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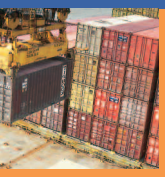
RISK WATCH

Britannia
The Britannia Steam Ship Insurance Association Limited

Personal injury

Personal injury focus: hand and finger injuries

Loss prevention



Containers and cargoes

Regulatory update

Miscellaneous

The April 2014 edition of *Risk Watch* included an article about hand injuries, concentrating particularly on the correct and appropriate use of gloves. Unfortunately, accidents involving lacerations, fractures and in some severe cases, the amputation of hands and fingers, are still common. Such accidents are often caused by complacency, with inappropriate or insufficient personal protective equipment (PPE) being worn, combined with a lack of communication.

When accidents take place, it is often the case that, despite prompt treatment and repatriation, the resulting injuries to hands and fingers are very severe. Often the crew member involved is left with a disability, sometimes even the permanent total loss of the hand or fingers. This often means they cannot resume their sea duties. In this article, we highlight a few examples taken from recent cases handled by the Club.

Lack of communication

A third engineer (3/E) and a fitter were dismantling the No. 2 air compressor whilst a ship was at a shipyard for repairs. The high and low pressure valve plate of the No. 2 compressor had been dismantled and a leaking gasket of the cylinder head had been replaced. After the cylinder head bolts had been tightened, the second engineer (2/E) ordered that the repair work was to be resumed in the afternoon.

Personal injury

Personal injury focus: hand and finger injuries (continued)

When he returned to work the 2/E immediately started the compressor without noticing the 3/E had his hand inside cleaning the water in the valve. Consequently, all four fingers apart from the thumb of the left hand of the 3/E were cut off by the piston.

In this incident, several factors could have prevented the injury from occurring:

- as with any task, a risk assessment should have been completed for the careful planning of the work to be carried out;

- before working on the air compressor, the appropriate locking or tag out should have been done to isolate the compressor, together with the appropriate notice warning that work was in progress. If that had been done then adequate warning to the 3/E may have been given before the 2/E started the compressor; and

- upon resuming the repair work, the 2/E should have communicated to other crew members that he planned to test the equipment.

Lack of preparation

During an engine overhaul, an oiler was assembling a cylinder with the other engine room crew. While the oiler was removing the lifting tool, his middle finger got trapped which led to serious injury and the eventual amputation of the finger.

Lack of planning

A third engineer was working alone attempting to restrain and secure the hook of a provisions crane. He caught his right ring finger between the railing and the crane hook, crushing his finger. While it can be argued that the accident was partly due to a lack of attention on the part of the third engineer, advance planning could have made a difference. Several other crew members were nearby on the poop deck and, if the operation had been properly planned, then one of the other crew could have been allocated to assist the third engineer with his task.

