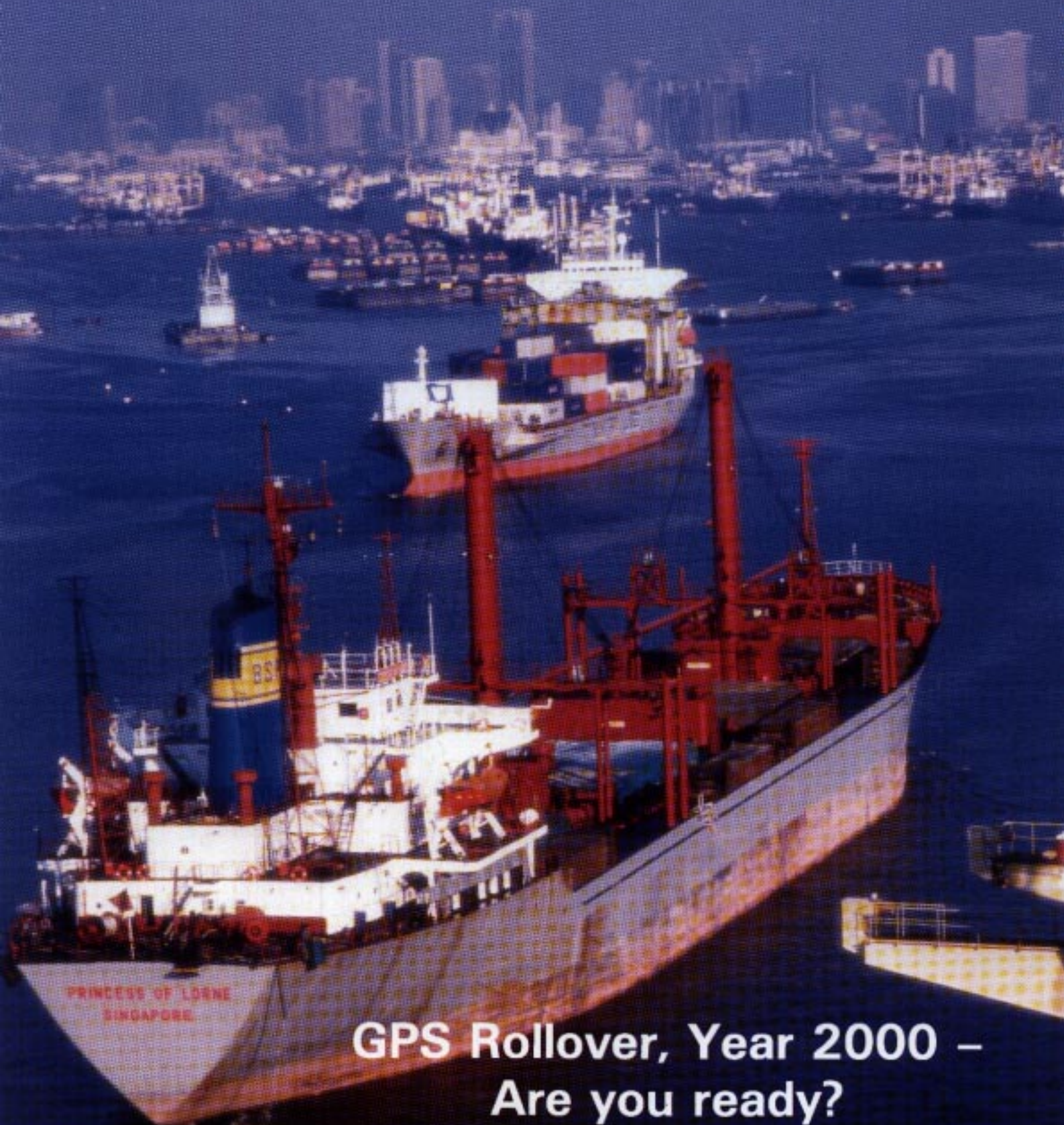

IMO NEWS



THE MAGAZINE OF THE INTERNATIONAL MARITIME ORGANIZATION

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**GPS Rollover, Year 2000 –
Are you ready?**

IMO appoints regional co-ordinators in Africa

IMO has appointed two regional co-ordinators in Africa, in the first stage of a pilot project to establish a modest field presence in selected developing regions, with priority to Africa.

Mr. John Paul Muindi, a World Maritime University graduate, has been appointed IMO Regional Co-ordinator for Eastern and Southern Africa sub-region. He will be based in Nairobi, Kenya. A Memorandum of Understanding between IMO and the Kenyan Government for the establishment of IMO Regional Presence for Technical Co-operation in Eastern and Southern Africa subregion was signed in Nairobi on 22 February 1999.

Mr. Ben Owusu-Mensah, also a graduate of the World Maritime University, has been appointed IMO Regional Co-ordinator for West and Central Africa (Anglophone) subregion and will be based in Accra, Ghana. A Memorandum of Understanding between IMO and the Ghanaian Government was signed on 7 May 1999.

The establishment of a regional presence, in partnership with the host States and United Nations Development Programme (UNDP) country offices, is intended to facilitate IMO's input into national and regional development policies and to provide field-level participation in the development and execution of IMO's Integrated Technical Co-operation Programme (ITCP).

Côte d'Ivoire has offered to host the IMO regional presence for West and Central Africa (Francophone) subregion and the Abidjan regional presence is expected to be established before the end of 1999.

Regional co-ordinators are contracted by IMO and their duties include identifying maritime needs and priorities and planning, co-ordinating and ensuring the delivery of IMO's programme of technical assistance in their respective regions.



Dr. Bonaya Godana, Kenya's Minister for Foreign Affairs (seated, facing camera, centre right) signs the Memorandum of Understanding between IMO and the Kenyan Government for the establishment of IMO Regional Presence for Technical Co-operation in Eastern and Southern Africa subregion with IMO's Director of Technical Co-operation, Mr. David Edwards (centre left, seated in blue chair) on 22 February 1999. Standing is Mr. Alex Chepsiror, Legal Officer, Kenyan Ministry of Foreign Affairs.



Mr. Ben Owusu-Mensah, IMO Regional Co-ordinator for West and Central Africa (Anglophone) subregion (left) and Mr. John Paul Muindi, IMO Regional Co-ordinator for Eastern and Southern Africa subregion (right) on a visit to IMO headquarters in London. They are pictured with Mr. Juvenal Shiundu, Programme Officer, Africa Section, IMO Technical Co-Operation Division (centre).

(continued on back page)

Front cover: Most people are already gearing up to resolve any potential problems resulting from the year 2000 (Y2K) "millenium bug", which may affect computer systems and any equipment with an embedded microchip. But another potential problem could have serious implications for navigation: the Global Positioning System (GPS) "end-of-week (EOW) rollover problem" on 21/22 August, 1999. The article on page 6 explains. (Photograph courtesy Port of Bangkok)

New bulk carrier regulations enter into force on 1 July 1999

A new chapter of the International Convention for the Safety of Life at Sea (SOLAS), 1974, on bulk carrier safety, enters into force on 1 July 1999. A number of other amendments to SOLAS also enter into force on the same day.

New chapter XII to SOLAS, “Additional Safety Measures for Bulk Carriers”

The regulations on bulk carrier safety were adopted at a conference held in November 1997, which was the culmination of several years work at IMO intended to address the rising numbers of bulk carriers being lost at sea – often with complete loss of crew on board – during the early 1990s.

The requirements for bulk carriers are included in a new chapter XII of SOLAS. They cover survivability and structural requirements for dry bulk carriers – which carry products such as iron ore, grains and coal – to prevent them from sinking if water enters the ship for any reason. Existing ships which do not comply with the appropriate requirements will have to be reinforced – or they may have to limit either the loading pattern of the cargoes they carry or move to carrying lighter cargoes, such as grain or timber.

The requirements arose from research by IMO Member States and industry organizations. A study into bulk carrier survivability carried out by the International Association of Classification Societies (IACS), at the request of IMO, found that if a ship is flooded in the forward hold, the bulkhead between the two foremost holds may not be able to withstand the pressure that results from the sloshing mixture of cargo and water, especially if the ship is loaded in alternate holds with high-density cargoes (such as iron ore). If the bulkhead between one hold and the next collapses, progressive flooding could rapidly occur throughout the length of the ship and the vessel would sink in a matter of minutes.

The IACS concluded that the most vulnerable areas are the bulkhead between numbers one and two holds at the forward end of the vessel and the

double bottom of the ship at this location. It proposed that particular attention should be paid to these areas during special surveys of ships and, where necessary, reinforcements should be carried out.

SOLAS chapter XII regulations

The regulations state that all new bulk carriers of 150 metres or more in length (built after 1 July 1999) carrying cargoes with a density of 1000 kg/m³ and above should have sufficient strength to withstand flooding of any one cargo hold, taking into account dynamic effects resulting from the presence of water in the hold and taking into account recommendations adopted by IMO.

For existing ships (built before 1 July 1999) carrying bulk cargoes with a density of 1780 kg/m³ and above, the transverse watertight bulkhead between the two foremost cargo holds and the double bottom of the foremost cargo hold should have sufficient strength to withstand flooding and the related dynamic effects in the foremost cargo hold.

Cargoes with a density of 1780 kg/m³ and above include iron ore, pig iron, steel, bauxite and cement. Less dense cargoes, but with a density of more than

1000 kg/m³, include grains such as wheat and rice, and timber.

Chapter XII allows surveyors to take into account restrictions on the cargo carried when considering the need for, and the extent of, strengthening of the transverse watertight bulkhead or double bottom. When restrictions on cargoes are imposed, the bulk carrier should be permanently marked with a solid triangle on its side shell.

The date of application of chapter XII to existing bulk carriers depends on their age. Bulk carriers which are 20 years old and over on 1 July 1999 will have to comply by the date of the first intermediate or periodical survey after that date, whichever is sooner. Bulk carriers aged 15–20 years must comply by the first periodical survey after 1 July 1999, but not later than 1 July 2002. Bulk carriers less than 15 years old must comply by the date of the first periodical survey after the ship reaches 15 years of age, but not later than the date on which the ship reaches 17 years of age.

Bulk carrier safety background

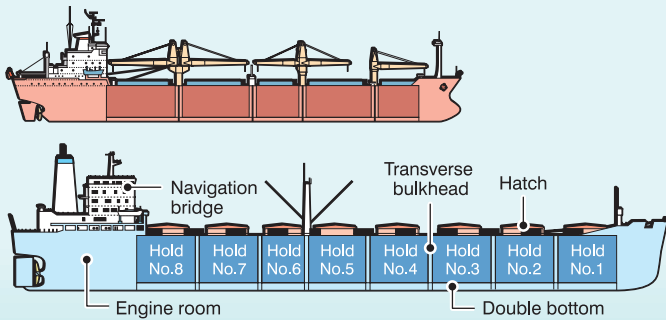
Modern bulk carriers, often described as the workhorses of maritime trade, can be traced back to the 1950s when shipyards began building ships designed



A bulk carrier at Fos, France. (Photograph by J.P. Jauffret, courtesy Port Autonome de Marseille)

Improving the safety of bulk carriers

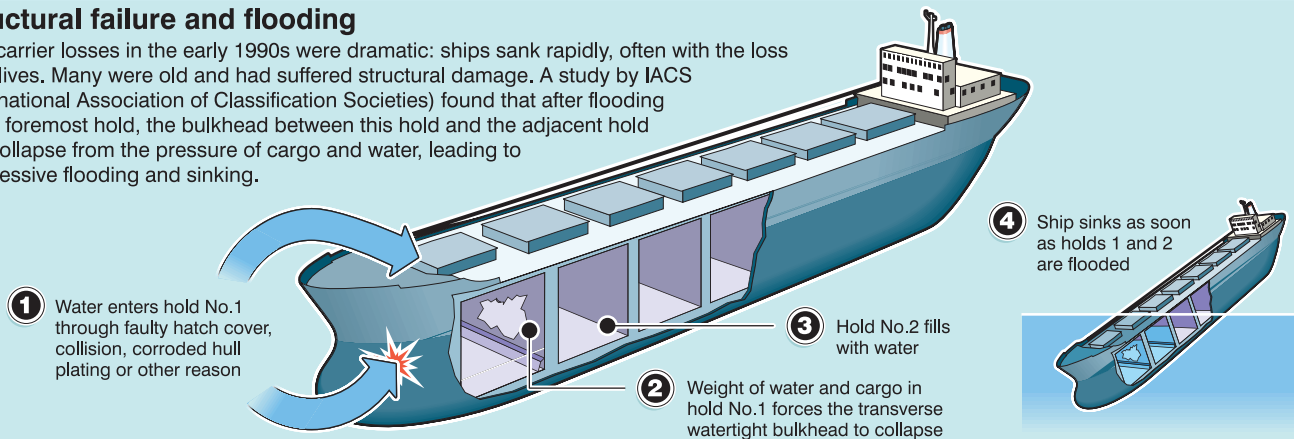
Modern bulk carriers, often described as the workhorses of the maritime trade, can be traced back to the 1950s when shipyards began building ships designed specifically for carrying non-packed commodities. Bulk carriers can be identified by the hatches above deck level which give access to the huge cargo holds below.



