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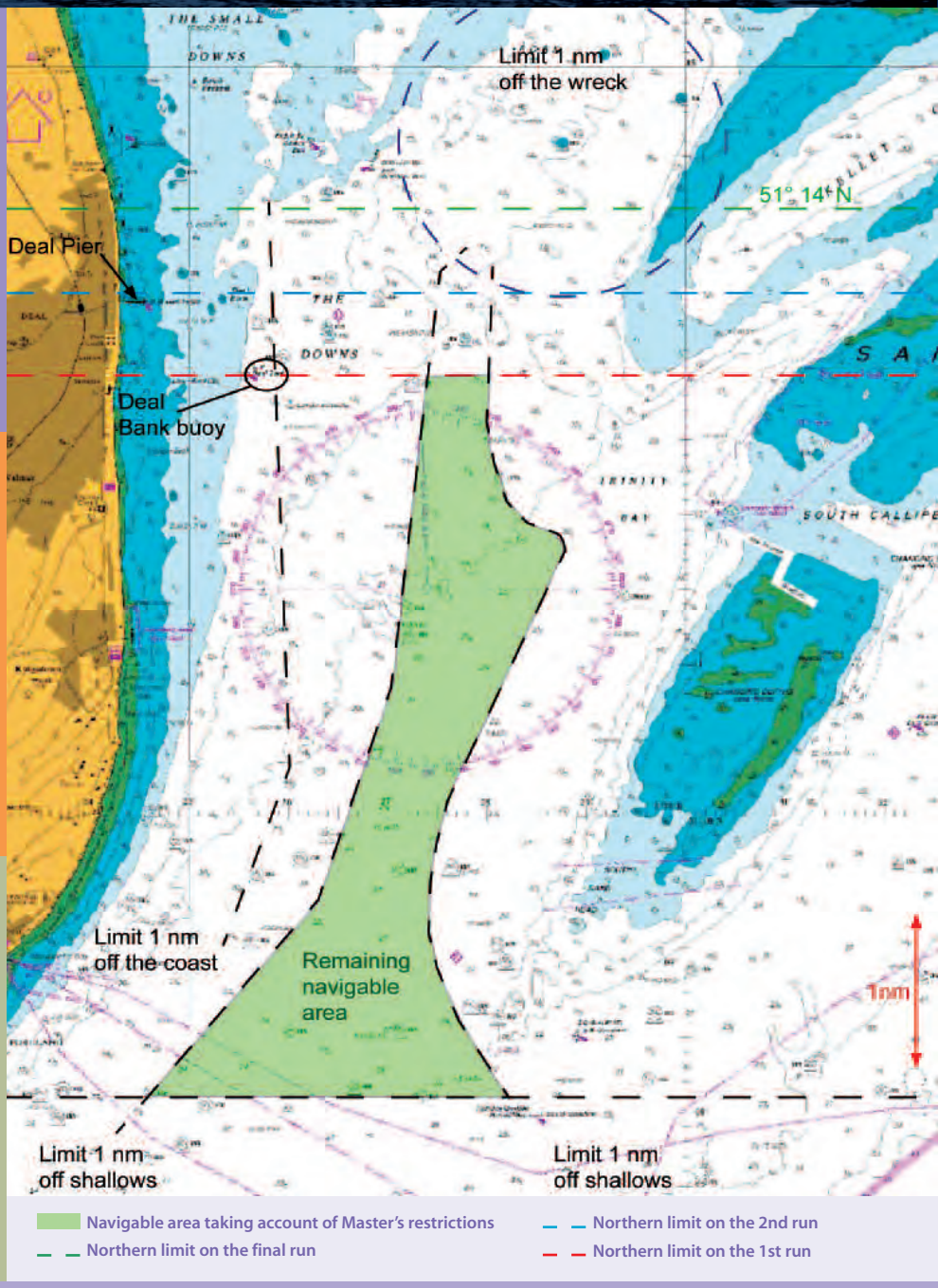
RISK WATCH

