

Introduction

The MARPOL Convention is the main international convention covering prevention of pollution of the marine environment by ships from operational or accidental causes. It is a combination of two treaties adopted in 1973 and 1978 respectively and updated by amendments through the years.

The International Convention for the Prevention of Pollution from Ships (MARPOL) was adopted on 2 November 1973 at IMO and covered pollution by oil, chemicals, harmful substances in packaged form, sewage and garbage. The Protocol of 1978 relating to the 1973 International Convention for the Prevention of Pollution from Ships (1978 MARPOL Protocol) was adopted at a Conference on Tanker Safety and Pollution Prevention in February 1978 held in response to a spate of tanker accidents in 1976-1977. (Measures relating to tanker design and operation were also incorporated into a Protocol of 1978 relating to the 1974 Convention on the Safety of Life at Sea, 1974).

As the 1973 MARPOL Convention had not yet entered into force, the 1978 MARPOL Protocol absorbed the parent Convention. The combined instrument is referred to as the International Convention for the Prevention of Marine Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78), and it entered into force on 2 October 1983 (Annexes I and II).

The Convention includes regulations aimed at preventing and minimizing pollution from ships - both accidental pollution and that from routine operations - and currently includes six technical Annexes:

Annex I	Regulations for the Prevention of Pollution by Oil
Annex II	Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk
Annex III	Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form
Annex IV	Prevention of Pollution by Sewage from Ships
Annex V	Prevention of Pollution by Garbage from Ships
Annex VI	Prevention of Air Pollution from Ships (entry into force 19 May 2005)

States Parties must accept Annexes I and II, but the other Annexes are voluntary.

History of MARPOL 73/78

Oil pollution of the seas was recognized as a problem in the first half of the 20th century and various countries introduced national regulations to control discharges of oil within their territorial waters. In 1954, the United Kingdom organized a conference on oil pollution which resulted in the adoption of the **International Convention for the Prevention of Pollution of the Sea by Oil (OILPOL), 1954**. Following entry into force of the IMO Convention in 1958, the depository and Secretariat functions in relation to the Convention were transferred from the United Kingdom Government to IMO.

OILPOL Convention

The 1954 Convention, which was amended in 1962, 1969 and 1971, primarily addressed pollution resulting from routine tanker operations and from the discharge of oily wastes from machinery spaces - regarded as the major causes of oil pollution from ships.

The 1954 OILPOL Convention, which entered into force on 26 July 1958, attempted to tackle the problem of pollution of the seas by oil - defined as crude oil, fuel oil, heavy diesel oil and lubricating oil in two main ways:

- it established "prohibited zones" extending at least 50 miles from the nearest land in which the discharge of oil or of mixtures containing more than 100 parts of oil per million was forbidden; and
- it required Contracting Parties to take all appropriate steps to promote the provision of facilities for the reception of oily water and residues.

In 1962, IMO adopted amendments to the Convention which extended its application to ships of a lower tonnage and also extended the "prohibited zones". Amendments adopted in 1969 contained regulations to further restrict operational discharge of oil from oil tankers and from machinery spaces of all ships.

Although the 1954 OILPOL Convention went some way in dealing with oil pollution, growth in oil trade and developments in industrial practices were beginning to make it clear that further action, was required. Nonetheless, pollution control was at the time still a minor concern for IMO, and indeed the world was only beginning to wake up to the environmental consequences of an increasingly industrialised society.

Torrey Canyon

In 1967, the tanker Torrey Canyon ran aground while entering the English Channel and spilled her entire cargo of 120,000 tons of crude oil into the sea. This resulted in the biggest oil pollution incident ever recorded up to that time. The incident raised questions about measures then in place to prevent oil pollution from ships and also exposed deficiencies in the existing system for providing compensation following accidents at sea.

First, IMO called an Extraordinary session of its Council, which drew up a plan of action on technical and legal aspects of the **Torrey Canyon** incident. Then, the IMO Assembly decided in 1969 to convene an international conference in 1973 to prepare a suitable international agreement for placing restraints on the contamination of the sea, land and air by ships.

In the meantime, in 1971, IMO adopted further amendments to OILPOL 1954 to afford additional protection to the Great Barrier Reef of Australia and also to limit the size of tanks on oil tankers, thereby minimizing the amount of oil which could escape in the event of a collision or stranding.

1973 Convention

Finally, an international Conference in **1973** adopted the **International Convention for the Prevention of Pollution from Ships**. While it was recognized that accidental pollution was spectacular, the Conference considered that operational pollution was still the bigger threat. As a result, the 1973 Convention incorporated much of OILPOL 1954 and its amendments into Annex I, covering oil.

But the Convention was also intended to address other forms of pollution from ships and therefore other annexes covered chemicals, harmful substances carried in packaged form, sewage and garbage. The 1973 Convention also included two Protocols dealing with *Reports on Incidents involving Harmful Substances* and *Arbitration*.

The 1973 Convention required ratification by 15 States, with a combined merchant fleet of not less than 50 percent of world shipping by gross tonnage, to enter into force. By 1976, it had only received three ratifications - Jordan, Kenya and Tunisia - representing less than one percent of the world's merchant shipping fleet. This was despite the fact that States could become Party to the Convention by only ratifying Annexes I (oil) and II (chemicals). Annexes III to V, covering harmful goods in packaged form, sewage and garbage, were optional.

It began to look as though the 1973 Convention might never enter into force, despite its importance.

