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Intergovernmental Review Meeting of
 Mediterranean Coastal States on the
 First Meeting of the Contracting
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 Protection of the Mediterranean Sea
 against Pollution and its related
 protocols

Cannes, 5-10 February 1979

Note on Incineration at Sea in relation to the Protocol
 for the Prevention of Pollution of the Mediterranean Sea
 by Dumping from Ships and Aircraft

I. INTRODUCTION

1. Article 13 (vi) of the Convention for the Protection of the Mediterranean Sea against Pollution calls upon UNEP, as the Organization responsible for carrying out the secretariat functions of the Convention and its related protocols:

"To ensure the necessary co-ordination with other international bodies which the Contracting Parties consider competent, and in particular, to enter into such administrative arrangements as may be required for the effective discharge of the secretariat functions."

2. With regard to the prevention of pollution from dumping activities, the work that has been carried out under the Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter (London, 1972) and the Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft (Oslo, 1972) may provide some useful precedents for the Parties to the Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft (hereinafter referred to as the Protocol). Some of the scientific work which has been undertaken for purposes of the London and Oslo Conventions is reviewed in document UNEP/IG.14/5. This document will address itself to the activities of the Commissions for the London and Oslo Conventions concerning incineration of wastes and other matter at sea.

II. ACTIVITIES UNDER THE LONDON CONVENTION CONCERNING INCINERATION OF WASTES AND OTHER MATTER AT SEA

3. At the first consultative meeting of the Contracting Parties to the London Dumping Convention, a resolution was passed which:

"REQUEST[ED] the Secretary-General of the Inter-Governmental Maritime Consultative Organization in concert with experts from the Contracting Parties, and the Oslo Commission:

- (i) to examine those provisions of the Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter which are applicable to at sea operations.
- (ii) to consider and draft any special provisions with a view to preventing marine and atmosphere pollution from incineration operations at sea, and to submit them to the next Consultative Meeting."

4. Whereupon, the Secretary-General convened a consultation on incineration at sea in implementation of the resolution. The experts participating in the consultation prepared draft technical guidelines on the control of incineration at sea which were submitted to the Contracting Parties of the London Dumping Convention at its second consultative meeting.

5. After revising the draft technical guidelines, the second consultative meeting adopted a resolution on incineration at sea that recommended that the Contracting Parties implement the Guidelines for the purpose of controlling incineration at sea as soon as possible on the understanding that the resolution did not prejudice the form of any legal instrument to be ultimately adopted within the framework of the London Convention.

6. Thereafter, in the intersessional period between consultative meetings, a Joint Ad Hoc Group on Incineration at Sea was convened by IMCO and the Oslo Commission to consider the technical aspects of incineration at sea. The report of the ad hoc group was submitted to the third consultative meeting of the Contracting Parties which noted, in particular, the ad hoc group's proposals concerning:

- (a) amendments to the Technical Guidelines on the Control of Incineration at Sea;
- (b) notification procedures concerning permits issued for incineration at sea;
- (c) the type and manner of consultation in emergency situations and in cases where doubts exist as to the efficiency of incineration;
- (d) the requirements on the construction of incineration vessels as proposed by IMCO's Sub-Committee on Bulk Chemicals; and
- (e) the definition of non-organohalogen "trace contaminants" and of "significant amounts".

7. Also with regard to the technical aspects of incineration at sea, the third Consultative Meeting had before it for consideration the outcome of the thirty-ninth session of IMCO's Maritime Safety Committee concerning:

- (a) draft guidelines for the application of the code for the construction and equipment of ships carrying dangerous chemicals in bulk to ships engaged in incineration at sea; and
- (b) the request of the Oslo Commission to consider the question of selecting suitable common incineration sites in the North Sea and defining an appropriate distance at which they should be kept clear of shipping lanes.

8. With regard to the legal aspects of the control of incineration at sea, the third consultative meeting had before it the report of the Ad Hoc Group of Legal Experts on Dumping which had also been convened by IMCO in the intersessional period. The report of the ad hoc group included proposals for:

- (a) a draft resolution adopting amendments to Annexes I and II of the London Dumping Convention and implementing the Technical Guidelines for the Control of Incineration at Sea;
- (b) draft texts of the amendments to Annexes I and II of the London Dumping Convention; and
- (c) a draft text of Regulations on the Control of Incineration at Sea which was presented in the form of an Addendum to Annex I of the Convention.