Number operating worldwide:	5,500 (approx)
Typical length:	180–275 metres
Typical deadweight:	33,000–150,000 tonnes
Number of cargo holds:	5–9
Principal cargoes:	Grains, coal, iron ore, bauxite, phosphate, nitrate
Total amount of all cargoes transported, 1996:	1,795 million tonnes
Number lost at sea, 1990 – May 1997:	99
Lives lost:	654

Structural failure and flooding

Bulk carrier losses in the early 1990s were dramatic: ships sank rapidly, often with the loss of all lives. Many were old and had suffered structural damage. A study by IACS (International Association of Classification Societies) found that after flooding in the foremost hold, the bulkhead between this hold and the adjacent hold can collapse from the pressure of cargo and water, leading to progressive flooding and sinking.



The dangers with two holds flooding

A study by the U.S. Maritime Administration (MARAD) found that a typical midsize bulk carrier should survive all one-hold flooding so long as the ship is not suffering from metal wastage and undetected cracks, but flooding of any two holds would have disastrous consequences.



Holds 1 & 2 or 2 & 3:
Ship sinks rapidly, no time for crew to abandon ship.



Holds 6 & 7: Submergence of the after deck and possible catastrophic down-flooding in the engine room.



Remaining holds: Sagging, which could cause structural failure, especially if the ship is poorly maintained.

Making bulk carriers safer

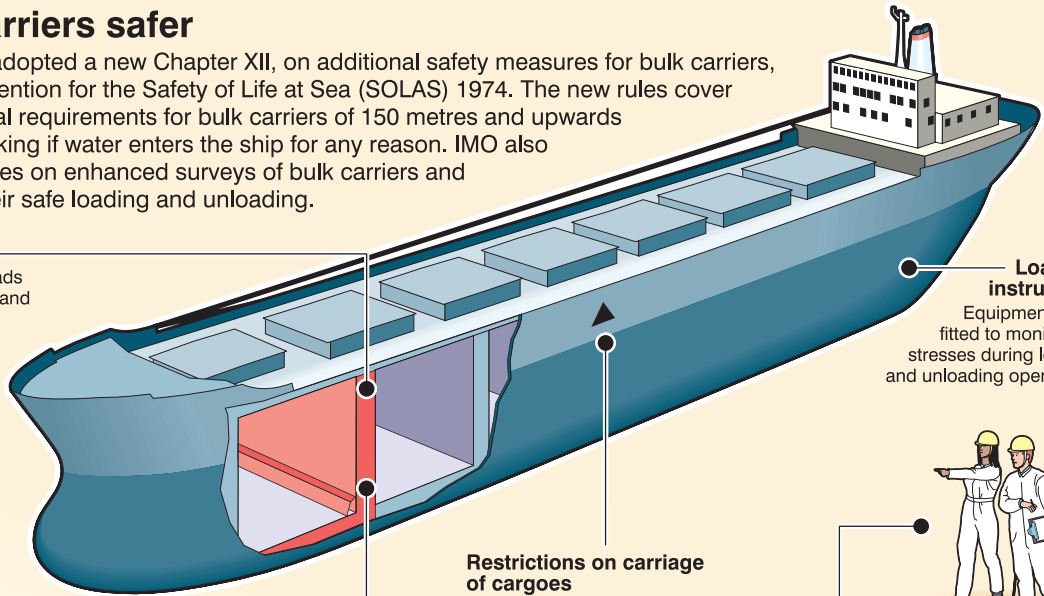
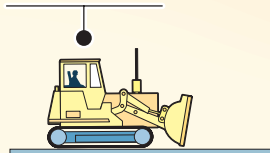
In November 1997 IMO adopted a new Chapter XII, on additional safety measures for bulk carriers, to the International Convention for the Safety of Life at Sea (SOLAS) 1974. The new rules cover survivability and structural requirements for bulk carriers of 150 metres and upwards to prevent them from sinking if water enters the ship for any reason. IMO also adopted revised guidelines on enhanced surveys of bulk carriers and a code of practice for their safe loading and unloading.

Stronger new ships

Increase the strength of bulkheads and the double bottom to withstand hold-flooded conditions.

Improving cargo handling practices

Conveyor belts (several kilometres long) often overload ships. Huge grabs (up to 36 tons), bulldozers and hydraulic hammers used for unloading can cause structural damage.



Existing ships

The bulkhead between holds 1 and 2 and the double bottom of hold 1 must be strengthened to withstand flooding in hold 1 unless loading restrictions are imposed.

Restrictions on carriage of cargoes

Existing bulk carriers which meet the new structural requirements by means of loading restrictions must be marked with a solid equilateral triangle on the hull at midships below the deck line.

Enhanced surveys

Enhanced programme of inspections to detect potential structural weakness and areas of corrosion.



GRAPHIC: LIZ GOULD

specifically for carrying non-packed commodities such as grains or ores.

IMO has been concerned with the safety of these ships since it first met in 1959. The 1960 SOLAS Convention – later replaced by SOLAS 1974 – included a chapter devoted to the carriage of grain, while a Code of Safe Practice for Solid Bulk Cargoes (BC Code) was adopted in 1965. Over the years, IMO has amended sections of the SOLAS Convention applicable to bulk carriers to keep it up to date, revised the BC Code and adopted the International Code for the Safe Carriage of Grain in Bulk (International Grain Code), which was subsequently made mandatory under SOLAS.

But a dramatic increase in losses of bulk carriers in the early 1990s raised alarm bells at IMO. Many of the ships that were involved suffered severe structural damage and sometimes literally broke in two, often with heavy loss of life. In 1990, 20 bulk carriers were lost with 94 fatalities, and 24 bulk carriers were lost in 1991 with 154 lives.

As a result, in 1991 the Assembly of IMO adopted an interim resolution, proposed by the Secretary-General, Mr. William A. O’Neil, to improve bulk carrier safety, concentrating on paying attention to the structural integrity and seaworthiness of ships and ensuring that the loading and carrying of cargo would not cause undue stresses. The casualty rate improved after this, but in 1994 was again causing concern. On the recommendation of Mr. O’Neil, IMO therefore established a correspondence group to consider the whole issue of bulk carrier safety and make proposals for changes in existing conventions concerning the structure and operation of bulk carriers.

Current work on bulk carrier safety

IMO is currently reviewing whether further measures will be needed to enhance bulk carrier safety, following the publication of the United Kingdom report into the sinking of the bulk carrier *Derbyshire* in 1980, with the loss of all on board.

The report was presented to the Maritime Safety Committee (MSC) in May 1998 by the United Kingdom and

contains further recommendations relating to the design and construction of bulk carriers. Issues under consideration by the MSC and its Sub-Committees include:

- .1 strength of hatch covers and coamings;
- .2 freeboard and bow height;
- .3 reserve buoyancy at fore end, including forecastles;
- .4 structural means to reduce loads on hatch covers and forward structure; and
- .5 foredeck and fore end access.

Vessel Traffic Services (VTS)

Regulation 8-2 of SOLAS chapter V (Safety of Navigation) on Vessel Traffic Services (VTS), adopted in June 1997, enters into force on 1 July 1999.

Vessel Traffic Services are traffic management systems, for example those used in busy straits.

The regulation sets out when VTS can be implemented. It says that they should be designed to contribute to the safety of life at sea, safety and efficiency of navigation and the protection of the marine environment, adjacent shore areas, worksites and offshore installations from possible adverse effects of maritime traffic.

Governments may establish VTS when, in their opinion, the volume of traffic or the degree of risk justifies such services, but no VTS should prejudice the “rights and duties of governments under international law” and a VTS may only be made mandatory in sea areas within a State’s territorial waters.

Stability requirements for passenger ships

In SOLAS chapter II-1, concerning subdivision and damage stability requirements, regulation 8.3 on “Special requirements for passenger ships, other than ro-ro passenger ships, carrying 400 persons or more” enters into force on 1 July 1999. The special requirements of the regulation, which was adopted in 1997, are aimed at ensuring that a ship carrying 400 persons or more can survive without capsizing with two main compartments flooded following damage.

Escape routes on ro-ro passenger ships

SOLAS regulation II-2/28.3 covers escape routes on ro-ro passenger ships constructed after 1 July 1999. It requires escape routes to be evaluated by an evacuation analysis early in the design process, aimed at identifying and eliminating congestion which may develop if a ship has to be evacuated. The analysis should also demonstrate that escape arrangements are sufficiently flexible to allow for the possibility that certain escape routes may not be available due to a casualty.

The regulation was adopted in November 1995 as part of a package of amendments adopted following the *Estonia* ferry disaster of September 1994.

Decision-support system for passenger ships

SOLAS regulation III/29 requires all passenger ships built before 1 July 1997 to provide a “decision-support system” for emergency management on the navigation bridge not later than the first periodical survey after 1 July 1999. (This regulation came into effect for new ships on 1 July 1997.) The decision-support system requires, as a minimum, a printed emergency plan or plans covering foreseeable emergency situations, including fire, damage to ship, pollution and unlawful acts.

This regulation was also adopted in November 1995 as part of a package of amendments adopted following the *Estonia* ferry disaster of September 1994.

Helicopter landing areas

Under the November 1995 SOLAS amendments which entered into force on 1 July 1997, regulation 28 of chapter III requires passenger ships of 130 metres in length and over built after 1 July 1999 to be fitted with a helicopter **landing** area.

However, the Maritime Safety Committee (MSC) is currently reviewing this requirement.

(Ro-ro passenger ships had to provide a helicopter **pick-up** area from 1 July 1997 or have one fitted not later than the first periodical survey after 1 July 1997.)

Gearing up for Y2K and the GPS rollover problem

The turn of the century is less than one year away and most people are already gearing up to resolve any potential problems resulting from the Year 2000 (Y2K) problem. But four months before the millennium, ship operators, owners and Administrations must address another potential problem which could have serious implications for navigation: the Global Positioning System (GPS) "end-of-week (EOW) rollover problem" on 21/22 August 1999.

The change from 1999 to 2000 might affect all computers and also any device with embedded microchips in which timing is used – either as a hardware timer unable to handle more than two digits for a year (00 to 99) or programmed to use that kind of time information.

The other key date is 21/22 August 1999, when the GPS may experience the "end-of-week (EOW) rollover problem". This stems from the fact that when GPS was developed it was given a range of 0 to 1023 weeks, beginning 6 January 1980. Week 1024 begins at 00:00:00 Sunday 22 August 1999, at which point some GPS receivers may not recognize the date.

This article explains the year 2000 and GPS rollover problems, and outlines the guidance available to the maritime industry and Administrations to address the issue.

IMO's advice and guidance

The Maritime Safety Committee, at its sixty-eighth session (28 May to 6 June 1997), approved MSC/Circ. 804, on Impact of the Year 2000 on software systems. The circular was drafted by the Sub-Committee on Radiocommunications and Search and Rescue (COMSAR), at its second session (27 to 31 January 1997), following a proposal by the United Kingdom to prepare a circular on the impact of the Year 2000 on software systems.