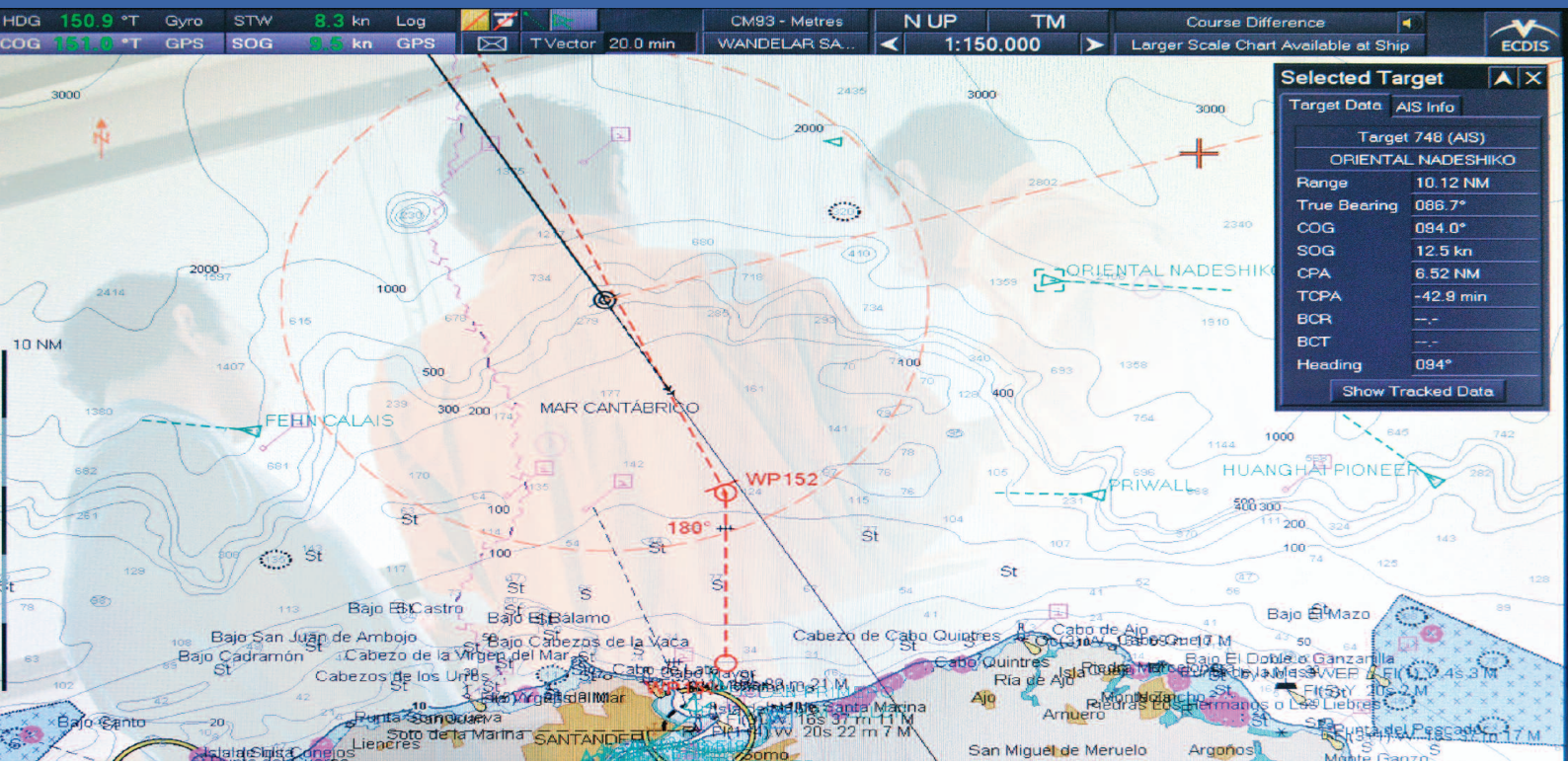
Lack of appropriate PPE

An engine fitter was assigned to fabricate a new angle valve using a drilling machine. He was wearing gloves and his gloved hand got caught in the drill bit, causing part of the thumb to be cut off. Due to the seriousness of the injury, his whole thumb eventually had to be amputated. PPE should be appropriate for the task and crew members must make sure that the PPE used is the right size and not loose. There is a risk that loose clothing, particularly gloves, can get caught in equipment. This is particularly important when using rotating machinery (such as the drilling machine in this example) and can lead to serious injuries.

Recommendations

Before carrying out any task a risk assessment must be carried out. This can be either formal or informal but must identify the potential dangers and the risks involved. The crew should then create a detailed plan of how the work should be done and what type of PPE (if appropriate) should be worn. Crew must also be aware of the safety procedures in place and know how to operate equipment in a safe manner. Crew must never be complacent and must always focus on the task as complacency and lack of attention can often cause injuries. By following these recommendations, hopefully the risks inherent in carrying out the tasks can be reduced to a minimum and many of these accidents can be prevented.

Electronic Chart Display and Information System (ECDIS) Some lessons learned



SOLAS Chapter V Regulation 19 makes the carriage and use of ECDIS mandatory on certain classes of ships and by July 2018 it will be mandatory for all existing tonnage over 10,000 gt. There have been several recent incidents which have highlighted difficulties in implementing ECDIS and in this article we set out the regulatory requirements and point out some of the lessons that can be learned from previous incidents.

Approval: the legislation

SOLAS: Chapter V Regulation 18 states that the ECDIS must be type approved by the flag state and tested by a recognised 'notified body'. It requires a certificate which states the performance standard against which the ECDIS is approved. The IMO also requires generic ECDIS training.

The Flag state: May have its own requirements for the installation, with particular requirements for back up systems that can take over in the event of a system failure. This is normally another independent ECDIS or an up to date paper chart system.