1978 Conference

In 1978, in response to a spate of tanker accidents in 1976-1977, IMO held a Conference on Tanker Safety and Pollution Prevention in February 1978. The conference adopted measures affecting tanker design and operation, which were incorporated into both the Protocol of 1978 relating to the 1974 Convention on the Safety of Life at Sea (1978 SOLAS Protocol) and the Protocol of 1978 relating to the 1973 International Convention for the Prevention of Pollution from Ships (1978 MARPOL Protocol) - adopted on 17 February 1978.

More importantly in terms of achieving the entry into force of MARPOL, the 1978 MARPOL Protocol allowed States to become Party to the Convention by first implementing Annex I (oil), as it was decided that Annex II (chemicals) would not become binding until three years after the Protocol entered into force.

This gave States time to overcome technical problems in Annex II, which for some had been a major obstacle in ratifying the Convention.

As the 1973 Convention had not yet entered into force, the 1978 MARPOL Protocol absorbed the parent Convention. The combined instrument - the **International Convention for the Prevention of Marine Pollution from Ships, 1973 as modified by the Protocol of 1978 relating thereto (MARPOL 73/78)** - finally entered into force on 2 October 1983 (for Annexes I and II).

Annex V, covering garbage, achieved sufficient ratifications to enter into force on 31 December 1988, while Annex III, covering harmful substances carried in packaged form, entered into force on 1 July 1992. Annex IV, covering sewage, enters into force on [27 September 2003](#). Annex VI, covering air pollution, was adopted in September 1997 and enters into force on 19 May 2005.

Annex I: Prevention of pollution by oil

Entry into force: 2 October 1983

[\(Revised Annex I enters into force 1 January 2007\)](#)

The 1973 Convention maintained the oil discharge criteria prescribed in the 1969 amendments to the 1954 Oil Pollution Convention, without substantial changes, namely, that operational discharges of oil from tankers are allowed only when all of the following conditions are met:

- the total quantity of oil which a tanker may discharge in any ballast voyage whilst under way must not exceed 1/15,000 of the total cargo carrying capacity of the vessel;
- the rate at which oil may be discharged must not exceed 60 litres per mile travelled by the ship; and
- no discharge of any oil whatsoever must be made from the cargo spaces of a tanker within 50 miles of the nearest land.

An oil record book is required, in which is recorded the movement of cargo oil and its residues from loading to discharging on a tank-to-tank basis.

In addition, in the 1973 Convention, the maximum quantity of oil permitted to be discharged on a ballast voyage of new oil tankers was reduced from 1/15,000 of the cargo capacity to 1/30,000 of the amount of cargo carried. These criteria applied equally both to persistent (black) and non-persistent (white) oils.

As with the 1969 OILPOL amendments, the 1973 Convention recognized the "load on top" (LOT) system which had been developed by the oil industry in the 1960s. On a ballast voyage the tanker takes on ballast water (departure ballast) in dirty cargo tanks. Other tanks are washed to take on clean ballast. The tank washings are pumped into a special slop tank. After a few days, the departure ballast settles and oil flows to the top. Clean water beneath is then decanted while new arrival ballast water is taken on. The upper layer of the departure ballast is transferred to the slop tanks. After further settling and decanting, the next cargo is loaded on top of the remaining oil in the slop tank, hence the term load on top.

A new and important feature of the 1973 Convention was the concept of "**special areas**" which are considered to be so vulnerable to pollution by oil that oil discharges within them have been completely prohibited, with minor and well-defined exceptions. The 1973 Convention identified the Mediterranean Sea, the Black Sea, and the Baltic Sea, the Red Sea and the

Gulfs area as special areas. All oil-carrying ships are required to be capable of operating the method of retaining oily wastes on board through the "load on top" system or for discharge to shore reception facilities.

This involves the fitting of appropriate equipment, including an oil-discharge monitoring and control system, oily-water separating equipment and a filtering system, slop tanks, sludge tanks, piping and pumping arrangements.

New oil tankers (i.e. those for which the building contract was placed after 31 December 1975) of 70,000 tons deadweight and above, must be fitted with segregated ballast tanks large enough to provide adequate operating draught without the need to carry ballast water in cargo oil tanks.

Secondly, new oil tankers are required to meet certain subdivision and damage stability requirements so that, in any loading conditions, they can survive after damage by collision or stranding.

The Protocol of 1978 made a number of changes to Annex I of the parent convention. Segregated ballast tanks (SBT) are required on all new tankers of 20,000 dwt and above (in the parent convention SBTs were only required on new tankers of 70,000 dwt and above). The Protocol also required SBTs to be protectively located - that is, they must be positioned in such a way that they will help protect the cargo tanks in the event of a collision or grounding.

Another important innovation concerned crude oil washing (COW), which had been developed by the oil industry in the 1970s and offered major benefits. Under COW, tanks are washed not with water but with crude oil - the cargo itself. COW was accepted as an alternative to SBTs on existing tankers and is an additional requirement on new tankers.

For existing crude oil tankers (built before entry into force of the Protocol) a third alternative was permissible for a period of two to four years after entry into force of MARPOL 73/78. The dedicated clean ballast tanks (CBT) system meant that certain tanks are dedicated solely to the carriage of ballast water. This was cheaper than a full SBT system since it utilized existing pumping and piping, but when the period of grace has expired other systems must be used.

Drainage and discharge arrangements were also altered in the Protocol, regulations for improved stripping systems were introduced.

