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The fight against marine pollution

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During the last two or three decades the pollution of the seas has caused considerable public concern. IMO has been responsible for developing international measures to counter pollution from ships ever since it came into existence in 1959. This article looks at the problems involved, how IMO has tackled them – and how effective its measures have been.

The fight against marine pollution

IMO NEWS 3/82

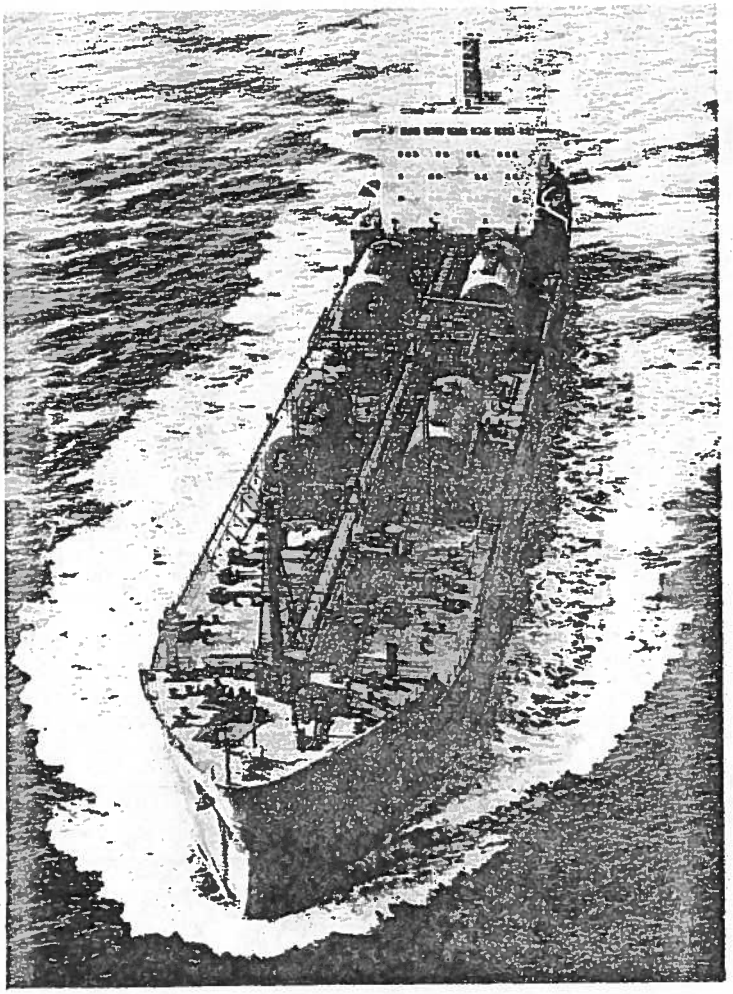
In 1967 the tanker *Torrey Canyon* ran aground off the coast of England, precipitating one of the biggest – and certainly the most famous – pollution disasters in maritime history.

For the first time, the public at large became aware that the increasing maritime carriage of oil and other products presented a major threat to the marine environment.

Since that time the danger has been emphasized by other accidents, other disasters, with the *Amoco Cadiz* incident of 1978 being the best known. In many areas tar and other traces of oil have become a familiar sight on holiday beaches. There are regular reports of sea birds dying after being trapped in oil discharged from tankers. Drums of poisonous chemicals are washed ashore with what seems to be increasing frequency.

The problem is certainly serious. The potential for pollution, in fact, is probably greater than ever before, since the amount of pollutants, such as oil and chemicals, transported by sea is far greater than it was when IMO came into being in 1959.

But despite this the indications are that the pollution menace, far from increasing, is generally being contained and in some important areas is actually being overcome. During the next few years the situation could improve still further.



The carriage of chemicals in bulk carriers like the one shown here has increased greatly in recent years. IMO has developed various regulations which are intended not only to improve safety but also to reduce the risk of pollution. (Panocean Anco)

The size of the problem

When IMO came into being its chief concern was to improve the safety of international shipping by adopting international treaties, codes and other measures. The prevention of marine pollution from ships was very much a secondary role – because at that time the problem itself seemed relatively minor.

But from that point on marine pollution was to become a matter of increasing concern as the quantities of potentially polluting material carried at sea grew. This was particularly true of oil and oil products.

