assistance.
  – The effect of current on ice should not be underestimated. If you are caught in the ice with the current in an unfavourable direction, this may expose the vessel to collision, grounding or other types of contact damage.

To avoid damage to the rudder and propeller blades. It may be advantageous to run the engines ahead to wash away ice around the propeller and rudder before attempting to run astern, which again should be kept to a minimum to avoid the rudder or propeller being exposed to solid ice.

– Especially in ballast condition, the cooling water inlet pipes may be chocked with ice. This can subsequently lead to a loss of cooling water. Engine crew must be properly briefed and made aware in order to avoid such situations.

– For vessels with high air draft or exposed rigging, icing can affect the stability of the vessel. Therefore, vessels may need to lay by and remove ice with mallets or other suitable tools.

The shipyard
– If the vessel is at the repair yard or dock, the vessel’s crew should check all items at risk of cold damage, and not leave this to the yard or sub-contractors.

– If the vessel is at the repair yard as a result of damage, and additional damage is incurred due to extreme cold whilst at the yard, the additional damages will be subject to a separate claim and will in many cases, be below the applicable deductible. This applies to both hull and machinery and loss of hire.

Bunkers
– Whilst at port or at the repair yard in locations with an extremely cold climate, it is imperative that heavy fuel oil bunkers remain properly heated at all times in order to retain enough viscosity to be pumpable and to be used. If the fuel oil is not kept at the proper temperature, it could take days before it is heated sufficiently to be used and, will thus delay the sailing of the vessel.
Winter season in Northern Baltic Sea

The 2002/2003 winter season was the worst on record since the winter of 1987. Our statistics appear to indicate that the preceding relatively mild winters may have lulled seafarers into a false sense of security. How this and future winters will unfold remains to be seen, but shipowners and operators would be well advised to ensure that their seagoing personnel are well aware of the planning, preparation and care required while navigating in ice.

Approximately 30% of all averages which occurred in connection with navigation in ice in the Baltic Sea during the past winter season, were collision cases. This is a substantial number and leads us to again remind shipowners of the issues involved.

The most common cause was collision between vessels in an ice convoy. Under normal circumstances blame has been apportioned equally between the colliding vessels. Otherwise, in determining liability, emphasis was placed on:
1. How the watch keeper had been alerted by the vessels involved,
2. How vessels ahead and abaft had been warned by the vessel which was stuck or slowed down in the ice,
3. Distances kept between the vessels, and of course
4. The ice situation in general.

In some collision cases, and in particular when an assisting icebreaker is involved, the case may be settled on a “knock-for-knock” basis. This means that both parties cover their own cost of repairs. The same principle may also be used or agreed upon between the parties, when two merchant vessels, assisting each other when navigating in ice, are involved in a collision.

However, the above “knock-for-knock” practice is only used in “standard” cases caused by difficult ice conditions. If gross negligence or other similar causes are involved, other methods of apportioning blame will be used.

Analysis of the collision cases shows that the vessels involved are very often blamed for not complying with the applicable rules; The International Regulations for Preventing Collisions at Sea, 1972 (COLREGS 72), and the Finnish/Swedish “Rules for Winter Navigation”.

The Finnish/Swedish “Rules for Winter Navigation” are endorsed by Germany, Denmark and the Baltic States. In addition to directing navigation during the winter period in Finland and Sweden, these Rules set the standard for ice navigation in the Baltic, including navigation in ice in conjunction with icebreakers in the majority of the Baltic.

For further details about the “Rules for Winter Navigation” please see the Finnish Maritime Authority’s home page at http://portal.liikennevirasto.fi/siva/www/e/professionals/winter_navigation

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Navigation when the vessel is part of a convoy is a risky operation, and the crew must be alert and maintain a proper lookout at all times. It is essential that all relevant regulations are properly complied with. Breach of COLREGS 72, especially the below mentioned rules, appears to be the most common cause of collisions:
- Rule 5 – Proper look out
- Rule 6 – Safe speed
- Rule 7 – Risk of collision
- Rule 8 – Action to avoid collision
- Rule 13 – Overtaking vessel
- Rule 17 – Action by stand-on vessel
- Rule 27 (a) (i) – vessel not under command (stopped) to show two red lights

The Finnish/Swedish “Rules for Winter Navigation” require
(a) Strict watch keeping both visually and especially by radar and immediate notification by VHF radio when loss of speed is experienced.
(b) In case of stoppage:
- Immediate signalling in case of failure of other means of communication
- Immediate engine manoeuvring
- Immediate rudder manoeuvring

Recommendation
When navigating in ice or in the vicinity of ice, shipowners must ensure that their onboard personnel are well aware of the regulations governing such navigation. Furthermore, masters must be advised of the requirement to ensure proper compliance with the governing regulations and also of the utmost care required in order to promote safe navigation.

This circular has been produced with the valuable assistance of former Hull Claims Manager, Captain John Hammaren in Finland.
Anchoring - Getting into a safe haven or into a potential disaster?

Over the years Gard has seen incidents where serious casualties have resulted from anchoring problems. Many of these incidents have been caused as a result of inadequate manning and/or improper watch arrangements on the bridge and/or in the engine room. This article describes some incidents related to anchoring and discusses lessons learned from them. Often such incidents have resulted in subsequent grounding.

Being on the high seas, with lots of leeward space to land is every master’s delight. With a firm hand on the wheel and an alert lookout, combined with well-run machinery, he can have a comfortable rest without being awoken by unfamiliar vessel movements.

Lying at anchor, on the other hand, may cause any master a fitful sleep.

Any small boat skipper knows his boat by the signals he gets through his various senses, and he senses immediately when something is amiss. Larger vessels give the same signals, but they become more distorted and are not so easily recognisable. Hence, a more rational and meticulous approach is required to safeguard the operation of the vessel.

The experienced small boat skipper will know immediately when his vessel is about to drag anchor, thus enabling him to counter the effects before becoming adrift. On a larger vessel such operation takes time, hence an alert watch, which can prepare for contingencies in case of a shift in weather or other conditions, is a must. It is therefore of utmost importance to pick your anchoring spot carefully, taking into consideration prevailing winds and currents, nature of anchoring surface, the topography both ashore and underwater, the duration of stay, the density and proximity of traffic, restraints that may be imposed by the state of the engines and anchoring equipment. The importance of maintaining the anchoring gear in good condition can not be over-stressed. The condition of the gear must be carefully checked prior to anchoring. There is no point in a good holding ground, if the anchor brake lining is worn and only able to function at a fraction of the design holding power, or if the additional chain stoppers are not in proper shape and fit for use.

Two incidents are described below, from which important lessons can be learned.

**Incident 1**

Having arrived at port to load, a strong east to south-easterly wind prevented the vessel from commencing cargo operations via feeder vessels. On the following morning, the master received orders from his agents to proceed, with pilot embarked, to a more protected location to commence cargo operations. However, British Admiralty Charts of the area were not particularly detailed. The pilot had only a photocopy of a larger scale local chart.

At around 1600 hrs the port anchor of the vessel was dropped approximately on the 50 m contour line on the photocopy map. The vessel had eight shackles of chain (approximately 220 m) in the water. The master estimated a turning radius of about two cables.

The vessel was moored on a heading of 150 degrees and, in the master’s estimation, outside the 20 m contour line should she swing right round. The vessel’s echo sounder transponder was situated in the bow of the vessel and when she initially anchored it was observed that there were 33 m of water indicated under the keel.

The pilot assured the master that the vessel was on good holding ground and that the loaded draft would be 11.8 m. The master was satisfied that the ship was anchored in a good position. On the final day of loading (four days later), the wind had shifted to the west and the vessel was now on a heading of 289 degrees. The master’s intention was that the ship should arrive at its discharge location with an even keel. Therefore, the plan was to complete loading with a trim by the stern of 45 cm. In order to achieve this, it was agreed that the last 700 tonnes of cargo were to be used for trimming purposes.

At 1520 hrs the feeder vessel gave notice to commence loading the remaining 700 tonnes. At 1540 hrs, the chief officer of the vessel boarded the feeder vessel and noted the draft of his vessel was 11.12 m forward and 10.52 m aft. The trim at the head surprised him. He was concerned that they were not able to attain the 45 cm stern trim. He checked his calculations and in addition he requested that the ballast tanks be sounded since he believed that the ship should not have had a head trim at the time. At 1600 hrs the first officer notified the master of his concern.

At 1615 hrs the aft draft was checked again. It remained at 10.52 m despite continuous loading into No. 7 hold. They then realised the vessel was aground and loading was suspended at 1620 hrs. The ship’s heading remained steady at 289 degrees. At 1800 hrs the steering gear was extensively damaged with the rudderstock protruding approximately 20 cm above the steering flat.

The following causes contributed to this incident:– When the wind veered, the anchor position changed from being in the lee of the land to being on the windward side of the land, a most unfortunate position to be anchored in. At that point in time it would have been prudent to change anchor position towards the other shore.

– Eight shackles of chain for 33 m anchoring depth was somewhat excessive. The recommended ratio is three to four times the depth depending on depth and holding ground.

– Neither the vessel nor the pilot had the proper charts with the required contour details of the location where the vessel was finally anchored.

– The vessel’s crew made incorrect assumptions as to the consequences to the ship if she swung about. The crew should have taken continuous soundings at the location they were anchored since limited information was available.

– The ship’s crew were over-confident of the pilot’s assessment as to the water depth of where the ship was anchored. This should have led them to be more diligent.

**Incident 2**

The ship approached the loading port...
and was directed by the harbour master to a nearby anchorage. The master was asked whether he would like the assistance of a pilot. The master politely rejected the offer and proceeded to the anchoring position.

The vessel anchored in a position 7.5 cables (approximately 1,400 m) from the shoreline, which was a sandy beach. The echo sounder indicated the depth of the water to be 31 m and the master ordered five shackles (approximately 140 m) on deck. The wind was a light breeze from south-west and everything looked rather smooth. The master rang finished with engines. A combination anchor watch and fire guard was established on the bridge.

Initially the vessel was supposed to start loading the next day, but loading was delayed due to problems at the terminal. In the meantime the weather forecast was indicating stronger winds from north-west. The harbour master also informed the ships at anchor that strong winds were expected.

During the early hours of the next day the wind force increased rapidly. The anchor watch, who was alternating between the bridge and fire guard duty, registered the increase in wind but did not react. After another 15 minutes, as he arrived on the bridge he realised the ship was not in the position it was supposed to be. He contacted the chief mate who arrived on the bridge some minutes later. He realised immediately the seriousness of the situation and contacted the engineer on duty and ordered an emergency start of the main engine. The first mate was sent on deck in order to let go of the other anchor. The wind was continuing to increase and the shore line approached rapidly. The second anchor was dropped but the ship did not stop drifting. By the time the engine was started, the ship was stranded.

The ensuing refloating operation was very expensive and the loss of time and repairs to the ship were even more expensive.

The following causes contributed to this incident:

– A pilot has local knowledge and is familiar with anchoring positions. The refusal of a pilot in this case may have contributed to the choice of a less attractive spot to anchor.

– It is important to find an anchorage with the most suitable bottom conditions. Sand is usually a good holding ground but here the ground was a combination of sand and rock and the vessel probably anchored on rocks. The lack of consideration for common wind and current direction when deciding where to anchor may have caused the dragging of anchors.

– The watch-keeping system must be adequate to handle a situation that might occur, such as the one described. There should always be a qualified individual on the bridge, someone who can initiate necessary action when needed. If the anchor position is exposed, do not hesitate to keep the engine room on standby. An ordinary start-up routine takes at least half an hour and this is time you do not have in an emergency situation.

– If the weather is deteriorating it is often much easier to leave your anchoring position in good time instead of staying there until you are forced to leave, which may be too late.

**Important factors and loss prevention**

Experience from accidents during anchoring shows that a lack of focus on the basics of anchoring is often the root cause of these accidents. The following key factors should be considered carefully, and their importance and consequences must be communicated to the ship’s crew:

– Bottom conditions and depth of water versus length of anchor chain.

– The importance of detailed maps and local knowledge.

– How to handle inaccurate or lack of information.

– Positioning aids: use, precision and errors.

– Change in prevailing conditions: wind, currents, tides, draft, traffic density.

– The point of no return off the lee shore.

History shows that humans underestimate the potential consequences of developing situations. Accident studies demonstrate that signals and indications of something wrong happening are constantly ignored by watch-keepers. It is important to impress on a ship’s complement that recognising and appreciating such signals and indications is the first step towards avoiding a casualty. It is also important to have in place a system which identifies and provides necessary training on an ongoing basis.
“Pilot on board!”

