



Secretary General's Report

Whilst I know that many of you are at sea, I do hope that at least some of you have been able to have a good break over this festive period and have been able to catch up with family and friends.

You will recall that I have mentioned in the past the subject of autonomous ships. This is an area which is now very much a reality with autonomous vessels being used in the military and in some specialist areas such as hydrographic surveying. Whilst the technology has been available for many years, it is only now starting to be used in the maritime industry. There is much talk coming from the manufacturers of this autonomous technology about what they can do, but there is a long way to go before we see this becoming a viable realization on any scale in our complex environment.

Firstly, we need to ensure that the use of these vessels is properly regulated around the world. This will take many years to achieve and, secondly, they must be able to operate safely wherever they may be used and can work within the current COLREGS.

I urge that you find out what is going on in this area in your own countries and regions and keep me informed here at the headquarters on developments. To that end, I have now become a member of the UK Maritime Autonomous Ships Regulatory Working Group (MASWRG) to ensure that the professional mariner is properly represented and is able to influence its work. Other nations such as the USA, the People's Republic of China, Norway, Finland, Sweden, the Republic of Korea are also represented in the MASWRG so it is truly international as they develop a recognised code of practice and develop papers to take to the IMO in the coming years to help develop the necessary changes to conventions and codes and define their legal status.

In November, I attended a two-day conference on autonomous ships in Southampton, UK, and gave a presentation to an international audience on IFSMA's views and policy. This was very well received and you can find the presentation and notes of interest from the conference on our website www.ifsma.org/log/blog.html. I urge you to look at these two documents. Please feel free to use them if you wish to get involved in the debate and provide influence to the industry. Do please keep us informed here at the HQ and ask for advice and guidance if needed.

At the IMO the 97th session of the Maritime Safety Committee met at the end of November and had a very busy agenda. There were a number of issues of interest for

IFSMA, as you would hope, and I made a couple of strong interventions on your behalf. My notes on the meeting are available on our website as are the formal minutes by the IMO Secretariat.

Next year at the IMO will be very busy and you will be pleased that we have co-sponsored a Nautical Institute paper in our ongoing policy of trying to get shipmasters removed from watchkeeping duties, particularly six-on, six-off. We are fortunate that New Zealand have agreed to sponsor this important work. I will let you know how it is received.

All that remains from me, is to wish you all a very happy, safe and prosperous New Year.

Commodore Jim Scorer, Secretary General

A New Year Message from The IMO Secretary-General to Our Members

While most of us have been taking advantage of the holiday period to spend time with our family and friends, I am very much aware that, for many seafarers, this has not been possible.

For the shipping industry, and for the seafarers who operate the ships, the holiday period is the same as any other as they continue their work to keep maritime trade flowing around the world and support the global economy.

For those seafarers who have been able to take some time off, I hope you have enjoyed your break; and for those of you at sea, I hope that you have at least been able to keep in touch with your family and will soon be reunited with them.

It was a very great honour for me to be elected last year as Secretary General of the International Maritime Organization, a specialised agency of the United Nations. Having served many years at sea myself, and risen to a command position on board ship, I am very much aware of the difficult lives that mariners lead and the complexity of the often dangerous and fragile maritime environment in which you work.

Here at IMO, one of our most important responsibilities is to provide the regulatory framework for shipping, and as we do this we always keep the seafarers in the forefront of our minds. We will continue efforts in that regard in the new year and beyond.

In sending you this message I should like to acknowledge

International Federation of Shipmasters' Associations

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and commend the work of IFSMA which, like so many of the bodies with consultative status with IMO, makes such a positive and beneficial contribution to our work. I look forward to continuing our fruitful collaboration into the future.



May I wish all IFSMA members, and seafarers everywhere, a safe, secure and prosperous 2017.

Kitack Lim

The Master Under Attack

By Michael Grey, IFSMA Hon. Member.

“It is better to be a maritime lawyer than a shipmaster!” This was the concluding thought of Lord Clarke, former Master of the Rolls and one of the UK’s most distinguished lawyers. Before an audience drawn from the maritime and legal community, he had been summing up the 2016 Cadwalader Debate, which had been considering “the authority and responsibility of the master in an age of instant access”.

“The Master under Attack” was the stark message advertising this event, held by the London Shipping Law Centre and usefully attended by Law Lords, QCs and some of the most prominent maritime lawyers. Moderated by InterManager’s Captain Kuba Szymanski, four speakers gave their views on the issue, which it was agreed was both topical and serious, the perception being that masters bear an ever-increasing burden and as the person “on the spot”, tend to have their authority questioned by people who have no problem blaming the master when things are not to their liking.

The West of England’s Michael Kelleher agreed that priorities were changing and the burden on both owners and masters were increasing, but that the clubs could be regarded as the master’s friend. They could, all things being equal, provide defence costs for a master involved in civil or even criminal actions, although this cover was not certain, especially in pollution cases. Support for both master and owner was more general in a collision case. He also pointed out that the master was a suitable target for the media to home in on, with the detention of a master after a casualty becoming a more common occurrence.

Michael G Chalos, partner in the US law firm K&L Gates had successfully defended Captain Hazlewood, late of the Exxon Valdez after that vessel’s notorious grounding in Alaskan waters. He was in no doubt that in recent years he had witnessed the erosion of the master’s authority. In the US, a criminal investigation was now the norm, after a casualty involving either death or pollution. The position of the shipmaster, he suggested, was being undermined by international crews, the rich rewards to “whistleblowers” in the US, technology and the power of the social media. In a blame culture, it was not unusual for government, politicians, press and publicity machinery to combine against a shipmaster involved in a high profile incident. He believed that the practices which emerged after the Exxon Valdez event had become the norm in subsequent accidents.

The US Coast Guard’s director for commercial regulations and standards Jeff Lantz agreed that the regulatory burden from international conventions bore most heavily upon the master although since the advent of the ISM Code this was now shared to a certain extent with shore management. He emphasised that the legal regime in the US recognises this shared responsibility and shore side management, who have been judged to benefit from their failure to comply have been successfully prosecuted. But he also noted that in a single year, after 57,000 ships had been boarded for inspection by the USCG, there were just 92 prosecutions and in only two of these was the master found to be guilty.

Former master and partner at Ince & Co Faz Peermohamed suggested that the perception of the over-burdened master was no illusion. He saw masters faced with unrealistic charterer demands, caused by the pressures of market forces, bullying and harassment, corrupt practices, the “micromanaging” of ship operations from ashore and a huge increase in inspections, and often pointless documentation. Additionally, in some parts masters had to deal with refugees and piracy, while fatigue went with the master’s role. There seemed to be a dearth of “fairness”.

Points raised during the evening included the need for flag states to support masters more, not least when seafarers were detained for many months awaiting proceedings. It was also acknowledged that the weight of these various burdens might be dissuading younger officers from command ambitions. Sadly the debate was abbreviated and could have been the subject for a far more thorough investigation. But this issue got a good airing and this, IFSMA members might consider, was important.