In 1960, world production of crude oil was just over 1,000 million tons. By 1970 it exceeded 2,000 million tons. By 1980 the 3,000 million mark had also been passed.

To transport this oil the world fleet of tankers grew from 64 million deadweight tons in 1960 until by 1970 it was 151m dwt and by 1980 had reached 325m dwt. Since during the same period the number of tankers in the world fleet only doubled – to around 7,000 ships – their average size grew even more rapidly.

In 1960 more than half the ships in the world tanker fleet were under 50,000 dwt. There were just a few 'giants' of more than 100,000 dwt afloat.

By 1970, 45 per cent of the world's tanker tonnage consisted of ships of more than 105,000 dwt. By 1980 more than half the fleet consisted of tankers of more than 200,000 dwt, and there were several ships in existence of more than half a million deadweight tons.

At the same time the amount of chemicals being transported by sea was growing. New ships were being developed which could carry many different types of chemicals at the same time and in bulk. Others could carry bulk ore cargoes or oil. Many dry cargoes also posed threats to the health of the seas.

When a tanker has emptied its cargo a certain amount of oil is left clinging to the tank sides and bottoms. During the return journey to the oil loading port the empty tanker has to take on sea water as ballast to make it manoeuvrable. The ballast is pumped into the empty cargo tanks where it is mixed with oil residues. Twenty years ago the normal procedure was to pump out oily water ballast into the sea before fresh cargo was loaded. Had this practice been allowed to continue, as much as 8 to 10 million tons of oil would now be entering the sea per annum from this source alone.

At the same time, all ships produce waste oils in the engine rooms which has to be disposed of in some way. In the past this was usually pumped into the sea.

Pollution can also be caused by maritime accidents. The oil carried by a loaded tanker which sinks will ultimately escape into the sea. Even dry cargo ships carry bunker oil which can escape after an accident, causing pollution.

Statistically accidental pollution of this type probably causes only a small percentage of the total amount of oil pollution of the sea each year, but when it happens near a coastline or in narrow waters then the results can be devastating – as the *Torrey Canyon* and *Amoco Cadiz* incidents showed.

In 1973 the United States National Academy of Sciences held a workshop to study oil pollution. Using data relating to 1971 it estimated that 6,113,000 tons of petrol hydrocarbons entered the sea.

Of this, transportation contributed 2,133,000 which was made up as follows:

	Tons
Tankers	1,080,000
Dry docking	250,000
Terminal operations	3,000
Bilges bunkering	500,000
Tanker accidents	200,000
Non-tanker accidents	100,000
	2,133,000

In addition to operational and accidental pollution from ships, the seas are still used as a dump for the waste materials of land-based society. For many years it was assumed that the oceans were big enough to cope – but as the quantities disposed of in this way grew and the substances

themselves – such as radioactive wastes – became more and more dangerous, so doubts began to emerge.

During the 1960s, demand for international action to combat pollution of the sea became more and more frequent. As far as pollution from ships was concerned, governments sought action through IMO.

The work of IMO

When IMO met for the first time in 1959 it became responsible for a number of international treaties relating to shipping, one of which was the International Convention for the Prevention of Pollution of the Sea by Oil. This was adopted by an international conference in 1954 and became international law in 1958.

At the time, it was the only international treaty which dealt solely with the subject of marine pollution from ships. It was confined to pollution of the sea by oil, and was intended to limit the deliberate discharge of oil into the sea, primarily by tankers, which was one consequence of the tank cleaning methods then used. The convention banned such discharges within 50 miles of land and within 100 miles in certain especially endangered areas.

In 1962 IMO extended these prohibited zones, but as tanker traffic increased so did the amount of oil entering the sea as a result of tanker operations. The effect of the convention was further minimized by the reluctance of some governments to ensure that their ports provide the necessary facilities required by the convention for receiving the oily mixtures and residues which vessels are required to retain on board.

Fortunately a new system called load-on-top (LOT) was being developed by the oil industry which promised not only to save wastage of oil but also to reduce oil pollution from tanker operations.

Under this system, the oily mixtures which result from ballasting and tank cleaning are pumped into a special slop tank where they are allowed to separate during the ballast stage of the voyage. The oil rises to the surface and when it is clean enough the water at the bottom can be pumped overboard. At the loading terminal fresh cargo is then loaded on top of the oil which remains in the slop tank.