Gard News looks at some aspects of the relationship between pilots and seafarers.

Areas of risk

“Despite the pilot’s duties and responsibilities, his presence on board does not exempt the Master and the OOW from their duties and responsibilities for the ship’s safety.” This is quoted from the IMO Code of Nautical Procedures and Practices, and should be well known to seafarers. It is, however, a fact that a large portion of navigation-related accidents occurs when a pilot is on board. The reason for this is obvious: the pilot is sent on board because the national authorities consider the area an increased risk, and in increased risk situations there will always be accidents. In addition, the tendency is that accidents are more severe and more expensive than ever before.

As indicated above, a pilot is sent on board because the national authorities consider the area an increased risk, and in increased risk situations there will always be accidents. However, it is Gard’s clear understanding that pilots prevent far more accidents than they cause, but the picture is complex, and there is reason to study this in more detail.

Navigation-related accidents are traditionally split into three main groups: collisions, groundings and contact damage (typically collisions with piers, etc.). Despite more advanced technology, the implementation of STCW 95 and a strong focus on the human element as well as fatigue, the expected decline in number of accidents per year has not taken place. In addition, the tendency is that accidents are more severe and more expensive than ever before.

So in situations where the navigational risk exceeds a given limit, national authorities respond by sending a pilot on board. This is where the challenges start: to a large extent bridge team management training focuses on co-operation among the bridge team and less emphasis is placed on situations where “outsiders” are introduced. Bridge manuals refer to “pilot to pilot navigation” and little or nothing is said about how to act when the pilot has embarked. In short, the pilot is expected to deliver the service he is paid to deliver and limited consideration is given to his co-operation with the bridge team. For that reason in many situations one does not achieve the desired increased level of safety; on the contrary, the responsibility for navigation is simply transferred from one person to another.

Communication

In accidents where a pilot is involved there is one factor that is frequently present: limited or no communication between the master and the pilot. There may be language problems and misunderstandings, unclear instructions...
to the bridge personnel about how to monitor the pilot’s actions and the bridge personnel may be over-confident about the pilot’s abilities. In some situations the pilot may not be familiar with the particular design of the navigational systems available on board. Very often these accidents may be avoided if there are clear instructions available from the ship management on how to handle situations with pilots on board.

**Lessons learned**

It is possible to extract some lessons from the above examples.

Voyage planning used to be a critical factor and the common response from the crew was “why should we plan the passage when the pilot always brings with him an alternative passage plan?”. It is Gard’s experience that this has improved: electronic charts have made it easy to adjust the ship’s voyage plan according to that brought on board by the pilot and attention from port state control officers has put this item on the agenda. It is also imperative that the pilot be briefed about the vessel’s manoeuvring capabilities. This includes rate of turn, propeller arrangement, output on the various manoeuvring orders and general ship data. In short, any information that can improve the pilot’s performance must be available. Many shipowners have developed so-called “pilot cards” for that purpose. These have proved to be effective and greatly appreciated by the pilots.

Language barriers have been and will continue to be a challenge; these can be related to communication between the pilot and the crew, as well as understanding the communication between the pilot and assisting parties such as shore staff, mooring boats and/or tugs. Very often these barriers can be greatly reduced by a thorough review of the passage prior to commencing it. The pilot can also be requested to communicate with external parties in a common language, or to translate his communication with them for the bridge team. Many accidents are rooted in surprises and unexpected situations that could have been avoided if the pilot and the bridge team had a common understanding about how the passage would be carried out.

The impact of commercial pressure should not be underestimated. This may result from a variety of reasons:

- the terminal wishes to maximise utilisation of the piers and requires effective (high speed) approach to the terminal;
- some pilots are paid per pilotage and increase speed for that reason;
- charterers require maximum utilisation of the ship, and under keen clearance may be challenged. This occurs particularly in river passages. The availability and suitability of tugs and mooring boats should also be considered: in many situations these are too small or too few for the purpose, but are accepted due to the commercial pressure.

Cultural differences should also be considered. The pilot is perceived as an authority and in many cultures it is difficult to correct or even question a decision made by an authority. Corrections to obvious errors may therefore be delayed and in some cases not put forward at all. Reluctance to get involved in a situation has contributed to several severe marine accidents. In particular, this may be a problem when the master is not on the bridge. It is therefore important that all members of the bridge team have the necessary authority and confidence to interfere if they are in doubt. This can only be achieved by active leadership and involvement by the master. The IMO Code of Nautical Procedures and Practices also states: "If in any doubt as to the pilot's actions or intentions, the officer in charge of the navigational watch shall seek clarification from the pilot and, if doubt still exists, shall notify the master immediately and take whatever action is necessary before the master arrives".

**Common understanding**

The first step to reduce the risk of navigation-related accidents when a pilot is on board is a common understanding by the bridge team of the risks involved. These include geographical hazards as well as cultural and management-related challenges. Introducing company “pilot handling procedures” in the ship management system has proved to be effective. In addition to voyage planning, these should include routines for pre-voyage briefing, monitoring of the pilot’s activities and communication between pilot and officer of the watch (OOW)/master. Exchange of information is also mentioned in the IMO Code of Nautical Procedures and Practices: “The master and the pilot shall exchange information regarding navigation procedures, local conditions and the ship’s characteristics”.

**Conclusion**

In summary, much progress will be achieved by implementing some simple steps in the ship procedures:

- Active use of pilot cards for transfer of ship information.
- Implementation of company procedures for pilot handling.
- Making bridge teams aware of cultural challenges that may occur when a pilot is on board, and giving them the confidence and authority to seek clarification when in doubt.
- Taking into consideration the commercial pressure that may be imposed by pilots, charterers and terminals.

Bon voyage!
Pilot on the bridge - Role, Authority and Responsibility

Introduction
As you are aware, many navigational incidents leading to groundings and collisions involve pilots. The primary problems involve the role, responsibility and authority of the pilot onboard. This Loss Prevention Circular focuses on 4 case study examples of pilot aided grounding and collision followed by general guidance on the prevention of these types of incidents.

Case 1: Collision with terminal dolphin
At 0200 hrs, Vessel 1 was given instructions to leave a pre-designated anchorage and proceed to load cargo at the terminal. The vessel was underway at 0254 hrs and two pilots boarded at 0354 hrs. The vessel entered the breakwater with the Master on the bridge.

The vessel made routine visits at that location thus the Master thus felt comfortable with the berthing routines. The vessel passed the breakwater at 8.5 knots even though the maximum permitted speed was only 5 knots. Although the Master observed that they were exceeding the maximum speed, the Master did not attempt to bring this to the attention of the pilots.

Four tugs were requisitioned to assist the vessel in berthing at the terminal. Due to the excessive speed of the vessel, the tugs had difficulty maintaining speed to keep up with the vessel as she made her way to the terminal.

As the vessel approached the terminal, all verbal communication between the pilots and the tugs were in the local language (non-English) that was not understood by the Master. The aft tug was made fast after the vessel entered the breakwater and was quite close to the berth. The forward tug approached while the vessel was only 50 metres from the berth. Furthermore, before the line could be made fast on the vessel, the tug started pulling on the line, whereby the entire line was run out and was of no assistance to the vessel. The two remaining tugs were of no assistance at all.

As a result, the vessel lost control and could not be stopped before colliding with the mooring dolphin. Extensive damage was caused both to the ship and to the mooring dolphin.

The following causes contributed to this incident:
(1) The vessel’s speed was excessive when trying to connect to the tugs.
(2) There was a lack of communication between the pilot and the master at many stages while transiting the channel. There was little or no information exchanged regarding the docking plan and how the 4 tugs were to be put to use and coordinated.
(3) The Master did not insist that pilot not exceed the maximum allowable speed as it entered the breakwater.
(4) The pilot, when communicating with the tugs, was speaking a language that was not understood by the Master. This made it difficult for the Master to have a proper situational awareness.
(5) The Master was over-confident as to the abilities of the pilot.

Case 2: Grounding at mooring
Having arrived at port to load, a strong east to south-easterly wind prevented Vessel 2 from commencing cargo operations via feeder vessels. On a following morning, the Master received orders from his agents to proceed, with pilot embarked, to a more protected location to commence cargo operations. However, British Admiralty Charts of the area are not particularly detailed. The pilot had only a photocopy of a larger scale local chart.

At 1606 hrs the port anchor of the vessel was dropped approximately on the 50 m contour line on the photocopy map. The vessel had 8 shackles of chain (approximately 220 m) in the water that, the Master estimated, gave a distance of about two cables from the anchor to the stern of the vessel and thus provided a turning radius of about two cables.

The vessel was moored on a heading of 150° and, in the Master’s estimation, outside the 20 m contour line should she swing right round. The vessel’s echo sounder transponder is situated in the bow of the vessel and when she initially anchored it was observed that there were 33 m of water indicated under the keel.

The pilot assured the Master that the vessel was on good holding ground and that the loaded draft would be 11.8 m. The Master was satisfied that the ship was anchored in a good position.

On the final day of loading (four days later), the wind had shifted to the west and the vessel was now on a heading of 289°. The Master’s intention was that the ship should arrive at its discharge location with an even keel. Therefore, the intention was to complete loading with a trim by the stern of 45 cm. In order to achieve this, it was agreed that the last 700 tonnes of cargo were to be used for trimming purposes.

At 15:20 hrs the feeder vessel gave notice to commence loading the
remaining 700 tonnes. At 1540 hrs, the Chief Officer of the vessel boarded the feeder vessel and noted the draft of his vessel was 11.12 m forward and 10.52 m aft. The trim at the head surprised him. He was concerned that they were not able to attain the 45 cm stern trim. Loading was suspended while he checked his calculations. In addition, he requested that the ballast tanks be sounded since he believed that the ship should not have had a head trim at the time. At 1600 hrs the First Officer notified the Master of his concern.

At 16.15 hrs the aft draft was checked again. It remained at 10.52 m despite continuous loading into no. 7 hold. The ship’s heading remained steady at 289°. At 1800 hrs the steering gear was extensively damaged with the rudderstock protruding approximately 20 cm above the steering flat.

The following causes contributed to this incident:

(1) When the wind veered, the anchor position changed from being in the lee of the land to being in the lovart side of the land, a most unfortunate position to be anchored in. At that point in time it would have been prudent to change anchor position towards the other shore.

(2) Eight (8) shackles of chain on 33 meters depth was somewhat excessive. The recommended ratio is three to four times the depth depending on depth and holding ground.

(3) Neither the vessel nor the pilot had the proper charts with the required contour details of the location they finally anchored.

(4) The vessel crew made incorrect assumptions as to the consequences to the ship if she swung about. The crew should have taken continuous soundings at the location they were anchored since limited information was available.

(5) The ship’s crew were over-confident with the pilot’s assessment as to the water depth of where the ship was anchored. This should have led them to be more diligent.

Case 3: Grounding while navigating
At 2040 hrs Vessel 3, a pilot and his apprentice at the wharf boarded the general cargo ship. The vessel had completed loading at approximately 1600 hrs and was preparing a transit to a new port where additional cargo was to be loaded. It was estimated that it would take 25 hours to complete the passage.

The vessel had not made the engines ready for passage at the time the pilots boarded. They had determined that the vessel had approximately 12 hours more than necessary to make the passage. The Master was aware that some pilots would not take the vessel through the passage at night and told the pilot that departure could be postponed until daybreak.

The pilot assured the Master that it was safe to sail at night. The Master then suggested that they take a route where the channel was wider. However, the pilot preferred and recommended another passage. This passage was recommended for day passage only and required a number of sharp turns to navigate. However, due to commercial pressure, night passage for the route suggested by the pilot was allowed.

The Master and pilot exchanged more information about the vessel and then the Master ordered the engines to be prepared for departure. At 2100 hrs the crew was called to their manoeuvring stations and began unmooring. At 2137 hrs full manoeuvring speed was ordered and executed.

Five persons were in the wheelhouse: the Master, pilot, apprentice, OOW and the helmsman. The OOW used one of the radars when unoccupied by one of the pilots and plotted fixes on the chart on average of every 5 minutes.

A number of minor manoeuvres were made between 2227 hrs and 2218 hrs. At 2218 hrs, the ship prepared to make a 60-degree turn to port at 11.5 knots. At 2225 hrs, the pilot began the planned port turn by ordering a 10 degrees port rudder. Having observed the vessel’s reaction to this rudder angle was not quick enough, the pilot increased the rudder angle to 20 degrees. The rate of turn increased but after the turn was completed, the vessel ended up closer to the shore on her starboard side than was intended.