Britannia
The Britannia Steam Ship Insurance Association Limited

Navigation and seamanship

Containers and cargoes

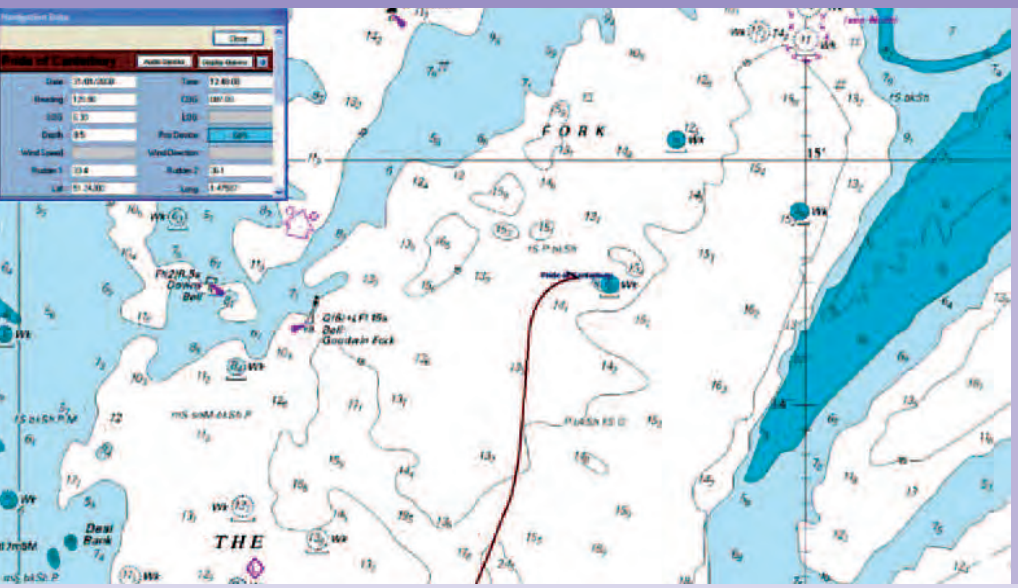
Crew matters



ECDIS

A number of recent incidents have demonstrated that bridge watchkeeping officers are not always properly trained in the use of the ECDIS (Electronic Chart Data Information System) and that the correct use and limitations of such equipment may not be properly understood. With modern navigational technology becoming more commonplace aboard merchant vessels today it is important that ships' deck officers and their line managers ashore recognise the importance of formal ECDIS training in order to ensure that their vessels continue to be properly operated by competent personnel.

Navigation and seamanship



Track record of PRIDE OF CANTERBURY approaching the wreck of MAHRATTA.

ECDIS (continued)

What is an ECDIS?

ECIDS equipment is defined in the IMO ECDIS Performance Standards as being a navigation information system which, with adequate back-up arrangements, can be accepted as complying with the up-to-date paper chart, a requirement of the SOLAS regulations. Only a 'type-approved' ECDIS operating with up-to-date electronic navigational charts (ENCs) and with appropriate back-up may be used in place of all paper charts onboard a vessel. No electronic system is completely failsafe and therefore the IMO requires that the overall system includes both a primary ECDIS and an adequate independent back-up arrangement that provides:

• an independent facility enabling a safe take over of the ECDIS functions in order to ensure that a system failure does not result in a critical situation.

• a means to provide for safe navigation for the remaining part of the voyage in case of ECDIS failure.

What is an ENC?

An ENC or 'Electronic Navigational Chart' (simply referred to as 'vector charts' by some sources) is a term that was originally introduced for digital chart data complying with the International Hydrographic Office chart data transfer standard S-57. The IMO requires that ENCs can only be produced by or on the authority of a government, authorised Hydrographic or other relevant government institution. Any other vector data is unofficial and does not meet carriage requirements.

ENCs have the following characteristics:

• content is based on source data or official charts of the responsible Hydrographic Office;

• compiled and coded according to international standards;

• referenced to World Geodetic System 1984 Datum (WGS84);

• content is the responsibility and liability of the issuing Hydrographic office;

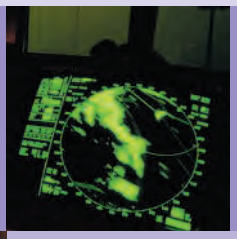
• regularly updated with official update information and distributed digitally.

A further feature of ECDIS is that it is capable of distinguishing an ENC from unofficial chart data. When unofficial data is used, ECDIS informs the watchkeeping officer by a continuous warning on the screen that an up-to-date paper chart must be used for navigation. Only a type-approved ECDIS operating with fully updated ENCs and with appropriate back-up may be used to replace all paper charts onboard a vessel.