In 1969 IMO adopted amendments to the 1954 Oil Pollution Convention which were designed to make the LOT system mandatory. They limited the amount of cargo oil which could be discharged into the sea and also the rate of discharge.

Meanwhile, the *Torrey Canyon* disaster had shown all too clearly what could happen when one of the new breed of supertankers went aground and the accident intensified efforts to curb marine pollution.

The accident showed, among other things, that the existing legal and compensation regime was inadequate. In 1969 IMO therefore adopted two new conventions, one of which enabled governments to take action when their coastlines were threatened by pollution from foreign flag ships outside their territorial waters. The other established a new system for providing compensation to victims of oil pollution damage at the same time establishing an upper limit to the liability of the tanker owner for such damage. This was backed up in 1971 by another convention which established an International Oil Pollution Compensation Fund which was intended to provide further compensation when the limits laid down in the 1969 convention are exceeded.

In 1971 IMO adopted two further amendments to the 1954 convention. One limited the size of tanks on new tankers by making tanks smaller; the amount of oil which could escape into the sea in the event of the tank being damaged would correspondingly be reduced. The second amendment provided further protection to Australia's Great Barrier Reef by extending the zone where discharge of oil was forbidden.

By 1971 the maritime carriage of chemicals was becoming commonplace and in the same year IMO took action to control this traffic by adopting a new code for the construction and equipment of ships engaged in it. Basically, chemicals are divided into three types, depending upon their hazard, and the requirements for the ships which carry them vary accordingly.

For some time, however, the Organization had been preparing for a major convention which would cover pollution of all types and from all sources. In 1973 a conference was convened which adopted the International Convention for the Prevention of Pollution from Ships – the most important and most ambitious anti-pollution instrument ever adopted.

The convention deals with both operational and accidental pollution. It includes five annexes which contain regulations designed to prevent pollution by oil; noxious liquid substances carried in bulk (such as chemicals); harmful substances carried in packaged forms; sewage; and garbage.

The convention represents perhaps the most comprehensive initiative ever undertaken to eliminate operational pollution and to reduce accidental pollution on a global scale.

Annex I limits the quantity of oil which can be discharged from new oil tankers on a ballast voyage to 1/30,000 of cargo carried on the previous voyage (half the 1969

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figure). Special areas are established (including the Mediterranean, Baltic and Black Seas), where discharge of oil is completely forbidden. Special oil-discharge monitoring and control equipment, oily-water separating equipment and other systems are required which will enable checks to be made as to whether oil discharge requirements have been complied with. Governments must ensure that adequate facilities are provided for the reception and treatment of oily wastes.

Furthermore, all new oil tankers of 70,000 dwt and above must be fitted with segregated ballast tanks – in other words, sufficient tanks to carry the ballast water needed on the journey back to the loading port without taking ballast into cargo tanks. Since these segregated tanks cannot be used for the transport of oil, the mixture of oil and water which results from the carriage of ballast water in cargo tanks is eliminated.

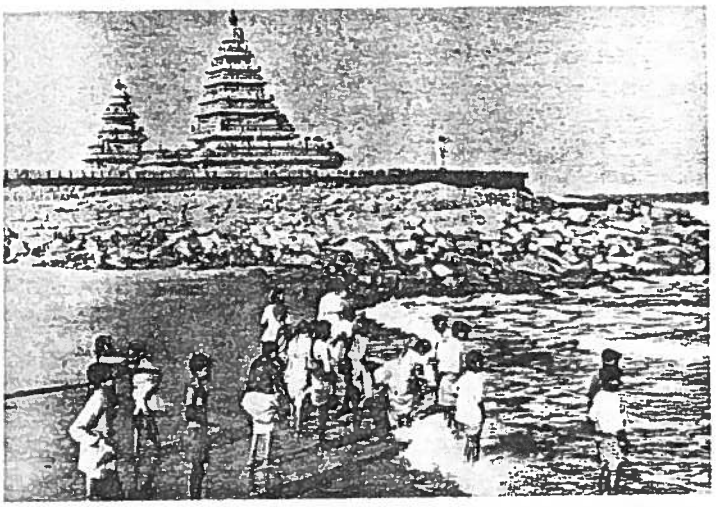
The limitations on tank size adopted in 1971 are also incorporated into the MARPOL Convention; and tankers must be so constructed that they can survive assumed damage to a degree which is specified on the basis of the ship's length.