AMVER, What It Is and What It Does

The AMVER participating cruise ship *Celebrity Solstice* rescued two sailors from a deserted island after their 37-foot sailboat was damaged after running aground on a deserted island near Malden Island, Kiribati in April 2015.

The two sailors were on a voyage from Tahiti to Hawaii when they ran aground on a reef and radioed a family member their boat was damaged but they were safe on the island. The family member then contacted US Coast Guard rescue personnel in Hawaii. Rescue personnel used AMVER to locate *Celebrity Solstice* only 184 miles from the stranded sailors. The captain of the 963-foot ship agreed to divert and rescue the sailors. The cruise ship was able to communicate with the sailors by radio and instructed them to hike to a suitable location for the cruise ship to land a rescue boat. The two survivors were taken aboard the cruise ship and transported back to Hawaii. AMVER, sponsored by the United States Coast Guard, is a unique, computer-based, and voluntary global ship reporting system used worldwide by search and rescue authorities to arrange for assistance to persons in distress at sea.

Celebrity Solstice enrolled in AMVER in 2008 and has earned six participation awards.

Furthermore, AMVER participating cruise ship *Carnival Glory* rescued five Cuban migrants from a makeshift raft approximately 50 miles southeast of Key West, Florida on 30 September, 2016. US Coast Guard rescue personnel in Key West received notification from the Panamanian-flagged vessel. A video clip of the rescue is to be found on the AMVER Home page at <http://www.amver.com/>

With AMVER, rescue coordinators can identify participating ships in the area of distress and divert the best-suited ship or ships to respond. Vessels send periodic position reports to the AMVER centre until arriving at their port of call.

This data is able to project the position of each ship at any point during its voyage. In an emergency, any rescue coordination centre can request this data to determine the relative position of AMVER ships near the distress location.

AMVER, sponsored by the United States Coast Guard, is a unique, computer-based, and voluntary global ship reporting system used worldwide by search and rescue authorities to arrange for assistance to persons in distress at sea. AMVER's success is tied directly to the number of merchant vessels regularly reporting their position. The more ships on plot, the greater the chance a ship will be identified near the position of distress.

Ships incur no additional obligation to respond than already exists under international law of the sea. Since AM-

VER identifies the best ship or ships to respond to a ship in distress, it releases other vessels to continue their voyage, saving fuel, time and payroll costs. Information sent to AMVER is protected and used only in a *bona fide* maritime emergency.

AMVER provides an additional measure of safety by allowing rescue coordinators to compress the search area in the event a participating ship is unreported or overdue.

Who can participate?

Participation in AMVER is free, voluntary, and open to merchant ships of all flags. Participation is generally limited to ships over 1000 gross tons, on a voyage of 24 hours or longer. Recently, however, enrolment has been expanded to accommodate vessels outside the normal criteria, such as cruise ships, research vessels and fish processors.

Advantages to participation in AMVER

Participation is voluntary, free of cost, and **open to all ships of all flags**. AMVER is a worldwide voluntary ship reporting system operated by the United States Coast Guard (USCG) to promote safety of life and property at sea. The mission is to quickly provide SAR authorities, on demand, accurate information on the positions and characteristics of vessels near a reported distress. Any merchant vessel anywhere on the globe, on a voyage of greater than 24 hours duration, is welcome in the AMVER system and family. International participation is voluntary regardless of the vessel's flag of registry, the nationality of the owner or company, or ports of call.

AMVER still provides a value to search and rescue personnel by ensuring the right ship is sent to the right place at the right time.

History of the AMVER System

The genesis of the AMVER system ultimately finds its roots in the loss of RMS *Titanic* in 1912. Ships passing within sight of the ill-fated passenger liner were unaware that it had hit an iceberg and was sinking. Upon later investigation, those who had seen the distress flares from the stricken ship admitted they thought they were merely part of maiden voyage celebrations.

However, the resultant idea of a ship reporting system that could identify other ships in the area of a ship in distress, which could then be sent to its assistance, would not become a reality until the advent of computer technology. As late as the mid-20th century the world's commercial shipping fleet and burgeoning air transport system lacked an available full-time, global emergency reporting system. On 15 April, 1958 the United States Coast Guard and commercial shipping representatives began discussions which led to the creation of AMVER.

Originally known as the Atlantic Merchant Vessel Emergency Reporting (AMVER) System, it became operational on July 18, 1958. AMVER began as an experiment, confined to waters of the North Atlantic Ocean, notorious for icebergs, fog and winter storms. Vice-Admiral Alfred C. Richmond, Coast Guard Commandant at the time, called on all commercial vessels of US and foreign registry, over 1,000 gross tons and making a voyage of more than 24 hours, to voluntarily become AMVER participants. The basic premise of AMVER, as a vehicle for mariner to help mariner without regard to nationality, continues to this day.

By 1962, Rescue Coordination Centres (RCCs) in England and Ireland were offered and began using, search and rescue (SAR) information from AMVER. By 1963, AMVER was plotting vessels on voyages worldwide and by 1968, an additional 37 coast radio stations in the Pacific and 28 in the Atlantic were cooperating partners in AMVER and the international effort to pursue and promote the safety of life at sea.

In 1971, the system was formally expanded worldwide as operations were shifted to Washington hosted on a Control Data Corporation mainframe computer at the Department of Transportation Systems Center. AMVER's name required revision once again to reflect its global reach. But at this point, the AMVER acronym was so well known in the industry that the Coast Guard was reluctant to change it. Instead, the title was changed to the Automated (computerized) Mutual-assistance (its basic premise) VESSEL RESCUE (its stated purpose) System. Today, due to its global acceptance and familiarity, it is simply called AMVER.

AMVER took its place in the history of the 1960s and 1970s by playing an important role in the US space programme. AMVER was a part of the Mercury, Gemini, Apollo and Skylab Programmes, providing NASA with a prospective maritime support plan in the event of a space flight emergency.

Introducing the International Ice Patrol

In 1912 the tragic sinking of the luxury passenger liner RMS *Titanic* prompted the maritime nations of the world with ships transiting the North Atlantic to establish an iceberg patrol in the area. Since 1913, the United States Coast Guard (USCG) has been tasked with the management and operation of what is known as the International



Ice Patrol (IIP). The mission of the International Ice Patrol is to monitor the iceberg danger near the Grand Banks of Newfoundland in the North Atlantic and provide the iceberg limit to the maritime community.

Except for the years of the two World Wars, The Ice Patrol has been active each ice season since 1913. During this period, the Ice Patrol has amassed an enviable safety record. **No vessel that has heeded the Ice Patrol's published iceberg limit has collided with an iceberg.**



In the US the International Ice Patrol and in Canada the Canadian Ice Service (CIS) issue one daily iceberg analysis under the North American Ice Service (NAIS), a collaborative agreement to unify North American ice information and improve service to mariners. This iceberg analysis is published in text bulletins and a graphical chart by 0000Z each day and when changing conditions require a revision.