The ISM Code: This infers that the deck officers on board should be completely familiar with the ECDIS model on board. Thus, type specific training may be required by the flag state although there is currently no internationally agreed requirement for this type of training.

The International Hydrographic Organisation (IHO): Determines what presentation standards must be maintained (IHO specification S-52 for chart content and display aspects).

The presentation requirements of S-52 have just been revised with an upgrade covering:

- Mariner's choice to select alarms above a basic navigational minimum
- Configuration of alarms when fitted
- Light/beacon/buoy/landmark extra information
- A magenta 'd' for seasonal marks
- Standardisation of symbology for indication highlights and automatic updates

This will take the form of a software upgrade to current ECDIS equipment. However, we understand some ECDIS units may not be compatible with the new presentation library. This update is mandatory for ships using ECDIS and must be in place by 1 August 2016 or the first survey after that date. The ECDIS will be tested against test data contained in IHO S-64.

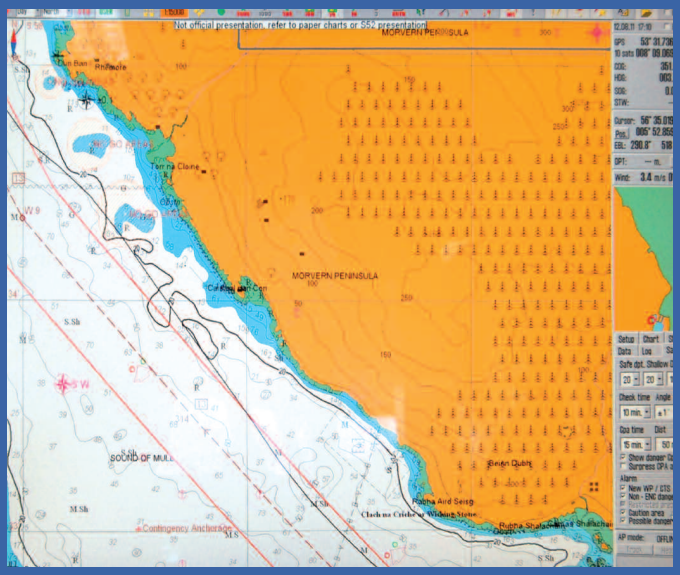
ECDIS used for 'training purposes'

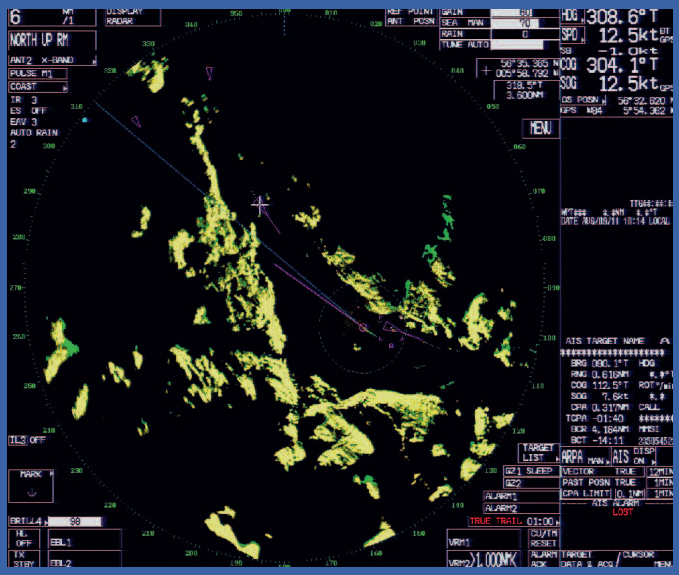
Where a ship is reported to be carrying ECDIS for 'training purposes' this can be cause for concern. When ECDIS is fitted on board, and not all deck officers have the requisite certification, the system cannot be used as a primary means of navigation. Therefore paper charts must be used for all passage plans. If ECDIS is being used on board for training purposes then there must be a sufficient number of fully qualified navigators to supervise the training and ECDIS can never be used for the primary navigation. The ship's safety management system (SMS) should cover all these aspects whenever ECDIS is fitted on board for training purposes only.