The second annex to the convention contains detailed discharge criteria and measures for the control of pollution by chemicals. Some 150 substances have been evaluated and divided into four categories according to the hazard they present to the environment. Residues must be discharged into shore reception facilities unless various conditions are complied with and no discharge is permitted at all within 12 miles of shore or, in addition, for substances of the first three categories, in water less than 25 metres deep.

The other three annexes are optional but they are nevertheless important. They include regulations which ban the discharge of sewage within four miles of land. The treatment of garbage is also dealt with and the disposal of plastics into the sea is prohibited.

The MARPOL convention was an extremely ambitious instrument and progress towards securing its entry into force proved rather slow, partly because of technical difficulties involved in its implementation. Meanwhile, the threat of pollution, especially oil pollution, continued and in the winter of 1976–77 a series of accidents off the coast of the United States showed that further action was required.

The result was the convening of an international conference on Tanker Safety and Pollution Prevention which resulted in the adoption of Protocols to two important IMO Conventions – MARPOL and the International Convention for the Safety of Life at Sea, 1974 (SOLAS).



Children play beside the shore temple of Mahabalipuram in Kerala, India. IMO is assisting regional efforts to counter marine pollution in South Asia. (Indian Tourist Office)

The MARPOL Protocol incorporated improvements to the measures relating to pollution by oil (Annex I). For new oil tankers of 20,000 dwt and above segregated ballast tanks (SBT) were required to be protectively-located – that is, to be positioned in such a way that they would afford the maximum protection to the cargo tanks in the event of the ship running aground or being involved in a collision.

A new development known as crude oil washing (COW) was also introduced. This was an improvement on the LOT method which used sea water to clean the tanks after the cargo was discharged. Under the COW system, crude oil is itself sprayed on to the tank sides: this not only cleans off the deposits more effectively than water, but also avoids the problem of separating mixtures of oil and water which resulted from water washing. All crude oil tankers must operate with SBT or COW or dedicate some of the cargo tanks for the carriage of ballast water only. Because the same piping arrangements are used for both oil and water, the clean ballast tanks (CBT) option is permitted only on existing crude oil tankers and then for a limited time only. Product carriers have to operate with either SBT or CBT.

To ensure that the revised convention was effectively implemented, its survey and certification requirements were considerably strengthened in the Protocol.

To speed up the entry into force of the modified convention, a device was adopted whereby the Protocol absorbed the parent convention: governments ratifying the protocol must implement the 1973 MARPOL Convention as modified by the 1978 Protocol (hence the instrument is generally called MARPOL 73/78). Because most of the difficulties encountered had concerned the annex dealing with chemicals, provision was made for this annex to enter into force three years after the annex dealing with oil.

The reaction of governments to MARPOL 73/78 has been encouraging and it is hoped that the treaty will enter into force during the course of next year.

The best way to avoid accidental pollution is, of course, to avoid accidents. Many of IMO's conventions contain special provisions for tankers, chemical carriers and other ships whose cargoes present a threat to the health of the oceans.

The officers and crews of such ships must have special training, as stipulated in the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978 (STCW).

The 1978 Protocol to the SOLAS convention strengthens requirements regarding the use of inert gas systems (which are designed to prevent tanker explosions by eliminating dangerous gases from cargo areas); they are now mandatory on tankers of 20,000 dwt and above. Special navigational equipment must be carried – some of it duplicated in case of breakdown.

The 1972 International Regulations for the Prevention of Collisions at Sea also makes special provisions for ships such as large tankers whose ability to manoeuvre is limited by reason of their draught.

One other convention should be mentioned at this point. This is the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972, usually known as the London Dumping Convention. This instrument was adopted in 1972 at a conference organized by the United Kingdom but Secretariat responsibility for it has since been transferred to IMO.

The convention recognizes that the capacity of the sea to assimilate wastes and render them harmless is not unlimited. The dumping of some materials – such as mercury, plastics, and some radio-active wastes – is completely banned and in other cases is strictly controlled.

In addition to conventions, IMO has over the years adopted numerous codes and recommendations dealing with the prevention of marine pollution.

One of these is the comprehensive *Manual on Oil Pollution* which is designed for the use of governments in preparing anti-pollution measures and is periodically revised.