Incidents involving the use of ECDIS

Although ECDIS is increasingly being used aboard vessels today it is imperative that traditional navigational skills are not lost. Whilst ships' navigators should become confident in the use of ECDIS there is a danger that many watchkeeping officers, particularly junior officers, will not sufficiently interrogate the information that is being displayed and they may become increasingly trusting of flawed data. For instance, the symbols displayed can change according to the settings of the safety contour including wrecks and isolated danger symbols. It must be remembered that ECDIS is merely an aid to navigation and should never be used as a substitute for good seamanship.

The UK Maritime Accident Investigation Branch official report concerning a large passenger ferry (PRIDE OF CANTERBURY) which grounded on a charted wreck detailed that the ECS (Electronic Chart System) was not approved for use as the primary means of navigation, although the officers were utilising it as if it was. In addition, none of the bridge team who were on watch during the period in which the vessel was navigating in close proximity to land had undergone any generic training in the use of ECDIS. Indeed only the vessel's Master had attended the manufacturer's own in-house course for training in the use of such equipment. It is believed that the lack of proper training in the use of ECDIS possibly led to the



Port side missing CP propeller and hub.

Starboard CP propeller and hub.

wreck being undetected, or that the wreck may have been displayed but that the ECDIS symbol was possibly misunderstood.

The ferry was slow-steaming off the south coast of England in winds of Bf10, awaiting permission to enter the port of Dover which had suspended traffic movements because of the severe weather conditions. The Master had instructed the OOW to steam slowly (approximately North then South) in the area known as 'The Downs', keeping one mile from the coast and shallow areas and not proceeding north beyond Deal Bank. Steerage was frequently being lost at slow speed. There were significant numbers of other ferries in the area sheltering from the bad weather.

The Managers had a policy of not relying entirely on the ECDIS hence there were relevant paper charts on the chart table. Notwithstanding this, navigation was being carried out almost exclusively by reference to the ECDIS, even though the system was 'non-approved'. Illustrating this was the fact that the Master's parameters for navigation limits whilst slow-steaming had not been drawn on the paper chart.

During the 'North run' in question all of the bridge team were distracted by fire alarms resulting from a lorry driver being allowed to run his engine in order to preserve his refrigerated cargo. Further, the Master was being distracted by telephone calls requesting information. The result was that the turn at the end of the 'run' was commenced later than was intended.

The chief officer ordered hard to starboard; soon after, the Master noted a shallow patch on the ECDIS and full ahead on the port engine was ordered. The chief officer suggested going astern but the Master dismissed the advice. As the turn continued the ECDIS showed that the bow had swung clear of the shallow patch but a load noise was then heard. The vessel had suffered serious damage to her port propeller.

Another ECDIS-assisted grounding incident recently investigated by the Marine Accident Investigation Branch (MAIB) involved CFL PERFORMER and demonstrates a situation which arose owing to over-reliance on a navigational aid.

On this occasion ECDIS was the primary means of navigation. The planned route (on ECDIS) took the vessel across the Haisborough Sound, where the charted depth was considerably less than the vessel's draught. None of the watch-keeping officers had been trained on the use of ECDIS.

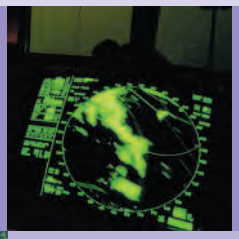
The OOW had set the ECDIS alarm to warn when the vessel was approaching a waypoint or when the cross-track error had exceeded 185m. The OOW then proceeded to prepare for forthcoming audits and incorrectly assumed that the vessel would remain in safe water. As a result he neglected to properly monitor the vessel's progress and did not adequately interrogate the information that was being displayed to him.