Some oil tankers operate solely in specific trades between ports which are provided with adequate reception facilities. Some others do not use water as ballast. The TSPP Conference recognized that such ships should not be subject to all MARPOL requirements and they were consequently exempted from the SBT, COW and CBT requirements. It is generally recognized that the effectiveness of international conventions depends upon the degree to which they are obeyed and this in turn depends largely upon the extent to which they are enforced. The 1978 Protocol to MARPOL therefore introduced stricter regulations for the survey and certification of ships.

The 1992 amendments to Annex I made it mandatory for new oil tankers to have double hulls - and it brought in a phase-in schedule for existing tankers to fit double hulls, which was subsequently revised in 2001 and 2003.

[See also Oil Pollution](#)

Annex II: Control of pollution by noxious liquid substances

Entry into force: 6 April 1987

[\(Revised Annex II enters into force 1 January 2007\)](#)

Annex II details the discharge criteria and measures for the control of pollution by noxious liquid substances carried in bulk.

Some 250 substances were evaluated and included in the list appended to the Convention. The discharge of their residues is allowed only to reception facilities until certain concentrations and conditions (which vary with the category of substances) are complied with.

In any case, no discharge of residues containing noxious substances is permitted within 12 miles of the nearest land. More stringent restrictions applied to the Baltic and Black Sea areas.

[See also Chemical Pollution](#)

Annex III: Prevention of pollution by harmful substances in packaged form

Entry into force: 1 July 1992

The first of the convention's optional annexes. States ratifying the Convention must accept Annexes I and II but can choose not to accept the other three - hence they have taken much longer to enter into force.

Annex III contains general requirements for the issuing of detailed standards on packing, marking, labelling, documentation, stowage, quantity limitations, exceptions and notifications for preventing pollution by harmful substances.

The International Maritime Dangerous Goods (IMDG) Code has, since 1991, included marine pollutants.

[See also Harmful Substances in Packaged Form](#)

Annex IV: Prevention of pollution by sewage from ships

Entry into force: [27 September 2003](#)

The second of the optional Annexes, Annex IV contains requirements to control pollution of the sea by sewage. [A revised Annex was adopted in 2004.](#)

[See also Sewage](#)

Annex V: Prevention of pollution by garbage from ships

Entry into force: 31 December 1988

This deals with different types of garbage and specifies the distances from land and the manner in which they may be disposed of. The requirements are much stricter in a number of "special areas" but perhaps the most important feature of the Annex is the complete ban imposed on the dumping into the sea of all forms of plastic.

[See also Garbage](#)

Annex VI: Prevention of Air Pollution from Ships

Adoption: September 1997

Entry into force: 19 May 2005

The regulations in this annex set limits on sulphur oxide and nitrogen oxide emissions from ship exhausts and prohibit deliberate emissions of ozone depleting substances.

[See 1997 amendments](#)

[See also Air Pollution](#)

Enforcement

Any violation of the MARPOL 73/78 Convention within the jurisdiction of any Party to the Convention is punishable either under the law of that Party or under the law of the flag State. In this respect, the term "jurisdiction" in the Convention should be construed in the light of international law in force at the time the Convention is applied or interpreted.

With the exception of very small vessels, ships engaged on international voyages must carry on board valid international certificates which may be accepted at foreign ports as prima facie evidence that the ship complies with the requirements of the Convention.

If, however, there are clear grounds for believing that the condition of the ship or its equipment does not correspond substantially with the particulars of the certificate, or if the ship does not carry a valid certificate, the authority carrying out the inspection may detain the ship until it is satisfied that the ship can proceed to sea without presenting unreasonable threat of harm to the marine environment.

Under Article 17, the Parties to the Convention accept the obligation to promote, in consultation with other international bodies and with the assistance of UNEP, support for those Parties which request technical assistance for various purposes, such as training, the supply of equipment, research, and combating pollution.

Amendment Procedure

Amendments to the technical Annexes of MARPOL 73/78 can be adopted using the "tacit acceptance" procedure, whereby the amendments enter into force on a specified date unless an agreed number of States Parties object by an agreed date.

In practice, amendments are usually adopted either by IMO's Marine Environment Protection Committee (MEPC) or by a Conference of Parties to MARPOL.

The 1984 amendments

Adoption: 7 September 1984

Entry into force: 7 January 1986

The amendments to Annex I were designed to make implementation easier and more effective. New requirements were designed to prevent oily water being discharged in special areas, and other requirements were strengthened. But in some cases they were eased, provided that various conditions were met: some discharges were now permitted below the waterline, for example, which helps to cut costs by reducing the need for extra piping.

The 1985 (Annex II) amendments

Adoption: 5 December 1985

Entry into force: 6 April 1987

The amendments to Annex II, which deals with liquid noxious substances (such as chemicals), were intended to take into account technological developments since the Annex was drafted in 1973 and to simplify its implementation. In particular, the aim was to reduce the need for reception facilities for chemical wastes and to improve cargo tank stripping efficiencies.

The amendments also made the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code) mandatory for ships built on or after 1 July 1986. This is important because the Annex itself is concerned only with discharge procedures: the Code contains carriage requirements. The Code itself was revised to take into account anti-pollution requirements and therefore make the amended Annex more effective in reducing accidental pollution

The 1985 (Protocol I) amendments

Adoption: 5 December 1985

Entry into force: 6 April 1987

The amendments made it an explicit requirement to report incidents involving discharge into the sea of harmful substances in packaged form.

The 1987 Amendments

Adoption: December 1987

Entry into force: 1 April 1989

The amendments extended Annex I Special Area status to the Gulf of Aden

The 1989 (March) amendments

Adoption: March 1989

Entry into force: 13 October 1990

The amendments affected the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code), mandatory under both MARPOL 73/78 and SOLAS and applies to ships built on or after 1 July 1986 and the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (BCH). In both cases, the amendments included a revised list of chemicals. The BCH Code is mandatory under MARPOL 73/78 but voluntary under SOLAS 1974.