Mission and Vision

At the IIP the Mission is to monitor the iceberg danger in the North Atlantic Ocean and to provide relevant iceberg warning products to the maritime community with the Vision to eliminate the risk of iceberg collision.

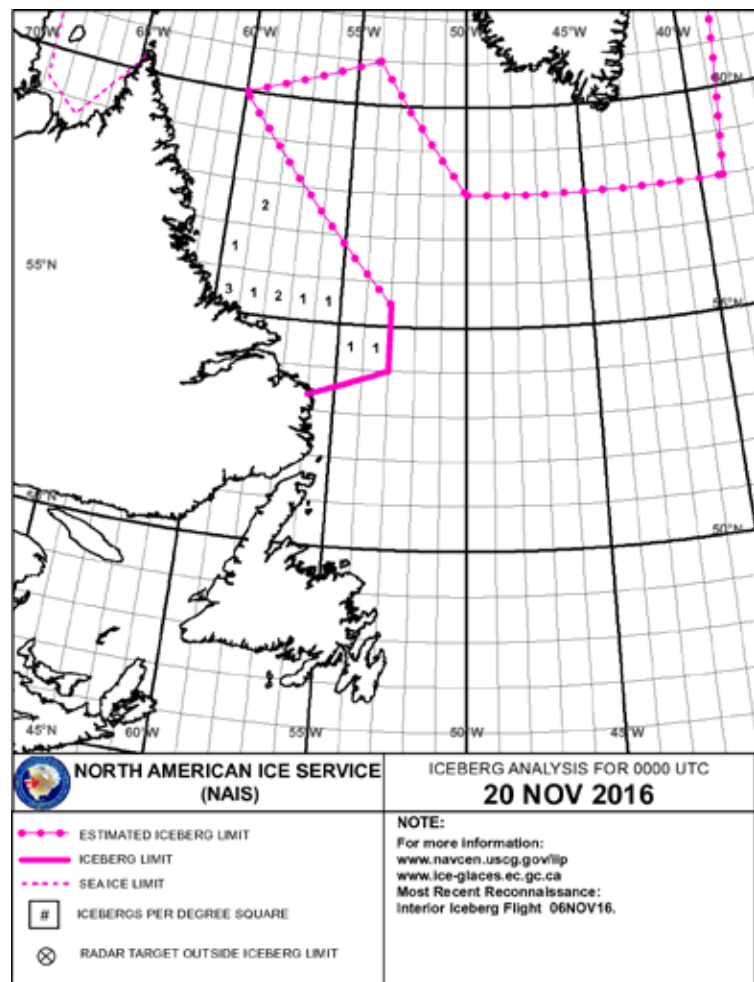
Operations

The IIP produces and releases iceberg information products from 1 February to 31 August each year, during which the US Coast Guard International Ice Patrol actively patrols the area of the Grand Banks of Newfoundland for the extent of iceberg danger as required. The remainder of the year the responsibility of product distribution is transferred to the Canadian Ice Service, which works closely with the International Ice Patrol under the North American Ice Service (NAIS). This partnership ensures accurate products are delivered to mariners year-round.

In the 1992 season, the longest on record, it ran from 7 March through to 26 September, a total of 203 days. Except during unusually heavy ice years, the Grand Banks are normally free of ice from August through to January.

Activities of the International Ice Patrol are delineated by treaty and US law to encompass only those ice regions of the North Atlantic Ocean through which the major trans-Atlantic tracks pass. There remain other areas of ice danger

where shipping must exercise extreme caution. A tragic example of this occurred on 30 January, 1959 when ss *Hanshedtoft* struck an iceberg about 40 miles south of Cape Farewell, Greenland. On her maiden voyage, this ship, equipped with the latest electronic navigational aids, sank without trace, taking with her the 95 passengers and crew on board.



Fixed wing Coast Guard aircraft conduct the primary reconnaissance work for the Ice Patrol. Ice reconnaissance flights are made on the average of five days every other week during the ice season. The mainstay of the Ice Patrol flights since 1962 has been the C-130 long range surveillance aircraft. IIP is currently using the HC-130J model operated out of Elizabeth City, North Carolina. The usual patrol time for these long range multi-engine planes is between five and seven hours, with each flight covering an expanse of water of at least 30,000 square miles (77,700 sq km). Information concerning ice conditions is collected primarily from air surveillance flights and ships operating in or passing through the ice area.

All the iceberg data is fed into a computer model at the IIP Operations Center in Suitland, Maryland, along with ocean current and wind data. Using this information, the model predicts the drift of the icebergs. Each day, the predicted iceberg locations are used to estimate the iceberg limit. This limit is incorporated into the Centre's daily products, the *NAIS Iceberg Bulletin* and *NAIS Iceberg Chart*. These products are available to users and the general public by several means, including INMARSAT SafetyNet, NAVTEX, SITOR, and the world-wide web, see icon: N.Amer Ice Svc. (www.navcen.uscg.gov)

Except for the years of the two World Wars, the International Ice Patrol has conducted each season since 1913. During the period the Ice Patrol has amassed an enviable safety record with not a single reported loss of life or property due to collision with an iceberg outside the advertised limit in the vicinity of the Grand Banks. However, the potential for a catastrophe still exists.

Picture credits:

Illustrations kindly provided by the United States Coast Guard ©.

THE IMO DIGEST

A review of IMO business in November

Belarus joins

The Republic of Belarus has become the latest Member of IMO, following the deposit of an instrument of acceptance of the Convention on the International Maritime Organization with the Secretary-General of the United Nations on 29 November 2016. With the acceptance of the Convention by Belarus, the number of IMO Member States stands at 172, with a further three Associate Members.

Simulator training

A visit to a newly established maritime training facility in Almere, The Netherlands on 28 November saw IMO Secretary-General HE Kitack Lim experience first-hand some of the latest technology and training methods used to equip seafarers with the skills needed for a career at sea. Simulator training forms a key part of mandatory training under IMO's STCW Convention, which establishes international standards for training, certification and watchkeeping. His Excellency was joined by IMO Directors Frederick Kenney and Ashok Mahapatra in a tour of the Center for Simulator Maritime Training (CSMART), which demonstrated full mission bridge and engine room simulators.

Innovation for sustainable transport

A UN conference has highlighted the importance of technology and innovation in ensuring sustainable transport. IMO was present at the UN's first ever Global Sustainable Transport Conference, held in Ashgabat, Turkmenistan on 26-27 November. Concluding the two-day conference with the so-called Ashgabat Statement, participants stressed the need to promote the integration of science, technology and innovation into sustainable transport by tapping into technological opportunities in forthcoming decades. It is understood that this will bring about fundamental, transformative changes to transport. It was said that this can be achieved through the use of energy-efficient technology, as well as information and communications technology. Delegates called for the strengthening of capacity-building support to developing countries.

