Volume 17: Number 2
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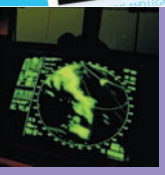
RISK WATCH

Britannia
The Britannia Steam Ship Insurance Association Limited

CLAIMS AND LEGAL

a supplement for Members' claims handlers and legal departments



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Heavy weather

A tragic death and the complex causes

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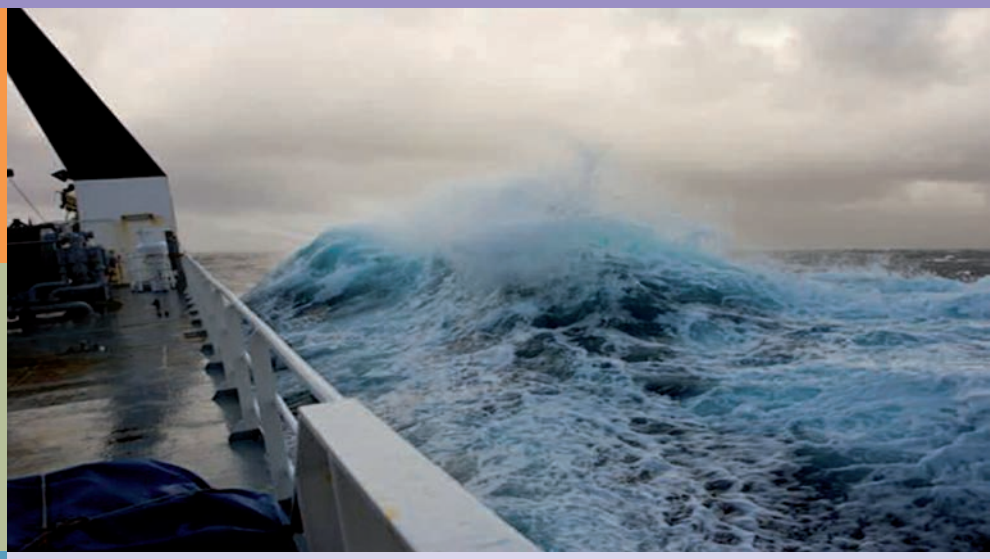


The Masters of many large container ships and indeed any ships which have a large flared bow and a significant counter stern will be aware of the potential for parametric rolling and the sea conditions that give rise to it. However, a recent report into a fatal accident on board a Member's large container vessel which was struggling to deal with the effects of typhoon Hagupit off Hong Kong, provides a very useful explanation of how an extreme and violent roll arose, not through any synchronisation, but from more fundamental and simpler factors.

As reported by the Federal Bureau of Maritime Casualty Investigations in Germany, the CHICAGO EXPRESS had been obliged to sail from Hong Kong by virtue of a typhoon warning and had done so, necessarily, in a partly loaded condition. Soon after leaving Hong Kong she began rolling severely to angles of up to 32°. An alteration to a north-easterly course in accordance with the planned voyage was abandoned when the rolling became even more severe and the CHICAGO EXPRESS returned to a south-easterly course against the prevailing wind and swell. Thereafter the rolling was limited to acceptable levels of about 20°. However, it was still necessary for the navigators repeatedly to alter course and speed as they attempted to judge, in conditions of darkness, the direction of the prevailing sea.

Navigation and seamanship

Heavy weather – a tragic death and the complex causes (continued)

Courses varied from 070° to 175° and speed from 1 knot up to 8 knots, but with typical speeds of 3 – 5 knots. Weather conditions were such that after 6.5 hours of sailing from Hong Kong, she was only 22 nautical miles away. Wind force of Bf 11, gusting to Bf 12, were encountered.

It is important to note that the vessel sailed with a GM of 7.7m.

At 0245 hrs the Master was reportedly situated to the right of the radar screens, the 2nd Officer at the chart table, a sailor at the helm and an AB (acting as lookout) situated near the GMDSS station. As the vessel rolled towards starboard, an unexpected and particularly violent wave reportedly hit the vessel from starboard, the ship rolled quickly to port then back to starboard to an angle of 44°; a particularly short roll period of 10 seconds was estimated. The Master, the helmsman and the lookout all lost their footings. The helmsman recovered quickly. Thereafter it appeared to be some time before the 2nd Officer noted that the Master and lookout were no longer in their previous positions. After a brief moment the Master was found on the starboard-side at the rear of the bridge, behind the chart table, and the lookout at the portside of the bridge near the bridge companion way. The lookout unfortunately succumbed to severe head injuries and died a short time after the accident. The Master suffered severe multiple external and internal injuries to, inter alia, his spine, several ribs, his lungs as well as the right leg (severe open facture). He was in acute danger of losing his life for a considerable period of time after the accident and it is still not possible to say whether he will regain full health. The violent rolling also caused four other crewmembers to suffer bruises and minor injuries as a result of falling.