At its sixty-ninth session (11 to 20 May 1998), the MSC approved MSC/Circ. 868, on Addressing the Year 2000 problem, intended to amplify and expand on MSC/Circ. 804 to take account of the wider concerns on the potential failure of information technology systems prior to, on or after 1 January 2000. Problems to the proper functioning of important electronic devices, such as navigational receivers and control systems for the main engine plant of ships, were matters of primary concern.

In December 1998, the MSC, at its seventieth session (7 to 11 December 1998), approved MSC/Circ. 894, on Addressing the Year 2000 problem: Co-operation within mandatory ship reporting systems, following consideration of a submission by Indonesia, Malaysia and Singapore proposing amendments to the mandatory ship

reporting system "In the Straits of Malacca and Singapore" to include Year 2000 compliance information in the designator "Q" (relating to defects/damage/deficiencies/other limitations) in the format of the reporting messages that are required to be sent by ships to the coastal States concerned.

The Committee noted that there was no provision in the Guidelines and criteria for ship reporting systems (resolution MSC.43(64)) for incorporating temporary matters, but recommended that local notices to mariners be promulgated to request ships to report the status of their Year 2000 readiness.

Other organizations/ Administrations

A number of maritime Administrations and maritime industry organizations have initiated actions and issued guidance on how to deal with the Year 2000 problem and the GPS "rollover" at midnight 21/22 August 1999. Some examples are listed below:

- The Maritime and Coastguard Agency (MCA) in the United Kingdom has issued Marine Guidance Note MGN41(M+F) on Marine Electronic Systems and the Year 2000 Problem (it is also attached to IMO MSC/Circ. 868), containing information on embedded systems, the effect of Year 2000 non-compliance, the GPS problem and precautionary measures.
- The Australian Maritime Safety Authority (AMSA) has issued a Marine Notice 1/1998 on Management of Computer Systems, containing a brief description of the Year 2000 problem and bringing to the attention of shipmasters the actions AMSA is expecting them to take.
- The International Association of Classification Societies (IACS) has issued a press

Key dates that may cause problems

21/22 August 1999	GPS rollover
9 September 1999	9/9/99 may be a key figure in some systems, perhaps triggering a return to 0000
1 October 1999	01/10 may be a key figure in some systems
1 January 2000	Millennium changeover
29 February 2000	Systems need to be geared up for the leap year
1 March 2000	Related to the potential leap-year problem

release, dated 16 December 1998, on the IACS statement on Year 2000 compliance; it recommends steps to be included in a vessel owner's compliance programme and attaches document DISC PD2000-1:1998, on a definition of Year 2000 conformity requirements, issued by the British Standards Institution (BSI).

- Nippon Kaiji Kyokai (Class NK) in Japan has issued NK Technical Information Nos. 277, 278 and 279, providing background information on the Year 2000 and GPS week rollover problems and information on the results of survey questionnaires sent out to manufacturers, respectively.
- Lloyd's Register issued, in November 1998, Guidelines for Year 2000 Projects: A guide to solving the problems associated with ships and the millennium bug.
- The International Chamber of Shipping (ICS) has issued a number of circulars drawing attention to various issues associated with the Year 2000 problem and also containing an operations checklist for ships – contingency planning.
- The International Group of P&I Clubs has held a series of conferences on the Year 2000 problem and has developed the Ship2000 Toolkit.
- The Norwegian Maritime Y2K Committee, representing the Norwegian Shipowners' Association, Det Norske Veritas, the Central Union of Marine Underwriters, Storebrand, the Federation of Norwegian Engineering Industries and the Maritime Forum, has issued the Millennium Project Guide for the Shipping Industry. This project guide focuses on the technical systems on ships; it contains guidelines on how to structure the process and provides lists of shipborne equipment and systems.
- The Rotterdam Municipal Port Management announced on 26 January 1999 that it wanted shipping lines and charterers to sign a declaration that their seagoing ships using the port during the turn of the century are millennium-ready. They would be

The Year 2000 problem

The Year 2000 problem, or Y2K, is the term used to describe the potential failure of information technology systems prior to, on or after 1 January 2000. The potential exists because of the widespread practice of using two digits, not four, to represent the year in computer databases, software applications and hardware chips. Difficulty will arise in the Y2K when that year is "00" and machines will be unable to differentiate it from the year 1900. As a result, microchip-based systems may function incorrectly, or not at all.

The problem affects computers in the office and throughout each ship in a wide variety of devices with embedded microchips. The issue may be as simple as a timer or a GPS receiver or as sophisticated as the monitoring and control system for the main engine plant. All parties must assess the extent of the problem in their operations, prioritize affected units/systems and decide on the correct action. Depending on the system, equipment or software involved, the correct action may be to repair, replace or scrap.

Education of the nature and extent of the problem is critical in correcting it. The problem does not reside merely in mainframe or personal computer systems. It also affects programs embedded in any microchip-based system. One of the first steps in addressing the problem is to conduct an inventory of equipment that may be affected. It should be ensured that all new software and hardware are Year 2000 compliant. Failure to identify and correct systems that could be affected by the Y2K problem could result in a more serious safety problem, such as unexpected shutdown of the main engines and ship's navigation systems resulting in a collision or grounding of the ship.

Ref: MSC Circ. 868.

The GPS end-of-week (EOW) rollover problem

The Global Positioning System (GPS) Standard Positioning Service (SPS) is a space-based three-dimensional positioning, velocity and time system which is operated by the United States Air Force.

The atomic clocks in the GPS satellites were set with base dates in January 1980 and the indicator for the week was set at a maximum of 1023. This is because GPS receivers use a 10-bit field to store the week number ($2^{10} = 1024$). On 21/22 August 1999, the atomic clocks will reset themselves to week 0. GPS receivers, navigation equipment and timekeeping equipment which has not been properly programmed to deal with this change may experience problems when the week counter is reset – but it is not clear how serious these problems will be.

More recent equipment (post-1994) is more likely to be pre-programmed to deal with the potential problem than older equipment.

If the software in the GPS receiver is not programmed to deal with the rollover problem, then the receiver will internally interpret the new week 0 as 6 January 1980. It might then stop tracking any satellite and the systems might not perform correctly.

GPS receivers are used for navigation on ships and also in communications systems to synchronize the timing or the frequency of systems and in timekeeping equipment where accuracy of timing is important.

Some Internet websites

Among the many Internet websites addressing Year 2000/GPS rollover, the following may be of particular interest to the maritime community:

http://www.imo.org/imo/y2k/y2kgps2.htm	IMO (Year 2000)
http://www.uscg.mil/hq/g-m/y2k.htm	United States Coast Guard (Year 2000)
http://www.navcen.uscg.mil/gps/geninfo/y2k/gpsweek.htm	United States Coast Guard (GPS)
http://www.amsa.gov.au/ns/dgps/eow.htm	Australian Maritime Safety Authority (GPS)
http://www.ship2000.com	International Chamber of Shipping and others (Year 2000. Contains many links to other internet websites)
http://www.inmarsat.org/year2000/	Inmarsat
http://www.sperry-marine.com/	Litton Marine Systems
http://www.classnk.or.jp	Nippon Kaiji Kyokai (Class NK)

asked to fill in a questionnaire concerning three specific aspects: the nautical equipment of the ship, the cargo facilities and the equipment related to the safety of the ship, for this purpose. The term "millennium-ready" means, in this context, that it has been ascertained that the equipment contains no electronic components or that the shipping line has declared that the equipment will cause no date-related problems, and that a contingency plan is available in the unlikely event of the equipment nevertheless causing date problems. The Port Management would, in principle, carry out random checks on 10% of the forms received to see whether they have been filled in truthfully.

Upon the initiative of the United States Coast Guard and the United Kingdom Maritime and Coastguard Agency, a meeting was held at the Headquarters of IMO on 3 and 4 March 1999 to consider issues relating to the Year 2000 (Y2K) problem, to which representatives of non-governmental industry organizations were invited. The meeting agreed to two documents: "The Year 2000 Code of Good Practice" and "Key Elements of Y2K Contingency Plans for Ships, Ports and Terminals". The documents have been circulated by IMO (Circular Letter No. 2121).

Ships and ports alike must be sure that all systems which may experience problems are geared up for the crucial dates in 1999 and 2000. (Photograph courtesy Port of Bilbao)

Harmonized system of ship survey and certification to enter into force in 2000

A harmonized system of survey and certification covering international shipping regulations will enter into force on 3 February 2000.

The system will cover survey and certification requirements of the International Convention for the Safety of Life at Sea (SOLAS), 1974, the International Convention on Load Lines (LL), 1966 and the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78), as well as the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code), the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (BCH Code) and the International Gas Carrier (IGC) Code.

All of these instruments require the issuing of certificates to show that requirements have been met, and this has to be done by means of a survey which can involve the ship being out of service for several days. The harmonized system will alleviate the problems caused by survey dates and intervals between surveys which do not coincide, so that a ship should no longer have to go into port or repair yard for a survey required by one convention shortly after doing the same thing in connection with another instrument.

Harmonized system adopted in 1988

The harmonized system of survey and certification for the Load Lines and SOLAS Conventions was adopted by IMO at an International Conference on the Harmonized System of Survey and Certification held in 1988 – which itself had its origins in the 1978 Conference on Tanker Safety and Pollution Prevention which recognized the difficulties caused by the survey and certification requirements of SOLAS, the Load Lines Convention and MARPOL 73/78. The 1978 Conference called upon IMO to develop a harmonized system which would enable the surveys to be carried out at the same time.

The 1988 Conference adopted protocols to the SOLAS and Load Lines Conventions to introduce the harmonized system. Both Conventions required explicit acceptance of the 1988 Protocols by a specified number of States – 15 States with a combined merchant shipping fleet of not less than 50% of world merchant shipping tonnage – for the system to enter into force.

The conditions for entry into force of the 1988 SOLAS and Load Lines Protocols were met on 2 February 1999, when the Bahamas deposited instruments of accession to both instruments with IMO. Malta also recently acceded to the 1988 Protocols. Both Protocols each have 32 States Parties. The Load Lines Protocol has 32 States Parties, with 54.29% of world merchant shipping tonnage. The 1988 SOLAS Protocol has 32 States Parties, with 54.31% of world merchant shipping tonnage.

In terms of MARPOL 73/78, the Convention allowed for amendments to the certification and survey requirements to be accepted by a procedure known as “tacit acceptance”, meaning that amendments enter into force on a specified date unless sufficient objections are received. As a result, MARPOL 73/78 was amended on 16 March 1990 to introduce the harmonized

system of survey and certification, with the proviso that the amendments enter into force at the same time as the entry-into-force date of the 1988 SOLAS Protocol and the 1988 Load Lines Protocol.

The harmonized system

In practice, many Administrations and classification societies already operate a form of harmonized survey and certification. Moreover, a resolution adopted by the IMO Assembly in 1991, and amended in 1993 (resolution A.718(17), as modified by resolution A.745(18)), allowed for Governments which had ratified the SOLAS and LL 1988 Protocols to implement the harmonized system ahead of the entry-into-force date of the Protocols.

The harmonized system provides for:

- a one-year standard interval between surveys, based on initial, annual, intermediate, periodical and renewal surveys as appropriate;
- a scheme for providing the necessary flexibility for the execution of each survey, with the provision that the renewal survey may be completed within three months before the expiry date of the existing certificate with no loss of its period of validity;

Types of survey

Initial survey – A complete inspection of all items relating to the particular certificate before the ship is put into service to ensure they are in a satisfactory condition and fit for the service for which the ship is intended.

Periodical survey – Inspection of the items relating to the particular certificate to ensure that they are in a satisfactory condition and fit for the service for which the ship is intended.

Renewal survey – As per periodical survey, but leads to the issue of a new certificate.

Intermediate survey – Inspection of specified items.

Annual survey – General inspection of the items relating to the particular certificate to ensure that they have been maintained and remain satisfactory for the service for which the ship is intended.

Additional survey – Inspection, either general or partial according to the circumstances, to be made after a repair resulting from casualty investigations or whenever any important repairs or renewals are made.

