

International Council for the
Exploration of the Sea

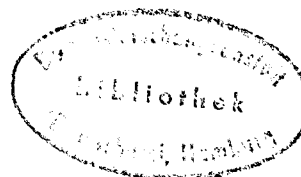
C.M. 1971/E:15*
Fisheries Improvement Committee



UN Conference on Human Environment

Agenda item III(a)(i) - Identification and
Control of pollutants emanating from ships,
vessels and other equipment operating in
the marine environment

prepared by IMCO



UN CONFERENCE ON HUMAN ENVIRONMENT

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I. INTRODUCTION

1. One of the earliest indications of marine pollution as a problem requiring international control was pollution of the sea by oil, the increasing threat of which was first drawn to the attention of the Economic and Social Council at its eleventh session in 1950. In the following year, as a result of enquiries instigated by the Council, governments with the technical facilities to do so were asked to undertake studies on the subject and to communicate the results to the UN Secretary-General who would transmit them to IMCO when that agency was established.

2. The first major step in preventing such pollution however, took place in April-May 1954 when an ad hoc diplomatic Conference was held in London. Forty-two countries, including all the major maritime powers, attended this Conference at which the United Nations and the Food and Agriculture Organization were represented. The resulting instrument, "The International Convention for the Prevention of Pollution of the Sea by Oil, 1954", was deposited with IMCO when that Organization was established in 1959. Such allocation of responsibilities was appropriate under Article I, paragraph (a) of the IMCO Convention which reads as follows:-

"to provide machinery for co-operation among Governments in the field of governmental regulation and practices relating to technical matters of all kinds affecting shipping engaged in international trade, and to encourage the general adoption of the highest practicable standards in matters concerning maritime safety and efficiency of navigation;"

3. The 1954 Convention deals with deliberate or operational discharge of oil from ships, its principal aim in the past having been the protection of amenities, such as beaches, from pollution by oil discharged from ships, especially tankers, during routine tank-washing and ballasting operations. The Convention was subsequently amended in 1962 and again in 1969, with the aim of achieving the ultimate goal of total prohibition of intentional discharge of oil.

4. In 1967 the stranding of the "Torrey Canyon" brought to light the immense threat of massive pollution which could result from accidental discharge of oil in the event of strandings, collisions, etc. Prompt action by the IICO Council, immediately after the disaster, resulted in an eighteen point programme, the technical aspects of which were pursued as a matter of urgency by the Maritime Safety Committee and its subsidiary bodies. Acting upon the recommendations of the Committee, the IICO Assembly at an Extraordinary Session, especially convened in November 1968, approved measures designed to prevent accidents to ships (and in relation also to general safety at sea) and to promote rapid and efficient action to deal with them should they occur.

5. Although the foregoing measures were necessary and effective in dealing with some of the major problems brought to light by the "Torrey Canyon" disaster, the Council of IICO recognized also that it had introduced new problems of pollution control and regulation which were essentially legal in character. In order to deal with these problems adequately and effectively, the Council established a Legal Committee and charged it with the mandate to study and recommend action on all the legal problems brought to light by the disaster.

6. This work culminated in the convening by IICO of an international legal conference which was held in Brussels (Belgium) in November 1969. This Conference adopted and opened for signature two international conventions. The first deals mainly with the right of coastal States to take measures to prevent, mitigate or eliminate actual or anticipated oil damage resulting from a maritime accident. The second deals principally with liability and insurance in respect of oil pollution damage arising from a maritime accident.

7. Notwithstanding the foregoing action by IICO to deal with oil pollution, far-reaching developments in modern industrial practices have introduced the need for further action on a much larger scale and considerably broader in scope than has hitherto been required. The principal features may be summarized as follows:

- (a) the number of ships at sea has increased bringing about a corresponding increase in the probability of accidents particularly in congested areas;
- (b) the size of individual tankers has grown to "mammoth" proportions thus introducing a threat of massive accidental pollution on a scale which has not previously been envisaged;
- (c) the increasing diversity and quantity of petroleum derivatives and other chemical cargoes carried by ships has introduced a threat of pollution by substances some of which are more harmful to the environment (though perhaps less obvious and offensive in the aesthetic sense) than oil;

- (d) there has been a rapid increase in the use of various craft and other equipment in the exploration and exploitation of the sea-bed and ocean floor thus giving rise to a potential risk of serious pollution by oil or other products particularly as a result of accidents which could involve shipping engaged in normal maritime transport operations;
- (e) ships and barges have been utilized to an increasing extent for the purpose of dumping large quantities of sewage, industrial waste, solid objects and toxic chemicals into the oceans which could give rise to harmful pollution.

8. The above trends, which appear likely to continue to increase at least throughout the current decade, illustrate that measures for protecting the marine environment from the effects of shipborne pollutants are closely related to measures designed to preserve the safety of ships and other equipment operating in the environment and their associated personnel. In this context the serious nature of the developing situation and the broad scope of the problems involved were recognized by the IICO Assembly when, in October 1969, it decided to convene an international conference in 1973 for the purpose of preparing a suitable international agreement for placing restraints on the contamination of the sea, land and air by ships, vessels or other equipment operating in the marine environment (Resolution A.176(VI)). As a further step in March 1971, the Maritime Safety Committee approved a draft Resolution inviting the Assembly to decide:

- (a) that the 1973 Conference shall have as its main objective, the achievement by 1975 if possible, but certainly by the end of the decade, the complete elimination of the wilful and intentional pollution of the seas by oil and noxious substances other than oil, and the minimization of accidental spills; and

- (b) that the Maritime Safety Committee should direct its appropriate Sub-Committees to give first priority to the problem of achieving these goals.