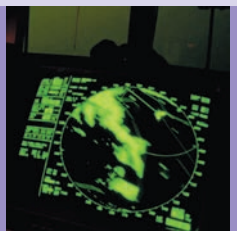
Due to large deformations and scuff marks in parts of the interior panelling at floor level on the bridge, it became apparent that the Master and AB must have been more or less catapulted across the entire width of the bridge.

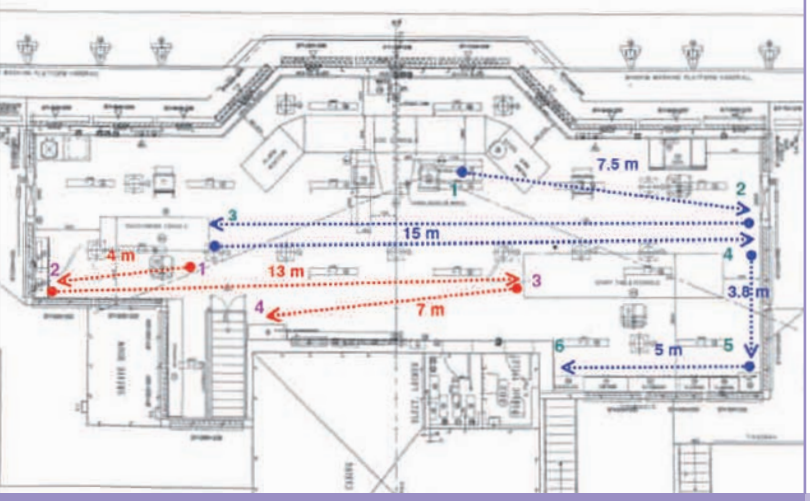
According to witnesses the ship's command did not initiate any change of course in the final minutes before the violent rolling occurred and indeed the impression had been that the weather and the ship's motions were beginning to reduce.

The investigators were quick to point out certain deficiencies in the design and layout of the bridge which was lacking sufficient hand holds in many places. Hand rails were not available at the positions where the Master and the lookout had been standing. Rectification of this deficiency would be easily made but the more difficult issue was what caused the vessel to roll so violently.

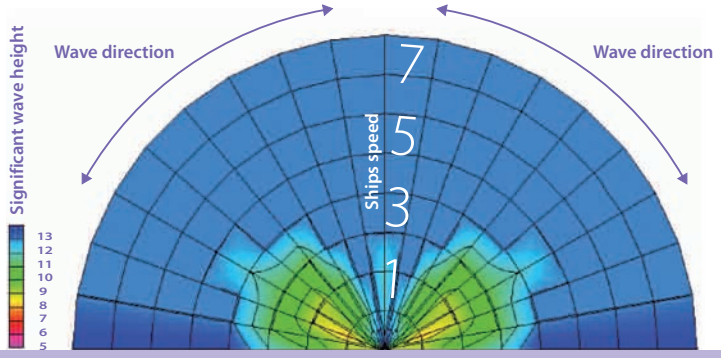
Of obvious concern right from the beginning was the high GM of 7.7m. The investigating authority utilised the services of the Hamburg-Harburg Technical University to analyse the various factors that could have produced the severe roll.

The University, as one would expect when investigating such a vessel steaming into head-seas, looked at parametric rolling but modelling dismissed this as a possible cause. They concluded that the light ship condition, with a draft of only 9m compared to design draft of 14m, meant that there were no significant fluctuations in water plane area from immersion aft or forward of the flared-bow and counter-stern and thereby no fluctuations in righting lever which are necessary to induce parametric excitation. Accordingly, if parametric rolling was not caused then the rolling must have been caused directly by the action of the swell. Computer modelling of the vessel's motions and the wave conditions encountered produced some interesting conclusions about the accident. According to the model, roll angles of 35° would have occurred in swell waves with a period of 9.95 seconds (close to that encountered by the vessel) when the vessel was steaming particularly slowly. The large roll angle was caused by the direct roll excitation of the sea in a critical situation where the course was at sufficient angle to the swell waves together with the





Presumed movements of the master and lookout after they had fallen.