Further amendments affected Annex II of MARPOL - updating and replacing the lists of chemicals in appendices II and III.

The October 1989 amendments

Adoption: 17 October 1989

Entry into force: 18 February 1991

The amendments make the North Sea a "special area" under Annex V of the convention. This greatly increases the protection of the sea against the dumping of garbage from ships

The 1990 (HSSC) amendments

Adoption: March 1990

Entry into force: 3 February 2000 (coinciding with the entry into force of the 1988 SOLAS and Load Lines Protocols).

The amendments are designed to introduce the harmonized system of survey and certificates (HSSC) into MARPOL 73/78 at the same time as it enters into force for the SOLAS and Load Lines Conventions.

All three 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 alleviates 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.

The 1990 (IBC Code) amendments

Adoption: March 1990

Entry into force: On the same date as the March 1990 HSSC amendments i.e. 3 February 2000.

The amendments introduced the HSSC into the IBC Code

The 1990 (BCH) amendments

Adoption: March 1990

Entry into force: On the same date as the March 1990 HSSC amendments i.e. 3 February 2000.

The amendments introduced the HSSC into the BCH Code.

The 1990 (Annexes I and V) amendments

Adoption: November 1990

Entry into force: 17 March 1992

The amendments extended Special Area Status under Annexes I and V to the Antarctic.

The 1991 amendments

Adoption: 4 July 1991

Entry into force: 4 April 1993

The amendments made the Wider Caribbean a Special Area under Annex V.

Other amendments added a new chapter IV to Annex I, requiring ships to carry an oil pollution emergency plan.

The 1992 amendments

Adoption: 6 March 1992

Entry into force: 6 July 1993

The amendments to Annex I of the convention which deals with pollution by oil brought in the "double hull" requirements for

tankers, applicable to new ships (tankers ordered after 6 July 1993, whose keels were laid on or after 6 January 1994 or which are delivered on or after 6 July 1996) as well as existing ships built before that date, with a phase-in period.

New-build tankers are covered by Regulation 13F, while regulation 13G applies to existing crude oil tankers of 20,000 dwt and product carriers of 30,000 dwt and above. Regulation 13G came into effect on 6 July 1995.

Regulation 13F requires all new tankers of 5,000 dwt and above to be fitted with double hulls separated by a space of up to 2 metres (on tankers below 5,000 dwt the space must be at least 0.76m).

As an alternative, tankers may incorporate the "mid-deck" concept under which the pressure within the cargo tank does not exceed the external hydrostatic water pressure. Tankers built to this design have double sides but not a double bottom. Instead, another deck is installed inside the cargo tank with the venting arranged in such a way that there is an upward pressure on the bottom of the hull.

Other methods of design and construction may be accepted as alternatives "provided that such methods ensure at least the same level of protection against oil pollution in the event of a collision or stranding and are approved in principle by the Marine Environment Protection Committee based on guidelines developed by the Organization.

For oil tankers of 20,000 dwt and above new requirements were introduced concerning subdivision and stability.

The amendments also considerably reduced the amount of oil which can be discharged into the sea from ships (for example, following the cleaning of cargo tanks or from engine room bilges). Originally oil tankers were permitted to discharge oil or oily mixtures at the rate of 60 litres per nautical mile. The amendments reduced this to 30 litres. For non-tankers of 400 grt and above the permitted oil content of the effluent which may be discharged into the sea is cut from 100 parts per million to 15 parts per million.

Regulation 24(4), which deals with the limitation of size and arrangement of cargo tanks, was also modified.

Regulation 13G applies to existing crude oil tankers of 20,000 dwt and product carriers of 30,000 dwt and above.

Tankers that are **25 years old** and which were **not** constructed according to the requirements of the 1978 Protocol to MARPOL 73/78 have to be fitted with double sides and double bottoms. The Protocol applies to tankers ordered after 1 June 1979, which were begun after 1 January 1980 or completed after 1 June 1982. Tankers built according to the standards of the Protocol are exempt until they reach the age of **30**.

Existing tankers are subject to an enhanced programme of inspections during their periodical, intermediate and annual surveys. Tankers that are five years old or more must carry on board a completed file of survey reports together with a conditional evaluation report endorsed by the flag Administration.

Tankers built in the 1970s which are at or past their 25th must comply with Regulation 13F. If not, their owners must decide whether to convert them to the standards set out in regulation 13F, or to scrap them.

Another set of tankers built according to the standards of the 1978 protocol will soon be approaching their 30th birthday - and the same decisions must be taken.

The 1994 amendments

Adoption: 13 November 1994

Entry into force: 3 March 1996

The amendments affect four of the Convention's five technical annexes (II, III, V, and I) and are all designed to improve the way it is implemented. They make it possible for ships to be inspected when in the ports of other Parties to the Convention to ensure that crews are able to carry out essential shipboard procedures relating to marine pollution prevention. These are contained in resolution A.742 (18), which was adopted by the IMO Assembly in November 1993.

The amendments are similar to those made to SOLAS in May 1994. Extending port State control to operational requirements is seen as an important way of improving the efficiency with which international safety and anti-pollution treaties are implemented.

The 1995 amendments

Adoption: 14 September 1995

Entry into force: 1 July 1997

The amendments concern Annex V. They are designed to improve the way the Convention is implemented. Regulation 2 was clarified and a new regulation 9 added dealing with placards, garbage management plans and garbage record keeping.