- . a maximum period of validity of five years for all certificates for cargo ships;
- . a maximum period of validity of 12 months for the Passenger Ship Safety Certificate;
- . a system for the extension of certificates limited to three months to enable a ship to complete its voyage (or one month for ships engaged on short voyages);
- . when an extension has been granted, the period of validity of the new certificate is to start from the expiry date of the existing certificate before its extension.

The main changes to the SOLAS and Load Lines Conventions are that annual inspections have been made mandatory for cargo ships and unscheduled inspections have been discontinued. Other changes refer to survey intervals and requirements.

In practice, many flag States have already implemented a harmonized system of surveys and certification.

Tacit acceptance in LL Convention

The Load Lines Protocol will also introduce the "tacit acceptance" amendment procedure into the Load Lines Convention. At present, amendments enter into force after they have been positively accepted by two thirds of Parties, but the procedure has proved to be so slow in practice that none of the amendments adopted to the Convention has ever entered into force.

Under tacit acceptance, amendments enter into force on a date chosen at the time of adoption, unless they are rejected by one third of Parties or by Parties the combined merchant fleets of which represent 50% of gross tonnage of all the world's merchant fleets.

The tacit acceptance procedure will enable changes to the Convention, as modified by the Protocol, to enter into force within two years (or less, in certain cases). This is important because the Convention is currently being revised by IMO. Further changes are also expected to be made affecting bulk carriers as a result of a report published last year on the sinking of the bulk carrier Derbyshire in September 1980 with the loss of more than 40 lives. This was presented to the Maritime Safety Committee in May 1998 by the United Kingdom and contains further recommendations relating to the design and construction of

Load Lines on the side of a ship. The 1966 Load Lines Convention, which regulates the form of the marks and where they are placed, is currently being revised.

bulk carriers. The matters to be considered include:

- .1 strength of hatch covers and coamings;
- .2 freeboard and bow height;
- .3 reserve buoyancy at fore end, including forecastles;
- .4 structural means to reduce loads on hatch covers and forward structure; and
- .5 foredeck and fore end access.

These issues will be considered in the context of the ongoing review of the 1966 Load Lines Convention.

The Sub-Committee on Stability and Load Lines and on Fishing Vessels Safety (SLF) agreed at its recent 42nd session (8±12 February 1999) to estab-

lish a correspondence group to prepare a draft text of new amendments to the 1966 LL Convention, as well as to look at what action may be needed as regards bulk carrier safety and a number of other issues. The Sub-Committee agreed that it has been clearly demonstrated that current LL Convention standards may be inadequate with respect to wave loads and permissible strengths of hatch covers for bulk carriers and other ship types.

The correspondence group will prepare a report for submission to the next Sub-Committee session, scheduled for September 2000, for further consideration.

List of certificates required on board ship relating to the harmonized system of survey and certification (some depend on the type of ship)

- Passenger Ship Safety Certificate, including Record of Equipment
- Cargo Ship Safety Construction Certificate
- Cargo Ship Safety Equipment Certificate, including Record of Equipment
- Cargo Ship Safety Radio Certificate, including Record of Equipment
- Cargo Ship Safety Certificate, including Record of Equipment
- International Load Line Certificate
- International Load Line Exemption Certificate
- International Oil Pollution Prevention Certificate
- International Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk
- International Certificate of Fitness for the Carriage of Liquefied Gases in Bulk
- Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk
- International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk

Combating piracy and armed robbery against ships – call for international code

Governments need to intensify their efforts to combat piracy and armed robbery against ships, and IMO should consider developing an international code for the investigation of piracy and armed robbery against ships and recommending an appropriate punishment for the crime.

These were the conclusions reached at the first of a series of regional seminars, organized by IMO, to discuss the prevention and suppression of piracy and armed robbery against ships.

The most recent seminar and workshop took place in Singapore, for the South-East Asia region, in February 1999. In October 1998, a seminar and workshop on piracy and armed robbery against ships for the Latin American and Wider Caribbean region was conducted in Brasilia.

At both seminars, participating States agreed that piracy and armed robbery against ships represent a serious and growing problem and may pose a threat to the safety of life at sea and the marine environment.

A third regional seminar and workshop is being planned for the West African region for the second half of 1999; and, subject to the availability of funds, a regional seminar and workshop for the Indian Ocean region is envisaged during the year.

Proposed international code

The Brasilia and Singapore seminars adopted similar resolutions calling for IMO's Maritime Safety Committee (MSC) – which next meets for its 71st session 19–28 May 1999 – to recommend that the IMO Legal Committee consider developing an international code for the investigation of piracy and armed robbery against ships and recommending an appropriate punishment for the crime.

The resolutions note that the fight against piracy and armed robbery against ships is, in some cases, hampered by the absence of effective procedures in some countries for investigating reported cases of piracy committed on the high seas.

In other cases, where arrests have been made, some countries do not have in place the legislative framework necessary to adequately punish criminals convicted of piracy. There is also a need to harmonize, at an international level, procedures for exercising jurisdiction for investigating reported cases of piracy and armed robbery against ships and the punishment or extradition of suspects of such crimes.

Review of piracy circulars

The seminars reviewed circulars issued by IMO aimed at dealing with piracy and armed robbery against ships, which were adopted in 1993, and proposed changes to update the circulars and make the guidelines more comprehensive. These proposed changes will be put forward to the MSC. The circulars concerned are:

- MSC/Circ.622: Recommendations to Governments for combating piracy and armed robbery against ships, which analyses the types of attacks encountered by ships in different parts of the world and suggests possible counter-measures that could be employed by Rescue Co-ordination Centres and security forces.
- MSC/Circ.623: Guidance to shipowners and ship operators, shipmasters and crews on preventing and suppressing acts of piracy and armed robbery against ships, which contains advice on measures that could be taken on board to prevent attacks or, when they occur, to minimize the danger to the crew and ship.

Piracy missions

In addition to the piracy seminars, IMO has organized missions of experts to certain countries for the purpose of increasing awareness of the problem of piracy and armed robbery against ships, impressing on those countries the need for action and also motivating political will to act at national and regional levels.

The first mission took place in October 1998 when the IMO team,

consisting of representatives of the Governments of Australia, the United Kingdom and the United States, observers from the International Chamber of Shipping and International Shipping Federation (ICS/ISF) and the International Transport Workers' Federation (ITF/ICFTU) and IMO staff members, visited Manila, Kuala Lumpur and Jakarta.

A similar mission was undertaken to the ports of Santos and Rio de Janeiro in Brazil in October 1998.

A third mission, followed by a regional seminar and workshop, is scheduled to take place in West Africa in the second half of 1999.

Piracy statistics

The number of acts of piracy and armed robbery against ships reported to IMO in 1998 was 210, a decrease of 42 (17%) over the figure for 1997.

The areas most affected in 1998 (i.e., five incidents reported or more) were the Far East, in particular the South China Sea and the Malacca Strait, South America and the Caribbean, the Indian Ocean and West and East Africa.

Compared to 1997, the number of incidents reported to have occurred decreased from 8 to 6 in the Malacca Strait, from 101 to 94 in the South China Sea, from 45 to 38 in South America and the Caribbean, from 41 to 25 in the Indian Ocean, from 11 to 2 in the Mediterranean and Black Seas and from 30 to 22 in West Africa, but increased from 11 to 19 in East Africa.

Most of the attacks world-wide were reported in territorial waters while the ships were at anchor or berthed. In many of the reports received, the crews were violently attacked by groups of one to five people carrying guns.

A total of 51 crew members of the ships involved were killed and 31 wounded during the reported incidents. On two occasions, pirates used false distress signals to deceive their victims.

The total number of incidents of piracy and armed robbery against ships, reported to have occurred from 1984 to the end of February 1999, was 1,395.

Amendments to make IMDG Code mandatory agreed

The Sub-Committee agreed on procedures to make the International Maritime Dangerous Goods (IMDG) Code – or certain parts of it – mandatory. The meeting agreed draft amendments to make the Code mandatory under the International Convention for the Safety of Life at Sea (SOLAS) chapter VII (Carriage of Dangerous Goods) and the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78), Annex III (Regulations for the Prevention of Pollution by Harmful Substances in Packaged Form).

The IMDG Code was originally adopted by the fourth IMO Assembly in 1965. Under SOLAS chapter VII, the International Bulk Chemical Code (IBC Code) and the International Gas Carrier Code (IGC Code) are mandatory, and are referred to in the regulations of the chapter, but the IMDG Code is only referred to in a footnote.

In MARPOL Annex III “Regulations for the Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form”, the IMDG Code is referred to, but is not mandatory.

The draft amendments to SOLAS and MARPOL will be put to the Maritime Safety Committee (MSC) in May 1999 and to the Marine Environment Protection Committee (MEPC) in June/July 1999 for approval. The aim is for the amendments to be adopted in time to make the IMDG Code mandatory by 1 January 2002 at the earliest. There is still some debate as to which sections should be mandatory and which should remain as recommendations.

Reformatting of IMDG Code

The Sub-Committee reviewed progress in the development of “Amendment 30” to the IMDG Code. Amendment 30 involves the complete reformatting of the IMDG Code, with the aim of making it more user-friendly and understandable. The proposed text of the reformatted IMDG Code includes seven sections:

- 1 General Provisions and Definitions (Part 1);
- 2 Classification (Part 2);
- 3 Dangerous Goods List (DGL) and Limited Quantities Exceptions (Part 3);

- 4 Use of Packagings, Intermediate Bulk Containers and Tanks (Part 4);
- 5 Consignment Procedures (Part 5);
- 6 Construction and Testing of Packagings, Intermediate Bulk Containers (IBCs), Portable Tanks and Road Tank Vehicles (Part 6); and
- 7 Requirements Concerning Transport Operations (Part 7).

The DSC Editorial and Technical Group has been working on developing the revised and reformatted IMDG Code, but several sections still need to be finalized before they can be approved and adopted by the MSC. The Sub-Committee proposed that the finalized draft could be approved by the next session of the Sub-Committee, DSC 5, in February 2000, and the finalized version be adopted by the MSC’s 72nd session in May 2000. Amendment 30 (the reformatted IMDG Code) could then enter into force on 1 January 2001, with a 12-month implementation period ending 31 December 2001 – after which date the Code is expected to become mandatory.

Draft circular on bulk cargo density agreed

The Sub-Committee agreed, for approval by MSC 71 in May 1999, a draft MSC circular on uniform method of measurement of the density of bulk cargoes, which aims to provide a uniform method of measurement of the density of bulk cargoes in compliance with the requirements contained in SOLAS chapter XII (Bulk Carrier Safety) which was adopted in November 1997 and enters into force on 1 July 1999.

Regulation XII/10 states that “Prior to loading bulk cargo on a bulk carrier, the shipper shall declare the density of the cargo” and requires (as interpreted by resolution MSC.79(70)) that, for specified bulk carriers, “unless such bulk carriers comply with all the relevant requirements of this chapter applicable to the carriage of solid bulk cargoes having a density of 1780 kg/m^3 and above, any cargo declared to have a density within the range 1250 kg/m^3 to 1780 kg/m^3 shall have its density verified by an accredited testing organization.”

Review of the BC Code

The Sub-Committee began work on a complete revision of the Code of Safe Practice for Solid Bulk Cargoes (BC Code) and will continue the work inter-sessionally, including consideration of:

- amendments to the technical names of the materials used in appendices A, B and C;
- development of new procedures for evaluating liquefaction of solid bulk materials; and
- adequacy of ventilation requirements for ships carrying dangerous goods in SOLAS chapter II-2 (Construction – Fire protection, fire detection and fire extinction)

vis-à-vis the provisions of the BC Code.

The BC Code was first adopted in 1965 and its primary aim is to promote safe stowage and shipment by:

- (1) highlighting the dangers associated with the shipment of certain types of bulk cargoes;
- (2) giving guidance on the procedures to be adopted when the shipment of bulk cargoes is contemplated;
- (3) listing typical materials currently shipped in bulk, together with advice on their properties, handling, etc.; and
- (4) describing test procedures to be employed to determine various characteristics of the materials to be carried.

The BC Code deals with three basic types of cargoes:

- those cargoes which may liquefy (appendix A);
- materials possessing chemical hazards (appendix B); and
- other materials not falling within these two categories (appendix C).