But the development of legislation is only part of the process. It is now generally felt that the existing body of legislation embodied in IMO's conventions and other instruments is virtually complete; and the emphasis in recent years has swung away from the adoption of new legislation towards the more effective implementation of that which already exists.

The Organization has encouraged governments to develop their own contingency plans for dealing with pollution and has in particular encouraged the development of regional co-operation. Since 1976 IMO, in co-operation with the United Nations Environment Programme has been operating a Regional Oil Combating Centre for the Mediterranean Sea in Malta. Similar ventures are now being planned for other parts of the world.

The Organization has also taken steps to strengthen the inspection and certification procedures contained in various conventions. These include greater powers for authorities to take action with regard to foreign ships which visit their ports. Basically it is the responsibility of the country in which the ship is registered (that is, the flag state) to ensure that its ships conform to standards laid down by IMO. But many conventions contain provisions for port state inspection and in some cases these too have been strengthened.

Finally, IMO has built up an effective technical assistance programme whose function is to provide expert advice and guidance wherever it is required. Many governments lack the resources, experience and expertise which is necessary to implement IMO measures effectively. To help overcome this problem, IMO has built up a team of advisers and consultants – some of whom are based in the field – which includes several who specialize in the prevention of marine pollution.

The position today: is pollution getting worse?

The section above described the action which IMO has taken so far to reduce pollution of the sea from ships. It is a record which most would agree is both comprehensive – and impressive. But how effective has it been? Are the oceans today cleaner than they

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were 20 years ago – or more polluted?

It is impossible to say with any certainty exactly how much pollution is caused by ships each year – many pollution incidents are not witnessed and are therefore not recorded. But some estimates have been made, using the best information available.

The estimate most widely quoted in recent years was the one made by the United States National Academy of Sciences for 1971. It was quoted earlier in this article.

In November of last year the National Academy of Sciences (NAS) organized another workshop to up-date this estimate and IMO was invited to contribute to the section dealing with oil pollution from marine transportation.

Although comparisons between the two estimates should be treated with caution, since the data used was not strictly comparable, it would appear that during the 1970s oil pollution from ships did decrease quite appreciably.

The IMO experts estimated that some 1,490,000 tons of oil entered the sea in 1980 as a result of shipping operations – compared with more than 2 million tons in 1971. The improvement is perhaps even more significant when one takes into account the increase in oil transported during the 1970s.

In 1971, 1,355 million tonnes of oil was transported by sea; in 1980 1,588 million tonnes.

In 1971 the world tanker fleet totalled 6,292 ships with a total deadweight of 170 million tons. By 1980 there were 7,112 tankers with a total deadweight of 340 million tons.

There are many reasons for this improvement. One is the greater use of load-on-top and latterly crude oil washing on tankers. These techniques, coupled with other measures adopted by IMO, have led to a great reduction in the amount of pollution caused by routine tanker operations such as tank cleaning.

Similarly, the increased availability of reception facilities in ports and improved cleaning techniques have led to a substantial reduction in the amount of oil emptied into the sea by ships going into dry dock (in the earlier NAS study it was estimated that in 1971 one half of tankers would arrive for drydocking without tank washing residues).

The improvement is in fact due almost entirely to a reduction in operational pollution. Pollution arising from tanker accidents varies from year to year and one *Torrey Canyon* or *Amoco Cadiz* can distort the figures considerably. The IMO experts estimated that in 1980 tanker and non-tanker accidents together resulted in 420,000 tons of oil entering the sea – compared with 300,000 tons in 1971.

This picture was taken in Roussillon, France, but the sight of children playing on the beach is typical of resorts all round the Mediterranean Coast in the summer months. The Mediterranean is one of a number of 'special areas' where the discharge of oil into the sea is forbidden. (Anne Bolt)

Despite the fact that the world tanker fleet had grown considerably between the two dates, this high rate of accidental pollution is still worrying – particularly when other evidence is taken into account.

For the last few years the IMO Steering Group on Casualty Statistics has been preparing and analysing statistics on casualties involving tankers, chemical carriers and combination carriers (ships which are designed to carry oil or bulk cargoes such as ores). The statistics go back to 1968 and show that during this period the serious casualty rate per hundred tankers at risk has averaged 2·39 per year. In 1981 the rate was 2·79 per cent – second only to 1979, when the rate was 3·24 per cent.