Significant wave height required to produce a roll of 45 degrees.

simultaneous low roll damping produced by a low speed. Despite the crew's best efforts to steer the vessel into the prevailing seas it was likely that one or more large waves approached from one side when the vessel's speed was below a critical level. This co-incidence of circumstances induced a heavy rolling motion.

To support the findings in respect of 35° roll angles, the computer modelling was run through alternative circumstances and it was found that the roll angle of the vessel of about 25° occurred in virtually every single situation where the vessel was steaming below 5 knots. This corresponded with the witness evidence of the vessel rolling around 20° when at speeds of 3 – 5 knots. The model showed that roll angles of 45° would be generated where the speed was less than 3 knots and the course steered resulted in waves being encountered at an angle of 60° to the bow.

The obvious solution was perhaps to reduce the vessel's GM. The report affirmed that a certain level of reduced stability would have resulted in the accident being unlikely to have occurred. However the more relevant question is to what extent could the stability have had to be reduced to achieve an appreciable effect on the rolling and whether that level of reduction of GM could have been achieved by the vessel given the circumstances of her departure from Hong Kong. The ship motions were modelled again using the wave profiles encountered, but this time with a reduced GM of 6.72 metres, and it was found that the conditions under which large rolls would occur did not fundamentally alter. With a reduction of about 3.5 metres to a GM of 4.2 metres, rolling at 30° would still have occurred if the vessel was sailing at only 1 or 2 knots. The report concluded that the threat of violent rolling therefore remained latent but did admit that such a reduction in GM would have resulted in markedly lower transverse acceleration – it was this that effectively catapulted the Master and lookout across the bridge. In any event, such a GM reduction was not possible due to the cargo volume and circumstances of the vessel's departure from Hong Kong. The vessel was forced by the local Authorities to leave port in a condition, due to insufficient cargo, that was far removed from that intended in the actual ship design.

It should be noted that effective roll damping can only be achieved at adequate speed. The crew had no way of recognising that the slow speed was contributing to the rolling. If the vessel had been proceeding at about 7 knots, the rolling motion would have been damped noticeably. Such an evaluation by the crew requires specific calculations and importantly, selecting a higher speed may have led to parametric rolling or critical resonance.

It seems therefore, the report asserted, that we must generally accept the fact that large vessels can roll violently in certain conditions and that this can only be mitigated in the design stage. In terms of design, it would seem that larger bilge keels are one of the more obvious solutions.

A copy of the full report can be obtained in German from www.bsu-bund.de and in English from:

www.maib.gov.uk

For navigators wishing to refresh their knowledge of dangerous phenomena associated with ships' motions, the UK Marine & Coastguard Agency recently issued a Marine Information Note (MIN 357 (M)) which helpfully lists some of the circumstances in which severe ship motions may arise. The note can be obtained from:

www.mcga.gov.uk/c4mca/min357.pdf

Navigation and seamanship

'Hit and run'– a very damaging allegation

The Association has recently handled a significant number of cases involving our Members' ships colliding with Chinese fishing vessels. Unfortunately, some of these have been accompanied by allegations of 'hit and run'. Such allegations can have serious consequences which are entirely separate, and distinct from, the consequences of the collision itself.

Should a navigator be found to have failed in his duty to render assistance following a collision then, in the event of the death of those fishermen by virtue of the ocean vessel failing to stop and assist, the result could be the imposition of criminal charges against those navigators, and upon conviction, a lengthy prison sentence.

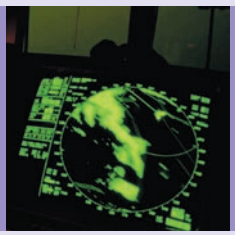
Members should be aware that in respect of matters subject to PRC jurisdiction, local MSA regulations also provide that civil liability may be determined wholly in favour of the other (fishing) vessel, irrespective of fault, in circumstances where it was determined to be a 'hit and run'.

Navigators should be fully aware of their obligations to search for and rescue any vessel, or seafarers thought to be in peril. Indeed it is rare to find any seafarer who would knowingly steam away from a vessel on which the lives of the seafarers on board are clearly at risk. However, following a collision, the reports to the Association often include circumstances where the crew believed that there was no risk to the fishing vessel or they believed that the fishing vessel was being adequately assisted by other fishing vessels and consequently proceeded away from the site of the alleged collision.