II. IDENTIFICATION OF PRINCIPAL POLLUTANTS AND THEIR SOURCES

9. With reference to maritime operations the principal sources of pollution are:

- (a) deliberate discharge of oil and oily mixtures and other noxious and hazardous cargoes arising from routine tank cleaning and ballasting operations in tankers or from the bilges of ships;
- (b) deliberate dumping of shore-generated waste containing oil and other pollutants by ships and barges;
- (c) accidental release of oil and other noxious substances as a result of maritime casualties involving ships (particularly tankers);
- (d) accidental release of oil and other pollutants as a result of mishaps involving equipment operating in the marine environment including sub-marine pipelines.

Oil

10. For the purposes of existing conventions relating to pollution of the sea the term "oil" has been defined mainly on the basis of amenity considerations and therefore generally relates to oils of a "persistent" nature such as crude oil, fuel oil, heavy diesel oil and lubricating oil. Recent proposals however have drawn attention to oils and oil products which are less persistent in nature (and therefore presently excluded from the above definition) but which nevertheless cause considerable damage when released into the sea. These proposals are now under consideration in both the technical and legal divisions of IMCO with a view to formulating definitions of oil of a more general character.

Noxious cargoes other than oil

11. Particularly during the last decade, increasing quantities of noxious and hazardous substances have been transported both in packages and in bulk thus introducing a threat of significant pollution if released into the sea either deliberately or through a maritime casualty. From this point of view the hazardous characteristics must be assessed taking into account, not only human toxicity but also aquatic toxicity and their effects on living resources and amenities. For this reason GESAMP was requested by IICO to identify those cargoes other than oil (as defined in the Oil Pollution Convention), which would warrant special measures to prevent their escape into the sea. The Group has now prepared a list (GESAMP III/19, Annex V) containing between 300 and 400 substances grouped under two main categories as follows:

Category I - Substances which on release into the sea present a major hazard to either human health or marine resources or cause serious harm to amenities and therefore justify the application of special measures to prevent their escape into the marine environment. This category includes such items as pesticides, compounds of mercury, fluorine, arsenic or antimony and persistent oils.

Category II - Substances which on release into the sea may present a hazard to either human health or marine life or are harmful to amenities but which because of their short-term or strictly localized effect, require special anti-pollution measures only in certain

circumstances or localities - i.e., if a large shipment is involved or if the release is likely to take place in the proximity of susceptible marine resources or in an enclosed area such as a bay, canal or dock. This category includes compounds of lead, zinc or chromium, concentrated acids or alkalis etc.

12. It would appear that Category I substances pose a greater threat to the marine environment and might therefore require the exercise of rather more stringent or extensive control measures than those in Category II.

Other principal pollutants

13. The Review of Harmful Chemical Substances (GESAMP III/19, Annex IV) provides useful guidance in identifying harmful pollutants being discharged from the shore. These pollutants reach the sea by dumping from ships and barges, via rivers, or via pipelines. A question therefore arises as to whether sea dumping would be best controlled by regulating the transporting vessels or by controlling the disposal of the pollutants at source bearing in mind that the enforcement of restrictions on discharge into the sea would appear to impose a need to study and recommend alternative methods of disposal. There is clearly a need to develop a consistent policy for the control of marine pollution, covering all sources and methods of disposal. A recent study on Ocean Dumping*, prepared by the United States Government, clearly sets out many of the major problems involved.

* This is entitled "OCEAN DUMPING", A National Policy. (A Report to the President prepared by the Council on Environmental Quality - October 1970).

14. It may be useful also to examine certain categories of pollutants for which GESAMP has recommended the application or consideration of restrictive measures. These include:

(a) Domestic sewage and food processing waste

Although GESAMP has indicated that the principal source is via direct outfalls and rivers, two major countries have informed IMCO that they each discharge about five million tons annually by the use of ships and barges. Little indication of quantities dumped by other countries has been obtained. The main polluting characteristics appear to be contamination of shellfish and reduction of amenities, oxygen depletion and high nutrient concentration. These indicate that the problem in general may be one of control rather than total prohibition. However, because industrial wastes are frequently discharged to sewers, sewage sludge may contain certain very harmful substances such as pesticides, PCB's and heavy metals, and may require more stringent control or, in some cases, prohibition. Where this is so, the measures could perhaps be more easily applied at the source (i.e. usage and original disposal).

(b) Pesticides

The principal sources are shown as agricultural run-off and through the atmosphere hence it may be that control could be more effectively exercised by restricting the usage ashore. Nevertheless IMCO has received information from one Member Government which shows that

considerable quantities of pesticides and other highly toxic substances have been dumped by ships and barges in deep water in the North Atlantic Ocean. This practice would certainly seem to require the application of control measures, although GESAMP has indicated that this source is only of slight concern at present principally in respect of organo-chlorine compounds and polychlorinated biphenyls.

(c) Inorganic and organic wastes

It is difficult to estimate, individually, the discharged quantities of organic and inorganic wastes as these frequently appear to be included with petro-chemical products and other substances in industrial sludge. It seems certain however that considerable quantities are being dumped at sea by ships and barges. Inorganic waste may contain numerous pollutants including persistent and toxic substances, some of which (mercury, zinc and copper) are subject to accumulation by marine organisms. Acids, alkalis, and arsenic compounds are also considered by GESAMP to warrant consideration with a view to applying restrictive measures. For organic wastes the principal problems are toxicity, oxygen depletion, suspended solids and discolouration. Here again the problem appears to be partly one of restriction or prohibition and partly one of controlling the location of discharge.