Mandatory application of the INF Code

The Sub-Committee finalized amendments to the Code for the Safe Carriage of Irradiated Nuclear Fuel, Plutonium and High-Level Radioactive Wastes in Flasks on board Ships (INF Code) aiming at making it mandatory as of 1 January 2001. The amendments, together with proposed amendments to SOLAS chapter VII, will be put forward for adoption by the MSC at its 71st session in May 1999.

Anti-fouling systems – moving towards the non-toxic solution

Ships travel faster through water and consume less fuel when their hulls are clean and smooth – free from fouling organisms, such as barnacles, algae or molluscs. In the early days of sailing ships, lime and later arsenical and mercurial compounds and the pesticide DDT were used to coat ships' hulls to act as anti-fouling systems, and by the 1970s most ships' hulls were coated with paints containing organotins, in particular the organotin compound tributyltin (TBT).

Tributyltin – used as a fungicide, bactericide, insecticide and wood preservative – is known to be harmful to a range of aquatic organisms, including microalgae, molluscs and crustaceans, fish and some invertebrates.

As a biocide in anti-fouling paint, it proved extremely effective at keeping the hulls of ships and boats smooth and clean. And when it was introduced into anti-fouling paints, it was considered less harmful than the biocides that were used in anti-fouling systems at the time: such as DDT and arsenic.

As a biocide, TBT needed to be toxic to be effective in killing off the organisms that would attach to the

ship's hull. The main problem was its persistence in the marine environment.

As TBT began to be widely used in anti-fouling paints, scientists began to find increasingly high concentrations of TBT in areas with high concentrations of boats and ships, such as marinas, ports and harbours. In the open seas and oceanic waters, TBT contamination was seen as less of a problem, although later studies showed evidence of accumulation of TBT in fish and mammals.

In the 1970s and 1980s, high concentrations of TBT in shellfish on the coast of France caused the collapse of commercial shell fisheries in at least one area, and this prompted many States to act and enforce some restrictions on the use of TBT in anti-fouling paints. France prohibited the use of TBT-based paints on vessels less than 25 metres in length in 1982 and other countries followed suit, including Japan, which imposed strict regulations on the use of TBT in anti-fouling paints in 1990 and prohibited the production of such paints in 1997.

In 1988, the problem was brought to the attention of the Marine Environment Protection Committee (MEPC).



Anti-fouling paint is applied to a ship's hull. (Photograph courtesy Hempel's Marine Paints)

As a result, IMO in 1990 adopted resolution MEPC.46(30) "Measures to Control Potential Adverse Impacts Associated with Use of Tributyl Tin Compounds in Anti-Fouling Paints", recommending governments to adopt measures to eliminate anti-fouling paints containing TBT.

The adoption of such measures by some countries proved effective: in areas where a ban on TBT-based anti-fouling paints was imposed on smaller vessels, there was evidence of a decline in TBT contamination, including recovery from abnormal shell growth in oysters and a decline in imposex in dogwhelks.

From 1990 onwards, the MEPC was presented with TBT monitoring study results which reconfirmed the toxicity of TBT compounds to marine organisms. The Committee was also pre-



Thick fouling of barnacles, mussels and other shells on a ship's hull. The fouling must be removed by handscraping, followed by sweeping or blast cleaning where necessary. (Photograph courtesy Jotun Paints)

sented with information on existing alternative anti-fouling systems, including their effectiveness and the risk posed to the aquatic environment by these systems.

The MEPC is now working towards adopting mandatory regulations to phase out and prohibit the use of organotin compounds acting as biocides in anti-fouling systems early in the 21st century.

Fouling – the problem

Fouling is an unwanted growth of biological material – such as barnacles and algae – on a surface immersed in water. Vessel bottoms not protected by anti-fouling systems may gather 150 kg of fouling per square metre in less than six months of being at sea. On a Very Large Crude Carrier with an underwater area of 40,000 m², this would add up to 6,000 tonnes of fouling. Just a small amount of fouling can lead to an increase of fuel consumption of up to 40%, and possibly as much as 50%, since the resistance to movement will be increased. A clean ship can sail faster and with less energy.

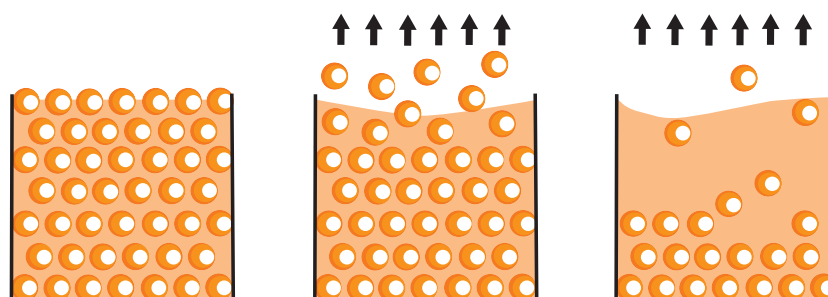
Development of anti-fouling systems containing TBT

During the 1960s the chemicals industry developed efficacious and cost-effective anti-fouling paints using metallic compounds, in particular the organotin compound tributyltin (TBT). By the 1970s, most seagoing vessels had TBT painted on their hulls.

With the early organotin-based anti-fouling paints, the active ingredients were dispersed in the resinous matrix – the “paint” – from which they “leached” into the seawater, killing barnacles and other marine life that had attached to the ship. But the release rate for the biocide in these “free association” paints was uncontrolled and tended to be rapid initially, with the effect wearing off in 18 to 24 months as the biocide leached out of the paint.

A particular breakthrough in anti-fouling paints came in the late 1960s, with the development of so-called self-polishing paints, in which the organotin compounds are chemically bonded to the polymer base. The leaching rate of these paints is controlled because the biocide is released when seawater

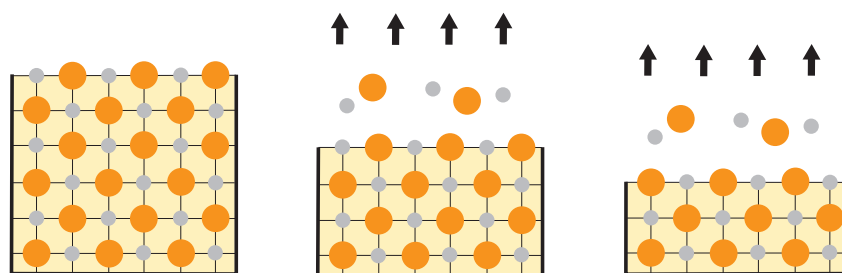
Free association paint



● BIOCIDES (DISPERSED IN A RESINOUS MATRIX)

Biocide leaches freely from resinous matrix. Initial release is rapid, subsequent release declines, so anti-fouling performance of paint diminishes over time. Source: European Chemical Industry Council (CEFIC).

Self-polishing copolymer system



● TBT ● COPOLYMER SYSTEM

Seawater hydrolyses the TBT–copolymer bond and the TBT biocide and copolymer resin are slowly released at a controlled rate. Uniform anti-fouling performance is achieved throughout the lifetime of the paint. Source: CEFIC.

reacts with the surface layer of the paint. Once the surface layer is worn off, the reaction to release the biocide begins again with the next layer. In this way, the leaching rate is the same throughout the life of the paint – and it became possible for ships to go up to 60 months without repainting.

Naturally, the self-polishing paints containing TBT were – and continue to be – a huge success with the shipping industry.

But it soon became clear there was a price to pay for the efficient self-polishing anti-fouling paints contain-

ing TBT. Environmental studies began to provide evidence that organotin compounds persist in the water and in sediments, killing sealife other than that attached to the hulls of ships and possibly entering the food chain. Specifically, TBT was shown to cause shell deformations in oysters; sex changes (imposex) in whelks; and immune response, neurotoxic and genetic affects in other marine species.

The 1990 resolution MEPC.46(30) “Measures to Control Potential Adverse Impacts Associated with Use of Tributyl Tin Compounds in Anti-

Fouling Paints” recommends that Governments adopt measures to eliminate the use of anti-fouling paint containing TBT on non-aluminium-hulled vessels of less than 25 metres in length and eliminate the use of anti-fouling paints with an average leaching rate of more than 4 micrograms of TBT per square centimetre per day.

These recommendations were intended to be interim measures until IMO could consider a possible total prohibition of TBT compounds in anti-fouling paints for ships.

The MEPC in 1996, at its 38th session, established a correspondence group to look at the issues involved. The main conclusions were reported back to the Committee and it was agreed to establish a working group to look at the issue. At its 42nd session, in November 1998, the MEPC approved a draft Assembly resolution which includes a proposed deadline of 2008 for the complete prohibition on the presence of organotin compounds acting as biocides in anti-fouling systems on ships.

The draft resolution, developed by the working group which met during MEPC 42, is intended to be submitted to the 21st IMO Assembly, scheduled for November 1999.



A self-polishing anti-fouling system has been applied to this ship and the polishing pattern that appears when the ship has been sailing for a while can be seen. When applied, all coats appear in red shades. When the outer coat has been polished away and the underlying coat is exposed to seawater it changes to a whitish shade. This allows for monitoring of polishing and performance. The patterns on the hull are the result of overlapping zones arising from the movement of the applicator's hand with the paint gun. (Hempel's Marine Paints)

Alternative systems

Alternatives to organotin-based systems include copper-based coatings and silicon-based systems, which make the surface of the ship slippery so that sealife will be easily washed off as the ship moves through water. Further

development of alternative anti-fouling systems is being carried out. Underwater cleaning systems avoid the ship having to be put into dry dock for ridding the hull of sealife, while ultrasonic or electrolytic devices may also work to rid the ship of foulants.

Copper-based anti-fouling paints – Already exist and less toxic than TBT in aquatic environment. Only effective against marine fauna – to combat weed growth, herbicides are added which may pose new threats to the environment.

Tin-free anti-fouling paints – Have proved adequate on passenger ferries in North Sea. Work best on vessels that go to dry dock every three and a half years or more frequently because some fouling does occur. Works on special-purpose vessels such as tugs, pilot boats, lifeboats, research vessels if these are used at least 100 days per year and go into dry dock at least every three years. When use is not as frequent, they run more risk of fouling and will need dry-docking every year.

Non-stick coatings – Contain no biocide but have extremely slippery surface – preventing fouling occurring and making it easier to clean when it does. Most suitable for vessels with minimum speed of 30 knots. Damage to coating is difficult to repair. Light fouling occurs but is easily removed



Green algae coats a ship. Just a small amount of fouling can cause a significant reduction in speed and increased fuel consumption. (Jotun Paints)

with high-pressure hose in annual dry-dock visits.

Cleaning – Periodic cleaning of hull is most appropriate for ships operating in both seawater and fresh water and in areas where few organisms attach to hull. Cleaning of merchant ships involves divers using rotating brushes or high-pressure hoses.

Natural resistance, natural biocides – Substances produced in nature which prevent fouling or hinder fouling process – based on capacity of marine organisms such as corals and sponges to remain free of fouling. Paint industry and research institutes are



Manufacturers are developing new antifouling systems, including TBT-free systems. At Hempel's testing facilities in Spain and Singapore, new products are tested by subjecting them to severe fouling conditions and comparing the panels against reference panels which are unprotected or coated with existing products. (Hempel's Marine Paints)

involved in Camellia project (running 1996–2000), subsidised by EU, to research the use of natural compounds.

Electricity – Creating a difference in electrical charge between the hull and seawater unleashes chemical process which prevents fouling. This technology has been shown to be more effective than tin-free paint in preventing fouling, but system is easily damaged and expensive. Also creates increased corrosion risk and higher energy consumption.

Prickly coatings – Includes coatings with microscopic prickles. Effectiveness depends on length and distribution of prickles, but have been shown to prevent attachment of barnacles and algae with no harm to environment. However, prickles could increase water resistance of vessel. Use of prickly surfaces on static objects such as buoys and cooling-water inlets is seen as a realistic option in the near future.