From this moment on, the Master became particularly vigilant and closely monitored the rudder orders. He did not communicate his concern to the pilot. There was little or no time to exchange opinions on this matter since the vessel was approaching another tight turn of 50 degrees to starboard to pass between two islands.

At the required location, the pilot issued a 10 degrees starboard rudder at a point at a point where one of the
islands was 3.5 cables (0.55 km) ahead of the vessel's wheelhouse. The Master considered this rudder angle may have been insufficient to obtain the required rate of return but hesitated to change the pilot's orders. He did however make sure the rudder indicator needle moved to the requested 10° to starboard.

The pilot observed that the vessel was slow to react to his order of 10° starboard rudder and ordered a 20° starboard rudder. Neither the time nor the vessel's exact position was recorded when this order was given, however, the distance to the island was decreasing.

Having heard the pilot's last order, the Master ordered the rudder hard to starboard. The Master's order was repeated by the pilot and was executed by the helmsman. The bow of the vessel cleared the island and kept sweeping to starboard. However, the vessel's port side was observed to be quickly approaching the island.

At 2231 hrs, with the island's northern tip several metres off of the vessel's port side and ahead of the wheelhouse, the pilot ordered the rudder hard to port and stop engine. A slight vibration was felt followed by the distinct touch of a hard object. Some seconds later, air was heard escaping from the tanks.

Although no oil was spilled in the water, the vessel was ascertained to have damage to her side shell plating. The shell plating was punctured in several places allowing seawater to ingress into an empty ballast and fuel tanks.

The following caused to this incident:
1. There was a lack of proper voyage planning. The time between when the pilots boarded the vessel and when the ship got underway was quite short particularly since they had 12 hours more than necessary to make the transit to the next port.
2. The pilot insisted transiting a direction that was recommended for day travel. The Master should have insisted in following the recommended route. However, he was also familiar with the pilot since he had made routine visits to this location and felt over-confident in the pilot's recommendations.
3. There was a significant breakdown of communication between the Master and the pilot. Once the first order for 10 degree rudder didn’t result in the required rate of change in direction was made, the Master should have been aware that another 10 degree rudder order in the second turn would not acquire the desired results. He should have communicated this to the pilot and/or discussed the manoeuvring characteristics: (1) during the pre-voyage briefing, (2) after the first 10 degree rudder order that was changed to a 20 degree rudder, and/or (3) just after the pilot's second 10 degree rudder command.
4. There was a lack of fundamental seafaring skills used for the tight turning manoeuvre to starboard. A standard practice of reducing the speed of the vessel, commanding the turn, and then bringing the vessel back up to manoeuvring speed should have been used.

Case 4: Grounding while navigating
At 1300 hrs Vessel 4 departed partially loaded with two pilots on board. The pilots agreed to alternate their watch. Pilot 1 was to conduct the vessel between 1300 and 1800 hrs and Pilot 2 between 1800 and 2300 hrs and so on. From 1300 to 2300 hrs the passage was without any significant incident other than the vessel encountering some concentrations of fishing vessels.

After the change of watch at 0000 hrs, personnel on the bridge comprised of the second officer, who the OOW, Pilot 1, and the quartermaster who was at the helm. The visibility had been good until approximately 0100 hrs when the vessel entered a light haze. The radars had been placed on the 12-mile range at the time. By 0125 hrs, the visibility had decreased to about 150 metres. No dedicated lookout was posted.

At approximately 0113 hrs the vessel reported its position to the local Marine Communications and Traffic Service (MCTS). The vessel also stated that their ETA to the point where the next course alteration was planned was 0240 hrs.

Communication between the pilot and the OOW was conducted in English and there were no communication barriers.

The OOW had been recording the position of the vessel at approximately 15-minute intervals on the chart in use. The pilot did not refer to those positions nor did he refer to the chart to refresh his memory. The pilot carried a personal course book that he used to navigate the vessel. This book had no provisions for recording of ETA or the actual time of course alternations. The pilot relied solely on his memory to keep track of the vessel's position.

At approximately 0130 hrs, the pilot saw on the radar, what he believed, to be the entrance to the passage and began the required course alteration to starboard. The pilot did not reconfirm the vessel's position prior to the course alteration. The OOW took a range and bearing of a point of land and noted these values on the chart. Before the
OOW had time to plot the vessel’s position on the chart, the pilot began a course alteration. The OOW returned to the conning position and ensured the helmsman promptly executed the pilot’s orders.

Shortly after reaching the new heading, the pilot realised that the vessel was not on the proper course and ordered a hard-a-starboard helm in the hopes of bringing her around but this was unsuccessful and the vessel grounded at 0135 hrs.

Depth soundings were taken in the area of the grounding and it was determined that the bow was firmly aground and the stern was afloat in deeper waters. The vessel sustained extensive damage to shell plating and internals in way of stem to No. 3 double-bottom tanks.

The following causes contributed to this incident:
(1) There was a substantial lack of bridge resource management (BRM). The OOW and/or the Master should have been more diligent about ensuring that the OOW was there to reconfirm decisions made by the pilot. This could have been done through better verbal communication between the pilot and the OOW.

(2) The pilot did not reconfirm his mental model of his position before making the critical turn. The OOW, did not have the proper situational awareness with regard to the vessel’s position. The pilot did not reconfirm the vessel’s position prior to the course alteration. When the pilot gave the order to turn, the OOW only focused upon whether the helmsman made the turn. He didn’t reconfirm that they turned at the proper location.

(3) The weather played a marginal role in the grounding. However, as a precaution, the vessel may have considered placing a dedicated lookout.

Recommendations and Lessons Learned
(1) The Master is in command of the ship at all times with only one exception: when transiting through the Panama Canal. Therefore, it is always the duty of the Master and OOW to keep a situational awareness of all activities of the pilot. Although the pilot is most knowledgeable about local waters, it is the responsibility of the Master/OOW to verify position through proper use of charts, radars and other position fixing devices and follow local rules on speed and routing.

(2) Voyage planning is crucial in all situations including when pilots are on board. Sufficient time should be allowed for proper communication between the Master, pilots and OOWs. This voyage plan should include every important activity starting from the embarkation of the pilot, in and out of the berth, and finally the disembarkation of the pilot.

(3) If the pilot is to command tugs and/or personnel at a berth in a language that is foreign to the crew, the Master must demand that the pilot communicates with the Master and/or OOW in a common language.

(4) When the piloted voyage is taking the vessel through narrow waters, you should mark “wheel-over” points either on the chart or at the radar screen in order to know when you are reaching “points of no return”. This helps to allow the pilot, Master, and/or OOW to keep a better situational awareness.

(5) The ship’s crew is normally the most knowledgeable regarding the manoeuvring capabilities of the ship. Detailed descriptions of the ship’s manoeuvring characteristics should be communicated during the voyage planning stage. In addition, the Master and/or OOW should communicate manoeuvring capabilities during the voyage, as necessary. The Master and OOW should never feel hesitant to discuss these matters with the pilot if they feel it necessary to do so.

(6) Ensure that the vessel is equipped with the necessary updated charts for the intended voyage. It is not sufficient to rely on the pilot to provide this information.

(7) The OOW should always closely monitor the activities of the pilot. Many times, the pilot will not necessarily communicate with the OOW regarding the vessel and/or voyage. The OOW should not hesitate to communicate with the pilot on any relevant matters regarding the vessel or the voyage.

(8) The OOW should not only be diligent with regard to his duties to ensure the pilot’s orders are properly followed but also to monitor the pilot’s activities. If the OOW has concerns regarding the pilot’s activities, he should contact the Master immediately.

(9) The vessel should have clear procedures and instructions to Master’s and OOWs on what to do with a pilot onboard. These should be included as part of the ships safety management system (SMS).

(10) BRM is an important activity to ensure safety. Any BRM training should include how to handle the change in communication, command, and control when a pilot takes over navigation of the ship.
Useful lessons can be learned from the following incident, which could happen anywhere, any time, with almost any ship.

The incident

“Good afternoon, Mr Captain. I’ll take over. Starboard 10, come to two five six degrees and full ahead.”

“Starboard 10 to two five six degrees, full ahead. She is all yours, Mr Pilot.”

We are on board an ordinary tanker, on an ordinary day, approaching an ordinary terminal somewhere in the Western Hemisphere. The weather is grey but the visibility is not too bad, although it is early evening. The speed is slowly increasing and the last light of day is rapidly disappearing. The atmosphere on the bridge is relaxed.

“Full speed, Mr Pilot, 14 knots.”

“Full speed. Thank you, Mr Captain.”

The pilot and the master continue talking about everyday matters such as the weather, how long they are staying at the berth, etc.

“I’m leaving the bridge”, says the master. “I have to prepare some papers before we berth. The second mate will assist you. If you need me, just tell him and he will get hold of me.”

The voyage continues and the pilot gives instructions regarding the necessary course alterations, as the fairway becomes gradually narrower. The ship is still at full speed.

The pilot calls the harbour master (in his native language) and tells him that ETA (estimated time of arrival) will be in half an hour. He also gives the three tugs awaiting to assist berthing the ship an update on the situation (also in his native language). There is no request for translation from the second mate and no information is volunteered by the pilot.

We continue full ahead. Traffic increases as we enter sheltered waters. The background lights from the harbour area make it difficult to see the difference between moving and stationary objects.

“Mr Mate, can you prepare to receive the first tug on port bow? We will have starboard side alongside.” (Two other tugs are also ordered but this is not mentioned by the pilot).

“Aye-Aye, sir”, says the mate.

The pilot contacts the tugs on the VHF again (still in the local language) and, as he is talking, his mobile phone rings. The mate calls the master, who enters the bridge after a couple of minutes. He consults the radar and although it is many years since the last time he was in this harbour, he feels somewhat uneasy with our present speed, as we are rapidly approaching the inner part of the harbour. The master is tempted to ask the pilot to reduce the speed, but for some odd reason he does not. The pilot orders half ahead and continues to talk in his mobile phone. We are approaching the berth and the master is more and more anxious about the speed, so he politely suggests the pilot to reduce the speed. The pilot explains that there is another ship waiting to leave the berth and he has to board it as soon as possible.

The first tug is closing in on port bow and is ready to receive the heaving line from the ship. The second mate, who has just left the bridge, is now on the forecastle making his first attempt at the heaving line, but misses the tug. He sees that they are now alarmingly close to the berth and hurries to do his second attempt. This time he succeeds and reports back to the bridge that the line from the tug is on board and secured. At the same time the pilot, who has just finished his telephone call, is at the bridge, hectically instructing the tugs on how to berth the ship, still in the local language – this time with a raised voice.

The tugs seem to have problems keeping up with the speed of our ship and this is communicated to the pilot. The distance to the berth is rapidly diminishing and the pilot asks for slow astern. The master, who is really getting nervous now, orders slow astern and even increases this to half astern. The pilot orders the aft tug to start pulling in order to reduce the speed of our ship.

The master finally realises that there is no way he can avoid hitting the berth and orders full astern. Because of the full astern manoeuvre, the ship does an uncontrolled starboard turn and hits the berth with a speed of 2 knots, making a 3-metre long gash on the starboard bow and causing extensive damage to the berth.

What went wrong

The situation described above could happen anywhere, any time, with a lot of ships trading the seven seas of today.

Can we learn something from this incident?
– The vessel’s speed was excessive.
– When trying to connect to the tugs the ship’s speed was too high.
– There was lack of communication between the pilot and the master at many stages while transiting the fairway. There was little or no information exchanged regarding the docking plan and how the three tugs were to be put to use and co-ordinated.
– The master did not insist that the pilot should reduce the speed as they approached the harbour area.
– The pilot, when communicating with the tugs, was speaking a language that was not understood by the master. This made it difficult for the master to be fully aware of the situation.
– The master was over-confident of the abilities of the pilot.
– And guess what: the pilot will of course blame the master for interfering in his efforts to manoeuvre the ship safely alongside because he ordered full astern!