(d) Solid objects

The main problem relates to amenity considerations (plastic packings, bottles, old cars and other rubbish) although solid objects, such as wire ropes and containers cause considerable hindrance to maritime

activities such as fishing. Some countries have issued notices to mariners against the dumping of solid objects by ships in the course of their normal operations. The most serious source however, appears to be deliberate dumping of rubbish from the shore by vessels. This can include both floatable and sinkable objects which may subsequently shift considerable distances. Control measures might therefore be necessary to designate suitable dumping areas and to regulate the operation of the vessels concerned on either a regional or an international basis.

(e) Dredging spoil and inert wastes

The main sources are indicated as being through exploration and exploitation of the sea-bed mineral resources and dumping by ships and barges. Comparatively large quantities appear to be involved which can cause significant harm to marine life, maritime activities and amenities. The main problem appears to be that of preventing the dumping of spoil by the vessels concerned in certain areas of the ocean, again an essentially maritime problem of regional or international significance.

15. Two other areas for possible action exist which have particular reference to pollution from ships. At present, however, the problems mainly appear to concern ports, harbours and docks rather than the high seas. These are:

- (a) discharge of sewage from ships in the course of their normal operations. It may be necessary in the future to take international action to encourage the fitting of sewage disposal units in ships. IMCO is at present

collecting information from its Member Governments on existing national regulations on this problem with a view to formulating, in co-operation with ILO, international standards or guidelines for the disposal of sewage aboard ships.

- (b) air pollution from ships. In many ports ships are obliged to comply with local regulations but, on the basis of information supplied by governments, the technical bodies of IMCO concluded that there does not appear to be any need for international action on the subject as yet.

III. MEASURES FOR DEALING WITH MARINE POLLUTION

16. The main principles for establishing measures for dealing with marine pollution caused by ships and other vessels may be summarized as follows:

- (a) Technical aspects:

- (i) controlling the deliberate discharge of pollutants from ships with a view, where necessary, to ultimate prohibition;
- (ii) preventing maritime accidents from which pollution can arise;
- (iii) establishing conditions for the safe carriage of noxious and hazardous cargoes;
- (iv) reducing uncontrolled release of pollutants should maritime accidents occur;
- (v) recommending appropriate remedial measures for pollution (methods of dealing with spillages)

(b) Legal aspects:

- (i) providing appropriate powers to enable States to take action to mitigate or eliminate pollution damage as a result of maritime casualties;
- (ii) providing the means of redress for damage caused by pollution (liability and compensation).

Deliberate discharge of pollutants

17. The existing international instrument dealing with deliberate discharge of oil from ships is the International Convention for the Prevention of Pollution of the Sea by Oil, 1954, as amended in 1962. Under the conditions existing in 1954, the principal problem was the protection of amenities from oil pollution.

This was principally achieved by prescribing certain "prohibited zones", extending to at least 50 miles from the nearest land, in which the discharge of oil or oily mixture (containing 100 parts of oil per million parts of mixture or more) was not permitted.

18. In 1962, the Organization convened the International Conference on Prevention of Pollution of the Sea by Oil, which amended the 1954 Convention principally by extending its application to include ships of lesser gross tonnage and by extending zones in which the discharge of oil was prohibited. As amended in 1962, the basic instrument has now been accepted by 42 States including all the major maritime nations. Its provisions, which are mainly technical, cover some 91% of world ocean-going tonnage and about 95% of world tanker tonnage.

19. In the years since the 1954 Conference however, scientific and technical developments have progressed with a rapidity which could scarcely have been foreseen at that time. For example, the development of petrochemical products (such as plastics,

synthetic fibres, detergents, etc.) has brought about a startling increase in the demand for (and transport of) crude oil to the refineries of industrialized countries. This situation has been enhanced by an ever increasing demand for petroleum based fuels. It has been estimated that*:

- (i) the total world production of petroleum (including natural gas liquids) increased from 280 million tons in 1938 to 1995 million tons in 1968;
- (ii) the world tanker tonnage increased from 17 million tons dwt in 1938 to 117 million tons dwt in 1968;
- (iii) the total number of tankers increased from 2270 in 1951 to 5644 in 1968.

20. This situation led to the adoption by IMCO in 1969 of further amendments to the Convention which represent a further significant step towards the total prohibition of deliberate pollution by oil from ships, by strictly limiting the amount of oil which a tanker may discharge in any ballast voyage to 1/15000 of the total cargo-carrying capacity of the vessel and restricting the maximum instantaneous rate at which this quantity may be discharged to 60 litres per mile travelled by the vessel. Furthermore no discharge of oil whatsoever will be permitted from the cargo spaces of a tanker within 50 miles of the nearest land. Comparable restrictions will apply to vessels other than tankers. An additional amendment is now being considered by the IMCO Assembly for adoption to provide special protection for the Great Barrier Reef area in view of its unique scientific and environmental significance.