The possibility exists that Masters are particularly wary of the risks of other fishing vessels attempting to delay their vessel or, more likely, being ordered by the local MSA to wait at a designated anchorage for the purposes of conducting an on-board investigation. This nervousness may contribute to a decision to make an unduly hasty departure from the casualty scene. Navigators who are tempted to leave a collision scene without assisting or reporting the incident should note that such actions are often futile in that increasingly, by use of AIS, the existence of previously denied collisions with fishing vessels are easily proven and the conduct of the vessel following a collision is made plain for all parties to see.

Navigators subsequently found to have been involved in a collision which they previously denied, or where they failed adequately to render assistance to the colliding fishing vessel - when assistance was clearly required – can find themselves poorly treated by local authorities as a result of failure to disclose material facts or making false denials. Candid, honest and prompt co-operation with the investigating authorities, especially in the PRC, is strongly recommended. Any collision involving the death of fishermen is tragic but co-operation with the local authorities, particularly within the PRC, is likely to result in more lenient treatment of seafarers. The frank and honest declaration of circumstances will also enable the Association more readily to determine liability and be in a position to negotiate quickly any damages payable to those injured, or relatives of the deceased. Prompt negotiation serves to impress upon the local authorities that the injured parties will be well cared for and will alleviate what is often significant pressure upon those authorities to treat the alleged wrongdoers harshly.

What is appropriate assistance in terms of search and rescue is of course subjective and very much dependent on the circumstances. Navigators may well be justified in believing that a fishing vessel has not been damaged so as to involve risk to life or indeed has not been damaged at all. Similarly, a Master may



be justified in believing that a fishing vessel which has been severely damaged would be best assisted by other fishing vessels in the vicinity which are close at hand and perhaps more manoeuvrable. In making such judgements however, the Master must err on the side of caution and, most importantly, must record what efforts he had taken to determine whether a casualty has occurred, what efforts he has made to assist and, if he departs the scene of the possible casualty, why he did so. Such contemporaneous evidence is considerably more valuable than a Master attempting to justify his actions (which can easily be seen as excuses) several days after the event under what is, effectively, interrogation. A prompt and detailed log entry, describing not just to the facts of the collision but also the efforts to determine the whereabouts and status of any fishing vessel with which contact may have been made and the efforts to assist that vessel is strongly recommended. Such details should include any alteration of course and speed, visual observations, attempts to communicate with any stricken vessel, or any other local vessels, the reporting to local authorities of the possible incident and the details of any actual assistance given to the other vessel. When a decision is made to depart the scene then the reasons for doing so should be entered into the log book.

Windlass failures are becoming more common

The Association has highlighted concerns about the growing number of groundings, many of which have occurred as a result of dragging anchor. The Association's experience of vessels dragging anchor includes instances of catastrophic windlass failure and it seems the UK Marine Accident Investigation Branch has identified a pattern of catastrophic failure in high-pressure hydraulic anchor windlasses. Their Marine Safety Bulletin 1/2009 featured a Britannia-entered bulk carrier which fouled a submerged gas pipeline off Tees Bay, UK, as a result of the anchor cable running out to the bitter-end following hydraulic failure. In the same location, in similar circumstances of heavy strain on the windlass, a motor exploded as a vessel attempted to weigh anchor; in this incident the windlass operator was seriously injured by flying pieces of machinery. Other incidents of vessels dragging anchor with serious consequences and of windlass operators suffering serious injury are cited in the Bulletin. It appears that metallurgical fatigue and/or manufacturing defects are not the primary concern but rather the extreme pressures arising from heaving anchor in adverse sea conditions. This results in anchor chains being tensioned beyond the intended safe load of the windlass. The over-stressing appears to be a result of inappropriate operation by mariners who, perhaps, expect the windlass to perform in conditions for which it was not designed. The Bulletin comments upon the appropriate use of engines to relieve tension (Members are also referred to *Risk Watch* May 2008; 'A test of seamanship').

The MAIB wish to monitor the incidence of such failures and request that mariners experiencing hydraulic windlass failure report in confidence to:

maib@dft.gsi.gov.uk

The Bulletin is available at:

www.maib.gov.uk/publications/safety_bulletins/safety_bulletins_2009/safety_bulletin_1_2009.cfm

VDR data – an opportunity lost

The usefulness of VDRs following an incident cannot be overestimated. The factual circumstances of any incident provided by VDR data, whether it be a collision, grounding or indeed the effects of heavy weather, become apparent very quickly and are often indisputable. Consequently, much time and money, especially in legal fees, can be avoided. The data is also a very useful risk management tool. However, the Association has disappointing experience of collecting such VDR data as it is often not saved. Indeed one investigating expert recently commented that up to 50% of VDR data is either not saved or is corrupted. That same expert noted that many ships' checklists, used by a Master following a casualty, do not contain any reference to saving the VDR data i.e. a simple instruction to push the 'save' button. It is suspected that many shipowners' casualty response manuals fail to include provision for reminding the Master to save VDR data. VDR data is such a great benefit to the Association and instructing lawyers when handling casualties that Members are asked to ensure that their guidelines and checklists clearly highlight both the importance of preserving VDR data and has to do so.