Recommendations and lessons learned
– The master is in command of the ship at all times with only one exception: when transiting through the Panama Canal. Therefore, it is always the duty of the master and the officer of the watch (OOW) to be aware of all actions of the pilot. Although the pilot is more knowledgeable about local waters, it is the responsibility of the master/OOW to verify the position through the proper use of charts, radars and other position fixing devices and follow local rules on speed and routing.
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– Voyage planning is crucial in all situations including when pilots are on board. Sufficient time should be allowed for proper communication between the master, pilots and OOWs. This voyage plan should include every important activity starting from the embarkation of the pilot, entry and exit from the berth and finally the disembarkation of the pilot.
– If the pilot communicates with tugs, etc., in the local language (which is likely), the master should ask him to explain what was said in a common language (probably English).
– When the voyage under pilotage takes the vessel through narrow waters, one should mark “wheel-over” points either on the chart or at the radar screen in order to know when “points of no return” are reached. This helps the pilot, master, and/or OOW to have better situational awareness.
– The ship’s crew is normally the most knowledgeable regarding the manoeuvring capabilities of the ship. Detailed descriptions of the ship’s manoeuvring characteristics should be communicated during the voyage planning stage. In addition, the master and/or OOW should communicate manoeuvring capabilities during the voyage, as necessary. The master and OOW should never hesitate to discuss these matters with the pilot if they feel it necessary to do so.
– One should ensure that the vessel is equipped with the necessary updated charts for the intended voyage. It is not sufficient to rely on the pilot to provide this information.
– The OOW should always closely monitor the activities of the pilot. Many times the pilot will not communicate with the OOW regarding the vessel and/or voyage as necessary. The OOW should not hesitate to communicate with the pilot on any relevant matters regarding the vessel or the voyage.
– The OOW should not only be diligent with regard to his duties to ensure that the pilot’s orders are properly followed, but should also monitor the pilot’s activities. If the OOW has concerns regarding the pilot’s activities, he should contact the master immediately.
– The vessel should have clear procedures and instructions to masters and OOWs on what to do with a pilot on board. These should be included as part of the ship’s safety management system (SMS).

Hydrodynamic interaction between ships

The United Kingdom Maritime and Coastguard Agency Marine Guidance Note No. 199 (M) contains advice on the causes of hydrodynamic interaction between ships and the measures that can be taken to reduce its effect.

When two ships operate in close proximity, like for instance when performing ship-to-ship re-fuelling, cargo transfer between moving ships, or when harbour tugs assist ships in port, they will be attracted to each other and consequently collision might happen. Hydrodynamic interaction between ships continues to be a major contributory factor in marine casualties and hazardous incidents. An awareness of the nature of the pressure fields round a vessel moving through the water and an appreciation of the effect of speed and the importance of rudder action should enable a vessel handler to foresee the possibility of an interaction situation arising and to be in a better position to deal with it when it does arise. During passage planning depth contours and channel dimensions should be examined to identify areas where interaction may be experienced.

The United Kingdom Maritime and Coastguard Agency has issued the extremely helpful Marine Guidance Note No. 199 (M), which provides advice on the causes of hydrodynamic interaction and the measures that can be taken to reduce its effect. Gard recommends that owners bring the contents of Marine Guidance Note No. 199 (M) to the attention of their navigators.

Who is to blame?
Who is then to blame? In practice, both, master and pilot, but it is important to keep in mind that as the master is in command of the ship, he is the one who gets the blame!
During the last ten years the Association has registered about 30 claims per year resulting from wash damage. Vessels are frequently involved in cases described as “wash damage” when they are sailing in rivers and other narrow waters. The allegation is that a vessel proceeded at too high speed and that the displacement of water caused the waves to rise and fall which had the effect of causing other vessels started to move alongside the quay. If the effect is too strong or a vessel not properly moored or if the mooring facilities ashore not sufficiently strong, the mooring lines will break or bollards may be pulled out of their bases. Damage may also be caused to fenders and to the quays when the vessel is pressed against the quay or dolphins.

Gangways connected to the vessel can easily be damaged or pushed against loading or discharging equipment ashore which, as a consequence, also may sustain damage. In a situation where a tanker connected to loading or discharging hoses or chucksan arms is affected by wash from a passing vessel, the loading arms may be pulled out of position and break. The consequences could be a claim for several hundred thousand dollars of damage to the shore installation plus a claim for million of dollars for pollution caused by the broken hoses.

High speed vessels like liners and deep draft vessels are often involved in wash or surge-damage claims. When a vessel is proceeding with high speed, serious wave effects could cause damage even if the vessel is relatively far from the vessels moored alongside or other objects ashore which could be damaged. Damage could be caused even if the vessel is proceeding with a speed less than the prescribed limit within the river or port area. There are many factors which may affect the creation of waves or the extent of damage caused. There is often an allegation that the vessel causing the damage passed too close to the other vessel or vessels moored alongside. If the river is narrow and the vessel deep drafted the effect of the displaced water will increase.

What is considered safe speed for the vessel to steer and manoeuvre can, under certain circumstances, be found excessive when looking at the consequences vis-à-vis the other vessels. It will be up to the master of the vessel to prove that he proceeded with safe speed under the present circumstances and without the risk of causing damage to other vessels or property in the area. A surge effect between the vessels could also easily happen when vessels are passing in narrow waters. One of the vessels, usually the smallest, could be pushed away by the bow-wave and afterwards sucked against the hull of the other vessels, or the other vessels could lose steering and collide with a third vessel or run aground.

When passing in waters where other vessels could be exposed to the wave effect it is always of importance to notice whether the vessels alongside are moving and whether their mooring lines were properly attended to or slack. It is also important to record the speed of one’s own vessel, as well as the time and approximate distance to the object if something unusual is observed or notice of damage received from other vessels. The wave effect of one’s own vessel could also be influenced by other vessels passing or one’s own vessel could be held liable for wash caused by another vessel.
When our local correspondents are called in to assist they will ask for log extracts, speed and course recorder tapes, report from the vessel and other information which may be of help to reconstruct the sailing at the time of the alleged incident. They will also try to interview the pilot and get all possible information from local authorities who may have taped VHF Communications and radar observations. When there is an allegation of damage caused to a vessel it may also be of importance to find out whether other vessels in the area did experience any problems during the passage of the suspect vessel.

Propeller wash claims also frequently occur. When approaching the berth and in an attempt to stop the vessel in time, excess propeller wash may be caused. This could easily damage mooring boats or tugs which will be affected by the increased current and can be pushed against the quay or dolphins or other vessels nearby. Small boats can even be filled with water which could cause them to capsize and result in personal injury or death. Propeller wash during mooring or unmooring could also cause other vessels moored alongside to start moving and collide with a third vessel or damage shore property. The current caused by the propeller could also cause excavation of the ground under or in close vicinity to the berth. Passenger ferries often have their landings close of the centre of cities where pleasure boat marinas usually are situated. Boats in these could easily be affected by the wash caused during manoeuvring to berth.

About 40 per cent of the wash claims registered over the last few years occurred in US waters and 35 per cent in North European waters.

The situation arose when a Client’s vessel (the first vessel) was tied up, port side alongside, undertaking cargo operations. Two of the crane jibs were protruding outside on the seaboard side, well lit and marked. The stevedores and crew were having a meal break when another vessel (the second vessel) approached in order to dock starboard side alongside behind the stern of the first vessel. However, something went terribly wrong and the well-planned manoeuvre ended up in total disaster. The approaching vessel hit the two jibs of the first vessel’s crane in succession, leaving one of the cranes inoperative and the other in need of immediate repairs.

The two vessels endured the inescapable after-effects of a major claim: surveyors and lawyers attended, statements and reports were to be prepared. Exchange of securities, choice of law and jurisdiction occupied the claims handlers on both sides. Investigations into possible repair solutions were carried out. Eventually, owners of the first vessel and their insurers elected to have the repairs carried out abroad. The decision was based on past experience and local knowledge. Hence, the crane most badly damaged was shipped for repairs. The vessel continued trading, but without the original crane capacity. Once the crane was completed the vessel was deviated for refitting and rigging. Eventually the vessel was back in trade in the same condition as she was before the incident took place.

A simple matter to most, repairs are carried out and paid, and the “wrongdoer” indemnifies the innocent party for the loss and damage. But not so simple!

Although there was agreement between the parties as to the liability of the other vessel, a lengthy debate took place about the decision taken regarding repairs and the reasonableness of the actions. In spite of various joint surveys throughout the repair process, further documentation was requested.

Records had to be made available regarding every decision, strategic and operational, which had the slightest connection with the decision to repair the crane or run the vessel without the crane temporarily, the company’s scrapping policy, the use of redundant cranes after scrapping of other vessels in the fleet, chartering of substitute tonnage. Decisions taken on various levels in the organisation over a span of several years, or actions taken on a detailed operational area throughout the handling of the claim, had to be documented through memos, minutes of meetings, etc. Because the decisions and actions in question were of the sort that are traditionally taken rather informally in shipping companies, it became quite difficult to document them.

Thus, the requests meant a lot of time and effort had to be spent to search for documents or interview people in order to recapitulate the relevant facts.

This incident shows that, even in what appears to be the most straightforward of cases, it is of paramount importance to be able to document one’s actions and decisions and to keep records accessible.
Hull and machinery incident - Consequences of a blackout

There are many reasons for a blackout, one of them being human error. Blackouts are every mariner’s nightmare, especially if they occur in narrow waters with lots of traffic or during canal passages or in harbour entrances. Even in open waters, blackouts can be a problem during periods of heavy weather. There have been several cases during canal passage or in harbour entrance where a blackout could have led to serious breakdown.

The incident reported below was caused by crew negligence on a vessel heading from one of the rivers in the Gulf of Mexico leading to the Panama Canal. The vessel was loaded with explosive cargo bound for the Far East.

During normal sea trade on motor vessels the electric power is supplied from either shaft generators or auxiliary engines through the main switchboard. In case of a blackout, the vessel in question was also equipped with an emergency generator with a separate emergency switchboard in a separate room. The emergency generator delivered power to the steering gear, emergency lights, etc. Such emergency generators are normally designed with a switch on a switchboard, which indicates “automatic” or “manual mode”. During normal trade the switch will be on automatic mode. The manual is only used for manual start and testing.

The normal practice is that the emergency generator is tested once a week by being started with the switch in manual mode and then switched back to automatic, otherwise the emergency generator would not start in case of a blackout. A lot of vessels today have this particular design, which is very common.

All the engineers on board this particular vessel were quite sure that the emergency generator was in good working condition, as it was regularly tested. The problem was that during the last test they had forgotten to switch back to automatic mode.

The pilot was on board and the vessel was outbound in a narrow river. Everything was normal until the vessel had a problem with the fuel supply for the auxiliary engines which resulted in a blackout and again shutdown of the main engine and loss of all power (all three auxiliary engines were running on diesel oil). Since the emergency switch was on manual mode, the generator did not start, which again resulted in loss of steering gear power, and the situation suddenly started to be critical.

Before the blackout the vessel speed was approximately five knots. The master lost all steering power and the vessel turned to starboard and “luckily” ended on a sand bank.

The engineers managed to solve the fuel supply problem very quickly and found out why the emergency generator had not started. The vessel was moved with the assistance of tugs and was taken to anchorage to carry out underwater hull inspections.

No damage to the hull was found but the vessel had to stay in anchorage for 24 hours because of the investigations being carried out by the coast guard.

There are still a lot of vessels trading with this particular “design weakness”. Vessels with this design should have routines to avoid incidents like the one described above, which could lead to major breakdowns and unnecessary costs. Needless to say, one should also ensure that such routines are followed properly.
The interface between hull and machinery insurance and P&I from the P&I claims handler’s perspective

Gard News has a look at the cover for collision liability and liability for contact damage to third party property under the most common standard hull terms and the P&I Rules, and considers how the two types of cover interact in practice.

Introduction

P&I insurance is primarily intended to cover a shipowner or operator’s liability to others and it generally excludes damage to the insured’s own property. Hull and machinery is basically insurance for the client’s ship as its primary asset. Where the two types of insurance interact is in the area of collision liability and liability for contact damage to third party property.

Is it necessary for those handling P&I claims to understand the basics of hull and machinery terms? For those handling liability for property claims, the answer is a definite “yes”. Hull and machinery and P&I are often complementary when it comes to collision liability and liability for damage to piers, loading cranes and other third party property. As a matter of fact, the first need of protection insurance (the “P” in P&I) arose because hull underwriters in the mid-1800s were not prepared to cover more than three-fourths of shipowners’ collision liability. Mutual insurance associations of shipowners evolved to protect each other in respect of losses arising out of bearing one-fourth liability as self-insurance.

A limitation that applies to all standard hull conditions is that the owner is insured for collision liability up to the insured value of the vessel, but no further. In certain circumstances, the collision liability may exceed that insured value, in which case the P&I insurance will respond. This is the so-called “excess collision liability cover”.