* "The Growth of Petroleum Production and Movement" by H. Jagger (Institute of Petroleum)

21. For the prevention of deliberate oil pollution, the Oil Pollution Convention is supported by numerous recommendations to Governments on technical and administrative matters such as:

- (a) the development of methods of tank cleaning and ballasting of tankers whereby oily mixtures are not discharged into the sea. In this connexion Governments have co-operated closely with the major oil companies with beneficial results such as the development of the well known "Load on Top" system now used by about 80% of the world's tanker fleet. It has been estimated that the use of this system enables a tanker to limit the amount of oil it discharges to about 1 or 2 per cent of that which would have been discharged if the tanks were washed directly to the sea*;
- (b) the provision of adequate penalties to discourage discharges in breach of the Convention;
- (c) the provision of adequate shore reception facilities in ports for oily mixtures retained on board;
- (d) the fitting of ships with efficient oil/water separating equipment and oil content meters. Draft International Performance specifications have now been prepared and have been submitted to the IMCO Assembly for adoption in October 1971.

The measures described in the foregoing paragraphs with reference to the deliberate discharge of oil are now under consideration in IMCO with a view to establishing similar control measures to the extent necessary for noxious and hazardous cargoes other than oil in accordance with its future programme, as set out in paragraph 8, Section I.

* These figures have been derived from estimates contained in "Ballast and Wash Waters from Tankers" by M.P. Holdsworth (Shell International Marine Ltd.)

Accidental pollution from ships

22. The prevention of accidents to ships is one of the principal methods of preventing pollution of the marine environment. In this context the International Convention for the Safety of Life at Sea, 1960, the prime purpose of which is to ensure the safety of human life at sea, makes a major contribution to the prevention of accidental pollution. The Convention has now been accepted by no less than 83 States and contains provisions relating to:

- (a) ship construction (subdivision and stability, machinery and electrical installations, fire protection etc);
- (b) Life-Saving Appliances;
- (c) Radiotelegraphy and radiotelephony;
- (d) Safety of Navigation;
- (e) Carriage of Grain;
- (f) Carriage of Dangerous Goods;
- (g) Nuclear Ships.

Furthermore, the International Regulations for Preventing Collisions at Sea, 1960 which are universally followed, contribute to the basic safety of ships from the navigational viewpoint.

23. The SOLAS Convention and the Collision Regulations are supported by Recommendations to governments (some of which may soon be made mandatory) concerning such aspects as:

- (a) the fitting, use and testing of additional shipborne navigational equipment;
- (b) the establishment of port advisory services as a contribution to safety in ports and their approaches and the current study of methods for traffic control and surveillance;

- (c) the provision of pilotage services for certain classes of ships in which the employment of a pilot should be made mandatory;
- (d) the provision of data on the manoeuvring capabilities and stopping distances of ships to ensure that the master and officers have all necessary information readily available when required;
- (e) the establishment and compulsory observance of traffic separation schemes and areas to be avoided by ships of certain classes.

24. The Organization is continuing to give high priority to the development of further measures aimed at minimizing accidents which could give rise to pollution of the sea, including:

- (a) the convening of an international conference in 1972 to revise the Collision Regulations;
- (b) the establishment of standards of training and qualifications for mariners aimed at increased safety of ships;
- (c) the development of appropriate measures for improving the manoeuvrability and stopping ability of large ships such as very large crude carriers (VLCC).
- (d) determining the cause of explosions which have occurred in tankers and devising methods of preventing them.

25. The variety and complexity of the measures listed in the foregoing paragraph admirably illustrate the need for a full understanding of the navigation, construction, operation and management of ships as an essential prerequisite to the formulation of preventive measures for pollution emanating from ships. It might further be recognized that the prevention of oil pollution arising from off-shore drilling rigs, (including pipelines for transporting oil to the shore) which is mainly an accidental risk, is unavoidably involved with the control of shipping.

26. With respect to the equipment itself (as distinct from the sea-bed on which it is standing) the preventive measures may well require the same basic approach as for accidents involving ships (i.e. a basic safety convention supported by recommendations affecting navigation, construction or equipment) and might, with advantage, be dealt with by the régime already established. Some recommendations on this subject have already been made by IMCO as follows:

- (a) the establishment of fairways through off-shore exploration areas;
- (b) the dissemination of information, charting and manning of drilling rigs and production platforms;
- (c) radiocommunication requirements for drilling rigs and production platforms;
- (d) fire safety of mobile off-shore units.

It is IMCO's intention to formulate a comprehensive document covering all aspects of safety of such equipment based on recommendations which have been or are being developed by the various technical bodies concerned.

Carriage of noxious and hazardous cargoes

27. Dangerous chemical cargoes, including highly toxic substances have been carried in ships for many years. Until recently they consisted mainly of packaged consignments subject to regulations which were basically framed to provide for the safety of the ship and its crew in respect of such hazards as fire, explosion, poisoning, corrosion and radioactivity etc. It was in this context that the International Maritime Dangerous Goods Code was compiled by IMCO to serve as a basis for national regulations for

the control of such cargoes during transport, which Contracting Governments are obliged to make under Chapter VII of the International Convention for the Safety of Life at Sea, 1960. This Code contains provisions for approximately two thousand individual substances relating to:

- (a) The nature of the substance to be carried (limiting concentration or required degree of phlegmatization etc.);
- (b) The required conditions for segregation from other dangerous cargoes;
- (c) The required separation from other types of cargo (foodstuffs etc);
- (d) Other conditions for stowage in the vessels on or underdeck etc;
- (e) Fire precautions and fire fighting procedures;
- (f) Specifications and tests for packagings to ensure that they are suitable and sufficiently robust to prevent the escape of the substance under normal risks of handling and transport;
- (g) Medical First Aid measures to be applied in the event of accidents.