Containers and cargoes

Loading coal in Indonesia

An incident on board one of our Member's vessels in Indonesia highlights the risks of self-heating and spontaneous combustion of coal cargo, as well as the hazards of loading from barges.

Indonesia is one of the world's biggest exporters of coal. The major export ports are in East and South Kalimantan (Borneo) and adjacent islands such as Tarakan, Pulau Laut, and Sebuku Island. To a lesser extent Sumatra also exports coal, from its South and West coast ports. Not every export port has a jetty that can accommodate ocean going ships. It is not unusual, therefore, for loading to take place from barges whilst the ship is anchored.

When coal is stock-piled and during its transport from the mine to the ship, the coal is always exposed to the weather.

Most Indonesian coal has a maximum particle size in excess of 7mm and accordingly the transportable moisture limit (TML) is not normally a problem.

Fire experts, Messrs Burgoynes, have dealt with 18 incidents involving overheating coal off Kalimantan (Indonesian Borneo) in the last two years. The majority of cases involved the loading of low-grade coal with temperatures in excess of 55°C. They advise that there are apparently a number of operators who are shipping coal without following accepted industry good practice. Such operators may mis-declare cargo as not being prone to self - heating or provide no details of the self - heating or methane-emitting characteristics of the cargo. Unless loading is closely monitored the problems are usually only seen after the cargo has been loaded. Once loaded, it is difficult to arrange for the removal of the coal due to the lack of suitable facilities, i.e. floating cranes and empty barges, in the region. The Master should insist that the shipper provides a cargo declaration that is consistent with the requirements of the International Maritime Solid Bulk Cargoes (IMSBC) Code, and should not load cargo without having received the required declaration.

The IMSBC Code requires the shipper (or agent) to provide cargo details, including:

- moisture content
- sulphur content
- particle size
- information on whether the cargo may be liable to emit methane or self-heat, or both.

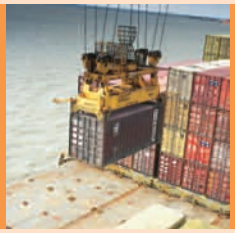
The following is a summary of points to bear in mind when handling Indonesian coal that has tendency to self-combustion:

1 The hatches should be closed immediately after completion of loading in each cargo space. The hatch covers can also be sealed with a suitable sealing tape. Surface ventilation should be limited to the extent necessary to remove gases which may have accumulated. Forced ventilation should not be used. On no account should air be directed into the body of the coal, as air could promote self-heating.

2 Personnel should not be allowed to enter the cargo space, unless they are wearing self-contained breathing apparatus and then only if access is critical to the safety of the ship or safety of life. The self-contained breathing apparatus should be worn only by personnel trained in its use.

3 When required by the competent authority, the temperature of the cargo in each cargo space should be measured at regular intervals to detect self-heating.

4 If the temperature of the cargo exceeds 55°C, and the carbon monoxide level is increasing rapidly, a potential fire situation may be developing. The cargo space should be completely closed down and all



ventilation ceased. The Master should seek expert advice immediately and should consider heading for the nearest suitable port of refuge. Water should not be used for cooling the material or fighting coal cargo fires at sea, but may be used for cooling the boundaries of the cargo space.

The IMSBC Code requires the ship to have:

- an instrument for measuring the concentration of methane, oxygen and carbon monoxide in the holds
- a means of measuring the pH values of cargo bilge samples
- a means of measuring cargo temperature during loading and the voyage (recommendatory)

Burgoynes recommend the use of a relatively inexpensive infra-red thermometer, which the crew can use to 'scan' the surface of the cargo prior to, and during, loading and quickly inform the Master if the temperatures are of concern.

Since loadings are normally carried out at unsheltered anchorages there can also be problems with loading barges making contact with the ships. This is more common during the west monsoon season, which peaks from November to February. Loading barges, which are normally 300 feet long, with a carrying capacity of up to 8000 tons, are usually towed and attended by only one tug. The barges are not provided with any navigational lights, and so extra precautions must be taken when navigating at the anchorage at night.