Another intriguing aspect is that there are variations in the standard hull conditions in different markets on the extent and type of collision liability cover. One example: if the other vessel sinks as a result of the collision and a wreck removal is ordered by the authorities – would the hull cover respond to the collision liability proportion of the wreck removal costs? The answer will differ across conditions and markets, and since the P&I insurance will respond to the liability that falls outside the hull insurance, the P&I underwriter must obtain information as soon as possible in order to properly assess the exposure and protect his interests.

Some shipowners have placed full (four-fourths) collision liability under their P&I insurance. This collision liability cover would be the most comprehensive liability cover, because all third party liability arising out of the collision would in principle be covered without restrictions or monetary limitations. However, the shipowner would still need his hull and machinery insurance to deal with the loss of or damage to his own vessel.

Standard hull and machinery conditions also provide cover in respect of liability arising out of the striking by the insured ship of third party property other than a ship. The insurance covers the risk of loss or damage caused by physical contact between the hull or the insured vessel (or equipment permanently affixed to the vessel) and third party property, for example a pier or buoy. Americans sometimes refer to such incidents as “allision” but this is not a universal term. FFO (damage to fixed and floating objects) is the shorthand for striking damage under the English terms.

Whereas collision liability is sometimes apportioned three-fourths/one-fourth between hull and P&I, the FFO liability risk is very rarely split in this way. Standard English hull conditions exclude the FFO liability risk, which the shipowner would then add to the P&I insurance. Under Norwegian conditions, the FFO liability risk is usually placed under the hull insurance. The same goes for German conditions, which also provide cover for damage to third party property caused by the movement of the insured vessel even absent any physical contact – e.g., property damage caused by a wave created by the insured vessel passing at excessive speed.

1 Rule 63 of Assuranceforeningen Gard’s 2005 Rules for Ships excludes damage to the ship or any part thereof unless it forms part of a claim for confiscation under Rule 49. Rule 50, however, allows recovery where the member is the owner of the damaged property and would have been liable had the property been owned by a third party.

2 Liability for the cost of cleaning the other ship oiled in a collision, however, is covered by hull insurance to the same extent hull insurance covers collision liability.

3 For example, Norwegian and German hull conditions include removal of the wreck of the other vessel as a collision liability. English and Swedish conditions do not.
Again, the cornerstone of the P&I insurance is that it responds to liabilities that are not covered under the hull insurance. Hence, the P&I insurance would cover “wave damage” liability when the ship is insured on English hull conditions.

There are also variations in standard hull conditions across markets as to the scope of cover for liabilities not caused by collision or striking as defined above. Examples are property damage caused by the use of the ship’s equipment in the course of operations, for instance the dragging of a sub-sea fibre cable by the ship’s anchor or the damage to terminal equipment by the ship’s crane. Again, the P&I insurance will respond to liabilities that fall outside the terms of the hull insurance.

Comparison of conditions
It is beyond the scope of this article to set out all the variations in standard hull conditions around the world, but some of the more important differences between English, German and Norwegian conditions are tabled below.

P&I cover for collision, striking and other property damage
The P&I insurance is designed as a named risk cover, where only risks that are positively mentioned in the terms of entry and the Club’s Rules will be covered. The member is covered for the risks specified in Parts II, III and IV of the Rules as are agreed between the member and the Association. P&I cover for collision, striking and damage to property begins only where standard hull terms leave off. This is made explicit in Rule 71:

Rules 36, Collision with other ships,7 and 37, Damage to fixed or floating objects,6 cover the liability not covered by the hull insurance. Further, Rule 39, Loss or damage to property,5 will pick up liability for property damage that is not customarily covered by standard hull terms. For example, liability for damage to third party property caused by the ship’s use of equipment is not covered by standard hull terms. Thus, damage to the dock caused by the ship’s cargo gear while engaged in cargo operations would be a P&I liability. Because standard hull conditions differ, and because P&I is designed to pick up liability only where standard hull terms leave off, the P&I claims handler must know the facts of the incident and the terms of the hull policy before deciding whether the particular property claim falls within the P&I cover.

Claims handling considerations
What considerations drive a shipowner to place collision and striking (FFO) liabilities with either hull and machinery or P&I? A vital factor will always be price, but there are other important factors as well. From a claims handling standpoint, there are certain benefits of placing the full collision and FFO liabilities with one insurer that ought not to be overlooked.

In a serious collision or FFO incident, the interplay between the shipowner and affected underwriters is of vital importance. Several aspects must be considered and co-ordinated at an early stage. One such aspect is security for claims to third parties in order to prevent the arrest of the insured ship. Such an arrest may cause material losses as it will delay the inspection and repair of the ship, which may increase the exposure for the hull and loss of hire underwriters. Hence, there will usually be some pressure on the underwriters to provide security. The more “patchy” the conditions of cover, the more difficult this is likely to be.

Sometimes the P&I underwriter is requested to provide a P&I Club letter of undertaking (LOU) to cover liability that should properly fall on the hull underwriters, e.g., in a collision case where the hull underwriters cover three-fourths of the liability. One reason is that an LOU from an International Group Club is more often accepted.

Summary of conditions for collision and FFO cover under main hull and machinery terms available

<table>
<thead>
<tr>
<th>English – ITC Hull 834</th>
<th>German – D.T.V.5</th>
<th>Norwegian Marine Insurance Plan (and other Scandinavian hull terms)</th>
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<tbody>
<tr>
<td>Running Down Clause (RDC); Three-fourths to be covered by hull and machinery terms. One-fourth to be covered by P&amp;I. Fixed and Floating Objects (FFO); Four-fourths to be covered by P&amp;I.</td>
<td>Collision (RDC) and striking (FFO) covered by hull and machinery terms plus liability for damage caused by movements of the vessel or navigational measures including wave damage.</td>
<td>Collision (RDC) and striking (FFO) covered by hull and machinery terms.</td>
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4 The Institute Time Clauses, Hulls, 1 10 83 (ITCH 83) remain the most widely-used version of English conditions. Under their latest version (International Hull Clauses 2003) four-fourths RDC and FFO are optional.
6 “Rule 71” Other insurance. The Association shall not cover:
- Liabilities, losses, costs or expenses which are covered by the Hull Policies or would have been covered by the Hull Policies had the Ship been fully insured on standard terms (…).
7 “Rule 36” Collision with other ships
The Association shall cover liability to pay damages to any other person incurred as a result of a collision with another ship, if and to the extent that such liability is not covered under the Hull Policies on the Ship, including:
- one fourth of the liability incurred by the member; or
- four fourths of such liability; or
- such other fraction of such liability as may be applicable and have been agreed with the Association (…)."
8 “Rule 37” Damage to fixed or floating objects
The Association shall cover:
(a) liability for loss or damage to any fixed or floating object by reason of contact between the Ship and such object, when not covered under the Hull Policies (…)."
9 “Rule 39” Loss or damage to property
The Association shall cover liability for loss of or damage to property not specified elsewhere in Part II of these Rules."
Lloyd's Open Form continues to adapt and change: LOF 2011

Gard News summarises changes incorporated into the new LOF 2011, launched on 9th May 2011.

Introduction
The Lloyd's Standard Form of Salvage Agreements (Lloyd's Open Form or LOF) is well recognised as the leading international standard salvage agreement. Since its formal inception in January 1908, LOF has undergone several revisions in order to meet the intervening and changing law and circumstances, severity of maritime accidents, concern over damage to the environment and the needs and concerns of the shipping and salvage industries.

LOF, Lloyds Standard Salvage and Arbitration (LSSA) Clauses and Procedural rules are all administered by the Lloyd's Salvage Arbitration Branch (SAB), whose role is to provide a reputable and secure framework within which the LOF arbitration process can operate. Since 1908 the actual wording of LOF has been revised eleven times. The curious can find the years of revision marked on the bottom left-hand corner of page two of LOF.

New developments - LOF 2011
Following meetings held by Lloyds Salvage Group (LSG) in 2010 and March 2011, the following amendments to LOF 2000 and LSSA Clauses have been agreed. The new LOF is known as LOF 2011.

Accessibility of awards - another move towards transparency
LOF arbitrators’ awards or appeal awards and reasons have traditionally been confidential to the parties involved; however, in March 2011 the LSG agreed that arbitrators’ awards or appeal awards and reasons should be made more widely accessible via a subscription to the appropriate area of Lloyd’s website. A new clause 3 has been added to LOF 2011 (on page two) under important notices, subject to the conditions set out in new clause 12 of LSSA Clauses. The Council of Lloyd’s is now entitled to make available awards or appeal awards and reasons on its website 21 days after publication of the award, unless:

1) An appeal has been entered against the award and, if so, the award and reasons will only be made available on Lloyd’s website either after the notice of appeal has been withdrawn or the appeal arbitrator has issued his appeal award;
2) If any party to the award has applied to the arbitrator to withhold the publication of the award on the Lloyd's Agency website. If so, the arbitrator may withhold the award if he/she considers that there is good reason for deferring or withholding accessibility of the award. It is envisaged that this will be done where other litigation is in progress and reasons for the award may impinge thereon.

**Notification to Council of Lloyd's**

It has generally been the case that LOF was agreed and services successfully rendered without any notification to the SAB. This was mainly because salvors and salved interests were able to reach a quick amicable settlement and therefore did not require the services of the SAB and the LOF arbitration system. However, it was felt that the number of such cases has increased over recent years and it has become very difficult to gauge the actual level of use of LOF. A new clause 4 has been added to LOF 2011 on page two under important notices. Salvors are now required to notify the Council of Lloyd's within 14 days of their engagement and forward the signed LOF 2011 agreement or a true copy thereof to the Council of Lloyd's as soon as possible.

**Security for arbitrator’s and appeal arbitrator’s fees**

It has generally been the case that salvage security, which traditionally covers fees and/or costs of the arbitrator as well as Lloyd's, was provided direct to the salvors. There was some concern that salvage security was being provided in a form that is not acceptable to Lloyd's or has not been provided at all raising concerns on the level of arbitrators' exposure to the potential non payment of fees. New clauses 6.6 and 10.8 have been added to LSSA Clauses providing that arbitrator (clause 6.6) and appeal arbitrator (clause 10.8) respectively with power to order one or more of the parties to provide security for arbitrators' fees in a sum or sums and in a form to be determined by the arbitrator.

**Container vessels - Special provisions in relation to salvaged cargo in containers**

**LSSA Clauses - New clause 13**

The Arbitration Act 1996 requires notices to be given to the owners of the salvaged property, which in container vessel cases can be several thousand. Some may not have insurance, or may otherwise be unrepresented. It has proved expensive and difficult to trace and contact every unrepresented cargo owner of a laden container to keep them advised and as a result this has delayed any hearing and ultimately resolved without the parties resorting to arbitration, the requirement for the provision of security for arbitrators’ fees will help satisfy any concerns as to the arbitrators’ exposure to the potential non payment of arbitrators’ fees. The changes described above once again signify LOF's ability to adapt and change to the needs and concerns of the shipping and salvage industries.

**Footnotes**

1 See article “ Lloyd's Open Form continues to adapt and change” in Gard News issue No. 197.


3 Details of how to apply for subscription to the website can be obtained from the Salvage Arbitration Branch (www.lloydsagency.com).

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Operating in ice
By Andrew Kendrick,
Vice President, Operations of STX Canada Marine Inc.

In this article, Andrew Kendrick summarises his own observations on how to view the risks of operating in ice, and how to ensure that these risks are kept to acceptable levels. This involves understanding the ice, selecting the right approach to ship design, and providing the operators with enough experience, training and information to match their actions to the needs of the voyage.

Introduction
When I was a boy, one of my favourite books was Walter Lord's "A Night to Remember"; the story of the TITANIC. The book included a fold-out plan of the great ship, so I could follow how the flooding developed, understand the increasing difficulties of launching the inadequate lifeboats, and (perhaps a few years later) understand how a combination of design and operational decisions had led most of the passengers and crew to disaster.

Despite my early interest in the TITANIC, I had never expected to spend the most interesting part of my career dealing with ships in ice. This was another low probability, high consequence event, though in this case the consequences have mainly been positive. Over the years I have expanded my 'ice library' to include many more volumes on accidents and disasters, ranging from vividly imagined retellings of famous events such as the Franklin and Shackleton expeditions to very dry technical reports on ice damage and sinkings in all the ice-infested oceans and seas of the world.

Ice
All ice is not created equal, and both heredity and environment have strong influences on what ice can do to a ship. Most of the ice that a ship encounters is sea ice, formed from salt water. The ice crystals themselves are fresh water, but brine is trapped in the ice and the brine pockets and the irregular crystal structures constitute areas of weakness. Ice can become harder as it ages, if the brine drains out and the ice refreezes into a more homogeneous matrix. This partial melt and refreeze is one of the processes that make multi-year ice in polar regions much more dangerous than first year ice in areas such as the Baltic and the Gulf of St Lawrence. Glacial ice is very old, fresh and extremely hard. The best way for ships to handle glacial ice is to avoid it.