28. Recently, at the suggestion of ECAFE, the technical bodies of IMCO commenced work on the handling of dangerous goods in ports. A preliminary survey of the problems arising and possible methods of control has been prepared as a basis for the development of appropriate safety measures harmonized as far as possible with the provisions of the Dangerous Goods Code.

29. With regard to the bulk carriage of dangerous chemicals, a Code for the Construction, Equipment and Operation of Ships carrying such cargoes has been prepared and is being submitted to the IMCO Assembly in October 1971 for adoption. The Code provides suitable design criteria, construction standards and other safety measures for ships transporting chemical substances in bulk to as to minimize the risk to the ship, its crew and the neighbourhood with respect to fire, health, water pollution, air pollution and reactivity hazard. It contains requirements for such matters as construction and arrangements of ships, pumping and piping systems, electrical installations, fire protection, ship operation, etc. Depending on the degree of their hazards, chemicals are required to be carried in one of three types of ships; Types I and II ships are of double hull construction and capable of survival after collision or stranding damage specified for each type of ship. The Code also lays down the maximum quantity of products permitted to be carried in one tank. It is intended that the Code will be extended, or further Codes will be drawn up, to cover hazardous gases and chemicals in non-propelled vessels.

30. For noxious and hazardous cargoes other than oil the major considerations may be summarized as follows:

- (a) the need for prohibiting the deliberate discharge of tank washings or dirty ballast into the sea;
- (b) the possible need for limiting the total quantity permitted for transport in any one ship;
- (c) the construction and equipment of the ships carrying such cargoes;
- (d) the need for including the ships concerned under the existing system of routeing and avoidance of particular areas such as those containing valuable marine resources and other measures for preventing maritime accidents;

- (e) for packaged cargoes, the need to consider the pattern of stowage and the type of containers so as to minimize the risk of serious pollution following accidents.

Minimizing spillages from accidents

31. The demand for ships to carry continually increasing quantities of oil has in recent years, led not only to an increase in the number of vessels so employed but also to a very substantial increase in the size of individual tankers. Whereas in 1948, a tanker of approximately 26,000 tons was the largest vessel of this type, by the end of 1970 over 100 tankers exceeding 100,000 tons dwt were in service. By mid-1973 (the time of the IMCO Conference), it is expected that there will be more than 400 tankers, each exceeding 200,000 tons dwt, in operation. At present, a tanker of 470,000 tons dwt is under construction and, according to a current estimate given by the oil industry, by the end of this century tankers of 1,000,000 tons dwt might very well be relatively commonplace. Up to the present time the size of individual tanks in tankers is limited only by strength considerations which might permit the design of a 1,000,000 ton tanker with individual tanks as large as or exceeding the total capacity of the "Torrey Canyon". The magnitude of the pollution which might arise from a ship of these dimensions, if involved in an accident (such as collision or stranding), led the Maritime Safety Committee to take urgent and positive action aimed at limiting the escape of oil in such a mishap.

32. Based on the results of an intensive study by a technical body of IMCO which included consideration of tank design and distribution and of the cost and other consequences of tank size limitation, the Maritime Safety Committee has formulated

requirements for tank arrangements and limitation of tank size for submission to the IMCO Assembly in October 1971 for adoption as an amendment to the Oil Pollution Convention. The requirements set out a limitation of hypothetical oil outflow in the event of collision or stranding of oil tankers to a value of 30,000 m³. The implications of this oil outflow limitation will vary according to various factors, such as arrangements of tanks, the fitting of double bottoms, the interposing of clean water ballast tanks, etc. but in the case of a normal single hull tanker with two longitudinal bulkheads, the capacity of a single centre tank and a wing tank will be limited to 30,000 m³ and 15,000 m³, respectively.

33. These requirements will apply to tankers for which the building contract is placed on or after 1 January 1972, and also to any other tanker which will be delivered after 1 January 1977. The Committee also decided that governments should be urged to implement the requirements as soon as possible, without awaiting formal entry into force of the amendment to the Convention, in respect of ships for which the building contract is placed on or after the date of adoption by the Assembly in October 1971. The Committee further confirmed that interim guidelines formulated earlier as a matter of urgency, will continue to apply pending the implementation of the amendments.

34. The total loss of a ship in the event of an accident almost invariably results in the total loss of its cargo. In many such cases the flooding of the machinery space has been found to be one of the major contributory factors. If, therefore, a ship carrying oil or other noxious and hazardous cargo whether in bulk, in containers or in packages, is so designed that it can survive the flooding of machinery space, a considerable reduction in the risk of massive pollution resulting from a

large quantity of such cargo being released into the sea can be achieved. With this in view, consideration is being given to improving the subdivision requirements for machinery spaces of ships carrying such cargoes. Other aspects under consideration concern the provision of suitable arrangements to permit the salvaging of cargo in cases of accidents to ships, including investigation of the use of portable pumps which could be airlifted quickly to a casualty and the provision of facilities to receive the transferred cargo.

Methods of dealing with spillages

35. In addition to preventive measures much can and has been done to develop effective measures for dealing with oil pollution when it occurs. In implementation of Resolution 13 of the International Conference on Prevention of Pollution of the Sea by Oil, 1962, Governments have informed IICO of the results of research and practical experience. On the basis of this information Recommendations have been issued on:

- (a) the establishment of an effective system by which reports of accidents involving significant pollution can be received from governments and transmitted to other governments concerned. In this connexion the existing arrangements for the reporting of incidents are at present being reviewed with a view to devising a simplified system to enable governments to be informed of their occurrence and in order that the Organization can compile a record of them for the furtherance of its work;
- (b) the encouragement by governments of research on methods of disposal of oil in cases of significant spillage;

- (c) the implementation of national arrangements to enable governments to deal with significant spillages of oil such as the establishment of emergency ports equipped with the necessary facilities.