IMO works with developing countries through its integrated technical cooperation programme to promote sustainable maritime transport. For example, IMO's GloMEEP project is aimed at supporting the uptake and implementation of energy efficiency measures for shipping, thereby reducing greenhouse gas emissions.

During the conference, IMO's Jesper Loldrup participated in a panel on sustainable transport with regard to the climate crisis, highlighting IMO's work on energy efficiency including recent decisions made to further reduce greenhouse gas emissions from international shipping.

The UN Conference brought together key stakeholders from Governments, the UN system and other international organizations, the private sector, and civil society to engage in a dialogue that emphasizes the integrated and cross-cutting nature of sustainable transport and its multiple roles in supporting the achievement of the Sustainable Development Goals (SDGs). All modes of transport – road, rail, aviation, ferry and maritime – were addressed.



Search and Rescue

IMO supported countries in western Africa to enhance their national search and rescue (SAR) services with a regional training course and meeting which took place in Lagos, Nigeria from 21 to 23 November. Activities assisted Member States under the Nigeria SAR Region (Benin, Cameroon, Congo, Democratic Republic of Congo, Equatorial Guinea, Gabon, Nigeria and São Tomé and Príncipe) to develop their regional SAR Plan and to increase regional cooperation.

This course covered the duties of search and rescue On-Scene Coordinators, which was followed by the third meeting of the regional SAR Coordinating Committee. Activities were organized in collaboration with the International Maritime Rescue Federation (IMRF) and hosted by the Nigeria Maritime Administration and Safety Agency. IMO was represented by Captain Dallas Laryea and Mr Honorat Hoba.

Ballast Water Management Convention – Planning for Enforcement

IMO's Ballast Water Management Convention was the topic of detailed discussion at the Planning for Enforcement forum in London on 23 November. With the Convention set to enter into force in September 2017, requiring ships to manage their ballast water to help prevent the spread of potentially harmful invasive aquatic species, IMO's Markus Helavuori gave an update on the Convention's latest developments.

Specifically, he outlined decisions taken during the IMO Marine Environment Protection Committee's 70th session in October, which included adoption of revised guidelines to update the approval procedures for ballast water management systems (BWMS). This forum was organized by the UK Chamber of Shipping.

Dumping of wastes at sea

The Islamic Republic of Iran has become the latest country to accede to the IMO treaty covering dumping of wastes at sea.

HE Dr Hamid Baeidi Nejad, newly appointed Ambassador of the Islamic Republic of Iran to the United Kingdom and Permanent Representative to IMO, met IMO Secretary-General HE Kitack Lim at IMO HQ, London, to deposit the instrument of accession to the London Convention Protocol of 1996 and corresponding amendments of 2009.

The London Protocol entered into force ten years ago, modernizing the original London Convention dumping treaty by prohibiting all dumping at sea with the exception of wastes commonly agreed by Governments and then put on an approved list.

New work to assess the environmental impacts of wastes from mining operations which have been disposed of into the marine environment is set to begin shortly.

This work will be undertaken by a dedicated working group, established by the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP). GESAMP, which is a UN advisory body, set up the working group when it met for its 43rd annual session, in Nairobi, Kenya from 14-18 November. The move to assess impacts of mining wastes at sea comes in response to a request from the Parties to the London Convention and Protocol, which regulate the dumping of wastes at sea.

GESAMP's annual meeting was attended by scientists and representatives of GESAMP's UN sponsoring organizations.

The agenda covered the group's current work, including the evaluation of the hazards of harmful substances carried by ships and the review of applications for active substances to be used in ballast water management systems. Here experts discussed the input of chemicals to the oceans from the atmosphere.

They also looked at trends in global pollution in the coastal environment and the current studies on the sources, fate and effects of micro-plastics in the environment.

Marine geoengineering, which is the subject of study by another GESAMP working group, was also discussed.

GESAMP went on to discuss its role in and contribution to UN related processes such as the 2030 Agenda for Sustainable Development, and its engagement with the wider international community. IMO hosts the GESAMP Secretariat.

Strathclyde Maritime Safety Research Centre

HE Kitack Lim has officially opened the new Maritime Safety Research Centre (MSRC) at the University of Strathclyde in Scotland. In his inaugural address, the Secretary General said that the centre could play an important role in the shift of maritime safety from empirical to risk-informed legislation and goal-based standards.

The MSRC is an industry/university partnership, involving Strathclyde's Department of Naval Architecture, Ocean & Marine Engineering, Royal Caribbean Cruises Ltd, and

the classification society DNV GL. It will aim to improve safety at sea through a close collaboration between industry and academe.

Maritime Interdiction

Maritime law enforcement officers from West and Central Africa, who may be called upon to deal with transnational crimes at sea, underwent practical and theoretical training during an IMO-sponsored, two-week course at the NATO Maritime Interdiction Operations Training Centre (NMI-OTC), in Souda Bay, Crete, Greece from 7-17 November.

The course covered investigation planning, suspect interviewing skills, collecting, handling and preservation of evidence at sea.

Participants included enforcement officials from marine police, coast guard and naval forces from Cameroon; Cape Verde; Cote d'Ivoire; Democratic Republic of Congo; Guinea-Bissau; Liberia; Mauritania; Nigeria; São Tomé and Príncipe; Sierra Leone; and Togo. This was the first such course for officials from West and Central Africa.

MAIIF/IMPA Joint Education Project

The Marine Accident Investigators International Forum (MAIIF) has completed numerous studies and investigations on the operational relationship between marine pilots and ship masters/watchkeeping officers. For its part, the International Maritime Pilots' Association (IMPA) has completed a number of surveys regarding operational practices on the bridge of vessels under pilotage including matters such as the initial master/pilot exchange and the nature and extent of support received from bridge teams throughout pilotage assignments. Safety deficiencies associated with teamwork on the bridge, including communication between marine pilots and masters/officers of the watch, is a shared concern for the two organizations.

It is well established that the pilot and the bridge team should develop a shared mental model of how a voyage will unfold. The initial master-pilot exchange is an important part of the process by which the master and the pilot can develop such a model and resolve uncertainties about how intended manoeuvres are to be carried out. It is also important that adequate communication between the pilot and the bridge team continues throughout the voyage. When the pilot and bridge officers share a similar mental model of the voyage, they are able to individually monitor the progress of manoeuvres from their different vantage points on the vessel, thereby reducing the possibility of single point failure.

While the IMO and Member States have demonstrated due diligence and have implemented mandatory training for ships' crews and pilots, the number of accidents in which the cause or a finding as to risk is related to the pilot/bridge team relationship continues to be an object of concern. MAIIF and IMPA have found that, in the absence of effective monitoring, the pilot has little support in the navigation of the vessel.

In marine pilotage operations, effective situational awareness involves: 1) perceiving critical factors in the environment, 2) understanding what those factors mean with respect to controlling the vessel, and 3) projecting what will happen in the near future and taking appropriate action. Situational awareness is enhanced by good communication and, since the bridge team and the pilot work together towards a common goal, ongoing sharing of information is necessary for both parties to be fully effective.