Late in the melt season - spring or summer, depending on the location - first year sea ice in particular can become quite 'rotten'. Its strength reduces much more rapidly than its thickness until the final stages of melting. The same thicknesses of ice can have very different strengths in autumn, winter and spring, which is one of many factors complicating safe navigation in ice. In general, ice is a very complex material that can react to apparently similar loads in very different ways, sometimes shattering dramatically and at other times only crushing locally.

Climate change will not lead to the complete disappearance of sea ice any time soon. Winter ice will remain present in large quantities throughout the Arctic and in most of the other seas where it is now found, although the ice season may become somewhat shorter. Climate change is reducing the volume of multi-year ice in the Arctic, which may have significant effects on the economics and risk levels associated with Arctic operations in the next few decades. At the same time, there are actually larger numbers of icebergs in many regions of polar and adjacent waters than has been the case in the past, as glaciers move and calve into the sea at faster rates. Large bergs can themselves calve off smaller bergy bits and growlers. As is well known, about 90 per cent of any type of ice or iceberg is submerged. An (idealised) 10 m cube of ice could therefore have a mass of 1,000 tonnes but only a 1 m freeboard and very little radar cross-section. In even a modest sea state, this will be effectively undetectable either visually or by radar.

Ice hazards
There are three principal mechanisms by which ice can damage a ship. The first is by the ship - hull, propeller, rudder, or other appendage - hitting the ice. Icebreaking is a succession of ice impacts, but the largest impacts are not the result of continuous icebreaking. They occur when the ship hits something heavier than the surrounding cover - a multi-year floe, a large ridge, or the edge of the ice if the ship has been in open water, a lead or an icebreaker track.
In the second mechanism the ice can hit the ship itself. This is a more common hazard for offshore structures, but ships have also been damaged and sunk by wave-induced impacts, or by being hit by large and mobile fles or bergs. Some ships have also had chunks of glacier or large iceberg fall onto them, which in almost all cases is the type of accident that justifies a Darwin award for extreme stupidity.

Finally, there is convergence or pressure. Ice fields are often quite mobile, and can first trap a ship and then exert increasing loads on the sides. Many early explorers, whalers, and other voyagers into ice-covered waters found their ships ‘nipped’ and then crushed by ice pressure. Nansen and some others recognised that this could be avoided by using egg-shaped - and strong - hulls that would be extruded upwards before the pressures became structurally dangerous. However, this is only a realistic option for smaller ships.

Extreme pressure events may cause damage, but quite moderate pressure can bring powerful icebreakers to a stop, or beset them in drifting ice. While there may be no immediate damage risk, ships can be carried into more dangerous areas or may even have to be abandoned after reaching their limits of endurance.

The limitations of rules
We still know much less about ice than about many other ship design drivers, although we have learnt a great deal about how to design some types of ships to be safe and effective in some ice conditions.

The Finnish-Swedish (Baltic) ice class rules have been developed over a period of 80 plus years, based partly on theoretical models but much more on experience. The structural and powering requirements continue to be tweaked, but for ships of similar size and configuration to those that have been used in the Baltic, design to the rules will not lead to any surprises. This does not mean that ships will not suffer some level of damage, especially for those with lower ice class than 1ASuper. They also may from time to time become stuck. The overall Finnish-Swedish system, in which icebreaker services and navigational control are as important as the design rules, is designed to be cost-effective rather than 100 per cent reliable.

For any ships that are not “traditional”, however, even in well-travelled seas such as the Baltic, designers need to be very careful about just “designing to the rules”. The advent of larger ships in some trades and, even more, the introduction of new technologies such as podded propulsors, can change the game in ways that the developers of the rules may not have anticipated. As an example, the much greater manoeuvrability in ice of ships with podded propulsors can lead to higher loads on some areas of the hull, and to damage as a result. The rules did not and could not predict this.

In other ice-infested waters there are even more challenges. The International Association of Classification Societies (IACS) has now promulgated Unified Requirements for Polar Class Ships (URs) to replace the previous hodge-podge of national and classification society rules and standards. These URs represent the state of the art in knowledge of how to design against ice loads (declaring an interest, I was one of those involved in drafting them). However, they are deliberately quite vague in suggesting what Polar Class is appropriate to any area or season or service - there is too much variability to allow for dogmatic statements on what class should be selected without a firm understanding of the nature of the operation and the hazards of the route. There is currently a very high level of interest, and an increasing amount of activity, in bringing natural resources out of the Arctic. These resources include ores and mineral concentrates, oil and gas. In some cases shipping may use the same routes and even ships of similar size, but these ships may be used in quite different ways. Producing LNG requires expensive plants, and storage of the product is difficult. This leads to a requirement that LNG tankers should be able to operate fast and reliably in the most severe ice conditions that are going to be found along a route. Similar considerations would apply to Arctic container ships, if the Northern Sea Route or “over the Pole” options do become serious transit options. These types of ship will have ice impacts energy levels much higher than anything we have direct experience of, even with nuclear icebreakers. Below the waterline, the way in which submerged ice pieces will bounce along the hull has also not been experienced at full scale, or much researched by analytical or physical models. For these types of operation, the designers have to be very cautious about applying any rule system blindly.

The challenges of operation
Returning to the TITANIC, it has been
claimed that the owners boasted that “God himself could not sink this ship”. As another of my mentors once, more accurately, warned me, “you can make a design foolproof, but not sailorproof”. However, I have great sympathy for the operators of ice-going ships, because the designers, researchers and training institutes have never really been able to give sailors a good understanding of what the capabilities of their ships actually are. A very experienced ice navigator of my acquaintance once told me that there are three speeds for operation in polar ice - slow, dead slow, and dead stop. This was certainly appropriate for the relatively low ice class ships he was familiar with, but is not adequate for the new generation on polar shipping.

The Russian administration requires ships to have “ice passports” (now certificates) that provide curves of safe speeds for ships in various ice conditions. This is an excellent concept, but there is no generally accepted way of generating such curves. Furthermore, the great variability in ice conditions - strength, thickness, concentration, floes size, etc. - gives any set of curves a very limited range of validity. Several applications have also been made of instrumentation systems intended to give warning of when local (or global) hull stresses are reaching dangerous levels. This also has drawbacks. In my personal experience the damaging loads have an uncanny ability to be where the sensors are not. However, both sensors and certificates can play a useful role and represent modest costs when set against the very large expenditures involved in building ice class ships, and the even greater liabilities in the event of significant damage.

It is also absolutely crucial to invest in the right sailors and in good quality ice information. The Canadian and Russian governments require the use of ice navigators on many voyages in the Arctic, and most experienced owners and operators do this even when it is not mandated. To date, there are no international standards for how to qualify as an ice navigator, and there is a heavy reliance on the use of ex-icebreaker captains, a species with a very finite supply. This is widely regarded as being a major area of concern for future ice operations.

The ice information situation on the other hand has been improving substantially in recent years, with the advent (amongst other things) of satellite sensing, enhanced communications, and specialised ice radar. The interpretation of ice images is still a very specialised skill, and forecasting remains difficult; but many polar operations take place with very poor visibility. Modern technology helps to mitigate this hazard.

**Risk management**

Whenever a new shipping service in ice is envisaged, it is an extremely good idea to undertake some form of risk assessment to identify the new (or modified) hazards that will be faced, and to select appropriate means of risk mitigation. My own experience of these exercises is that they need to be kept within a relatively small group of participants, but at the same time need to include a broad range of experience and real domain expertise. They should also draw on both enthusiasts and skeptics for the project - perhaps insurers could play an active role on the sceptical side of more teams.

Risk assessments will not necessarily provide precise answers to questions such as “how strong is strong enough?” or “how fast is too fast?” because we are still lacking some basic knowledge of how ships behave in ice. Generally, though, approximate answers are good enough for planning and design purposes, as long as they are then coupled with properly cautious operation.

In the medium and longer term, there is a continuing need for research and data collection into many aspects of ice operation. In the 1970s and 1980s much of the groundbreaking work in ice technology was funded directly by government bodies, and found its way quite rapidly into the public domain as a result. Recently, practice has shifted towards industry funded projects, with some positive but other more regrettable consequences. It takes ever longer for safety-related information to be published, or even to have proper levels of peer review. This leads to a lot of reinvention of wheels, not all of which are actually round. When a theoretical model is being used as the basis for any risk assessment, two key questions that should always be posed are, firstly, what form of full-scale validation can be provided, and, secondly, what is the range of validity of the approach.

**Conclusion**

It is quite possible to operate safely in almost any ice conditions found in the world’s oceans, using ships with appropriate designs and equipment, crewed by skilled and experienced mariners, and supported by good quality information. However, it is all too possible to make poor decisions in any one of these areas, and to run unacceptable risks as a result.
Safety culture - Incidents resulting from human error

Gard’s claims handlers see a large number of claims every day and although these may vary a lot in nature and size, from small petty claims to very serious ones, there are common features present in them that may be worthy of some reflection.

It is no secret among claims executives that in claims of all sizes and types certain common features can usually be observed:
1. The lion’s share of claims can be attributed to human error of some sort.
2. Claims caused by human error occur in spite of what seems to be adequate efforts by operators to prevent them, i.e., management and quality systems.
3. The largest claims are sometimes those which can most clearly be attributed to human error.

Some practical cases can serve to illustrate how the human element plays a role in claims. This article describes a few examples taken from real incidents, involving high-quality managers and owners who have strong focus on quality management, which will probably be of interest to readers.

Collision and grounding
A loaded chemical tanker of about 5,000 TDW is inward-bound on a river. The river is navigable by a deep-water channel about 500 m wide and clearly marked with light buoys, with mud banks on each side. The river is covered by Vessel Traffic System (VTS) and pilotage is mandatory. The vessel is about midway in the six-hour passage from pilot station to berth. Fog is limiting visibility to some two cables (365 m), which is roughly three times the vessel’s length. The vessel is proceeding at 10 knots and the pilot is giving rudder orders varying between proceeding at 10 knots and the pilot is giving rudder orders varying between 8 and 12 knots.

The second officer is on look-out and performing an easier port rudder manoeuvre would have led the vessel to pass the meeting vessel port to port and well clear of the riverbank to starboard.

Human error
What actually happened in the case described above was that the pilot misinterpreted the radar and thought that the bend in the river was further ahead than it actually was. Suddenly realising his mistake, he panicked and gave a hard to port rudder order so as to avoid grounding, but disregarding the approaching vessel ahead. The vessel makes a sharp turn to starboard, its port quarter makes contact with the bow of the approaching container vessel and then steers directly against the riverbank where it runs aground before the officers on the bridge are able to correct the course and reduce speed.

So far so good, but the trouble starts when the second officer makes the pilot aware of a green buoy on the port bow, which should have been to starboard. At the same time there is a large echo on the radar further ahead on the port bow, which obviously indicates a large vessel on an opposite course. The second officer observes that the pilot gets very nervous as he gives a rudder order to port, which eventually leaves the green buoy on the starboard bow, but also the large echo on the radar.

Now the situation is picked up by the master and the chief officer and they ask the pilot what is going on. The pilot replies that he made a mistake about the position in the river. The master gets nervous about the approaching vessel appearing on the radar, which is now also physically visible. The master orders full ahead and hard to starboard, which is immediately executed. At this point the VTS also picks up on the situation and calls the vessel on the VHF. As the vessel makes a sharp turn to starboard, its port quarter makes contact with the bow of the approaching container vessel and then steers directly against the riverbank where it runs aground before the officers on the bridge are able to correct the course and reduce speed.

a) they would have realised the potential danger of the situation sooner and would have corrected the pilot in time to prevent a dangerous situation, or
b) they would have intervened and taken more adequate steps when it was obvious that the pilot had erred and panicked.

There are unfortunately a number of claims which seem to be attributed to the master and the OOW (officer of the watch) relying too much on the pilot and not monitoring and questioning his instructions. The pilot is only an advisor and guide to the OOW and the responsibility and liability for the navigation and manoeuvring of the vessel rest with the master and the OOW even when the pilot is on the bridge.

Grounding
A vessel is under way on an ocean crossing with course set out from start to end. The course is set out and the voyage planned on a small scale planning chart. The course is set to pass some small groups of mid-ocean islands and the CPA (Closest Point of Approach) is considered and thought to be well on the safe side. On a nice tropical night with calm seas and good visibility, the vessel makes its approach to pass one group of islands well on the port side some time after midnight.