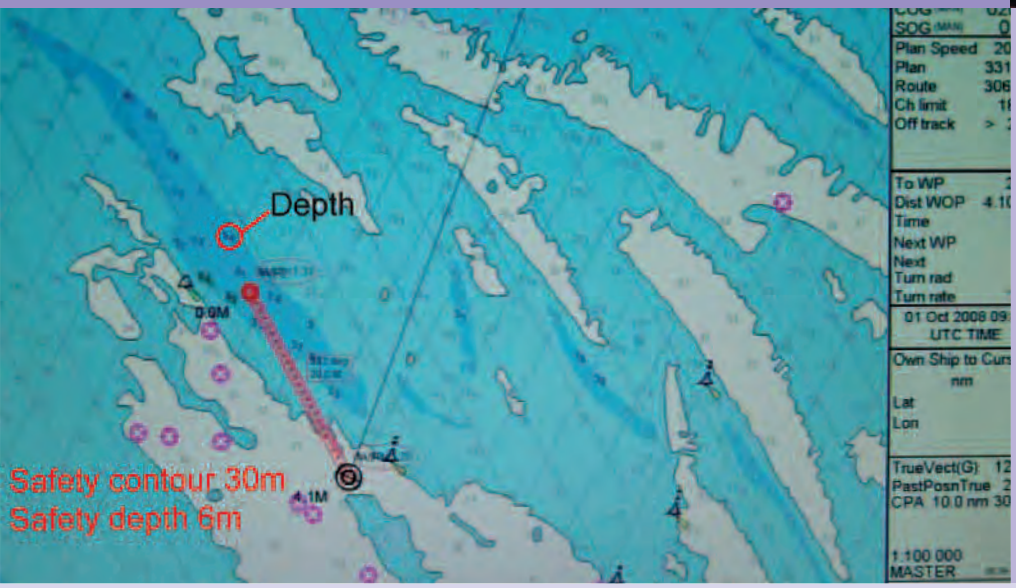
As the vessel entered shallow water the Master noticed the increase in vibration and ordered the OOW to check the depth of water. The 2nd Officer referred to the ECDIS display but as an inappropriate scale was being used he initially reported that there was a sufficient depth of water under the keel. He failed to notice that the echo sounder had not been switched on and as the vibration continued to increase he realised something was wrong and reduced the propeller to zero pitch. Upon selecting an appropriate scale on the ECDIS it was realised that there was insufficient water under the keel and the suspected grounding was subsequently confirmed when the echo sounder was switched on.

ECDIS – an aid to navigation

Navigating officers and Masters should be aware that ECDIS amounts to more than simply a digitised copy of a paper chart. It is effectively a decision support tool and allows for real-time navigation and monitoring of a ship's position.

Navigation and seamanship





Screen shot of ECDIS display showing depth and contour settings.

ECDIS (continued)

In addition it has the ability to interrogate information from a number of navigational sensors such as Radar, ARPA, GPS, and AIS and consolidate it into a single comprehensive and easily readable display. It also allows for the automatic updating of electronic chart information thus relieving navigators of the lengthy and tedious task of correcting paper charts which not only reduces the workload but also removes the risk of human error associated with the manual correction of such charts.

The route planning functions incorporated within ECDIS permit the passage planner to define set parameters for alarms relating to events such as off-track or channel limits being exceeded, when underway. Once the passage plan has been completed it is then possible to verify it through the software's own check features which assists the planner to identify if the intended ground track has entered into any danger areas or crosses safety contours. The safety contour consists of a highlighted boundary on the ECDIS display thereby enabling the operator to distinguish between safe and unsafe water with regard to depth of water taking the vessel's draft and height of tide into consideration where necessary. When planning a route, ECDIS will shade areas within the channel limits red if the safety contour is crossed (see above). A plan does not have to be free of warnings or alarms to allow it to be saved and utilised.

The ECDIS route monitoring functions are essentially divided into two categories, mainly referred to as the 'monitored route' and 'predicted movement', although the actual terminology used can differ depending upon the manufacturer of the equipment that is installed onboard the vessel. Functions of the 'monitored route' include the activation of an audible alarm when the vessel exceeds the channel limits and when approaching a user-defined waypoint.

Where 'predicted movement' is concerned, the automatic sounding of an audible alarm will occur when the system detects that the vessel is going to cross the safety contour set on the ECDIS display. In order for this alarm function to be activated it is first necessary to ensure that a watch vector has been defined by the operator. The watch vector is generally considered to be an extremely important feature within ECDIS and if it has not been activated then many of the associated electronic chart alarms will not be active. In the grounding incident involving CFL PERFORMER it transpired that the safety contour alarm had been set at 30 metres but the alarm did not sound owing to the fact that the watch vector had not been set. None of the officers onboard were aware of the significance of the safety contour and did not know how to establish a watch vector ahead of the vessel. (The vessel did have an ECDIS manual onboard but it was over 600 pages long).