The statistics show that, as is to be expected, the incidence rate for casualties is to some extent dependent upon the age of the ship. Ominously, many of the world's fleet of VLCCs (Very Large Crude Carriers) is now becoming quite old in shipping terms and the statistics show that 1981 was the worst year on record for casualties to tankers of 150,000 dwt and above.

It should be borne in mind that serious casualties do not only involve total losses of ships but also cover fires, explosions, groundings, breakdowns and so on. Most of these casualties are not likely to cause pollution and total losses even include ships which are scrapped as a result of damage – something which is more likely to occur today, when the market is depressed, than in 1971 when it was still high.

Nevertheless, the statistics do give cause for concern.

If the serious casualty rate is worrying, then there is some compensation to be gained from a study of collision statistics.

A paper prepared by the International Association of Institutes of Navigation (IAIN) in 1981 looked particularly at collisions which have occurred off the coast of north western Europe between 1956 and 1980.

The important points to remember about this region – which includes the English Channel and the southern North Sea – are that it is probably the busiest shipping area in the world and second that this was the first area to adopt the idea of traffic separation. This is a system whereby ships on opposing courses are kept apart by a neutral zone (rather like the divided highways used by road traffic). In the Channel, for example, traffic heading north-east keeps to the French side; that heading south-west keeps to the English.

Traffic separation and other routeing systems were given statutory backing by the Collision Regulations adopted by IMO in 1972. Since then they have been introduced in more than 100 different places around the world – and the IAIN study indicates that they are highly effective.

The number of collisions in the Channel area, according to the IAIN report, was as follows:

1956–61	1961–66	1966–71
156	176	122

1971–78	1976–81
64	45

The first TS scheme was introduced in the Dover Straits in 1967 and seems to have had an immediate and beneficial impact.

The figures are particularly encouraging when compared with figures from other parts of the world, where traffic separation schemes have not been introduced and shipping has increased. In parts of the Far East, for example, the number of collisions rose from only five in the period 1958–61 to 125 between 1976 and 1980.

The future

The previous section shows that international action through IMO has during the last decade or so had a considerable impact upon the world's oceans. Oil pollution from ships – especially operational pollution – has fallen, even though shipping and tanker tonnage has risen. In areas where traffic separation schemes have been introduced there has been a drop in the number of collisions, especially collisions between ships on opposing courses.

On the other hand, the tanker casualty statistics show that the accident rate is still uncomfortably high, that older ships are more likely to become casualties then new ones – and that the world's fleet of very large tankers is getting older.

On balance, however, a general improvement can be anticipated in the years to come as more stringent controls become internationally mandatory and implementation becomes more effective.

MARPOL 73/78 could well enter into force before the end of 1983. It will greatly strengthen existing measures to prevent oil pollution from ships and, for the first time, will introduce international controls concerning other forms of pollution. The annex dealing with pollution from chemicals – potentially the most dangerous pollutants of all – could become international law by 1986. These measures will be further strengthened by moves currently underway to make the International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (IBC Code) mandatory, and eventually to introduce further pollution prevention measures into this Code. This will ensure, for instance, that the chemicals posing the most serious pollution hazard will only be carried in chemical tankers equipped with the most stringent containment systems.

Amendments to SOLAS 1974 which were adopted in November 1981 are expected to enter into force in September 1984. Amongst other measures, they contain several relating to tankers which are designed to give even greater protection against fire and explosion.

The STCW Convention is regarded by many as second in importance only to SOLAS as far as maritime safety is concerned and it is equally crucial to the success of anti-pollution measures, for despite all the technical

advances of the last few decades the human element remains the most important component of all in shipping. This convention could also enter into force before the end of 1983.

Within a year or two, therefore, the body of international law which is designed to control and eventually eliminate pollution from ships will have been enormously strengthened. And further improvements are already being planned.

More amendments to SOLAS and the first set of amendments to MARPOL 73/78 (which will be adopted after the convention has entered into force) are now being prepared. Among other changes, as mentioned above, the intention is to make implementation of the IBC Code mandatory. At present codes do not have the same legal force as conventions and are intended primarily as recommendations to form a basis for domestic legislation.