Port state control (PSC) issues

PSC may inspect type-specific certificates against the actual ECDIS as installed. They may also inspect the certification of officers on board and check that all officers on board have had the required training. PSC may also review previous passage plans in order to ascertain whether ECDIS or paper charts are being used. Ships have been detained where the primary source of navigation should be paper charts but investigation by PSC has found that ECDIS has, in fact, been used as the primary source of navigation. PSC may also check that the ECDIS is listed in the ship's

Loss prevention





Electronic Chart Display and Information System (ECDIS)
Some lessons learned (continued)

record of equipment; it is considered a critical system in the ISM Code and therefore must be fully adopted in the SMS which will include details of planned maintenance and the importance of carrying critical spares.

Groundings

Alarm management

One of the recurring aspects of reported groundings involving ECDIS is the use of audible alarms. There are often too many audible alarms, for example from ECDIS or from other equipment on the bridge. This is a concern that has been raised by various marine investigators. This has been addressed, at least in part, in the revised presentation library where it states that navigational alarms should be set to a minimum by the navigator, using his discretion or in accordance with company policy. This however does not reduce the number of system alarms, which still have potential to cause confusion and distraction.

On one trip the distractions were such that it led to requests from the ship's command to the managing company asking for the alarms to be disabled. The company therefore sanctioned the disabling of alarms without informing class, which had the effect of making the system non-compliant with IMO performance standards.

The removal of audible alarms is not always beneficial. In another reported case, the visual navigation alarm indicated that the ship was running into shallow water but it was not noticed by the navigator because he was concentrating only on collision avoidance. The audible alarm was not connected and as such was not compliant with IMO performance standards. Crucially, despite the lack of an audible alarm the navigator appeared compliant, apparently still relying on the ECDIS to somehow alert him.

Too many alarms have been shown to cause alarm fatigue and to be a major distraction to competent watch keeping. However, disabling all ECDIS alarms prevents the system from functioning properly. This problem presents some challenges for the future development of performance standards for ECDIS but for the time being the audible alarms must be connected and operable. Good installation enabling all inputs to be fully integrated can go a long way to reducing the number of alarms.

Correct use of ECDIS safety settings

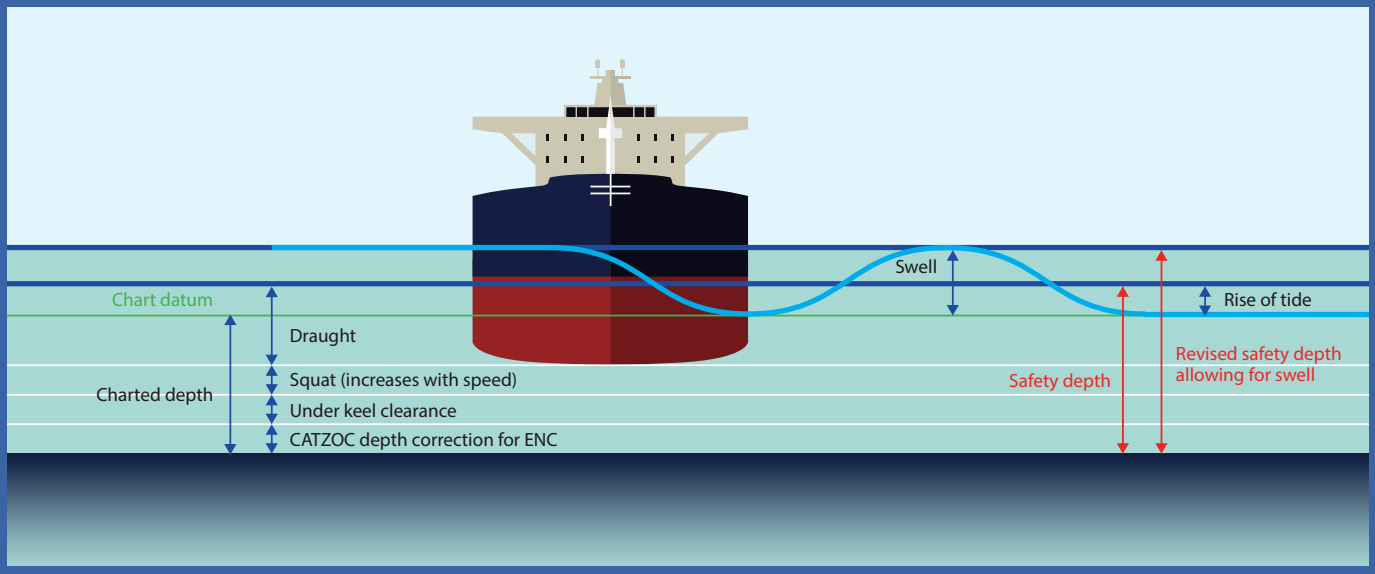
In most cases reviewed by the Club's loss prevention department, one or more of the safety settings was incorrect. Depending on the type of ECDIS, the equipment will have a safety depth feature and some may also have a contour setting. In either case, ECDIS has a safety guard zone. This is an area set by the navigator ahead and to angle on either bow for a safety depth in which an audible alarm should sound if a danger is identified within it. The safety depth should be used while planning the passage and a safety guard zone used for monitoring it.