Fortunately the CFL PERFORMER refloated by the use of her own engines and without any significant damage.

Conclusion

ECDIS is deemed by many to be an invaluable asset to both passage planning and the monitoring of the passage itself. However, navigators must be aware of the need to properly utilise the functions contained within the ECDIS and ENCs. It is a system that is designed to assist the OOW to make informed decisions and is not a substitute for good seamanship in whole or in part. There is a real possibility of information overload when using ECDIS and the display level should be set accordingly. The full benefits to be gained by using ECDIS cannot be properly realised if the operator has not received the necessary formal training through either completion of a generic ECDIS course or the manufacturer's own in-house training course that is specific to their particular equipment.

Co-mingling of fruit in reefer vessels

The Association has received notification of problems where two or more fruits are shipped together in the same hold, or a single type of fruit is loaded together in both the ambient and pre-cooled states. This practice is commonly called co-mingling of cargo.

It is generally unwise to allow the co-mingling of fresh fruit in a single hold. Co-mingling implies that all the fruit in that hold will be subject to the same atmospheric conditions. This may not be physiologically acceptable, as fresh fruit can be divided broadly into one of two different types. These are called climacteric fruit and non-climacteric fruit – see list on page 6.

Climacteric fruit shows an increase in respiration when it begins to ripen after harvest. The change is irreversible, produces ethylene gas and leads rapidly to a condition of full ripeness after which the fruit deteriorates.

Non-climacteric fruit ripens much more slowly without the dramatic change in respiration.

The rapid change in respiration in climacteric fruit is accompanied by an increase in the production of ethylene gas which is far greater than that found with non-climacteric fruit.

Ethylene gas triggers the ripening process in most fruit so if climacteric and non-climacteric fruit are co-mingled in a reefer compartment the ethylene produced by the former type of fruit may well trigger ripening in the latter, even with proper temperature control.

Co-mingling of the same type of fruit

Co-mingling fresh and cooled fruit in the same compartment creates unnecessary risk. This is best illustrated by the carriage of bananas which should be cooled within 24 hours of harvesting. As the harvest takes place six days a week and cannot be timed for a vessel's arrival, some of the bananas are pre-cooled prior to loading onboard.

The mixing in the same hold of both pre-cooled and fresh bananas defies the golden rule of unbroken cool chain treatment of fresh produce by:

a) breaking the cold chain of the pre-cooled fruit. This occurs when transferring from cold store to dockside, and during the period before cooling recommences onboard, and after hatch closure, owing to the heat transfer from fresh to cooled fruit, which cannot be eliminated immediately by the refrigeration system; and

b) 'shock treatment' of 12 – 24 hrs of air delivery at +12.5°C needed to cool fresh bananas to the required carriage temperature. If pre-cooled bananas are also present in the same hold where 'shock treatment' is to be applied then there is an unacceptable risk to the fresh fruit of chill injury. (Bananas can suffer irrecoverable chilling injury at <+ 13° C).

Other Risks

For non-climacteric fruit there is also significant risk in the co-mingling of fresh and cooled fruit. There will be a break in the cold chain and this alone must reduce the potential shelf life of fruit already cooled.

If ambient temperature cartons of grapes are stacked against or near to pre-cooled fruit there will inevitably be some temperature rise in the latter before cooling has an effect. This leads to condensation within the cooled cartons and this permits certain fungi, e.g. Botrytis, to germinate and damage the grapes. Similar effects are well known with potatoes and onions.

Containers and cargoes

Co-mingling of fruit in reefer vessels (continued)

Summary
The risks of unacceptable consequences are too great to permit the co-mingling of fresh fruit (or certain vegetables) in the same compartment or even in separate compartments if they are connected to a common re-circulating cooled air system.

What actions should be taken if a charterer or shipper proposes to co-mingle cargoes? The best method would be for the shipowner to refuse to accept such a charter or to make express provision in the charter party that the owners are not required to co-mingle such cargoes.