Commit to Safe Navigation

SAFE NAVIGATION IN PILOTAGE WATERS IS A SHARED TASK OF THE BRIDGE TEAM AND THE PILOT

- SHARE NAVIGATION INFORMATION
- RESPECT EACH OTHER
- COMMUNICATE THROUGHOUT THE VOYAGE
- WORK TOGETHER
- STAY ALERT

MAIIF IMPA IMO

The respective obligations of pilots and bridge teams are well established in various international instruments. The Standards of Training, Certification, and Watchkeeping Code emphasize the importance of an ongoing exchange of information between the master and the pilot and state that “*despite the duties and obligations of pilots, their presence on board does not relieve the master or officer in charge of the navigational watch from their duties and obligations for the safety of the ship.*” At the same time, IMO’s Resolution A960 states that: “*Masters and bridge officers have a duty to support the pilot and to ensure that his/her actions are monitored at all times*” and “*The master, bridge officers and pilot share a responsibility for good communications and understanding of each other’s role for the safe conduct of the vessel in pilotage waters.*” (A960, Annex 2, paragraphs 2.3 and 2.2).

Grounding of Maersk Garonne, Fremantle

At 0400 on 28 February 2015, a harbour pilot boarded the container ship *Maersk Garonne* for its passage into Fremantle's Inner Harbour. The pilotage generally progressed as intended by the pilot until the ship approached the entrance channel 40 minutes later. At this stage, he became concerned that the assisting harbour tugs would not be at the channel's entrance before the ship.

At 0442, the pilot decided to delay entering the channel by taking *Maersk Garonne* outside (south of) the channel and entering it later. At 0448, the ship grounded in charted shallow water. The ship did not suffer any damage and was re-floated on the rising tide about 3½ hours later.



Grounding of *Maersk Garonne*

Fremantle, Western Australia | 28 February 2015



Investigation

ATSB Transport Safety Report
Marine Occurrence Investigation
319-MO-2015-002
Final – 17 October 2016

The Australian Transport Safety Board (ATSB) investigation found that bridge resource management was not effectively implemented on board *Maersk Garonne*. As a result, the ship's bridge team was not fully engaged in the pilotage and did not effectively monitor the ship's passage. While the master retained responsibility for safe navigation of the ship, the harbour pilot was the only person actively focused on the pilotage. Consequently, single-person errors that occurred went undetected or inadequately challenged and uncorrected.

The investigation identified that Fremantle Pilots' publicly available passage planning guidance for the pilotage was inadequate and was not effectively implemented. Further, Fremantle Pilots' pilotage procedures did not include abort points or contingency plans for identified risks.

The investigation also found that procedures for tugs to be on station at the entrance to the port, or for their co-ordinated movement, were not clearly defined.

Safety message:

Comprehensive passage planning that includes risk-assessed contingency planning is vital to safe pilotage and underpins effective bridge resource management. The potentially severe consequences of a pilotage accident means that a low accident rate in the past is not a reliable indicator of safety risk.

The ATSB report: *Grounding of Maersk Garonne, Fremantle, WA on 28 February 2015* is available here: <http://tinyurl.com/ztkc4yj>

ATSB Advice Notes

Weighted heaving lines

On October 2016, the Australian Maritime Safety Authority (AMSA) issued Marine Notice 18/2016 regarding the use of weighted heaving lines. There was a need to bring to the attention of ship owners, ship operators, ship masters, port authorities, and tug operators the dangers of using weighted heaving lines when transferring mooring lines to tugs and shore linespersons.

AMSA had received a number of complaints about the use of monkey fists on heaving lines that contain weights. These incidents resulted in near misses to personnel on tugs and had the potential to damage wheelhouse windows. Such incidents can cause serious injury or a fatality to crew members and linespersons and/or damage to the vessel.

During the berthing of a vessel at Hay Point, metal objects in lieu of a monkey's fist were attached to the messenger line for securing to tug towlines. This metal object landed heavily on the tug's deck, narrowly missing the deck crew. In another incident, a tug attending the berthing of a ship at Newcastle had a heaving line thrown by the ship's crew which narrowly missed the Engineer and Deckhand. A heavy weight, consisting of a large rusty shackle, was used on this occasion. A tug attending the berthing of a ship at Dalrymple Bay had a weighted monkey fist land heavily on the deck of the tug narrowly missing the deck crew.

A number of seamanship publications provide instruction on the correct tying of a monkey's fist or heaving-line knot to weight the end of a heaving line. **This knot must be made of rope only.**

Maintenance of magnetic compasses

In November AMSA issued Marine Notice No 19/2016 to remind the maritime community that magnetic compasses are a very important tool for the safety of navigation.

This Marine Notice applies to "regulated Australian vessels" and certain foreign vessels (See Marine Order 27 (Safety of navigation and radio equipment) 2016.)

Magnetic Compass

Vessel owners and masters each have responsibilities for ensuring that magnetic compasses are maintained in good working order, adjusted and a table or curve of residual deviations is available. The performance of the compass should be monitored and, for a vessel more than 100gt, deviations recorded in a compass deviation book at regular intervals, ideally at least once every watch and also shortly after a large alteration of course. Failure to maintain a magnetic compass in good working condition or to monitor deviations may result in a vessel being delayed or detained and potentially the vessel owner and/or master being prosecuted.

When to adjust a magnetic compass

If the observations for a magnetic compass on a vessel show a deviation of the compass on any heading of more than five degrees, the compass must be adjusted by a qualified compass adjuster or the master of the vessel to correct the deviation.

Annex G of ISO 25862:2009 also recommends that a compass should be adjusted when:

1. they are first installed;
2. they become unreliable;
3. repairs or structural alterations have been made to the vessel that could affect its permanent or induced magnetism;
4. electrical or magnetic equipment close to the compass is added, removed or altered;
5. they show any physical defects;
6. if a record of compass deviations has not been maintained, or the recorded deviations are excessive; or
7. deemed necessary by the master for the safety of navigation, and no less often than every two years; every dry docking or after significant structural work.

Magnetism of a new ship can be particularly unstable. Therefore, the performance of a magnetic compass should be monitored carefully during the early life of the ship, and adjustments made if necessary.

To ensure a compass is in good working condition, it is important to check performance of magnetic compasses particularly after:

1. carrying cargoes which have magnetic properties;
2. using electromagnetic lifting appliances to load or discharge cargo;
3. a vessel has been in a casualty where it has been subject to severe contact or electrical charges;
4. a vessel has been operating on short voyages for a long period of time then relocates, which results in a large change in magnetic latitude; or
5. a vessel has been laid up or has been lying idle.
Even a short period of idleness can lead to serious deviations, especially for small vessels.