The chief officer observes during the last two hours of his 1600-2000 hrs watch that a slight breeze and current are working together to set the vessel slightly off course and towards the islands ahead. He therefore makes a correction to the course to compensate for the drift and moving towards the islands ahead. The chief officer makes the second officer aware of this.

The second officer continues to plot the positions throughout his watch and observes that the vessel is still drifting somewhat off course to the effect of making the CPA to the islands ahead less safe than planned. He therefore makes some minor course adjustments to compensate for drift and setting. At midnight the watch is handed over to

Gard News 207, August/October 2012

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the first officer, who is also made aware of the drift and the course adjustments. At 0040 hrs the vessel runs aground at full speed on the beach of a small low atoll. The beach is mainly sand and pebbles and slopes at a low angle into the sea so the vessel suffers minor damage but cannot be re-floated with its own power. A costly salvage operation follows.

Human error

The positions were plotted in the same small scale planning chart covering the entire ocean where the voyage was planned and the course set out. In a small scale chart it is difficult to accurately measure small distances and observe small deviations from the course between hourly plots. The reason for using a small scale chart was probably that it was not considered necessary to conduct “millimetre” navigation when crossing the ocean. The island on which the vessel grounded was marked on the chart in use, but only as a small dot and the course was set to pass at what seemed to be a safe distance.

The drift and current, however, worked together to set the vessel off course towards the island and it is painfully obvious that the corrective actions taken by the navigation officers were not adequate.

It can be concluded that the grounding would not have happened if:

a) a large scale chart had been used for position plotting since it would then have become apparent that the course was heading gradually towards the island, and/or
b) a much wider passing had been planned in the first place, and/or
c) a considerable safety margin had been applied when the corrections were made to compensate for drift and setting.

It is also possible that proper look-out and use of radar could have been an issue. On the other hand, the island was very low and it is arguable that it could not have been spotted visually in time in the dark tropical night. It is unclear whether and why the island was not seen on the radar, but it is a known fact that radars are subject to a lot of interference in tropical waters and it could be that both the rain and sea clutter settings had been adjusted to deal with that, thus at the same time removing or diminishing the radar image of the island.

Other claims

The above examples focus on navigation, which is possibly where one sees most clearly the impact of the human element. There are, however, a number of other claims types where the human element is often seen to play a significant role.

In some claims of a more technical nature sometimes shortcuts and omissions in maintenance and operation have consequences such as engine breakdowns, in some cases followed by groundings or collisions.

One issue that springs to mind is the recommendations for fuel treatment that come with the analysis reports of fuel, which in some claims are not adhered to. This can result in complex and technically difficult claims to deal with.

Human error may also play a role in more tragic cases, such as explosions and fires, often with severe injuries and even fatal consequences. The classic example is where a hot work permit is given for a specific location on board a tanker in ballast and, after conclusion of the relevant welding work, it is decided on the spot that while they are at it, they will also do some minor welding work in another location, which is not covered by the hot work permit. The result is a big explosion and loss of lives and major damage to the vessel.

Conclusion

The above examples are not unique. The list goes on, with a number of small and large cases within all claims segments apparently caused by lack of attention and/or lax attitude to standards of safe operation.

Much has been written and said about safety culture and the crux of the problem can probably be summed up as doing the right thing at the right time, firstly preventing and then responding to minor and major incidents with potential for damage to life, environment and property.

Operation of ships is full of regulations, instructions and guidelines which officers and crew are expected to know and adhere to. The ISM Code has to a large extent codified what is known as good seamanship. A culture of safety may perhaps be achieved through written instructions, but in the end it is a question of a common mind-set throughout the organisation. Management ashore and on board need not only ensure that the formal skills are in place but also ensure, encourage and inspire the necessary attitudes to achieve the safety objectives. Statistics prove beyond doubt that investing in a good safety culture provides results and pays off in the long term. It is the lack of a safety culture that is costly, not safety itself.
The evolution of the York-Antwerp Rules: On hold until 2016
By Richard Cornah, Chairman, Richards Hogg Lindley, Average Adjusters and Marine Claims Consultants, Liverpool.

No support at CMI 2012 meeting for York-Antwerp Rules amendment.

The concept of general average and the York-Antwerp Rules are sometimes seen as a throw-back to past times that have little relevance to the modern shipping and commercial environment. However, the arguments for an abolition or significant restriction of general average have been met with the realisation that general average losses and expenses would not go away, simply because the concept that had been used to identify and distribute them was extinguished or curtailed. The same risks would continue to exist and would need to be allocated between the parties under the contract of affreightment, and arrangements then made for insurance of that exposure with property or liability insurers.

Unlike international conventions that are at the mercy of ratification by individual states, the York-Antwerp Rules are incorporated into virtually all bills of lading and therefore apply as a matter of contract, thus achieving uniformity on a truly global scale.

Since the first rules were formulated in 1860 by an international group of owners, insurers, adjusters and other interested parties, the rules have been updated periodically. Initially, as the success of the project became apparent, the changes were largely to increase the scope of the rules, thus securing greater uniformity with each new version. Since 1924 the scope and format of the rules have remained recognisably the same, but periodic amendments continued to be made to meet changes in the commercial shipping environment. New versions were agreed in 1950 and 1974 and the 1994 revision saw important changes relating to environmental issues. The revisions are overseen by the Comité Maritime International (CMI), made up of some 50 national maritime law associations, which since 1947 has effectively been the custodian of the York-Antwerp Rules.

Dissatisfaction

Following the introduction of the 1994 Rules the International Union of Marine Insurers (IUMI) expressed their dissatisfaction with many aspects of general average, both in terms of the cost of the procedures and the misuse that operators of sub-standard ships were considered to be making of the system.

They therefore proposed a radical change whereby general average would be limited to common safety only, and all costs relating to ports of refuge would be excluded. CMI agreed that these concerns and proposals should be looked at closely and discussions took place at subsequent CMI meetings, leading up to their 2004 conference in Vancouver.

There was little support in the preliminary meetings or at Vancouver for the radical restriction to the “common safety” concept, with delegates taking the view that the existing system for dividing costs at a port of refuge was widely understood and generally worked well. The advantage that was recognised was that action can be taken promptly within a known framework, leaving legal issues to be sorted out later; any change would be likely to increase the number of costly disputes, particularly relating to the abandonment of voyages.

However, delegates supported a number of incremental changes proposed by CMI that included the exclusion of salvage, a reduction in allowances for crew wages and temporary repairs, and amendments to allowances for commission and interest. The new 2004 Rules were passed without the support of shipowners’ bodies, which felt that the changes were premature and unhelpful. The absence, for the first time, of a consensus among all interests was reflected in a very limited adoption of the 2004 Rules in bills of lading, and the 1994 Rules remained the most widely used.

Compromise - By 2016?

CMI were concerned that this situation was contrary to the objective of uniformity and, during the latter part of 2011, began preliminary discussions with interested parties to see if a compromise set of rules could be sanctioned at the then forthcoming 2012 CMI meeting in Beijing. In the event, compromise proposals put forward by a CMI working group and the British Marine Law Association which modified or put to one side the more contentious aspects of the 2004 Rules relating to salvage and crew wages, were not supported at the meeting. Many maritime law associations and industry bodies felt there had been insufficient time for consultation.

However, many present, including shipowners’ representatives, felt that the compromises suggested would provide a framework for a new set of rules that could meet with general acceptance.

The working group therefore recommended to the CMI Executive Council “that it should appoint a new International Working Group on General Average, with a mandate to carry out a general review of the York-Antwerp Rules on General Average, and, noting that the York-Antwerp Rules 2004 had not found acceptance in the shipowning community, to draft a new set of York-Antwerp rules which met the requirements of the ship and cargo owners and their respective insurers, with a view to their adoption at the 2016 CMI Conference”.

The new working group includes representatives from the International Chamber of Shipping and IUMI, and others attending in an individual capacity, including Richard Cornah of The Association of Average Adjusters and Michael Harvey of Association Mondiale de Despatcheurs. Given the time that is now available, the working group has the opportunity to carry out a “ground up” review of all aspects of general average. In addition to topics discussed previously, the group will need to consider the impact of ever larger container vessels, the introduction of the Rotterdam Rules and the increasing intervention of national and international authorities in managing casualties.
Help is at hand for the integration of ECDIS into shipping fleets.

Maritime navigation is going digital. Revisions to the Safety of Life at Sea (SOLAS) regulations requiring the carriage of Electronic Chart Display and Information Systems (ECDIS) on the commercial shipping fleet are ushering in a new era of voyage planning and navigation that relies upon digital charts. However, whilst the adoption of digital navigation may be mandatory, it is not simple. To comply with the revised regulations in a safe, timely and efficient manner, shipping companies need to plan ahead for the integration of ECDIS into their fleets.

The revised SOLAS regulations requiring the carriage of ECDIS on most large vessels mark a historic change to the way that ships navigate. ECDIS carriage becomes mandatory for different ship types and sizes on a rolling basis that began in 2012 and will be complete in 2018.

The transition to digital navigation has not only required action by shipowners, operators and officers, it has also placed a greater responsibility on those charged with producing accurate navigational data in a digital format, ready for use on ECDIS-equipped vessels. The UK Hydrographic Office (UKHO) is working harder than ever to meet the needs of the global fleet. The Admiralty Vector Chart Service (AVCS) now holds over 12,000 Electronic Navigational Charts, including unique coverage for over 200 of the world’s biggest and busiest ports. Over 200,000 pieces of information are triple-checked every year, making sure that the available navigational data is as safe as possible.

The key to the digital transition is early preparation. With dozens of ECDIS models on the market and differing flag state and class society requirements on ECDIS Type Approval certificates, installation standards and approved training, there is a huge amount for owners and operators to think about. The picture will continue to evolve during 2013 as shipping companies focus on the practical aspects of how compliance is not only achieved, but also demonstrated.

With all this in mind, 2013 is set to be a significant year in the transition to digital navigation, with the pace of change expected to rapidly accelerate as the shipping industry responds to the scale of the challenge that it faces. At every stage, there are important decisions to be taken by shipowners and operators over the right approach to take towards integrating ECDIS, with serious repercussions if the wrong choices are made. This is why the UKHO has developed two workshops to assist shipping companies with the transition to digital navigation.

Digital integration workshop
The first workshop, Admiralty Digital Integration, provides a nine-stage step-by-step process to ensure the ECDIS is compliant, safe and efficient. This workshop has been delivered worldwide during 2012 attracting over 1,000 representatives of the shipping industry. Due to its popularity it will continue to be presented in 2013.

Captain Paul Hailwood, an internationally-respected expert on ECDIS and integrated bridge operations, who leads the workshop, explains what delegates can expect: “Many shipping companies are daunted by the prospect of preparing for ECDIS and under-estimate the time required to properly plan for the integration of digital navigation into their fleet. Our workshop will not only help shipping companies to understand how to comply with the revised SOLAS regulations, it will also help them to arrive at the optimal ECDIS solution that is right for their fleet, right for their crew and right for their operations”.

In the workshop delegates are taken through the nine stages that they need to follow in order to achieve a safe and efficient transition to digital navigation.

Stage 1
The first step in the process is to identify the key SOLAS compliance dates for your fleet. Different vessel types and sizes face different compliance deadlines, with existing vessels required to install ECDIS before their first survey once the regulations are in force.

Stage 2
With the key compliance dates established, owners should then conduct an initial ECDIS risk assessment that identifies the general risks faced by their fleet during the ECDIS adoption process. This should take on board the views of both seafarers and shore staff, with the purpose of establishing a strategy for the adoption of ECDIS, including a time line.
Stage 3
The third stage in the process is to plan for ECDIS training. Ensuring that seafarers are compliant and confident in the use of ECDIS is perhaps the biggest challenge of the digital transition. Between now and 2018, it is estimated that up to 200,000 officers must undertake generic and type-specific ECDIS training. It is vital to ensure that any course is approved by a marine administration on the STCW white list and is accepted by the flag state of the vessel on which the officer will serve. It is also important that the relevant ECDIS manufacturer approves type-specific training.

Stage 4
Once the shipowner has chosen an ECDIS manufacturer, they must ensure the correct installation of ECDIS. It is important to verify that the ECDIS Type Approval certificate is acceptable to flag state and to comply with both flag state and classification society requirements for the installation process itself. It is also necessary to consider back-up systems, redundancy and ongoing maintenance of ECDIS.