In the absence of such express provisions, when a Master is faced with having to make a decision about a co-mingled cargo at the loadport, he should contact an expert or the Association's correspondents before loading, to receive advice about what can or cannot be stowed in the same compartment.

The vessel may not be informed prior to loading that cooled and fresh cargo is to be stowed together. Accordingly regular checks by officers of the pulp temperatures of cargo being loaded is vital and the records of these temperatures must be retained safely. When temperatures are found to be unusually high, all parties must be notified immediately.

This article was compiled with the valued assistance of CWA International Consultants Ltd.

Climacteric fruits
Apple, apricot, avocado, banana, kiwifruit, mango, muskmelon, nectarine, papaya, passion fruit, peach, pear, persimmon, plantain, plum, tomato.

Non-climacteric fruit
Cherry, clementine, cranberry, cucumber, date, grape, grapefruit, lemon, lime, lychee, olive, orange, pepper, pineapple, pomegranate, raspberry, satsuma, strawberry, watermelon.

Reefer problems in Venezuela

A recent claim involving containerised reefer cargoes has brought to light an issue with electricity supply, power pack failure and reefer socket shortages at certain (newly) nationalised ports in Venezuela. This issue is most notable in La Guaira and the associated El Palmar Container Yard.

In order to try to maintain the power supply the Association understands that the terminal has been 'piggy backing' or 'pig tailing' multiple reefers on one socket which meant that some units were left off-power for up to 10 hours.

It is therefore suggested that Members check the availability of reefer sockets (without 'piggy backing 'or 'pig tailing') at the discharge port and any associated container yard before accepting bookings to Venezuela. Once the cargo has been discharged, it is also recommended that Members ensure that their local agent checks to ensure that reefers are kept on power and liaises with receivers to ensure that cargo is delivered as soon as possible.

Collapsed Stowage

A recent incident onboard one of our Member's vessels provides a good example of Master's responsibility with respect of stowage and highlights the question of when the Master should intervene during the stowage and to what extent; an issue which was raised in the March 2009 edition of Claims and Legal.

The ship in question is a bulk carrier which loaded 36 containers of project cargo below deck. While on route to the destination in moderately heavy weather (maximum Bf9) the stow collapsed causing considerable damage to the cargo.

At the load port the charterer's supercargo had boarded the vessel to discuss with the Master the pre-stowage plan. Despite the Master making several recommendations to the charterer's supercargo upon completion of loading there remained 50 cm gaps between the containers and the sides of the cargo hold. A gap of several metres existed between the container stow and the aft bulkhead. In addition, although stevedores had secured the containers with twistlocks and bridge fittings no wires were used, nor wooden chocks/wedges, nor any other means of lashing.

In the opinion of the Association's surveyor who attended the incident, in order to carry containerised cargo safely under deck in a bulk carrier the following points must be considered:

Ideally, the tank tops of the cargo holds should be fitted with pockets or guides for the safe stowage of containers, alternatively timber sheets should be used between the tank top plating and the containers to avoid any steel to steel 'sliding'.

Wooden chocks/wedges should be used to fill the gaps between the container side-walls and the cargo hold side-walls.

Lashing bars and bridge fittings should be used to unitize (secure) container tiers and stacks in order to make one 'block 'of containers.

Chain or wire lashing should be used to immobilize the containers against moving fore and aft.

For further information about the rights and responsibilities of the Master with regard to stowage please see the March 2009 edition of Claims and Legal.

Aluminium alloy destined for Iran

One of our Members contracted to carry two containers said to contain a cargo of aluminium alloy from China to Iran. The ship's schedule required the cargo to be transhipped in Jebel Ali, UAE.

Whilst at Jebel Ali the two containers were detained by the Dubai customs authorities on the grounds that the material could be used for weapon making.

The action taken by the Dubai customs authorities would seem to be in connection with a UN embargo of Iran. The embargo affects goods which could be used by Iran in its nuclear development programme; goods which could be considered 'dual use' may be subject to sanctions. For example, a previous similar case in Dubai involved four containers of seamless pipes.

Understandably, shippers and receivers of this 'legal' commodity were unhappy at the delays and demanded full performance of the contract with continued failure to perform likely to lead to litigation. In this case our local correspondent, with the assistance of a local surveyor, successfully negotiated the release of the cargo/containers.