Contour setting: A safety contour is intended to show the navigator a distinction between safe and unsafe water. Most ECDIS systems are designed for the safety contour to default to 30 metres. At this setting many dangers will be obscured in the unsafe area. For example, on a ship with a draught of 8 metres negotiating the Dover Strait with a default setting of 30 metres, the ECDIS would show much of the Straits as unsafe water. Many shallow patches that the ship would go aground on would not be distinguished from all the 30 metre highlighted areas. Thus a safety contour should be selected in the same manner as the safety depth described below.

Safety depth: This setting, if set correctly with the alarms functioning, will give an audible and visual warning if there is an obstruction less then the safety depth set. For this to work properly, an accurate chart must be used. Electronic navigations charts (ENC) are based on the same information as paper charts with the same accuracy. However in ENC this information is referred to as CATZOC (Zone of Confidence Category). For example, Category B has an accuracy of horizontal distance of +/- 20 metres and depth error of +/- 1.2 metres. It is extremely important that this is considered carefully when calculating the safety depth. In most cases reviewed, the safety depth was either not set or set incorrectly.

The safety depth should be calculated as follows:

Safety depth = draught +minimum under keel clearance + allowance for squat + CATZOC depth correction + allowance for swell (if applicable) – height of tide. In some parts of the world the swell should be considered particularly when crossing a shoal or bar in an exposed location.



Cross track distances: This is the distance that the ship can deviate from the planned route before the alarm is activated. This should be set to give a safety margin between the maximum off track distance and the point at which the vessel would cross an obstruction. In one case the company had approved a series of routes without using cross track distance settings. These settings are key to keeping the ship in safe water, particularly in coastal waters.

System knowledge

In all the grounding cases reviewed the ECDIS was not set up correctly for the prevailing circumstances which was compounded in most cases by the audible alarms being deactivated. The navigators were working in misguided reliance on the ECDIS being a robust safety net despite the reduced alarm capability they had imposed. It is extremely important that all who use the ECDIS are fully conversant with the safety features, that they know what they are and how to correctly calculate and set them in the system. There is a need to understand how the structure of overlays works to create the picture on the screen and what features are removed or added with a particular setting.

It is important for navigators to use the most appropriate chart scale. Most ECDIS have an automatic optimum scale setting. This should be used and where necessary it can be zoomed in or out but always returning to the optimum setting. This is no different from using paper charts as the same logic applies.

Chart corrections and warnings

A major advantage of ECDIS is that electronic chart corrections can be updated by data input into the ECDIS. However, temporary and preliminary notices often have to be added manually. A review of recent cases has shown that, in many cases, those updating the charts have presumed that these notices are included in the weekly chart corrections as an automatic upload which is not always the case. Some chart providers do offer a service to cover this. However, it is for the ship operator to ensure that these corrections are updated on the system by whatever means.

Complacency

In the cases reviewed there appears to be a general conception that ECDIS can be completely relied upon. However, like any other navigation aid, it is only as good as the user. If information is entered properly and the safety parameters are correctly calculated then ECDIS is an excellent aid to navigation. Many previous developments such as ARPA were improvements on existing navigational aids such as RADAR. However, ECDIS is not just an improvement on paper charts but rather it requires a conceptual change to the way a bridge team operates because ECDIS consolidates all navigation information and allows for many different ways to present and utilise that information. Basic ECDIS requirements are set by the IMO but because there are many manufacturers producing ECDIS models, which operate quite differently and require type-specific training, navigators must make sure that they identify and work with the specific limitations of each ECDIS they rely upon.