The 1996 amendments

Adoption: 10 July 1996

Entry into force: 1 January 1998

One set of amendments concerned Protocol I to the Convention which contains provisions for reporting incidents involving harmful substances. The amendments included more precise requirements for the sending of such reports.

Other amendments brought requirements in MARPOL concerning the IBC and BCH Codes into line with amendments adopted to SOLAS.

The 1997 amendments

Adoption: 23 September 1997

Entry into force: 1 February 1999

Regulation 25A to Annex 1 specifies intact stability criteria for double hull tankers.

Another amendment made the North West European waters a "special area" under Regulation 10 of Annex 1. The waters cover the North Sea and its approaches, the Irish Sea and its approaches, the Celtic Sea, the English Channel and its approaches and part of the North East Atlantic immediately to the West of Ireland.

In special areas, discharge into the sea of oil or oily mixture from any oil tanker and ship over 400 gt is prohibited. Other special areas already designated under Annex I of MARPOL include: the Mediterranean Sea area, the Baltic Sea area, the Red Sea area, the Gulf of Aden area and the Antarctic area.

The Protocol of 1997 (Annex VI - Regulations for the Prevention of Air Pollution from Ships)

Adoption: 26 September 1997

Entry into force: 19 May 2005

The Protocol was adopted at a Conference held from 15 to 26 September 1997 and adds a new Annex VI on **Regulations for the Prevention of Air Pollution from Ships** to the Convention.

The rules set limits on sulphur oxide (SO_x) and nitrogen oxide (NO_x) emissions from ship exhausts and prohibit deliberate emissions of ozone depleting substances.

The new Annex VI includes a global cap of 4.5% m/m on the sulphur content of fuel oil and calls on IMO to monitor the worldwide average sulphur content of fuel once the Protocol comes into force.

Annex VI contains provisions allowing for special "SO_x Emission Control Areas" to be established with more stringent control on sulphur emissions. In these areas, the sulphur content of fuel oil used on board ships must not exceed 1.5% m/m. Alternatively, ships must fit an exhaust gas cleaning system or use any other technological method to limit SO_x emissions.

The Baltic Sea is designated as a SO_x Emission Control area in the Protocol.

Annex VI prohibits deliberate emissions of ozone depleting substances, which include halons and chlorofluorocarbons (CFCs). New installations containing ozone-depleting substances are prohibited on all ships. But new installations containing hydrochlorofluorocarbons (HCFCs) are permitted until 1 January 2020.

The requirements of the IMO Protocol are in accordance with the Montreal Protocol of 1987, as amended in London in 1990. The Montreal Protocol is an international environmental treaty, drawn up under the auspices of the United Nations, under which nations agreed to cut CFC consumption and production in order to protect the ozone layer.

Annex VI sets limits on emissions of nitrogen oxides (NO_x) from diesel engines. A mandatory NO_x Technical Code, developed by IMO, defines how this is to be done.

The Annex also prohibits the incineration on board ship of certain products, such as contaminated packaging materials and polychlorinated biphenyls (PCBs).

Format of Annex VI

Annex VI consists of three Chapters and a number of Appendices:

- Chapter 1 - General
- Chapter II - Survey, Certification and Means of Control
- Chapter III - Requirements for Control of Emissions from Ships
- Appendices, including the form of the International Air Pollution Prevention Certificate; criteria and procedures for designation of SO_x emission control areas; information for inclusion in the bunker delivery note; approval and operating limits for shipboard incinerators; test cycles and weighting factors for verification of compliance of marine diesel engines with the NO_x limits; and details of surveys and inspections to be carried out.

The 1999 amendments

Adoption: 1 July 1999

Entry into force: 1 January 2001 (under tacit acceptance)

Amendments to Regulation 13G of Annex I (Regulations for the Prevention of Pollution by Oil) make existing oil tankers between 20,000 and 30,000 tons deadweight carrying persistent product oil, including heavy diesel oil and fuel oil, subject to the same construction requirements as crude oil tankers.

Regulation 13G requires, in principle, existing tankers to comply with requirements for new tankers in Regulation 13F,

including double hull requirements for new tankers or alternative arrangements, not later than 25 years after date of delivery.

The amendments extend the application from applying to crude oil tankers of 20,000 tons deadweight and above and product carriers of 30,000 tons deadweight and above, to also apply to tankers between 20,000 and 30,000 tons deadweight which carry heavy diesel oil or fuel oil.

The aim of the amendments is to address concerns that oil pollution incidents involving persistent oils are as severe as those involving crude oil, so regulations applicable to crude oil tankers should also apply to tankers carrying persistent oils.

Related amendments to the Supplement of the IOPP (International Oil Pollution Prevention) Certificate, covering in particular oil separating/filtering equipment and retention and disposal of oil residues were also adopted.

A third MARPOL 73/78 amendment adopted relates to Annex II of MARPOL Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk. The amendment adds a new regulation 16 requiring a Shipboard marine pollution emergency plan for noxious liquid substances.

Amendments were also made to the International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk (IBC Code) and the Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk (BCH Code). The amendments address the maintenance of venting systems,

The 2000 amendments

Adoption: 13 March 2000

Entry into force: 1 January 2002 (under tacit acceptance)

The amendment to Annex III (*Prevention of Pollution by Harmful Substances Carried by Sea in Packaged Form*) deletes tainting as a criterion for marine pollutants from the Guidelines for the identification of harmful substances in packaged form. Tainting refers to the ability of a product to be taken up by an organism and thereby affect the taste or smell of seafood making it unpalatable. A substance is defined as tainting when it has been found to taint seafood.