AMSA Marine Notices are available here:

<http://tinyurl.com/nktwgku>

Africa – N. Atlantic SAR Summit

On 17 October 2016 representatives from the African SAR Group were able to learn how to create a model based on the Maritime Rescue Coordination Centres (RCC) of the North Atlantic Group when the two parties met. The meeting (*illustrated*) was facilitated by the International Maritime Rescue Federation (IMRF) in partnership with the IMO Technical Cooperation Committee in Rabat, Morocco.

Delegates from South Africa, Liberia, Nigeria, Kenya and Morocco attended the African Continent Regional SAR co-ordinators meeting, where, at the same time, the 16th meeting of the North Atlantic MRCC Group gathering SAR services from USA, Canada, Germany, France, Norway, United Kingdom, Spain, Iceland, Ireland and The Netherlands, took place.



Said Mohammed Drissi, Moroccan National Search and Rescue Coordinator: *'The objective of this parallel event was to give the African group an overview on what was done within the North Atlantic Group to develop SAR capabilities and operations and seek for ways to create a similar one for Africa.'*

At the African co-ordinators' meeting it was agreed that a common website is to be developed to enable search and rescue services in the Africa region to help publicise their work and provide an online library of resources for regional coordinators.

Increased cooperation and communication across the regions was an important theme of the meeting and there was also agreement to provide more common training targeting skills across all the regions with no restrictions because of geographic location.

Linked to this was the agreement to establish a regular communication device to keep the regional coordinators advised of other regions activity and inform of future events and activity that may be of interest to the wider group.

The group also identified a need for an annual report that reflects and reports on the activity across the African region. The report will provide an update of achievements, statistics of activity and establish current and future challenges.

Bruce Reid, CEO, IMRF, commented: 'We are incrementally building better communication and compiling more relevant data, which will help the Africa SAR services to be more effective improving their rescue capability and saving more lives in the waters of Africa.'

'This is only the second meeting and we are already seeing the positive results from actions agreed. It was also extremely valuable to put the African and North Atlantic teams together.'

African delegates also followed up on actions from the previous meeting including, adopting the updated Regional Coordinators SAR Focal Point; adopting the monthly communication test between Regional MRCC; establishing an Africa Region Trainer list, identifying areas of specialist course delivery and adoption of the Africa SAR development list.

The IMRF has been working in partnership with the IMO Technical Co-operation Committee to build the SAR coordination and response capability in Africa with funding support from the German Maritime Administration. This is to implement a development plan that has now delivered 24 activities including training, development meetings and exercises since the start of 2015.

The IMRF has announced that the G4 International Maritime Mass Rescue Conference will be held in Gothenburg, Sweden from 11-13 June 2017.

Illustration kindly provided by IMO©.

Construction and Development of Melaka Gateway Port

A foundation stone laying ceremony for the construction and development of Malaysia's Melaka Gateway deep sea port took place there on 19 October.



At the same time, KAJ Development Sdn Bhd (KAJD) and its investment partner Powerchina International Group Limited (Powerchina International), held a Memorandum of Agreement signing ceremony with its two new partners for the construction and development of the port: Shenzhen Yantian Port Group Co Ltd of Shenzhen, Guangdong, China, and Shandong's Rizhao Port Group Co Ltd.

KAJD and Powerchina International signed a partnership agreement on 1 September for a RM30 billion (US\$ 6.91 billion / £5.53 billion) deal for the investment, development and construction of the three out of four islands at Melaka Gateway in an area of totalling 1,366 acres (553 hectares).

Located on the natural island of Pulau Panjang, the strategic location of Melaka Gateway Port on the Malacca Strait naturally inherits its depth of water of 25 to 30 metres, making it an ideal choice for a deep-sea port facility. As only a few ports in Malaysia have this advantage, Pulau Panjang is an ideal choice.

It is understood that the Melaka Gateway Port will be designated as a liquid cargo terminal with storage facilities benefiting oil trading in Southeast Asia and beyond.

The deep-sea port at Pulau Panjang will also complement a maritime industrial park, which will be built on the fourth island of Melaka Gateway, where it will house a container terminal, break and dry bulk terminal, shipbuilding and ship repair services, as well as marine engineering and manufacturing.

Indian Master receives 2016 IMO Award for Exceptional Bravery at Sea

A report by Captain Daniel Chandra, CMMI India

Captain Radhika Menon, Master of the SCI tanker *Sampurna Swarajya*, was awarded the 2016 IMO Award for Exceptional Bravery at Sea for her role in the rescue of seven fishermen from a sinking fishing boat in very rough seas and severe weather. The presentation took place during a function held at IMO HQ in London. She had been selected for this award by a panel of judges out of 23 nominations received by IMO from Member States.

IMO Secretary General HE Kitack Lim presided at the function along with Captain A Mahapatra, Director, IMO Maritime Safety Division. Over 200 member delegates representing the various maritime nations attended the function. Mr. Dinesh Pattnaik acting Indian High Commissioner in London was the chief guest during the function. The other guests and Indian delegates who attended the function were: Mr Rajan, Minister coordination IHC London; Ms. Shetti, FS education IHC London; Captain J S Uppal and Mr Aji Vasudevan DG, Shipping Mumbai, and Captain Philip Matthews SVP, SCI Mumbai.

Secretary General Kitack Lim paid tribute to Captain Menon for her great determination and courage in leading the difficult rescue operation in the Bay of Bengal in June 2015. He also appreciated the efforts of all the seafarers for their commendable work and especially for the rescue efforts carried out by seafarers all over the world.

Captain Menon was nominated by the Government of India, for the rescue of all seven fishermen from the fishing boat *Durgamma*, which was adrift following engine failure and loss of her anchor in severe weather. Food and water



had been washed away and they were surviving on ice from the cold storage.

Through wave heights of more than 25 feet (7.62 metres), winds of more than 60 knots and heavy rain, on 22 June 2015, the Second Officer on *Sampurna Swarajya* spotted the stricken boat at a distance of 2.5 kilometres (1.5 miles), off the coast of Gopalpur, Orissa.

Captain Menon immediately ordered a rescue operation, utilizing the pilot ladder and with life jackets and buoys on standby. It took three arduous attempts in the lashing wind and rain and heavy swells before all seven weak and starving fishermen, aged from 15 to 50, were brought to safety on board the ship. Their families had already considered them to be lost at sea, but thanks to the rescue, led by Captain Menon, they were reunited with their loved ones a few days later.

Captain Menon is the first female captain in the Indian Merchant Navy and the first female to receive the IMO Award for Exceptional Bravery at Sea.

Captain Radhika Menon during her speech thanked all the crew members who made this possible and without any injuries during the rescue. She profusely thanked SCI for the training, continuous support and encouragement during her 25 years of service with the company.

Postscript

During the IMO award ceremony, other rescue awards were made.