36. A comprehensive manual is now being prepared which will contain practical information for the guidance of governments on methods, both mechanical and chemical, for dealing with oil on the sea or beaches. This manual is being compiled to assist governments, particularly those of developing countries, which are concerned with the implementation of contingency plans for dealing with spillages of oil not only from ships but from all sources. More specifically, the draft of the manual, which is now under consideration, contains information on:

- (a) the main characteristics of various types of crude oil and their behaviour in the sea;
- (b) the advantages and disadvantages of the various methods of dealing with oil on the sea such as burning, mechanical removal, use of booms and suction devices, absorbents, dispersants and emulsifiers etc;
- (c) methods of dealing with oil on the shore such as burning, mechanical removal or use of absorbent material or solvent/emulsifiers on various types of beaches and shorelines;
- (d) pollution problems arising in the operation of oil terminals;
- (e) available publications and reports relating to methods of dealing with pollution and methods of improving the enforcement of the Oil Pollution Convention.

Legal Aspects

37. In the legal field, two broad questions have emerged in relation to oil pollution particularly that arising from or threatened by maritime casualties. These concern:

- (a) the extent to which a State directly threatened or affected by a casualty which takes place outside its territorial sea can, or should be enabled to, take measures to protect its coastline, harbours, territorial sea or amenities even when such measures may affect the interests of shipowners, salvage companies or even of a flag government. A study on this problem resulted in the conclusion of the International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties (Brussels 1969) which specifies the conditions under which such action can be taken.
- (b) The nature, extent and amount of liability of the owner or operator of a ship for damage caused to third parties by oil which has escaped or been discharged from a ship as a result of an incident. In this connexion the International Convention on Civil Liability for Oil Pollution Damage, also concluded in Brussels in 1969, provides for compulsory liability and insurance together with certain conditions under which compensation may be claimed. It should be noted, however, that this Convention does not afford full protection of the victim in all cases and, for this reason, the Brussels Conference (1969) recommended that an international compensation fund should be established. A further draft

convention on this is now being prepared for consideration by an International Legal Conference, tentatively scheduled to be held in Brussels, in December 1971.

38. In accordance with a Recommendation of the International Legal Conference of 1969, the Legal Committee of INCO is carrying out further work based on the list of noxious and hazardous cargoes prepared by GESAMP (GESAMP III/19, Annex V), with a view to:

- (a) extending the application of the International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties to cover pollutants other than oil; and
- (b) questions of liability and compensation for damage caused by pollution from such agents on similar lines to the measures being taken in respect of oil.

IV. CONCLUSIONS

39. The foregoing analysis, particularly with reference to the measures which have been taken since 1954 in relation to oil pollution, demonstrate the emergence of a complete régime for dealing with all aspects of marine pollution caused by ships and other vessels. With reference to prohibition, prevention and redress, the essence of the system is the conclusion of international treaties enforceable by Contracting States. This constitutes, in effect, the creation of a new corpus of international law in this particular field, a task which, with reference to ships, can only be negotiated and enforced by an international organization with experience of the technical aspects of shipping. Furthermore, the experience gained by

IMCO may be useful to the future work connected with the decisions of the UN General Assembly to create a régime of the seas and to convene an International Conference on the Law of the Sea, particularly with reference to the rights of coastal States to prevent, mitigate or eliminate the threat of marine pollution arising from sea-bed activities and questions of liability and compensation for damage caused by such pollution.

40. In the field of pollution emanating from ships and other craft the action to be taken by IMCO in the immediate future is aimed at achieving by 1975 if possible and certainly by the end of the decade the complete elimination of deliberate pollution by oil and noxious substances other than oil and the minimization of accidental spills (see paragraph 8 above). If this target is to be achieved, the action to be taken at the International Conference to be convened by IMCO in 1973 is of prime importance. At its twenty-sixth session (7-10 June 1971) the IMCO Council took note of this recommendation and other relevant information on the progress being made in the implementation of Resolution 176(VI) by which the IMCO Assembly decided to convene the Conference, bearing in mind the existing conventions and recommendations as set out in the attached summary. The Council decided that the following instruments and related measures should be included in the Agenda for the Conference:

A. INSTRUMENTS

(1) Revision of the International Convention for the Prevention of Pollution of the Sea by Oil, 1954 to provide for the complete elimination of the wilful and intentional pollution of the seas by oil (see paragraph 21 above). This might result from a study of questions such as:

- (a) revision of the definition of the term "oil" as contained in the International Convention for the Prevention of Pollution of the Sea by Oil, 1954 (as amended in 1962) (see paragraph 10 above);

- (b) design and construction of tankers and other ships to keep oil and water separate by means of clean ballast systems, barriers or other suitable arrangements;
 - (c) development of oily water separators and oil content meters which will enable the total elimination of the emission of oil to be substantially achieved and automatically controlled;
 - (d) provision of special stations to clean oil tanks after unloading;
 - (e) provision of adequate shore reception facilities and equipment on ships so as to permit the discharge of dirty ballast while taking on cargo, thereby avoiding unnecessary delays; and
 - (f) provision of adequate port facilities and the fitting of ships with adequate sludge tanks to receive oily residues from purification of fuel and lubricating oil.
- (2) Extension of the International Convention for the Prevention of Pollution of the Sea by Oil, 1954, or establishment of a new convention to provide for the complete elimination of the wilful and intentional pollution of the sea by activities such as tank washing and bilge discharge involving noxious and hazardous cargoes other than oil (see paragraph 30 above).