There will always be a need to prevent fouling of ships, but shipowners need anti-fouling systems that will not in themselves create a marine pollution problem. (Hempel's Marine Paints)



Anti-fouling paint is applied to a ship. Ships have large surfaces and shipowners want antifouling systems that will last several years. (Jotun Paints)

An IMO Focus paper on anti-fouling systems is available from the IMO Information Office

Sub-Committee urges fight against fraudulent STCW certificates

The Sub-Committee finalized a Maritime Safety Committee (MSC) circular on fraudulent certificates of competency. This follows reports from Member States of a proliferation of fraudulent certificates of competency, or authentic certificates reportedly issued on the basis of forged foreign certificates, which had been found during port State control inspections and applications for recognition of certificates.

The circular invites Member States and Parties to the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) to report to IMO and to the relevant Administration any cases or suspected cases of fraudulent certificates, to intensify efforts to eliminate the problem, and to act under the terms of the Convention, including prosecution of those involved, if seafarers on board are found to be holding fraudulent certificates – this could also mean detaining the ship.

Cyprus, in a submission to the Sub-Committee, noted that the Department of Merchant Shipping, which is the competent authority for maritime affairs for the Government of the Republic of Cyprus, has confiscated, in the course of port State control, a large number of forged certificates and has found that some Parties to the STCW 78 Convention, as amended, have apparently issued certificates to officers on the basis of forged foreign certificates without examining either the authenticity of the certificate itself or the basic competence of the applicant.

Australia reported 12 instances of fraudulent certificates discovered by port State control inspectors, including six forged certificates, three that were confirmed to have been stolen, and three identified as non-genuine certificates.

Revised safe manning resolution agreed

The Sub-Committee agreed a draft update of resolution A.481(XII) (adopted in 1981), on principles of safe manning, for submission to the

21st IMO Assembly, in November 1999, following approval by the MSC.

The draft revised resolution is intended to take into account developments in the shipping industry since 1981. It includes basic principles to be applied when considering manning levels in order to ensure the safe operation of the ship. It also includes detailed guidelines for the application of principles of safe manning and guidance on contents and a model format of a minimum safe manning document. Each ship should be issued with a "minimum safe manning document", specifying the minimum safe manning levels. The document can then be inspected during port State control.

Transition to the 1995 STCW Convention

The Sub-Committee reviewed progress in implementing the 1995 amendments

to the STCW Convention, which require Parties to the Convention to communicate to IMO information on compliance with the 1995 amendments. The information is being reviewed by panels of competent persons, who will report on their findings to the IMO Secretary-General, who will in turn report to the MSC on the Parties which fully comply.

By the 1 August 1998 deadline, 82 out of the 133 STCW Parties had communicated information on compliance with the requirements of the revised Convention. Since that date, another 12 Parties have done so. The 82 Parties which met the deadline represent well over 90% of the world's ships and seafarers.

At the time of the Sub-Committee meeting, five panels had completed their work and reported to the Secretary-General; 30 had completed their initial evaluation and had sought clarifications from the Parties; and 47



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panels were still engaged in their initial evaluations.

The Sub-Committee approved two related circulars:

- Guidance for competent persons evaluating information submitted by Parties on implementation of amendments of the STCW Convention and STCW Code which have been adopted since, or came into force on, 1 August 1998;
- Guidance for port State control officers in respect of certificates of competency issued under the provisions of the STCW Convention.

Model course validated

The Sub-Committee validated a new IMO model course on the operational use of electronic chart display and information systems (ECDIS). The Sub-Committee also validated revised and updated versions of nine existing model courses.

WORLD MARITIME UNIVERSITY

WMU – 1998 Graduation breaks all records



A total of 116 students from 55 different countries received their Master of Science degrees from WMU's Chancellor, Mr. William O'Neil, IMO Secretary-General, in November 1998.

"This Graduation Ceremony breaks all our previous records, and shows how important WMU continues to be to the whole global maritime community," said WMU's Rector, Dr Karl

Laubstein. "In 1998, there were more female graduates, more graduates from the two-semester fast-track MSc course, and more graduates whose expenses have been paid by their employer. The ceremony underlined how successful a year 1998 was for the University."

The students graduating in 1998 bring the total of WMU graduates to

almost 1,400 from 132 countries around the world, from Albania to Zambia. The graduates return home to take up senior positions as managers, administrators, policy advisers and educators in the maritime field, and their impact on safety and marine pollution prevention world-wide is growing every year.

New programme structure for WMU

The University has revised the structure of its academic programme to offer three different qualifications in Maritime Affairs; the new programme will take effect from the students entering the 17-month programme in 2000.

The new course structure has been developed within the strategic planning process that WMU has been engaged on since 1995. "We found that our students and their employers really wanted a more flexible programme, one that would allow individuals to choose more freely the subject areas which they needed for their future careers," explained WMU's Rector, Dr Karl Laubstein. "We therefore introduced a generic degree – everyone will follow a programme in Maritime Affairs – but with a much greater range of options within it."

Students joining the new programme will all follow a common first semester, and then enter their chosen Pre-Specialisation in the second semester. There is now a new option, that of leaving with a Postgraduate Certificate at the end of the first academic year.

In the second year, students first follow one of five different Specialisations, after which students on the Postgraduate Diploma track graduate. Those on the Master of Science track will continue for a fourth and final semester, during which they can choose from a wide range of elective subjects, which may or may not include a dissertation.

"Our research showed us that students wanted to be able to mix and match their subjects of study – for example, to combine MET [Maritime Education and Training] with Shipping Management, or Maritime Safety with Port Management," Dr Laubstein went on. "The new programme in Maritime Affairs will allow them to do that, and will allow us to respond more easily to developments in the maritime world and to the demands of our graduates' employers."

Full details of the new programme are contained in the new Academic Handbook, which is available from the WMU Academic Registry from May 1999 onwards. The details will also be published on the WMU website (<http://www.wmu.se>).

IMO seeks to harness WMU graduates' expertise

IMO has written to all WMU graduates inviting them to participate in the IMO Roster of Experts and Consultants. The members of the Roster provide specialized advice to developing countries on a host of maritime subjects.

The letter was sent out in January by David Edwards, Director of the Technical Co-operation Division. "IMO has long regarded human resources as the greatest asset of the maritime industry. Despite the impact that WMU graduates have already made, there is still a wide range of problems existing in different countries which require specific technical assistance," he explained. "WMU graduates make ideal candidates as consultants who can offer advice in their respective fields of expertise to governments of countries other than their own."

If you are a WMU graduate who has not received this invitation, please contact Ms. A. Ardila, Head of the TC Personnel and Fellowships Unit, at IMO, 4 Albert Embankment, London, SE1 7SR, UK.

WMU extends links with organizations world-wide

The World Maritime University has been accepted as a member of three international organizations of universities: the Association of European Universities (CRE); the International Association of Universities (IAU) and the US Council of Graduate Schools.

"We believe that we need to raise our international visibility in the world of education, as well as in the maritime arena, to make sure that WMU's unique education programme is as well known as possible" said Rector Karl Laubstein.

Load Lines revision to benefit from tacit acceptance

The Sub-Committee agreed that its ongoing work in developing amendments to the 1966 Load Lines Convention could benefit from the tacit acceptance procedure introduced in the 1988 Protocol to the Convention, which will enter into force on 3 February 2000.

At present, amendments to the 1966 Convention enter into force only after they have been positively accepted by two thirds of Parties, but the procedure has proved to be so slow in practice that none of the amendments adopted to the Convention so far has ever entered into force.

Under tacit acceptance, amendments enter into force on a date chosen at the time of adoption, unless they are rejected by one third of Parties or by Parties whose combined fleets constitute 50% of world merchant shipping gross tonnage. The procedure will enable changes to the Convention to enter into force within two years (or less, in certain cases).

The conditions for entry into force of the 1988 Load Lines Protocol and the 1988 Protocol to the International Convention for the Safety of Life at Sea (SOLAS) were met on 2 February 1999, when the Bahamas deposited instruments of accession to both instruments with IMO (the Protocols enter into force one year later, i.e. 3 February 2000). Malta also recently acceded to the 1988 Protocols. Both Protocols each have 32 States Parties, at 1 March 1999.

As well as introducing tacit acceptance to the Load Lines Convention, the Protocols introduce a harmonized system of ship survey and certification.

Bulk carrier safety

The introduction of tacit acceptance to the Load Lines Convention is seen as particularly important for the development of amendments to the existing Load Lines regulations affecting bulk carriers.

The existing Load Lines regulations are being closely reviewed as a result of a report published in 1998 on the sinking of the bulk carrier *Derbyshire* in September 1980 with the loss of 44 lives. This was presented to the MSC in May 1998 by the United Kingdom and contains further recommendations relating to the design and construction of

bulk carriers. The matters to be considered include:

- .1 strength of hatch covers and coamings;
- .2 freeboard and bow height;
- .3 reserve buoyancy at fore end, including forecastles;
- .4 structural means to reduce loads on hatch covers and forward structure; and
- .5 foredeck and fore end access.

Following discussion in a working group, the Sub-Committee agreed that it has been clearly demonstrated that current LL Convention standards may be inadequate with respect to wave loads and permissible strength of hatch covers for bulk carriers and other ship types. The regulations will therefore be closely looked at, with a view to revising them where necessary. The Sub-Committee is expected to take into account work done by the Working Group on Bulk Carrier Safety, scheduled to meet at the next session of the Maritime Safety Committee (MSC 71) in May 1999, which is expected to review a number of submissions on bulk carrier safety.

These submissions are set to include the results of a hazard identification study to be carried out by the International Association of Classification Societies (IACS) relating to the watertight integrity of the fore end of bulk carriers and a report on progress made on a Formal Safety Assessment (FSA) study on bulk carrier safety.

Development of draft LL amendments

The Sub-Committee reviewed progress already made on revising the technical annexes of the Load Lines Convention and discussed a number of issues, including those relating to freeboard and reserve buoyancy, as well as the bulk carrier related issues.

The Sub-Committee agreed to establish a correspondence group to progress the work intersessionally and report to the next Sub-Committee session, scheduled for September 2000.

Draft revised SOLAS chapter II-1 reviewed

The Sub-Committee reviewed a draft revised SOLAS chapter II-1 (Construction – Subdivision and stability, ma-

chinery and electrical installations) parts A, B and B-1 and agreed that two more sessions would be needed to finalize the draft revised chapter.

The aim of the revision is to harmonize the subdivision and stability provisions for passenger ships (part B) and cargo ships (Part B-1), on the basis of the probabilistic method.

The Sub-Committee re-established a correspondence group to continue the work on developing the revised chapter II-1 ahead of the next Sub-Committee session.

High-Speed Craft Code amendments agreed

The Sub-Committee agreed to draft amendments to the International Code of Safety for High-Speed Craft (HSC Code). The HSC Code was adopted by IMO in May 1994, but the rapid pace of development in this sector of shipping has meant an early revision of the Code.

The revision of the Code is being coordinated by the Sub-Committee on Ship Design and Equipment (DE). Other sub-committees are also contributing to the revision, including the Sub-Committee on Fire Protection (FP), the Sub-Committee on Safety of Navigation (NAV), the Sub-Committee on Radiocommunications and Search and Rescue (COMSAR) and the Sub-Committee on Dangerous Goods, Solid Cargoes and Containers (DSC).

The draft amendments are intended to update the Code to bring it into line with amendments to SOLAS and incorporate new recommendations that have been adopted since 1994.

The draft amendments agreed by the SLF Sub-Committee cover buoyancy, stability and subdivision, and load line matters. The Sub-Committee agreed that further work was needed on issues relating to the extent of bottom raking damage to be applied to high-speed craft and agreed to establish a correspondence group to look at this aspect of the Code.

Specifically, the correspondence group will consider the practicality of applying residual stability criteria after a high-speed craft sustains raking damage of 35% of the length of the hull, or whether this should be a different percentage.

Revision of Fishing Vessel Safety Code and Voluntary Guidelines

The Sub-Committee agreed to establish a correspondence group to look into revising the Code of Safety for Fishermen and Fishing Vessels and the Voluntary Guidelines, which were developed in co-operation with the United Nations Food and Agriculture Organization (FAO) and the International Labour Organization (ILO).