Conclusion

In all the cases reviewed, the deck officers were fully trained to IMO standards and class requirements were met, yet the navigators were often not fully familiar with the functions and settings of the equipment they were using. For ECDIS to reach its full potential it is vital for masters, owners and managers to ensure that good working procedures are fully incorporated into the company safety management procedures for the ship.

ECDIS will invariably have a direct GPS, gyro and log speed feed but visual fixes should be entered to increase situational awareness and avoid total reliance on the GPS positioning.

ECDIS was devised in order to give the navigator more time to keep a navigational watch. What is seen on ECDIS should be used to relate to what is observed outside of the bridge windows. The use of ECDIS does not remove the need for the use of parallel indexing which still has its place. Navigators should not complacently follow the ECDIS. It should be fully understood and carefully monitored like any other system.

ECDIS may well make a good navigator better and a poor navigator worse.

Carriage of charcoal and other carbon cargo

The Club is aware of a number of recent fires caused by activated and non–activated charcoal and charcoal products. In many cases, the charcoal was not correctly declared or not declared as being dangerous.

Charcoal is usually produced by slow pyrolysis which is the heating of wood or other substances in the absence of oxygen. It is a light black residue consisting of carbon and any remaining ash which is obtained by removing water and other volatile constituents.

Activated charcoal has been heated by steam in a rotary kiln. The charcoal that comes out from the kiln is called unwashed activated charcoal. Unwashed activated charcoal has a higher ash and iron content. Washing the activated charcoal with acid and purified water results in a lower ash and iron content.

United Nations data shows the main exporting countries of charcoal are Somalia, Indonesia, Myanmar (Burma) and Paraguay.

Under the IMDG Code charcoal is classified as carbon and falls under 2 UN numbers and 3 packing groups:

UN number and proper shipping name:	
1361 CARBON animal or vegetable origin	Class 4.2 Packing group II
1361 CARBON animal or vegetable origin	Class 4.2 Packing group III
1362 CARBON, ACTIVATED	Class 4.2 Packing group III

Exempted cargo: special provisions

Often, no formal declaration of the relevant IMDG category is made but the informal description of the cargo which is used for booking and bill of lading purposes indicates that the cargo is charcoal or contains charcoal. Common examples of this type of informal description include 'shisha pipe' charcoal and 'quick self-lighting hookah'.

There is a special exemption provision contained in the IMDG Code (number 925) which can apply to this type of cargo and means that the IMDG Code will not apply. This exemption applies in circumstances where the consignment passes tests for self-heating substances as reflected in the Manual of Tests and Criteria (see 33.3.1.3.3).

This exempt product should be accompanied by a certificate from a laboratory, accredited by a competent authority, stating that the product to be loaded has been correctly sampled and tested by trained staff from that laboratory and that the sample has passed the test. This test certificate must accompany the booking in order for this exemption to apply. If the correct certificates are presented then the restrictions in the IMDG Code do not apply which means that no special packing or declaration is required and the cargo will not appear on the DG manifest.

The Club has had experience of shippers seeking to rely on this exemption but not presenting the proper certification. Without this certification, suspect cargo should be rejected with perhaps the expectation that the shipper presents it again but this time together with a dangerous goods declaration (i.e. 1361 or 1362).

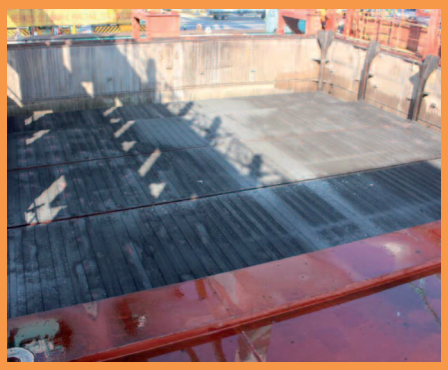
Heating and spontaneous ignition

A familiar problem which can lead to fires and subsequent claims is that carbon (UN number 1362 and 1361) is liable to heat up and ignite spontaneously in air if the material is not sufficiently heat treated and cooled down to ambient temperature before packing (as detailed in special provision 223). There is no way of knowing by visual inspection alone whether the cargo has been properly heat treated and cooled. According to the IMDG Code, carbon can be stowed on or below deck but must be protected from sources of heat and should be kept as cool as is reasonably practicable.