The amendment means that products identified as being marine pollutants solely on the basis of their tainting properties will no longer be classified as marine pollutants.

The 2001 amendments

Adoption: 27 April 2001

Entry into force: 1 September 2002

The amendment to Annex I brought in a new new global timetable for accelerating the phase-out of single-hull oil tankers which was subsequently revised again by the 2003 amendments.

The flag state administration may allow for some newer single hull ships registered in its country that conform to certain technical specifications to continue trading until the 25th anniversary of their delivery.

However, under the provisions of paragraph 8(b), any Port State can deny entry of those single hull tankers which are allowed to operate until their 25th anniversary to ports or offshore terminals. They must communicate their intention to do this to IMO.

As an additional precautionary measure, a Condition Assessment Scheme (CAS) will have to be applied to all Category 1 vessels continuing to trade after 2005 and all Category 2 vessels after 2010.

Although the CAS does not specify structural standards in excess of the provisions of other IMO conventions, codes and recommendations, its requirements stipulate more stringent and transparent verification of the reported structural condition of the ship and that documentary and survey procedures have been properly carried out and completed.

The requirements of the CAS include enhanced and transparent verification of the reported structural condition and of the ship and verification that the documentary and survey procedures have been properly carried out and completed. The Scheme requires that compliance with the CAS is assessed during the Enhanced Survey Programme of Inspections concurrent with intermediate or renewal surveys currently required by resolution A.744(18), as amended.

The 2003 Amendments

Adoption: 4 December 2003

Entry into force: April 2005

Under a revised regulation 13G of Annex I of MARPOL, the final phasing-out date for Category 1 tankers (pre-MARPOL tankers) is brought forward to 2005, from 2007. The final phasing-out date for category 2 and 3 tankers (MARPOL tankers and smaller tankers) is brought forward to 2010, from 2015.

The full timetable for the phasing out of single-hull tankers is as follows:

Category of oil tanker	Date or year
Category 1	5 April 2005 for ships delivered on 5 April 1982 or earlier 2005 for ships delivered after 5 April 1982

Category 2 and Category 3	5 April 2005 for ships delivered on 5 April 1977 or earlier 2005 for ships delivered after 5 April 1977 but before 1 January 1978 2006 for ships delivered in 1978 and 1979 2007 for ships delivered in 1980 and 1981 2008 for ships delivered in 1982 2009 for ships delivered in 1983 2010 for ships delivered in 1984 or later
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Under the revised regulation, the Condition Assessment Scheme (CAS) is to be made applicable to all single-hull tankers of 15 years, or older. Previously it was applicable to all Category 1 vessels continuing to trade after 2005 and all Category 2 vessels after 2010. Consequential enhancements to the CAS scheme were also adopted.

The revised regulation allows the Administration (flag State) to permit continued operation of category 2 or 3 tankers beyond 2010 subject to satisfactory results from the CAS, but the continued operation must not go beyond the anniversary of the date of delivery of the ship in 2015 or the date on which the ship reaches 25 years of age after the date of its delivery, whichever is earlier.

In the case of certain Category 2 or 3 oil tankers fitted with only double bottoms or double sides not used for the carriage of oil and extending to the entire cargo tank length or double hull spaces, not meeting the minimum distance protection requirements, which are not used for the carriage of oil and extend to the entire cargo tank length, the Administration may allow continued operation beyond 2010, provided that the ship was in service on 1 July 2001, the Administration is satisfied by verification of the official records that the ship complied with the conditions specified and that those conditions remain unchanged. Again, such continued operation must not go beyond the date on which the ship reaches 25 years of age after the date of its delivery.

Carriage of heavy grade oil

A new MARPOL regulation 13H on the prevention of oil pollution from oil tankers when carrying heavy grade oil (HGO) bans the carriage of HGO in single-hull tankers of 5,000 tons dwt and above after the date of entry into force of the regulation (5 April 2005), and in single-hull oil tankers of 600 tons dwt and above but less than 5,000 tons dwt, not later than the anniversary of their delivery date in 2008.

Under the new regulation, HGO means any of the following:

- crude oils having a density at 15°C higher than 900 kg/m³;
- fuel oils having either a density at 15°C higher than 900 kg/ m³ or a kinematic viscosity at 50°C higher than 180 mm²/s; and
- bitumen, tar and their emulsions.

In the case of certain Category 2 or 3 tankers carrying heavy grade oil as cargo, fitted only with double bottoms or double sides, not used for the carriage of oil and extending to the entire cargo tank length, or double hull spaces not meeting the minimum distance protection requirements which are not used for the carriage of oil and extend to the entire cargo tank length, the Administration may allow continued operation of such ships beyond 5 April 2005 until the date on which the ship reaches 25 years of age after the date of its delivery.

Regulation 13(H) also allows for continued operation of oil tankers of 5,000 tons dwt and above, carrying crude oil with a density at 15°C higher than 900 kg/ m³ but lower than 945 kg/ m³, if satisfactory results of the Condition Assessment Scheme warrant that, in the opinion of the Administration, the ship is fit to continue such operation, having regard to the size, age, operational area and structural conditions of the ship and provided that the continued operation shall not go beyond the date on which the ship reaches 25 years after the date of its delivery.