A **Certificate of Commendation** was presented to **Captain Hervé Lepage**, Master of the containership *CMA CGM Rossini*. Captain Lepage was nominated by France for his tireless efforts to find and rescue, in adverse weather and sea conditions, two crew members of the capsized catamaran *Lama-Lo*. The survivors had been drifting in a tender for 26 hours when Captain Lepage located them by successfully estimating the drift of the beacon transmissions – before skilfully manoeuvring the ship alongside the tender and helping the crew members on board. **Mr Michael Parker**, Chairman of CMA CGM Holdings UK and (from January 2016) non-executive chair of the UK Maritime and Coastguard Agency, received the certificate on his behalf.

Illustration kindly provided by IMO©.

SeafarerHelp - new Website



ISWAN's [SeafarerHelp](#) provides a free, confidential helpline service to seafarers and their families all over the world. With a multilingual team and 24-hour assistance year-round, the service helped nearly 10,000 seafarers of 86 different nationalities last year.

ISWAN has just launched a new website for SeafarerHelp that is designed to reach even more seafarers.

The new website, which can be viewed in nine different languages, provides a number of ways for seafarers and their families to get in touch, including by telephone, e-mail, Skype, text message and a Live Chat feature. Trends last year showed that seafarers preferred to contact the helpline by mobile devices over the internet, so the website is optimised for mobile use.

Seafarers can also access general information about common issues raised to the SeafarerHelp team via the website, along with downloadable resources providing guidance on health and wellbeing. The website includes ISWAN's Seafarer Centre Directory which helps seafarers find their nearest facilities in port.

Please direct seafarers in need of assistance to www.seafarerhelp.org and contact iswan@iswan.org

EfficienSea 2

Getting Connected to the Future

**By Dr Nick Ward FRIN AFNI CEng CIP
IALA Project Manager for EfficienSea2
(GLA Research Director)**

EfficienSea 2 is an EU Horizon 2020 funded project led by the Danish Maritime Authority (DMA), with 32 partners. This three-year Project started in May 2015 and held its mid-term conference in Copenhagen on 8 and 9 November 2016.



There were keynote presentations from Francis Zachariae, Secretary General of IALA on 'Bringing the Maritime Sector into the Digital Age' and from Troels Blicher Danielsen, Deputy Director General of the DMA, on 'How will digitalization and connectivity change shipping and Maritime Authorities?'

These were followed by an introduction to the Maritime Cloud and a demonstration of its core elements. A further keynote from the Comité International Radio-Maritime (CIRM) gave an industry point of view on how new, standardized, digital services will affect suppliers of navigational equipment.

The aim of the conference was to give both industry and other actors outside the project a chance to become familiar with and give feedback on the e-Navigation solutions being developed by EfficienSea2.

Broad range of solutions

The Maritime Cloud, consisting of a service registry, an identity registry and a management portal, the Maritime Cloud will make it possible to connect the end user of services with the service providers in a way which is both user friendly and safe.



The participants at the conference could for the first time experience the simple process of registering a ship in the identity registry, a service in the service registry and how the two registers are connected in the Maritime Cloud.

Participants were then introduced to the geographical display/web-based platform BalticWeb, which covers the Baltic Region. On stage, it was demonstrated how a registered user in the Maritime Cloud can sign into BalticWeb and connect to approved services, which will then be displayed in a safe and easy way.



Examples of services that will be included in the Maritime Cloud were also given. Service providers will in the future be free to provide solutions based on certain standards and services, developed by EfficienSea2, such as navigational warnings and satellite images were demonstrated.

The conference closed with a presentation from Cobham SATCOM on 'What will connectivity mean for shipping?'

Feedback from the industry

More than 170 participants attended the conference and the chance to get feedback was an essential goal for the EfficienSea2 project.

The International Maritime Solid Bulk Cargoes Code

Carrying solid bulk cargoes safely

IMO Resolution MSC.393(95) introduced amendments (03-15) to the International Maritime Solid Bulk Cargoes (IMSBC) Code which enter into force on 1 January, 2017.

Lloyd's Register together with UK P&I Club and Intercargo have produced a Pocket Guide to help you understand the IMSBC Code's key requirements and give you greater confidence in managing the risks of carrying solid bulk cargoes and achieving compliance with SOLAS.

The 24 page Pocket Guide may be downloaded from the Lloyd's Register website here: <http://tinyurl.com/h44jvp3>

Galileo Delivers Globally

Early in December (2016) the European Space Agency (ESA) announced that Europe's own Galileo satellite navigation system had begun operating, with the satellites delivering positioning, navigation and timing information to users around the globe.

On 9 December the European Commission, owner of the system, formally announced the start of Galileo Initial Services, the first step towards full operational capability. Further launches will continue to build the satellite constellation, which will gradually improve the system performance and availability worldwide.

ESA has overseen the design and deployment of Galileo on behalf of the Commission, with system operations and service provision due to be entrusted to the European Global Navigation Satellite System Agency next year (2017). After five years of launches there are now 18 satellites in orbit. The most recent four, launched last month (November 2016), are undergoing testing ahead of joining the constellation next spring.

The full Galileo constellation will consist of 24 satellites plus orbital spares, intended to prevent any interruption in service.

Galileo is now providing three service types, the availability of which will continue to be improved.

1. The Open Service is a free mass-market service for users with enabled chipsets in, for instance, smartphones and car navigation systems. Fully interoperable with GPS, combined coverage will deliver more accurate and reliable positioning for users.
2. Galileo's Public Regulated Service is an encrypted, robust service for government-authorized users such as civil protection, fire brigades and the police.
3. The Search and Rescue Service is Europe's contribution to the long-running Cospas-Sarsat international emergency beacon location. The time between someone locating a distress beacon when lost at sea or in the wilderness will be reduced from up to three hours to just ten minutes, with its location determined to within 5 km, rather than the previous 10 km.

Maritime Safety Committee (MSC)

The 97th session of the IMO Maritime Safety Committee (MSC) was held at IMO HQ in London from 21-25 November.

The International Federation of Ship Masters' Associations was represented at this meeting of MSC by Commodore Jim Scorer, Secretary General of the Federation and his IFSMA team.

The MSC adopted the following amendments:

- To SOLAS, including amendments on firefighting and on harmonization of survey periods of cargo ships not subject to the ESP Code.
- To the 2008 International Code on Intact Stability (IS Code), relating to ships engaged in anchor handling operations and to ships engaged in lifting and towing operations, including escort towing.
- To the International Code for Fire Safety Systems (FSS Code), clarifying the distribution of crew in public spaces for the calculation of stairways' width.
- To the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code), aligning the wheelhouse window fire-rating requirements in the IGC Code with those in SOLAS.
- To the International Code on the Enhanced Programme of Inspections during Surveys of Bulk Carriers and Oil Tankers, 2011 (2011 ESP Code).
- To the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and its related STCW Code, to include new mandatory minimum training requirements for masters and deck officers on ships operating in Polar

Waters; and an extension of emergency training for personnel on passenger ships.