IMO is also planning to raise the limits of liability laid down in the 1969 Civil Liability and 1971 Fund Conventions. This will enable victims of oil pollution disasters to gain more adequate compensation than is currently available. The Organization is also planning a new convention on compensation for damage arising from incidents involving hazardous and noxious substances, which includes pollution damage caused by chemicals.

Even so, the battle against pollution from ships is far from over. The world fleet of tankers is getting older. In a period of recession there is always a temptation to cut down on essential maintenance. The possibility of further *Amoco Cadiz* and *Torrey Canyon*-sized disasters is very real.

It is a possibility which makes proper implementation of anti-pollution measures more vital than ever. All major IMO conventions contain control procedures which are designed to ensure that ships, including tankers, are properly equipped and maintained. Many of these measures have been strengthened in recent years and the Organization is currently engaged in a review of survey and inspection requirements in several major instruments. The aim is to harmonize the requirements as far as possible, thereby making the task of enforcement both simpler and more effective.

At the same time IMO is helping to assist effective implementation by raising the standards of shipboard personnel. The technical assistance programme has always concentrated primarily on training. A further dimension to this has been added by the decision to establish a World Maritime University based in Malmö in Sweden, where expert training will be provided for top level administrators and other personnel from developing countries – the people who are most concerned with the implementation of IMO measures, including anti-pollution instruments, at the national level.

The battle against marine pollution, in fact, involves many different processes. First there must be a comprehensive body of international treaties, acceptable to the world community as a whole; those treaties have now been developed.

Second, national action must be taken to bring those treaties into force; much has already been done to achieve this, and within a few years all of the most important IMO legislation will be internationally binding.

Third, the means must exist for implementing those laws – which means recruiting and training people with the right skills and giving them the authority necessary to carry out their task: here the IMO technical assistance programme has played and is playing an invaluable role.

Fourth, existing measures should be kept under constant review so that improvements can be made: this is being done.

Fifth – and most important – there must be no complacency nor any relaxation in efforts to eliminate pollution from ships. Before too many congratulations are expressed for the achievements of the past it should be borne in mind that in 1981 the serious casualty rate for oil tankers was worse than it was in 1968. It is a statistic which indicates just how much work still remains to be done.

New IMO publications

A new publication *Noise Levels on Board Ships* contains the Code on Noise Levels on Board Ships adopted at the last IMO Assembly (resolution A.468(XII)) together with the Recommendation on methods of measuring noise levels at listening posts, which was adopted in 1975 by resolution A.343(IX). The English edition is now available and costs £1.75 post-free. The sales number is 814 82.05.E. French and Spanish editions will be available later.

Performance Standards for Navigational Equipment contains extracts from a number of recommendations adopted by the IMO Assembly during the last few years. They include recommendations adopted by the 12th Assembly in 1981, dealing with navigational radar equipment, shipborne receivers for use with differential Omega and devices to indicate speed and distance. The English edition of the publication costs £2.50 post-free and the sales number is 979 82.07.E.

Dedicated Clean Ballast Tanks contains the text of resolution A.495(XII). The English edition costs £2.50 and the sales number is 619 82.11.E. The resolution is concerned with revised specifications for oil tankers with ded cated clean ballast tanks, which are a requirement of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978.

The growth of the offshore oil industry has led to an increase in the use of specialized supply vessels. Resolution A.469(XII), adopted at the last Assembly, was concerned with their design and construction. It has now been published in English in *Guidelines for the Design and Construction of Offshore Supply Vessels*. The sales number is 807 82.12.E. and the price is £1.25.

A new version of *Procedures for the Control of Ships* contains resolution A.466(XII) and is available in English at £2.00. The sales number is 819 82.13.E.

Oily-Water Separating and Monitoring Equipment contains texts of three resolutions dealing with this subject, two of which were adopted at the last Assembly. They are resolutions A.444(XII), which is concerned with the installation of oily-water separating equipment, and A.496(XII) which deals with guidelines and specifications for oil discharge monitoring and control systems for oil tankers. The English edition is now available at £2.25 and the sales number is 608 82.15.E.

Inert Gas Systems for Ships Carrying Petroleum Products in Bulk contains the text of resolution A.473(XII) – interim regulation for inert gas systems on chemical tankers carrying petroleum products – and other relevant information. The English edition costs £2.50 and the sales number is 858 82.16.E. The French edition will be available later.