The Administration may allow continued operation of a single hull oil tanker of 600 tons deadweight and above but less than 5,000 tons deadweight, carrying heavy grade oil as cargo, if, in the opinion of the Administration, the ship is fit to continue such operation, having regard to the size, age, operational area and structural conditions of the ship, provided that the operation shall not go beyond the date on which the ship reaches 25 years after the date of its delivery.

The Administration of a Party to the present Convention may exempt an oil tanker of 600 tons deadweight and above carrying heavy grade oil as cargo if the ship is either engaged in voyages exclusively within an area under the Party's jurisdiction, or is engaged in voyages exclusively within an area under the jurisdiction of another Party, provided the Party within whose jurisdiction the ship will be operating agrees. The same applies to vessels operating as floating storage units of heavy grade oil.

A Party to MARPOL 73/78 shall be entitled to deny entry of single hull tankers carrying heavy grade oil which have been allowed to continue operation under the exemptions mentioned above, into the ports or offshore terminals under its jurisdiction, or deny ship-to-ship transfer of heavy grade oil in areas under its jurisdiction except when this is necessary for the purpose of securing the safety of a ship or saving life at sea.

Resolutions adopted

The amendments to MARPOL regulation 13G, the addition of a new regulation 13H, consequential amendments to the IOPP Certificate and the amendments to the Condition Assessment Scheme were adopted by the Committee as MEPC Resolutions

Among other resolutions adopted by the Committee, another on early implementation urged Parties to MARPOL 73/78 seriously to consider the application of the amendments as soon as possible to ships entitled to fly their flag, without waiting

for the amendments to enter into force and to communicate this action to the Organization. It also invited the maritime industry to implement the aforesaid amendments to Annex I of MARPOL 73/78 effectively as soon as possible.

The 2004 (April) Amendments

Adoption: 1 April 2004

Entry into force: 1 August 2005

The revised Annex will apply to new ships engaged in international voyages, of 400 gross tonnage and above or which are certified to carry more than 15 persons. Existing ships will be required to comply with the provisions of the revised Annex IV five years after the date of its entry into force. The Annex requires ships to be equipped with either a sewage treatment plant or a sewage comminuting and disinfecting system or a sewage holding tank.

The discharge of sewage into the sea will be prohibited, except when the ship has in operation an approved sewage treatment plant or is discharging comminuted and disinfected sewage using an approved system at a distance of more than three nautical miles from the nearest land; or is discharging sewage which is not comminuted or disinfected at a distance of more than 12 nautical miles from the nearest land.

Also, amendments to the Appendix to MARPOL Annex V on Prevention of pollution by garbage from ships which relate to the recording of the disposal of cargo residues in the Garbage Record Book.

The 2004 (October) Amendments

Adoption: 15 October 2004

Entry into force: 1 January 2007

Revised MARPOL Annex I (oil)

The revised MARPOL Annex I *Regulations for the prevention of pollution by oil* incorporates the various amendments adopted since MARPOL entered into force in 1983, including the amended regulation 13G (regulation 20 in the revised annex) and regulation 13H (regulation 21 in the revised annex) on the phasing-in of double hull requirements for oil tankers. It also separates, in different chapters, the construction and equipment provisions from the operational requirements and makes clear the distinctions between the requirements for new ships and those for existing ships. The revision provides a more user-friendly, simplified Annex I.

New requirements in the revised Annex I include the following:

- Regulation 22 Pump-room bottom protection: on oil tankers of 5,000 tonnes deadweight and above constructed on or after 1 January 2007, the pump-room shall be provided with a double bottom.
- Regulation 23 Accidental oil outflow performance - applicable to oil tankers delivered on or after [date of entry into force of revised Annex I plus 36 months] 1 January 2010; construction requirements to provide adequate protection against oil pollution in the event of stranding or collision.

Oman Sea - new special area under MARPOL Annex I

The Oman Sea area of the Arabian Seas is designated as a special area in the revised Annex I. The other special areas in Annex I are: Mediterranean Sea area; Baltic Sea area; Black Sea area; Red Sea area; "Gulfs" area; Gulf of Aden area; Antarctic area; and North West European Waters. In the special areas, there are stricter controls on discharge of oily wastes.

Revised MARPOL Annex II (noxious liquid substances carried in bulk)

The revised Annex II *Regulations for the control of pollution by noxious liquid substances in bulk* includes a new four-category categorization system for noxious and liquid substances. The revised annex is expected to enter into force on 1 January 2007.

The new categories are:

- **Category X:** Noxious Liquid Substances which, if discharged into the sea from tank cleaning or deballasting operations, are deemed to present a major hazard to either marine resources or human health and, therefore, justify the prohibition of the discharge into the marine environment;
- **Category Y:** Noxious Liquid Substances which, if discharged into the sea from tank cleaning or deballasting operations, are deemed to present a hazard to either marine resources or human health or cause harm to amenities or other legitimate uses of the sea and therefore justify a limitation on the quality and quantity of the discharge into the marine environment;
- **Category Z:** Noxious Liquid Substances which, if discharged into the sea from tank cleaning or deballasting operations, are deemed to present a minor hazard to either marine resources or human health and therefore justify less stringent restrictions on the quality and quantity of the discharge into the marine environment; and
- **Other Substances:** substances which have been evaluated and found to fall outside Category X, Y or Z because they are considered to present no harm to marine resources, human health, amenities or other legitimate uses of the sea when discharged into the sea from tank cleaning or deballasting operations. The discharge of bilge or ballast water or other residues or mixtures containing these substances are not subject to any requirements of MARPOL Annex II.