Stage 5
Alongside the installation of ECDIS, each shipping company needs to establish safe and efficient ECDIS operating procedures that are appropriate to its business, its policies and its operational needs, as well as being suitable for its vessels. Such ECDIS procedures should be incorporated into the Safety Management System.

Stage 6
Just as safe navigation has always relied upon accurate paper charts, shipping companies operating an ECDIS must ensure the use of up-to-date official Electronic Navigational Charts (ENCs). Where ENC coverage is not available and flag requirements can be met, Raster Navigational Charts, which are exact digital copies of paper charts, may be used. This requires ships to properly manage their charts, using a tool such as the Admiralty e-Navigator PC application. This is the easiest way to include the Admiralty Information Overlay, which is displayed as a layer on top of the electronic chart, highlighting Admiralty Temporary and Preliminary Notices to Mariners, along with navigationally significant differences between ENCs and paper charts.

Stage 7
Having already undertaken a fleet-wide risk assessment, shipping companies should then conduct individual ship ECDIS risk assessments in order to identify the hazards and procedures specific to the vessel and its ECDIS.

Again, ships’ officers should be involved in this process, with necessary refinements made to ECDIS operating procedures.

Stage 8
Once ECDIS training, procedures and installation are complete, the flag state will need to approve the ECDIS as the primary means of navigation for each ship. Each vessel will then be ready to make the transition from paper charts to ECDIS. This transition can take place over several months, in order to build up officers’ experience and confidence.

Stage 9
The final step in the process is to implement ECDIS on board. A good way to support this process is to place an ECDIS-experienced officer on board to assist with the implementation, mentor other officers and develop common standards.

Policy and procedures workshop
The second workshop, Admiralty Guide to policy and procedures for the operational use of ECDIS, is a response to the requests from those attending the first workshop for more detail and assistance with regulatory requirements and development of ECDIS policy and procedure.

To achieve SOLAS carriage requirements for the use of ECDIS as a primary means of navigation, the ship’s Safety Management System shall include procedures for the operational use of ECDIS. This workshop utilises the expertise of the UKHO to assist shipping companies to achieve this important requirement.

Legal requirements for the adoption of ECDIS may appear complex and vary with interpretation. The workshop will clarify these issues and provide a checklist of items and issues required by international standards. This will assist the shipping companies to prepare for any port state inspection or third party audit relating to the ECDIS.

Policy and procedures for the operational use of ECDIS should be developed through a structured risk analysis process. The workshop will identify the hazards associated with the operation of ECDIS and control measures to adopt to minimise the risk. Although the shipping industry is an expert at risk assessment, it is identifying the hazards and control methods which require expertise in ECDIS. The UKHO is well placed to provide this expertise.

Conclusion
The UKHO has been charting the world’s oceans for more than 200
Hull and machinery incident – Voyage planning and grounding

A grounding with valuable learning points.

The incident

During preparation for departure from a loading port, the 2nd Officer of a cargo vessel was assigned a number of different tasks. Once the loading was completed he was called on deck to assist with the bunkering, search for stowaways and carry out draught checks. However, he did not have sufficient time to complete the full passage plan for the voyage ahead. In the time available, he prepared a table of waypoints for the route and entered the waypoint coordinates into the GPS receivers. A quick brief took place prior to departure, focusing only on the upcoming pilotage and tug operation.

During the first morning of the voyage the 2nd Officer replaced the coastal chart with the overview chart, which covers the Pacific Ocean, and marked the route on the chart and on the plotting sheet. He noted that between two of the waypoints the course line passed close to a small group of islands some days into the voyage. The planned passing distance was assessed by the 2nd Officer to be 10 NM, which was believed to be an acceptable passing distance. On the local overview chart the course line almost touched the islands because of the small scale.

On the fourth evening of the voyage the Master completed his Night Order Book in the usual manner, without any reference to the approaching islands. The positions marked on the plotting sheet showed that the vessel was making progress in accordance with the plan. During the 2nd Officer’s night watch, he suddenly observed a large echo on the radar screen on the port bow. He assumed this had to do with the weather forecasted on the weather routing map and suggested to the AB present that they could expect some heavy rain showers. Binoculars were used to verify the information, but it was too dark to see anything. The 2nd Officer noted that the assumed rain shower was passing clear down the port side at a distance of about 5 NM. No further investigations were made.

The next OOW, the Chief Officer, arrived on the bridge, read the Master’s Night Orders, checked the GPS and noted from the cross-track error display that the vessel was on the course line. He then sat on the pilot’s chair immediately adjacent to the radar display. It was very dark and he was unable to assess the visibility. Before stepping down, the 2nd Officer informed him about the course and which waypoint was up next. The small group of islands and the presumed rain shower observation were not mentioned.

The Chief Officer then glanced at the radar screen and saw a large echo very close ahead. He assumed it was generated by a heavy storm cloud. He then felt the ship hit something. The vessel had hit an island and had run aground. The ship had grounded on the only group of islands present within hundreds of miles.

The financial impact of the incident was severe for owners and insurers. The incident led to the total loss of the ship and cargo, the escape of the ship’s bunkers and possible damage to the environment as a result, but, fortunately, no loss of life.

Lessons learned

The officer of the watch was following on the plotting sheet and did not consult the BA chart which was available on board. No-go areas were not marked on the plotting sheet. The course took the vessel directly over the island. A number of contributory factors were present, but this article will focus on “passage planning and positioning” and “bridge resource management”.

Passage planning and positioning

When the 2nd Officer had initially drawn the course line on the overview chart, he made an error in plotting the waypoint that was close to the island. This resulted in a course line indicating that the vessel would clear the group of islands by about 10 NM. If the correct waypoint had been plotted, the resulting course line would have indicated that it passed directly over one of the islands. No-go areas were not marked on the chart. Determining such a small passing distance on an overview chart was unsatisfactory and did not conform to the company’s instructions of clearing distances when a vessel was in open waters.

Although the bridge team was aware that they would be passing close to some islands, they were not aware of when that event would take place. The marking of critical areas on the charts would have assisted the bridge team in maintaining good situational awareness of the hazards ahead.

Both the 2nd Officer and Chief Officer were not aware that their vessel was heading towards the group of islands. This was because there was no indication on the plotting chart to alert them of the dangers ahead. It appeared that the bridge team was focused on following the GPS track superimposed on the radar screen instead of monitoring the vessel’s position in relation to surrounding hazards. Some hours before the grounding, the 2nd Officer noticed a large defined echo on the radar screen which he failed to identify or investigate as a possible land mass. This important information was not passed to the Chief Mate and neither did the Chief Mate notice it on the radar screen.

Bridge resource management

Several companies have adopted the concept of bridge resource management to address performance variability.

Bridge resource management is often defined as effective management and use of all resources, human and technical, available to the bridge team. The objective is to ensure the planning and execution of a safe passage. One of the most important aspects of bridge resource management is its potential protection against human error. Bridge resource management is not limited or confined to the execution of the passage plan, but is intended to be applied throughout the entire process, including the planning of the passage.
Reminder: Pilot transfer arrangements - revised requirements applicable to existing ships

Revised requirements covering some safety aspects of pilot transfer arrangements have been introduced through changes to SOLAS Regulation V/23 and apply to “equipment and arrangements for pilot transfer which are installed on or after 1 July 2012”. 1

Although the revised requirements affect primarily new ships, i.e. ships constructed on or after 1 July 2012, or for which the building contract is placed on or after 1 July 2012, some of the requirements also apply to existing ships constructed before 1 July 2012.

The revised requirements for existing ships in summary:
• Mechanical pilot hoists shall not be used.
• Shipside doors used for pilot transfer shall not open outwards (applies to ships constructed before 1 January 1994, and must be modified not later than the first survey on or after 1 July 2012).

Gard’s Members and clients should familiarise themselves with the revised requirements for pilot transfer arrangements as stipulated by SOLAS Regulation V/23. For ships fitted with mechanical pilot hoists or shipside doors opening outwards, replacements and modifications should be carried out in order to ensure compliance also after 1 July 2012. All replacements and modifications should be carried out in close co-operation with the Classification Society and Flag Administration.

For details of all relevant requirements for pilot transfer arrangements, please see IMO Resolution A.1045(27). An updated poster reflecting the revised requirements has been prepared by the International Maritime Pilot’s Association (IMPA). The updated poster is reproduced below.

Footnotes
1 The revised SOLAS Reg V/23 was adopted by the IMO Maritime Safety Committee (MSC) during their 88th session, see MSC.308(88) dated 3 December 2010. The term “installed on or after 1 July 2012” should in this context refer to a contractual delivery date for the system to the ship, or if this is not available, the date it was actually delivered to the ship. However, this does not apply to equipment and arrangements installed on or after 1 July 2012, which is a replacement of equipment and arrangements provided on board existing ships before 1 July 2012. Reference is also made to IMO MSC.1/Circ.1375 “Unified Interpretation of SOLAS Regulation V/23”.

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**REQUIRED BOARDING ARRANGEMENTS FOR PILOT**

In accordance with SOLAS Regulation V/23 & IMO Resolution A.1045(27)

INTERNATIONAL MARITIME PILOTS’ ASSOCIATION

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This document and all IMO Pilot-related documents are available for download at: http://www.impaHQ.org

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The Netherlands - Revised North Sea shipping routes come into force on 1 August 2013

Extensive changes have been announced to the routeing system in the Dutch North Sea. The North Sea is one of the world’s most densely trafficked sea areas and the changes are made in order to ensure the future safety of shipping and improve access to the main Dutch ports.

The changes will come into force on 1 August 2013 at 00:00 UTC (02:00 local time) and include:
- Introduction of a new Traffic Separation Scheme (TSS) in the approaches to Ijmuiden. Vessels sailing in opposite directions will have separate sea lanes.
- Routes are located further from the coast.
- Reduced number of route intersections.
- Relocation of anchorage areas.
- Areas around objects such as platforms have been reconfigured.
- Introduction of ‘areas to be avoided’ and ‘precautionary areas’. Vessels will not be allowed to sail in ‘areas to be avoided’, while vessels sailing in ‘precautionary areas’ will be requested to navigate with care.

From April 2013 onwards, maritime traffic will regularly receive messages focusing on the revised routes and Members and clients are recommended to advise their Masters operating in the area to monitor the messages through the usual channels. Notices to Mariners will be published on the websites of the Netherlands Hydrographic Office (www.hydro.nl) and the United Kingdom Hydrographic Office (UKHO) (www.ukho.gov.uk).

Members and clients are also reminded that updated nautical charts must be available on board before the changes take effect. New nautical charts and ENC’s are due to be released in mid-June 2013.

Further information on the forthcoming changes can be found on the website of Rijkswaterstaat (part of the Dutch Ministry of Infrastructure and the Environment): www.rws.nl/newshippingroutes.
New Panamax vessel requirements

All vessels arriving at the Panama Canal, whether for docking or transiting, must comply with Maritime Regulations for the Operation of the Panama Canal and the authorities’ Notice to Shipping No. N-1-2012, “Vessel Requirements”, dated 1st January 2012.

In Advisory Note No A-28-2012, dated 23 November 2012, the Panama Canal Authority (ACP) outlines the requirements applicable to vessels intending to transit the new locks upon completion of the current Canal expansion project. These new requirements primarily involve changes to:

- Vessel Requirements Section 2 - Size and draft limitations of vessels, with the introduction of two new designations:
  - Panamax Plus: All Panamax vessels authorized for Tropical Fresh Water (TFW) drafts greater than 12.04 metres and approved for transit of the new locks.
  - New Panamax: All vessels with dimensions greater than Panamax or Panamax Plus that comply with the size and draft limitations of the new locks; namely, 366 metres in length by 49 metres in beam by 15.2 metres TFW draft.

- Vessel Requirements Section 8 - Construction, number and location of chocks and bits.

Details of the new requirements can be found at http://www.pancanal.com/common/maritime/advisories/2012/a-28-2012.pdf and are of particular interest to shipowners and operators with existing Post-Panamax vessels and/or with plans for large newbuildings.

Members and clients should also note that, once the new locks are operational (late 2014 or early 2015), vessels transiting the Canal for the first time, whether newly-constructed or newly-modified, are subject to inspection and prior review and approval of vessel’s plans. Vessels without prior approval and/or not in compliance with Canal requirements may experience delays or be denied transit.

Footnotes
1 For further details and current status of the Panama Canal expansion project, please see the webpages of ACP.
2 Tropical Fresh Water of Gatun Lake, density 0.9954 tons/m3 at 29.4°C.
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