Case study:
These photographs show the aftermath of a fire which originated in a 20' unit stowed towards the bottom of a cargo hold.

The crew followed correct fire-fighting procedures as per the General Fire Schedule; they stopped ventilation, they used the ship's cargo space CO_2 fixed fire-fighting system and entered the hold to carry out boundary cooling and also sprayed water into the container to cool the seat of the fire, using the appropriate personal protection equipment including breathing apparatus.

Despite the crew having followed such measures, the cargo reignited during discharge.



Upper tier of containers showing smoke damage and debris from a charcoal fire in the lower part of the hold.

View of the aft end of the 'culprit' container showing heavy smoke staining and heat damage on the inside of the container.

Heat damage and smoke staining to container and the hold caused by a charcoal fire.

View from the aft end of the container showing that much of the plywood floor has been burnt, exposing the steel support beams.

Recommendations
In order to reduce the risk of fires in carbon cargo and to manage the risk of improperly declared cargo, Members may wish to consider the following:

- an automated system which searches bookings for the word 'charcoal' and other related products such as 'fire lighters, carbon, barbeques' in order that the appropriate actions can be taken to ensure it has been correctly declared. If the cargo falls within the exemption under special provision 925, ensure that the correct certification accompanies the booking.

- carrying all charcoal and charcoal-related products on deck. This would allow the crew to carry out visual and other checks to see if there are any signs of self heating in the cargo. Also, stowage on deck makes fire fighting much easier if fires do break out.

- ensuring that the crew are aware of the potential issues which may arise from carrying charcoal, including the possibility that after the initial fire is extinguished, the cargo may re-ignite.

Example of severe fire damage to containers that can be caused by a charcoal fire.

Fire hoses fixed in place to provide cooling inside and at the boundaries of the 'culprit' container of charcoal.

Discharge of a container of charcoal showing how charcoal can re-ignite with burning material falling through the floor of the container.

Example of 'shisha pipe' charcoal and 'quick self-lighting hookah'.

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Regulatory update

Ukraine: ballast water regulations

Following recent changes in the law in Ukraine there is no longer any mandatory requirement for the ship's segregated ballast to be sampled and analysed by the State Ecological Authorities prior to discharge. As a result of these changes in the law, Ecological Inspectors have no authority to demand to take samples of segregated ballast water, nor do they have authority to inspect the ship's documents, including IOPP Certification. Such inspections are the responsibility of Port State Control.

However, recent cases have shown that Ecological Inspectors try to exploit the master's lack of knowledge of Ukrainian law to try to gain access to the ship in order to take samples of ballast water for analysis. They then proceed to make allegations that the ballast water is contaminated in order to try to impose a fine where often there is no foundation at all for the allegation.

Our local correspondent advises that this is not common practice in all Ukrainian ports and in Odessa, Yuzhny and Ilyichevsk there have been no recent reports of this type of activity. However, there has been a recent case involving a Member's ship in Nikolaev where Ecological Inspectors attempted to gain access, which would suggest that this is still an ongoing issue. In this case it was alleged by the Ecological Inspectors that the waters surrounding the ship during de-ballasting were found to be contaminated with oil exceeding official limits. They tried to use this allegation to gain access on board to investigate the source of the alleged contamination.

Should Members face any such allegations and/or requests to carry out a segregated ballast inspection by Ecological Inspectors in Ukraine, the master should contact the local correspondent for assistance before allowing any inspectors on board.

Miscellaneous

Loss prevention poster campaign: Tanker sampling procedures

Risk Watch August 2015 concluded our trilogy of articles highlighting good practices that can be shared with Members by looking at contamination claims. Samples monitoring the quality of liquid cargoes and demonstrating that the condition of the cargo has not altered between the time of loading and discharge will provide the best defence against any cargo claims.

The Club has produced a poster to remind crew that careless sampling costs money and that it is important that samples should be collected, sealed, labelled and recorded in line with company procedures. The poster also has a check list which can be used in conjunction with on board procedures.

If extra copies of the poster and check list are needed, please do not hesitate to contact us. Posters can also be downloaded from the website.

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**