The revised annex includes a number of other significant changes. Improvements in ship technology, such as efficient stripping techniques, has made possible significantly lower permitted discharge levels of certain products which have been incorporated into Annex II. For ships constructed on or after 1 January 2007 the maximum permitted residue in the tank and its associated piping left after discharge will be set at a maximum of 75 litres for products in categories X, Y and Z - compared with previous limits which set a maximum of 100 or 300 litres, depending on the product category.

Alongside the revision of Annex II, the marine pollution hazards of thousands of chemicals have been evaluated by the Evaluation of Hazardous Substances Working Group, giving a resultant GESAMP2 Hazard Profile which indexes the substance according to its bio-accumulation; bio-degradation; acute toxicity; chronic toxicity; long-term health effects; and effects on marine wildlife and on benthic habitats.

As a result of the hazard evaluation process and the new categorization system, vegetable oils which were previously categorized as being unrestricted will now be required to be carried in chemical tankers. The revised Annex includes, under regulation 4 Exemptions, provision for the Administration to exempt ships certified to carry individually identified vegetable oils, subject to certain provisions relating to the location of the cargo tanks carrying the identified vegetable oil.

Transport of vegetable oils

An MEPC resolution on *Guidelines for the transport of vegetable oils in deep tanks or in independent tanks specially designed for the carriage of such vegetable oils on board dry cargo ships* allows general dry cargo ships that are currently certified to carry vegetable oil in bulk to continue to carry these vegetable oils on specific trades. The guidelines also take effect on 1 January 2007.

Consequential amendments to the IBC Code

Consequential amendments to the International Bulk Chemical Code (IBC Code) were also adopted at the session, reflecting the changes to MARPOL Annex II. The amendments incorporate revisions to the categorization of certain products relating to their properties as potential marine pollutants as well as revisions to ship type and carriage requirements following their evaluation by the Evaluation of Hazardous Substances Working Group.

Ships constructed after 1986 carrying substances identified in chapter 17 of the IBC Code must follow the requirements for design, construction, equipment and operation of ships contained in the Code.

The 2005 Amendments

Adoption: 22 July 2005

Entry into force: 21 November 2006

The amendments to the *Regulations for the Prevention of Air Pollution from Ships* in Annex VI include the establishment of the North Sea SOx Emission Control Area (SECA).

The NOx Technical Code was also updated.

The 2006 Amendments

Adoption: March 2006

Entry into force: 1 August 2007

MARPOL regulation on oil fuel tank protection

The amendment to the revised MARPOL Annex I (which was adopted in October 2004 with entry into force set for 1 January 2007) includes a new regulation 12A on oil fuel tank protection. The regulation is intended to apply to all ships delivered on or after 1 August 2010 with an aggregate oil fuel capacity of 600m³ and above. It includes requirements for the protected location of the fuel tanks and performance standards for accidental oil fuel outflow. A maximum capacity limit of 2,500m³ per oil fuel tank is included in the regulation, which also requires Administrations to consider general safety aspects, including the need for maintenance and inspection of wing and double-bottom tanks or spaces, when approving the design and construction of ships in accordance with the regulation. Consequential amendments to the IOPP Certificate were also adopted.

The MEPC also agreed to include appropriate text referring to the new regulation in the amendments to the *Guidelines for the application of the revised MARPOL Annex I requirements to FPSOs and FSUs* and approved a Unified Interpretation on the application of the regulation to column-stabilized MODUs.

Definition of heavy grade oil

A further amendment to the revised MARPOL Annex I relates to the definition of "heavy grade oil" in regulation 21 on *Prevention of oil pollution from oil tankers carrying heavy grade oil as cargo*, replacing the words "fuel oils" with "oils, other than crude oils", thereby broadening the scope of the regulation.

MARPOL Annex IV amendments

The amendment to MARPOL Annex IV *Prevention of pollution by sewage from ships* adds a new regulation 13 on *Port State control on operational requirements*. The regulation states that a ship, when in a port or an offshore terminal of another Party, is subject to inspection by officers duly authorized by such Party concerning operational requirements under the Annex, where there are clear grounds for believing that the master or crew are not familiar with essential shipboard procedures relating to the prevention of pollution by sewage.

Amendments to BCH Code

Amendments to the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (BCH Code) were adopted as a consequence of the revised Annex II of MARPOL 73/78 and the amended International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk (IBC Code), which are expected to enter into force on 1 January 2007. The MEPC also adopted a resolution on *Early and Effective Application of the 2006 amendments to the BCH Code* to invite MARPOL Parties to consider the application of the amendments to the BCH Code, as soon as practically possible, to ships entitled to fly their flag. Also adopted were the revised *Guidelines for the provisional assessment of liquids transported in bulk*. In this context the Committee urged industry, in particular the chemical industry, to provide information on the revision of List 2 of the MEPC circular which contains pollutant-only mixtures based on section 5 of the revised Guidelines.

The 2006 Amendments**Adoption:** October 2006**Entry into force:** 1 March 2008/1 January 2010**Entry into force:** 1 March 2008

The designation of the Southern South Africa waters as a Special Area under Annex I (*Regulations for the prevention of pollution by oil from ships*), will provide measures to protect wildlife and the marine environment in an ecologically important region used intensively by shipping.

Entry into force: 1 January 2010

The revised MARPOL Annex III *Regulations for the prevention of pollution by harmful substances carried by sea in packaged form*. The Annex has been revised to harmonize the regulations with the criteria for defining marine pollutants which have been adopted by the UN Transport of Dangerous Goods (TDG) Sub-Committee, based on the *United Nations Globally Harmonized System of Classification and Labelling of Chemicals (GHS)*.