Interim recommendations on the safe carriage of industrial personnel adopted

The MSC adopted Interim Recommendations on the safe carriage of more than 12 industrial personnel on board vessels engaged on international voyages. These are aimed at addressing the safe and efficient transfer of technicians at sea, such as those working in the growing offshore alternative energy sector.

Offshore industrial activities covered here would include the construction, maintenance, operation or servicing of offshore facilities related, but not limited, to exploration, the renewable or hydrocarbon energy sectors, aquaculture, ocean mining or similar activities.

Interim recommendations for carriage of liquefied hydrogen in bulk adopted

The MSC adopted interim recommendations for carriage of liquefied hydrogen in bulk, which have been developed as the International Gas Carrier (IGC) Code does not specify requirements for the carriage of liquefied hydrogen in bulk. This will include the provision of portable hydrogen detectors for each crew member working in the cargo area; selection of fire detectors and appropriate safety measures to prevent formation of an explosive mixture in the case of a leakage.

Addressing cargoes which may liquefy

The MSC approved draft amendments to the International Maritime Solid Bulk Cargoes Code (IMSBC Code) to emphasise the responsibility of the shipper for ensuring that a test to determine the transportable moisture limit (TML) of a solid bulk cargo.

Goal-based standards (GBS)

The MSC further developed proposed amendments to revise and update the GBS Verification Guidelines, based on the experience gained during the initial verification audits. A revised timetable and schedule of activities for the implementation of the GBS verification scheme was also agreed.

Navigation around offshore multiple structures

The MSC adopted, subject to subsequent confirmation by the IMO Assembly, amendments on a recommendation to Governments to take into account safety of navigation when multiple structures at sea, such as wind turbines, are being planned. The amendment would add a new paragraph in the general provisions on ships' routing on establishing multiple structures at sea. It recommends that Governments should take into account the impact multiple structures at sea, including but not limited to wind turbines, could have on the safety of navigation, including any radar interference.

Updated SafetyNET and NAVTEX manuals

The MSC approved amendments to update the Interna-

tional SafetyNET and the NAVTEX Manuals. The World Meteorological Organization (WMO), International Hydrographic Organization (IHO) and International Mobile Satellite Organization (IMSO) have contributed to the updating of the manuals, which will be issued as MSC circulars.

STCW Manila 2010 – transitional arrangements clarified

The MSC noted that the transitional arrangements for implementation of the 2010 Manila amendments to the STCW Convention and Code end on 1 January 2017.

However, there was concern that some Parties may not be in a position to issue STCW certificates in accordance with the requirements of the Convention by 1 January 2017. It was agreed that a practical and pragmatic approach should be taken during inspections, for a period of six months (ie until 1 July 2017), to allow flexibility in cases where seafarers are unable to provide certificates that were issued in compliance with the 2010 Manila Amendments.

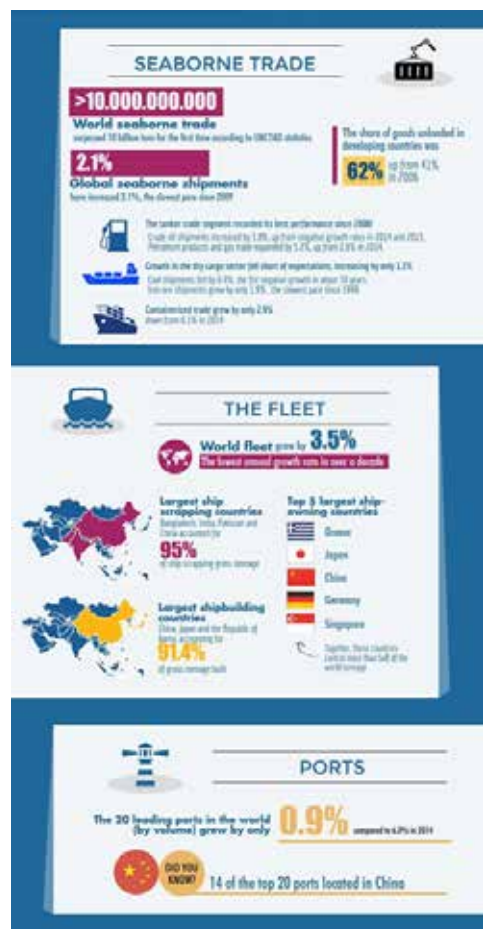
Navigational warnings – circular issued

The MSC approved a circular expressing grave concern over the reported launch of missiles by the Democratic People's Republic of Korea without due warnings.

More detailed notes can be found on our website at <http://www.ifsma.org/resources/MSC-97-REPORT.pdf>

UNCTAD Review of Maritime Transport 2016

The *Review of Maritime Transport* is an UNCTAD flagship publication, published annually since 1968.



Around 80% of the volume of international trade in goods is carried by sea, and the percentage is even higher for most developing countries. This document provides an analysis of structural and cyclical changes affecting seaborne trade, ports and shipping, as well as an extensive collection of statistical information.

The present edition, that published in 2016 reflecting on business in 2015, takes the view that the long-term growth pros-

pects for seaborne trade and maritime businesses are positive. There are ample opportunities for developing countries to generate income and employment and help promote foreign trade.

Over 118 pages of text sections concern: Developments in International Seaborne Trade; Structure, Ownership and Registration of the World Fleet; Freight Rates and Maritime Transport Costs; Ports and, to close, Legal Issues and Regulatory Developments.

The whole is supported by a list of tables, figures, boxes and references.

Explanatory notes and website links are given for what, in earlier editions, would have amounted to statistical annexes.

In 2015, estimated world seaborne trade volumes surpassed 10 billion tons – the first time in the records of UNCTAD. Shipments expanded by 2.1%, a pace notably slower than the historical average. The tanker trade segment recorded its best performance since 2008, while growth in the dry cargo sector, including bulk commodities and containerised trade in commodities, fell short of expectations.

While a slowdown in China is bad news for shipping, other countries have the potential to drive further growth. South-South trade is gaining momentum, and planned initiatives such as the One Belt, One Road Initiative and the Partnership for Quality Infrastructure, as well as the expanded Panama Canal and Suez Canal, all have the potential to affect seaborne trade, reshape world shipping networks and generate business opportunities.

The document (104 pages) can be read at:
http://unctad.org/en/PublicationsLibrary/rmt2016_en.pdf
or at: <http://tinyurl.com/hr63rrs>

Arctic Sea Ice and Warming Summers

Arctic sea ice, the vast sheath of frozen seawater floating on the Arctic Ocean and its neighbouring seas, has been hit with a double whammy over the past decades: as its extent shrunk, the oldest and thickest ice has either thinned or melted away, leaving the sea ice cap more vulnerable to the warming ocean and atmosphere.

To read the full article, together with diagrams and animations showing year by year changes, go to this NASA website: <http://tinyurl.com/h3l3e9o> atmosphere.

IFSMA AGA

Full details of the venue and dates have now been distributed to all members.

If you require information on this important event being held at MITAGS, Baltimore, USA, during April, please contact the office via email - hq@ifsma.org.