Where cargoes bound for Iran are to be transhipped in the UAE it would be prudent to enquire with the local correspondent whether that particular commodity has previously been subject to action by the authorities.

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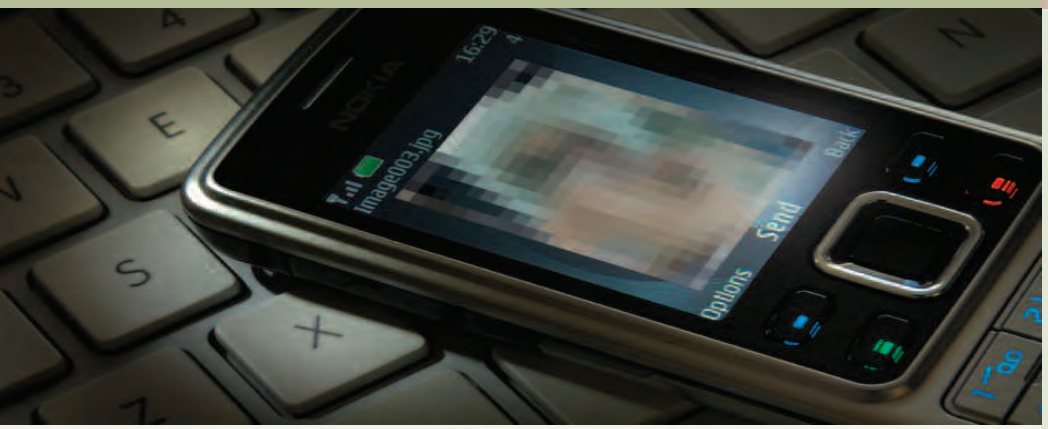
Crew Matters



Crew arrested over laptop and mobile telephone contents

The Association has recently been involved in an incident where the contents of a crew member's laptop were inspected by Customs Authorities. They found prohibited material (pornography) on the laptop and immediately arrested the crew member. Criminal charges have been brought and the seafarer faces a custodial sentence if convicted. In the same port (Liverpool), on another ship, four crew members were arrested recently in similar circumstances, involving pornography held on mobile phones.

Crew members should be aware that what they may consider to be acceptable material may not be acceptable in many jurisdictions around the world.

Crew members should also note that as the charges brought are criminal it is unlikely that they will be supported or assisted by their owners/managers following their arrest. Similarly, the Association and their correspondents cannot assist in such criminal matters.

Members should issue clear guidelines to crewmembers concerning possession of such material – in whatever medium - onboard. The costs of delay to the ship and positioning of replacement crewmembers should not be underestimated.

Monkey fist injuries

An incident recently reported to the Association involved a stevedore being hit by a monkey's fist which was attached to a heaving line being thrown ashore.

The heaving line was being thrown ashore during mooring operations. The Officer on mooring duty shouted a warning to the stevedores on the quay, saw them start to move away and assumed they had all heard the warning. However, one stevedore, who was not wearing a hard hat, failed to hear the warning and was hit by the monkey's fist, suffering minor injuries.

There is no suggestion that the ship's crew did anything wrong, but it is worth bearing in mind that caution should be exercised when passing lines ashore, or to tugs, as there is an inherent risk of injury if there is a lack of attention on the part of the recipient of the line.

The monkey's fist in question was filled with sand to provide extra weight. It should be noted that the Code of Safe Working Practices for Merchant Seamen, issued by the U.K. Maritime and Coastguard Agency, recommends that monkey's fists should be made only with rope and should not contain added weighting material.

Dangers of hot oil

In a recent incident on a Member's ship an Assistant Engineer received hot oil burns to his face. He was in the process of cleaning the fuel oil purifier cartridge and had loosened the filter casing nut when hot oil sprayed directly onto his face. Fortunately the ship was close to land and prompt action on the part of ship's crew ensured that he received immediate medical attention.

The task had not been properly planned in advance. Although the pressure gauges indicated that the internal pressure had been relieved, there was still some residual pressure within the casing.

This accident emphasises the need to ensure that a thorough risk assessment is conducted prior to the commencement of such a task.

Editor's message We are always looking for ways to maintain and increase the usefulness, relevance and general interest of the articles within Risk Watch. Please forward any comments to: **rwatched@triley.co.uk**