A preliminary list of noxious and hazardous cargoes other than oil has been prepared by GESAMP (GESAMP III/19, Annex V). The establishment of a convention would require the study of the current practices employed in the operation of ships carrying such cargoes (see paragraph 11 above).

(3) Extension of the International Convention for the Prevention of Pollution of the Sea by Oil, 1954, or establishment of a new convention to deal with the minimization of spillage of oil and other noxious substances as a result of accidents (see paragraphs 31-34 above). This might include such matters as:

- (a) tank size limitation, piping arrangements and general ship design (in tankers and possibly other ships carrying noxious and hazardous cargoes other than oil in bulk);
 - (b) capability of ships carrying oil and other noxious and hazardous cargoes to withstand flooding and to retain the cargo aboard in the event of hull damage;
 - (c) consideration of the packing and stowage requirements for highly toxic materials with a view to protecting the environment and to facilitate their recovery in cases of maritime accidents to ships; and
 - (d) fitting of ships with equipment to facilitate the salvaging of cargo after accidents, to transfer cargo from damaged tanks, or to deal with spillages which have occurred.
- (4) Establishment of an instrument dealing with the safe carriage of dangerous goods from the point of view of protection of the marine environment, its living resources and amenities.

This subject is at present covered by the International Maritime Dangerous Goods Code and the Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (see paragraphs 27-29 above). As regards operational aspects of bulk chemical ships, the International Chamber of Shipping (ICS), is preparing, in close co-operation

with IMCO, a Tanker Safety Guide (Chemicals). There may be a need to review the above Codes from the point of view of protection of the marine environment, its living resources and amenities.

(5) Establishment of an instrument dealing with the disposal or treatment of ship-generated sewage or waste (see paragraph 15(a) above).

The fifty-fifth (Maritime) session of the ILO (14-30 October 1970) adopted a Resolution which requested full collaboration between ILO and IMCO in making it possible for the sanitary facilities provided on board to be used without infringement of national or international legislation dealing with avoidance of pollution. IMCO is considering the matter with a view to formulating, if necessary, international standards or guidelines for the disposal of ship's garbage or other waste.

B. RELATED MEASURES

(1) Establishment of a scheme on effective enforcement for existing or future conventions.

While the enforcement of conventions is, and appears likely to remain, the prerogative of individual Contracting States with respect to their nationals, it is becoming increasingly apparent that, in dealing with certain aspects of enforcement, co-operative action by two or more contracting governments would be particularly efficacious. With reference to the International Convention for the Prevention of Pollution of the Sea by Oil, 1954, such action might be aimed at, not only the rapid detection and reporting of breaches of the Convention, but also at providing a uniform basis or system for dealing with such offences.

The following aspects might be considered in this context:

- (a) the development of an international arrangement to facilitate inspections of oil record books in loading and repair ports to detect breaches of the Convention;
- (b) the institution of a simple on-the-spot procedure for dealing with such offences;
- (c) review of the system of penalties referred to in IMCO Assembly Resolution A.153(ES.IV);
- (d) the development of internationally agreed specifications for instruments or other equipment, such as continuously recording oil content meters, to facilitate enforcement of the Convention.

The foregoing aspects relating to the enforcement of the Oil Pollution Convention may provide an indication as to the problems which may arise in connexion with the enforcement of conventions relating to the control of pollution by noxious substances other than oil.

(2) Without prejudice to any other conventions which might be formulated prior to the Conference, revision of existing conventions to provide for, and the incorporation in future conventions of a procedure for rapidly amending the standards and regulations contained therein in order to keep these up to date with the changing conditions of marine transportation including the introduction of changes to hazardous or polluting cargoes.

41. The IMCO Council also decided that the Organization should continue its work on certain other subjects upon which action may be taken either by IMCO or some other organization depending upon

the outcome of the UN Conference on Human Environment and the Law of the Sea Conference. These are as follows:

(1) Establishment of a new convention to provide for minimization of the wilful, intentional and accidental pollution of the seas by oil and other substances from off-shore facilities (see paragraphs 25-26 above). The following elements might be considered:

- (a) design, construction and operation of off-shore facilities to minimize intentional discharge into the seas of oil and other pollutants;
- (b) development of an oil content meter and/or other equipment to provide automatic shutdown when the effluent contains oil or other noxious substances;
- (c) design, construction and operation of off-shore facilities to reduce accidental discharges into the seas of oil and other pollutants and requirements for equipment for use in event of accidental discharge.

(2) Establishment of a new convention prohibiting the deliberate dumping by ships and barges of wastes containing certain persistent and very toxic pollutants especially those which may accumulate in biological materials; examples include pesticides, compounds of mercury, fluorine, arsenic or antimony and persistent oils. Such a convention might also control the dumping of less harmful substances by specifying certain areas in which deliberate dumping is prohibited although this aspect could perhaps be dealt with by suitable regional agreements (see paragraph 14 above);

(3) The extension of the International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties (Public Law Convention) and the International Convention on Civil Liability for Oil Pollution Damage (Private Law Convention) to cover pollution casualties by noxious and hazardous cargoes other than oil and those resulting from exploration and exploitation of the sea-bed and ocean floor (see paragraph 38 above). The International Legal Conference on Marine Pollution Damage, 1969, adopted a Resolution which recommended that Contracting States which become involved in a case of pollution danger by agents other than oil should co-operate as appropriate in applying wholly or partially the provisions of the Public Law Convention.