Crew should be alert during the barge-berthing operation and loading, as the loading barges rarely have proper fenders. In most cases the towing tug simply pulls the barge towards the ship and lets the barge proceed towards the ship's side by its own momentum. The barge may then strike the ship's side if the barge movement has been miscalculated. Masters should also be aware that some loading anchorages are exposed to sea and swell; they will need to ask the loading barge to leave the ship's side when sea swells get heavy. Any hanging-tyre fenders at ship's side should be lifted to deck when there is no barge alongside for any period of time as these fenders can be used by thieves for boarding the ship.

Our thanks to Capt. K. Sabaroedin (Marine Consultant) and to Messrs Burgoynes for material used in the compilation of this article.

Crew matters

Female stowaways

An article in the November 2009 issue of *Risk Watch* related how crewmembers befriending stowaways can be manipulated and be turned against the crew by those stowaways. Our Durban correspondent, P&I Associates (Pty) Ltd has been monitoring the treatment of stowaways quite closely and recently removed two female stowaways from a vessel in Cape Town. Female stowaways are rare and in the experience of the Association have only ever been found in the company of male stowaways.

Investigation of the case in Cape Town revealed that the crew had forgotten or ignored the IMO guidelines on the treatment of stowaways. The two female stowaways appear to have been allowed to spend far too much time in the company of the officers and crew. Photographs of the stowaways wearing the officers' clothes were found in their possession together with considerable sums of money – unusual for stowaways. One of the stowaways had a letter from a crewmember stating how much he would miss her. It is not clear whether these stowaways were actually prostitutes.

The incident could have turned sour for the crewmembers had the female stowaways made allegations of impropriety on board the vessel. Any stowaway can quite quickly turn the tables on the crewmembers that befriend them and manipulate the situation to suit themselves. The Association reminds Members to inform their crews that befriending stowaways and becoming involved with them on any level can result in a dangerous scenario and should be avoided.

Any stowaways found on board a vessel – whether male or female – must be treated in accordance with the IMO guidelines. Attendance at parties on board or the granting of any special favours must not be allowed. It is advisable that stowaways are removed and landed from the vessel as soon as possible in order to avoid any situation arising which could result in the crewmembers being charged with any criminal wrongdoing.

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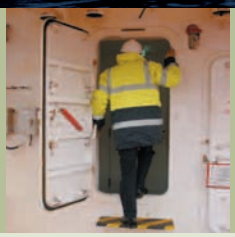
Crew matters



Customs and Kolkata

The Managers are currently dealing with an alleged customs infringement at the port of Kolkata.

Prior to arrival at the first port of call in a country, amongst the many documents that have to be presented to the authorities, it is generally a requirement of the local customs to provide a manifest of crewmembers' personal effects. In this particular case, the Customs Authorities conducted a search of the accommodation and found quantities of foreign currency that two crewmembers had failed to declare. Although the sum of money was just below the maximum amount allowed to be brought it in to the country, it was confiscated by the authorities, as it had not been declared.

Some months later, the Customs Authorities issued Show Cause notices, pursuant to the Indian Customs Act 1962. Amongst other things, the Act provides for the imposition of a fine of up to five times the amount of the seized goods. In this context, foreign currency is deemed to be goods for the purposes of calculating the fine. As the amount seized was nearly US$10,000, the potential fine is substantial.

This case illustrates the importance of ensuring that customs declarations are accurate. If there is any doubt, the agents at the first port of call in a country should be contacted for advice.

Miscellaneous

Publications

The Human Element : a guide to human behaviour in the shipping industry

A consortium led by the Maritime and Coastguard Agency (MCA) has launched a major new guide for the shipping industry which explains how human behaviour lies at the centre of both the profits and losses of the shipping industry, and what companies can do about it.

The guide has been compiled by organisational psychologists and provides insight, explanation and advice to help everyone involved in the shipping industry manage the human element more safely, effectively and profitably. It is aimed at all levels and areas of the industry, from the designers of ships to the management of the ships and through to the crews who operate them.

To find out more and to order a copy of the guide, please contact:

The Stationery Office
Online : www.tso.co.uk
Telephone : +44 (0)870 243 0123
Email: customer.services@tso.co.uk

A PDF read only version of the guide can also be found on the MCA website:
http://www.mcga.gov.uk/c4mca/the_human_element_a_guide_to_human_behaviour_in_the_shipping_industry

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**