Although IMO adopted the Torremolinos International Convention for the Safety of Fishing Vessels, in Torremolinos, Spain in 1977 and a Protocol to it in 1993, only five States have so far ratified, or acceded to, the 1993 Protocol. A total of 15 States, with aggregate fleets of at least 14,000 fishing vessels of 24 metres in length and over, is required for it to come into force.

Meanwhile, statistics show that fishing vessels continue to suffer the second highest number of casualties after general cargo ships, often with considerable loss of life.

Draft MSC circular on damage control plans agreed

The Sub-Committee agreed to a draft MSC circular giving guidelines for damage control plans, for submission to MSC 71 for approval. Damage control plans and damage control booklets are intended to provide ship's officers with clear information on the ship's watertight compartmentation and equipment related to maintaining the boundaries and effectiveness of the compartmentation so that, in the event of damage to the ship, proper precautions can be taken to prevent progressive flooding through openings therein and effective action can be taken to quickly mitigate and (where possible) recover the ship's loss of stability.

Draft model loading and stability manual agreed

The Sub-Committee agreed to a draft model loading and stability manual and agreed a draft MSC circular, for submission to MSC 71, to invite Member Governments to use the model manual.

Safety aspects of ballast water management reviewed

The Sub-Committee discussed the safety aspects of ballast water exchange at sea, in the context of the Marine Environment Protection Committee's work in developing international regulations to minimize the transfer of harmful aquatic organisms in ballast water.

The Sub-Committee concluded that ballast water exchange at sea could be conducted safely, but could also increase the likelihood of exceeding the operational limits with regards to a ship's stability and strength, and therefore the Ballast Water Management Plan should contain detailed procedures. The Sub-Committee agreed a number of proposed draft amendments to the draft code on ballast water management and to the draft regulations for the control and management of ship's ballast water, for submission to the MEPC.

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Draft amendments to SOLAS tanker emergency towing requirements agreed

The Sub-Committee agreed to draft amendments to SOLAS chapter II-1 regulation 3-4 “Emergency towing arrangements on tankers”. The draft amendments are intended to incorporate previously recommendatory guidelines on emergency towing arrangements into the mandatory regulations.

Under the proposed text, aft emergency towing arrangements would have to be fully self-contained and pre-rigged ready for rapid deployment as well as being so designed that a tug or a salvage vessel can make a reliable connection, even in the absence of main power on the ship to be towed.

In addition, the proposed amendments would make it mandatory for emergency towing arrangements at both ends to be of adequate strength, taking into account the size and deadweight of the ship and the expected forces during bad weather conditions.

The draft amendments will be put forward to the Maritime Safety Committee’s 72nd session in May–June 2000.

International approval procedures for life-saving appliances

The Sub-Committee continued work on reviewing draft standardized evaluation and test report forms for life-saving appliances, contained in a 500-page document. The forms will be an important tool in facilitating and harmonizing international approval procedures for these appliances, particularly since the entry into force on 1 July 1998 of the revised chapter III (Life-Saving Appliances and Arrangements) of SOLAS and its associated International Life-Saving Appliance (LSA) Code.

Once finalized, the standardized forms may replace the Revised Recommendation on Testing of Life-Saving Appliances (resolution MSC.81(70)).

The Sub-Committee agreed to continue the work intersessionally via a correspondence group, with the aim of completing the work in 2000.

Revision of High-Speed Craft Code

The Sub-Committee agreed that the best way of amending the International Code of Safety for High-Speed Craft (HSC Code) would be to develop a new edition relating to new high-speed craft and to apply the existing Code to existing craft.

The HSC Code was adopted by IMO in May 1994, but the rapid pace of development in this sector of shipping has meant an early revision of the Code.

The Sub-Committee has already been working on draft amendments to the Code and contributions have been put forward by other sub-committees, including the Sub-Committee on Fire Protection (FP), Sub-Committee on Safety of Navigation (NAV), Sub-Committee on Radiocommunications and Search and Rescue (COMSAR) and Sub-Committee on Stability and Load Lines and on Fishing Vessels Safety (SLF).

The draft amendments are intended to update the Code to bring it into line with amendments to SOLAS and new recommendations that have been adopted in the past four years – for example, requirements covering public address systems and helicopter pick-up areas. The draft amendments also address specific safety concerns on high-speed craft.

Draft WIG Craft Code

A Sub-Committee working group reviewed a proposed draft Code of Safety for Wing-in-Ground Craft, which is derived from the International Code of Safety for High-Speed Craft. Since a WIG craft is essentially a high-speed vessel with features of dynamically supported craft, the proposed draft Code contains principal provisions of the HSC Code relevant to such craft. At the same time, the WIG craft is a flying craft, and therefore appropriate provisions of the International Civil Aviation Organization (ICAO) are also incorporated.

After reviewing a number of provisions in the draft WIG Code, the Sub-Committee agreed to establish a corre-

spondence group to prepare a fresh text for consideration at the next Sub-Committee session, DE 43, in April 2000.

The draft WIG Code includes sections on buoyancy, stability and subdivision; directional and altitude control systems; anchoring, towing and berthing; fire safety; life-saving appliances and arrangements; navigational equipment; radiocommunications; stabilization systems; handling, controllability and performance; and inspection and maintenance requirements.

Draft circular on thermal protective lifejackets agreed

The Sub-Committee agreed to a draft MSC circular, for approval by MSC 71, containing recommendations on performance standards and tests for thermal protective lifejackets (TP lifejackets).

Draft Polar Code

The Sub-Committee reviewed contributions from a number of other Sub-Committees in developing the draft International Code of Safety for Ships in Polar Waters (Polar Code) and agreed that clarification was needed as to the scope and application of the Code. The Sub-Committee invited the Maritime Safety Committee (MSC) to consider the issue, taking into account the recommendations of the Sub-Committee, including the view that the Code should normally apply only to SOLAS ships.

The draft Polar Code is aimed at ensuring safe navigation of ships and the prevention of pollution in polar waters. It takes into account the sea and glacial ice which can represent serious structural hazards to all ships navigating in polar waters, and this is reflected in many provisions of the draft Code, including the application of higher levels of strengthening for polar ships. The draft Code covers design, outfitting and operation of relevant ships, including crewing by adequate numbers of suitably trained personnel.

Flag State performance self-assessment – draft resolution agreed

The Sub-Committee agreed a draft Assembly resolution on self-assessment of flag State performance for submission to the 21st Assembly in November after consideration by the Maritime Safety Committee (MSC) and the Marine Environment Protection Committee (MEPC).

The draft resolution includes the Flag State Performance Self-Assessment Form, already approved by the MSC and MEPC.

The Form is intended to establish a uniform set of internal and external criteria which can be used by flag States on a voluntary basis to obtain a clear picture of how well their maritime Administrations are functioning and to make their own assessment of their performance as flag States. The Form may be submitted to IMO when requests are made for technical assistance – however, this should not be considered a prerequisite for seeking or obtaining technical assistance.

The Form covers issues such as asking whether the Administration has the necessary laws, infrastructure and human resources in place to implement and enforce international maritime safety and pollution-prevention instruments.

The draft resolution urges Member Governments to use the Self-Assessment Form for the purpose of identifying their weaknesses, if any, in discharging their responsibilities as flag States.

The draft resolution invites Member Governments to submit a copy of completed forms to the Organization, on a voluntary basis, to enable the establishment of a database which would assist in its efforts in achieving consistent and effective implementation of IMO instruments.

The Sub-Committee began work on drawing up a list of criteria by which flag State performance could be measured and agreed to continue the discussions through a correspondence group ahead of the next session, scheduled for January 2000.

Review of resolution A.787(19) “Procedures for port State control”

The Sub-Committee agreed a draft Assembly resolution to include proposed amendments to resolution A.787(19). The proposed amendments will be put forward to the MSC and MEPC for submission to the 21st Assembly.

The proposed amendments are aimed at updating the resolution, which contains comprehensive guidelines and recommendations on port State control procedures.

Amongst the proposed amendments are the incorporation of procedures for port State control relating to the International Safety Management (ISM) Code and proposed new sections relating to “suspension of inspection” (to be allowed in exceptional circumstances) and “procedures for rectification of deficiencies and release”.

Casualty investigations – human factor guidelines amendments agreed

The Sub-Committee reviewed a draft resolution, containing guidelines on investigation of human factors in maritime casualties and incidents, for approval by the MSC and MEPC before submission to the 21st Assembly.

The Committees are expected to discuss whether the guidelines should be appended to the existing Code for the Investigation of Marine Casualties and Incidents (resolution A.849(20)) or be submitted as a new resolution.

The draft guidelines were developed by a Joint IMO/ILO Working Group on Investigation of Human Factors in Maritime Casualties.

Review and analysis of casualty reports

The Sub-Committee’s Working Group on Casualty Statistics and Investiga-

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E-mail: ccs@dial.pipex.com

tions reviewed a report from the Correspondence Group on Casualty Analysis, which reviews accident reports submitted to IMO.

The Correspondence Group analysed 136 incidents and found human factors played a large part in many incidents. For example, in the category “Grounding”, human factors contributing to the incidents analysed included: lack of training and experience of pilots; defective communication between bridge team and pilot; poor communications between bridge and engine-room; the absence of the master from the bridge in narrow or confined pilotage waters; and the failure to provide appropriate charts.

In the category “Collisions”, the following were included as factors: failure to avoid/recognize risk of collision (Convention on the International Regulations for Preventing Collisions at Sea (COLREG), rules 7 and 8); inadequate look-out, inexperience in plotting and charting the ship’s position, inappropriate radar range for plotting and detecting contacts, and inability to detect small vessels on radar; crew communication inadequacies; inadequate procedures, and lack of knowledge of anchors and their holding power, and anchorage in busy traffic areas; routine violations in bridge watchkeeping procedures, especially in small ships with limited a number of personnel; errors of judge-

ment in attempting to manoeuvre under prevailing conditions; failure to reduce speed to allow for conditions of weather; and fatigue and watchkeeper duties affected by trans-meridional flight.

The Working Group on Casualty Statistics and Investigations also reviewed the category “adverse weather” as a cause of casualties, and the Sub-Committee agreed with the view that the recording of “adverse weather” as being the underlying cause of a casualty should only be done after investigation of all other possible external and internal causes.

The Sub-Committee also noted that the introduction of a ship data recorder would aid the investigation of ships lost.

Summary of factors in incidents analysed	
Casualty category	Common issues
Collision Grounding	bridge resource management (BRM); contravention of COLREGs; inexperience, crew communication failures; pilot/bridge team issues; passage planning
Fire and explosion	safe working practice and carelessness; maintenance; lack of planning for emergencies; inadequate knowledge of means of escape
Foundering	failure of engineers to diagnose problems
Accidents to persons	lack of enforcement of safety regimes on board ship

Amendments to Athens Convention, draft bunker regime nearing completion

The Committee made substantive progress in drafting amendments to the Athens Convention and in drafting an international regime of compensation for pollution from ship bunkers, and anticipated that a diplomatic conference or conferences could be held in relation to these two instruments in the near future. Considerable progress was also made in reviewing a draft convention on wreck removal.

Draft amendments to the 1974 Athens Convention (provision of financial security)

The Committee reviewed a draft protocol to and draft amendments to the 1974 Athens Convention relating to the Carriage of Passengers and their Luggage by Sea. The aim is to introduce the concept of compulsory insurance for passenger claims.

The Athens Convention of 1974, and its 1990 Protocol, make a carrier liable for damage or loss suffered by a passenger if the incident causing the damage occurs during the course of the carriage and is due to fault or neglect of the carrier. Liability can be limited so long as the carrier did not act with intent to cause damage, or recklessly. The 1990 Protocol – which has not yet entered into force –

increased the limits of compensation payable in the event of death at around US\$225,000. As the 1990 Protocol has only been ratified by three States to date, it is likely that the proposed draft amendments will supersede and incorporate elements of the 1990 Protocol.

The Committee generally agreed that compulsory insurance should cover only liabilities related to the performing carrier, and that there was no need to include provisions to insure any liability of the contracting carrier in addition to that of the performing carrier.