INTER-GOVERNMENTAL MARITIME CONSULTATIVE ORGANIZATION

INTERNATIONAL MEASURES FOR THE PREVENTION OF POLLUTION OF THE SEA FROM SHIPS, VESSELS AND OTHER EQUIPMENT

	Deliberate pollution from the ships in the course of normal operation (e.g. discharge of cargo tank washings)	Accidental Pollution from Ships (e.g. spillage of oil and other noxious cargoes)	Accidental Pollution from Other Equipment (e.g. from sea bed exploitation)	Dumping of shore Generated Wastes by Ships and Barges
Basic Instruments or Convention	<p><u>Prevention</u> International Convention for the Prevention of Pollution of the Sea by Oil, 1954 as amended in 1962. Amendments to the Convention were adopted by the 1969 IMCO Assembly. Though not yet in force these represent a further step towards elimination of deliberate discharge of oil. The further following amendments are proposed for adoption by the 1971 IMCO Assembly. (a) Protection of the Great Barrier Reef (b) Tank arrangement and limitation of tank size of tankers</p> <p><u>Compensation</u> International Convention on Civil Liability for Oil Pollution Damage (1969)</p>	<p><u>Prevention of accidents to ships</u> International Convention for the Safety of Life at Sea, 1960, and subsequent amendments in the course of acceptance International Regulations for Preventing Collisions at Sea, 1960 (to be revised by an International Conference in 1972) <u>Prevention, mitigation or elimination of Oil Pollution Damage</u> International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties (1969) International Convention for the Prevention of Pollution of the Sea by Oil, 1954 (an amendment on Tank arrangements and limitation of tank size of Tankers to be adopted by 1971 IMCO Assembly) <u>Compensation of Oil Pollution Damage</u> International Convention on Civil Liabilities for Oil Pollution Damage International Compensation Fund for Oil Pollution Damage (to be adopted by an International Legal Conference in 1971)</p>	—	— (Information has been collected from Governments and the preparation of such international agreements as necessary is under consideration).
Other International Regulations or Code of Practice	—	<p><u>Safe transportation of agents other than oil</u> International Maritime Dangerous Goods Code Code for the construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk (proposed for adoption by 1971 IMCO Assembly)</p>	—	—
Recommendations to Governments	<p>The provision of facilities for the reception of oil residues at oil loading and other bulk loading terminals (OP Conf.Res.6, 1962). Detection of offences against and enforcement of the International Convention for the Prevention of Pollution of the Sea by Oil, 1954 (A.151(ES.IV) 1968). Penalties for unlawful discharge of oil into the sea (A.153 (ES IV), 1968). Oil reception facilities (A.154 (ES.IV), 1968)</p> <p>International performance specification for oily-water separating equipment and oil content meters (proposed for adoption by 1971 IMCO Assembly)</p> <p>Disposal of oily bilge and ballast water from ships in ports (excluding effluent from cargo/ballast tanks in tankers) (proposed for 1971 IMCO Assembly).</p>	<p><u>Prevention of accidents to ships</u> Carriage of electronic position-fixing equipment (A.156(ES.IV)) Use and testing of shipborne navigational equipment (A.157(ES.IV)) Port advisory services (A.158(ES.IV), 1968) Data concerning manoeuvring capabilities and stopping distances of ships (A.160(ES.IV), 1968) Information to be included in the manoeuvring booklet (MSC XXI, 1970) Steering gear of large ships (proposed for adoption by 1971 IMCO Assembly) Establishing traffic separation schemes and areas to be avoided by ships of certain classes (A.161(ES.IV), 1968) and subsequent additional recommendations Observance of traffic separation schemes (MSC XXIII, 1971) <u>Measures for dealing with spillages of oil</u> Reports on accidents involving significant spillages of oil (A.147(ES.IV), 1968) National arrangements for dealing with significant spillages of oil (A.148(ES.IV), 1968) Regional co-operation in dealing with significant spillages of oil (A.150(ES.IV), 1968) Research and exchange of information on methods for disposal of oil in cases of significant spillages (A.151(ES.IV), 1968) Manual for dealing with significant spillages of oil (under preparation)</p>	<p>Establishment of fairways through offshore exploitation areas (A.179 (VI), 1969). Dissemination of information, charting and manning of drilling rigs and production platforms (A.180(VI), 1969). Safety recommendation requirements for drilling and production platforms and similar units (A.181(VI), 1969). Fire safety of mobile offshore units (recommended for adoption by 1971 IMCO Assembly).</p> <p>Note: 1. From the International Maritime Dangerous Goods Code and information on the chemicals carried in bulk, noxious and hazardous cargoes, release of which either deliberately or by maritime casualty into the marine environment will cause serious pollution, have been identified by GESAMP. The list of these cargoes is being studied by the IMCO Legal Committee and technical bodies with a view to formulating such international agreements as necessary. 2. Information is being collected on pollution from disposal of sewage aboard ships with a view to formulating, if necessary, international standards or guidelines. 3. An example of regional co-operation in dealing with spillages of oil is the Agreement for Co-operation in Dealing with Pollution of the North Sea by Oil, reached by eight coastal States in 1969.</p>	—