The Committee maintained the view that the basis of liability in the Athens Convention should remain unchanged (i.e., the carrier is liable if the damage is due to fault or neglect of the carrier) though there was some support for a proposal for a two-tier liability regime to include strict liability up to a fixed amount and a second tier of unlimited fault-based liability. The issue may be revisited at a future diplomatic conference to consider the draft protocol and amendments to the Athens Convention.

The Committee noted that the International Civil Aviation Organization (ICAO) is working on the draft of the new Warsaw Convention, to be considered at a diplomatic conference in May 1999, which includes a two-tier liability regime for passengers' death or injury.

The Committee considered the possibility of introducing personal accident insurance (PAI) either as a supplement or as an alternative to compulsory liability insurance, but although there was some support for that option, the majority agreed that compulsory liability insurance was more appropriate.

In terms of limits of liability, the Committee agreed for the time being to include the limits set in the 1990 Protocol, with a view to reviewing the figures at a diplomatic conference.

A diplomatic conference is likely to be held in the 2000–2001 biennium or the 2002–2003 biennium.

IMO/ILO working group on seafarer's claims to meet next session

The Committee nominated eight delegations to participate in a joint IMO/International Labour Organization (ILO) Ad Hoc Expert Working Group

to consider the subject of liability and compensation regarding claims for death, personal injury and abandonment of seafarers. The Working Group will meet during the next session of the Committee, scheduled for October 1999.

Compensation for pollution from ships' bunkers

The Committee reviewed proposed draft articles for an international convention for liability and compensation for damage caused by oil from ships' bunkers. The aim of the draft convention is to establish a regime for spills of bulk (fuel) oil, when carried as fuel, as current regimes covering oil spills do not include bunker spills.

The draft convention includes articles on:

- application – to apply to pollution damage in territory, territorial sea, exclusive economic zone of a contracting State;
- liability – sets out who will be responsible for pollution damage caused by any oil on board or originating from a ship;
- compulsory insurance – requires insurance or other financial security to be maintained to cover liability under the convention;
- entry-into-force criteria.

The Committee discussed several articles in detail and agreed that the next step would be the preparation of an instrument for consideration by a diplomatic conference.

Draft wreck removal convention

The Committee reviewed in detail a draft wreck removal convention, which is intended to provide international rules on the rights and obligations of States and shipowners in dealing with wrecks and drifting or sunken cargo which may pose a hazard to navigation and/or pose a threat to the marine environment.

The Committee referred a number of issues to a correspondence group for further consideration ahead of the next session. These issues include: the definition of "wreck"; whether the draft convention should cover "casualties" or whether the definition of "wreck" should encompass casualties; and which State has the power beyond the territorial sea to remove a wreck.

The draft convention covers:

- reporting and locating ships and wrecks – covering the reporting of casualties to the nearest coastal State; warnings to mariners and coastal States about the wreck; action by the coastal State to locate the ship or wreck;
- determination of hazard – sets out who is responsible for determining whether a hazard exists when the wreck or ship is beyond territorial waters, based on a list of specific criteria, including depth of water above wreck and proximity of shipping routes;
- rights and obligations to remove hazardous ships and wrecks – sets out when the shipowner is responsible for removing the wreck and when a State may intervene;
- financial liability for locating, marking and removing ships and wrecks;
- time-bar – sets a time limit for claims for compensation;
- jurisdiction – sets out jurisdiction(s) where actions for compensation may be brought;
- financial security – sets out security required to cover liabilities regarding claims for compensation under the Convention;
- settlement of disputes.

Future work

The Committee agreed to devote its next session to consideration of the draft protocol to the Athens Convention and, if time becomes available, the Committee would then deal with bunkers, while keeping the draft wreck removal convention under review.

Books received

Shipping and regional security, edited by Sam Batemen and Stephen Bates. Published by the Strategic and Defence Studies Centre, Research School of Pacific and Asian Studies, The Australian National University, Canberra, ACT 0200, Australia. Price \$A20, including postage.

Proposed tanker pump-room safety measures should apply to existing ships, Sub-Committee agrees

The Sub-Committee agreed draft amendments to the SOLAS Convention relating to tanker pump-room safety to make a proposed new SOLAS regulation on cargo pump-rooms on tankers also applicable to existing ships.

The proposed regulation II-1/63 was approved by the Maritime Safety Committee (MSC) at its 69th session in May–June 1998 for adoption at a future session as part of the 2002 amendments to the SOLAS Convention. At the time, the decision on whether to make the regulation applicable to existing ships as well as new ones was deferred.

The proposed regulation includes measures aiming at preventing explosions in tanker cargo pump-rooms, including the fitting of temperature-sensing devices; interlocking lighting with ventilation, such that ventilation should be in operation when switching on the lighting; providing a system for continuous monitoring of the concentration of hydrocarbon gases; and providing bilge level monitoring devices.

Harmonized survey system – draft resolution agreed

The Sub-Committee agreed a draft Assembly resolution on global implementation of the harmonized system of survey and certification, aimed at encouraging all States to implement the harmonized system, even if they are not Parties to the relevant Protocols.

The harmonized system of survey and certification was introduced by the 1988 Protocols to the International Convention for the Safety of Life at Sea, 1974 (SOLAS) and the International Convention on Load Lines, 1966 (1966 Load Line Convention). The 1988 Protocols will enter into force on 3 February 2000. In addition, amendments adopted by IMO will introduce the system, on the same date, to the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78) (Annexes I and II), the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code); the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code); and the Code for

the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (BCH Code).

The draft resolution agrees that States which are not Parties to the 1988 SOLAS and Load Line Protocols may implement the harmonized system of survey and certification as from 3 February 2000 and may issue certificates in the form prescribed by the 1988 SOLAS and Load Line Protocols.

The draft resolution also invites port States to accept the certificates issued as equivalent to the certificates issued under the SOLAS and Load Line Conventions or Protocols in force for those States; and urges States which have not yet become Parties to the 1988 SOLAS and Load Line Protocols to do so as soon as possible.

Amendments to crude oil washing resolution agreed

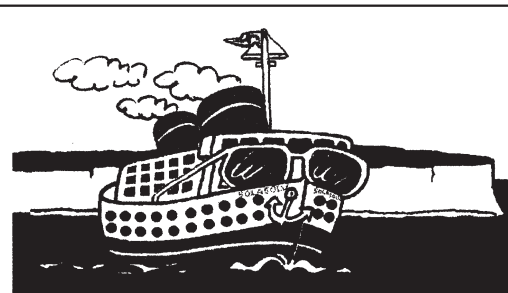
The Sub-Committee agreed draft amendments to resolution A.446(XI), as amended by resolution A.497(XII), “Amendments to the revised specifica-

tions for the design, operation and control of crude oil washing systems”.

Crude oil washing (COW), which was introduced into MARPOL 73/78 as part of the 1978 Protocol, involves cleaning of oil tanks by washing with crude oil rather than with water – in other words, the cargo itself. When sprayed onto the sediments clinging to the tank walls, the oil simply dissolves them, turning them back into usable oil that can be pumped off with the rest of the cargo. There is no need for slop tanks to be used since the process leaves virtually no oily wastes.

The draft amendments agreed by the Sub-Committee are aimed at simplifying the system for monitoring and controlling COW in order to avoid any health risks associated with internal examinations of tanks by surveyors.

The Sub-Committee also agreed proposed amendments to section 9 of the Standard Format for the COW Manual. Section 9 covers determination of the suitability of a crude oil for use in crude oil washing.



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Gas Carrier Code remains recommendatory

The Sub-Committee agreed **not** to make the Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (GC Code) mandatory for gas carriers built before the date of application of the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code). (The IGC Code is mandatory under SOLAS chapter VII and applies to gas carriers built after 1 July 1986).

The majority were against making the GC Code mandatory because existing gas carriers, engaged on international voyages, comply with the provisions of the Code and are issued with the Certificate of Fitness. Making the Code mandatory would only change a “*de facto*” situation into a “*de jure*” situation and would not enhance meaningfully the safety of gas carriers.

Further, the majority of the Sub-Committee felt that mandatory status of the GC Code, although not resulting in excessive cost to industry, would create unavoidable burden to Administrations, due to the need to introduce changes in legislation at the national level.

Draft circular on cargo-tank venting agreed

The Sub-Committee agreed a draft circular on application of cargo-tank venting requirements for combined chemical/oil tankers, for submission to the MSC and to the Marine Environment Protection Committee (MEPC).

Review of Annexes I and II of MARPOL 73/78

The Sub-Committee continued its ongoing revision of Annexes I (oil) and II

(noxious liquid substances carried in bulk, i.e. chemicals) of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78).

The Annexes are being reviewed in order to simplify them and take into account technological and scientific advances relating to protection of the environment.

Carriage requirements for IBC Code products

The Sub-Committee continued work on developing safety and environmental criteria for assigning carriage requirements to products listed in the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code).

Development of criteria for alternative pollution categorization

The Sub-Committee, through its ESPH (Evaluation of Safety and Pollution Hazards) Working Group, continued to develop criteria for assigning pollution categories to products covered by Annex II of MARPOL 73/78 under a three-category and five-category system. As part of the revision of Annex II, the Sub-Committee is reviewing whether to move to a three-category system from the current five-category system for products in order to ensure their safe carriage and protection of the marine environment.

The revised GESAMP (Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection) Hazard Evaluation Procedure is being used as a basis for assigning these criteria.

However, the Sub-Committee noted that additional resources would be needed if the evaluation of products by

GESAMP is to proceed rapidly enough for the Sub-Committee to meet the target date of 2002 for the completion of the revision of MARPOL Annex II.

The aim of the whole exercise of re-evaluating products is to make the criteria more consistent and meaningful, in line with the global harmonization process for dangerous goods which was begun after the 1992 UNCED Rio Conference.

Chapter 19 of Agenda 21 adopted by UNCED in 1992 included a programme on harmonization of classification and labelling of chemicals, and the United Nations Committee of Experts on the Transport of Dangerous Goods and the Organization for Economic Co-operation and Development (OECD) have been acting as clearing houses for the development of harmonized hazard classification systems covering the physical and biological properties that affect safety and protection of the environment.

Product categorization – background

The existing five-category system in Annex II includes categories A, B, C, D plus “other liquid substances”. The three-category system is based on the premise – in line with the development of the so-called precautionary approach¹ – that no product should be permitted to enter the sea in unlimited quantities, as is the case with category D and “other liquid substances” under Annex II. Therefore these two categories could be combined, creating a category for substances with limited restrictions.

A second category could combine current categories B and C, since ship technology now makes it easier for all ships to achieve minimum residue levels of 100 litres per tank – so there is no need to differentiate.

The third category would be equivalent to the existing category A – in other words, substances considered highly environmentally hazardous and which should not be discharged at all.

The five-category system of pollution categories

Pollution category	Maximum discharge quantity allowed from any one tank	
	Existing ships	New ships
A	None	None
B	300 litres	100 litres
C	900 litres	300 litres
D	Unrestricted (but discharge is allowed only under certain conditions, including being not less than 12 nautical miles from nearest land)	Unrestricted (but discharge is allowed only under certain conditions, including being not less than 12 nautical miles from nearest land)
Other	Unrestricted	Unrestricted

¹ The precautionary approach was introduced into the 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (LC), and is based on the premise that unless a substance can be proved to be harmless, it should not be dumped in the sea. Previously, the onus has been to prove something is harmful, to get its dumping banned.

UK donates US\$100,000 to Seafarers Memorial Trust Fund



The Seafarers Memorial Trust Fund, which was launched by IMO last year as part of its 50th anniversary celebrations, now stands at US\$1,350,000. The biggest contribution by a Member State so far has been made by the United Kingdom, which has donated US\$100,000. The photograph shows the Deputy Prime Minister, Mr. John Prescott, handing the cheque to the Secretary-General, Mr. William A. O'Neil.

IMO appoints regional co-ordinators in Africa

REGIONAL CO-ORDINATORS: CONTACT DETAILS

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(continued from page 2)

The Regional Co-ordinators have been appointed initially up to 31 December 2000. It is envisaged that the posts will be continued – and new ones established for other regions – according to the experience gained and availability of additional resources.

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