9. In presenting the proposals of the Ad Hoc Group of Legal Experts to the third consultative meeting, it was noted that the proposals were based on the following assumptions:

- (a) "incineration at sea" should be construed as a method of disposal at sea of wastes or other matter;
- (b) the most appropriate, expeditious and flexible means for the implementation of the provisions for the control of incineration at sea on a mandatory basis would be to amend Annexes of the London Dumping Convention;
- (c) the provisions should cover not only incineration operations at sea currently being carried out but also those conceivable in the future and therefore both Annexes I and II should be amended;
- (d) provisions for the control of incineration at sea which should be implemented on a mandatory basis, should be included in the Annex of the Convention, while those of a recommendatory nature could be adopted by the Consultative Meeting as Technical Guidelines;
- (e) provisions of paragraphs 8 and 9 of Annex I concerning the concept of trace contaminants and harmlessness apply to incineration at sea.

10. After consideration of the proposals mentioned above, the Contracting Parties attending the third consultative meeting adopted a resolution amending the Convention for the purpose of controlling incineration of wastes and other matter at sea. The text of the resolution and its attachments is contained in annex I to this document. In particular, delegations should note that an addendum was added to Annex I of the London Convention, containing Regulations for the Control of Incineration of Wastes and other Matter at Sea.

11. Although the meeting was not able, in the limited time available, to prepare complementary technical guidelines on the control of incineration of wastes and other matter at sea, the third consultative meeting requested the ad hoc group on incineration to prepare draft technical guidelines with a view to their adoption by the fourth consultative meeting.

12. The Contracting Parties also agreed that IICO should be notified immediately following issuance of a special permit to incinerate wastes and other matter at sea. In this connexion, a form of report for notification was adopted and is set forth in annex II to this document.

III. ACTIVITIES UNDER THE OSLO CONVENTION CONCERNING INCINERATION OF WASTES AND OTHER MATTER AT SEA

13. At its first meeting, the Oslo Commission agreed that the question of incineration of wastes and other matter at sea should be given early consideration by the Standing Advisory Committee on Scientific Advice (SACSA).

14. At the second meeting of the Oslo Commission, it was accepted that incineration at sea be exercised on an interim basis and should be carried out in accordance with the provisions of Annex II of the Oslo Convention, taking into account Annex III. It was also agreed that SACSA consider further the regulatory aspects of incineration at sea.

15. Based upon the work of SACSA, the Oslo Commission at its third meeting adopted a set of guidelines for the control of incineration at sea. The

Commission recommended that these guidelines should be immediately implemented on a voluntary basis by national authorities. The need for a more binding legal instrument was to be considered at the fourth meeting of the Commission in the light of experience gained in the application of the guidelines. Furthermore, SACSAs was requested by the Commission to prepare a procedural and operational code of practice for incineration at sea taking into consideration its earlier conclusions.

16. SACSAs completed its task in the intersessional period, and a draft code of practice on incineration of wastes at sea was presented to the fourth meeting of the Oslo Commission. The Commission approved the Code of Practice to be applied on a voluntary basis by the Contracting Parties. The code of practice is attached as annex III to this report.

17. Paragraph 10.1 of the code of practice stipulates that "the Secretariat should be notified immediately following the issuing of a permit to incinerate waste at sea". In this connexion, the Commission adopted a form of report for the notification of permits and a form of annual reports on all incineration operations carried out in a given year. These forms are attached as annexes IV and V to this report, respectively.

18. The fourth meeting of the Commission could not reach agreement as to the need for a legal instrument to control incineration of waste at sea, and it concluded that it would review this matter at its fifth meeting.

19. The Commission subsequently agreed, at its fifth meeting, that a legal instrument concerning incineration of waste at sea should be considered within the framework of the Oslo Convention. The Commission was of the opinion that such a legal instrument should be based on the results achieved within the context of the London Dumping Convention and should take into account the more stringent requirements of the marine environment area covered by the Oslo Convention. To achieve this, SACSAs was requested to carry out a thorough comparison between the London Convention regulations and guidelines and the Oslo Commission's code of practice. The matter of a legal instrument would then be discussed at the sixth meeting of the Commission in 1979.

IV. ACTION REQUIRED BY THE PARTIES TO THE PROTOCOL

20. In the light of the above, the secretariat would suggest that the Parties to the Protocol first discuss whether incineration of waste at sea is exercised in the Mediterranean Sea Area. If this is not the case, it is evident that no further action on this matter is needed. If incineration of waste at sea is being practised in the Mediterranean Sea Area, then the Parties will need to decide if technical and legal regulatory mechanisms need to be developed to control incineration and what form (guidelines, recommendations, amendments to the Protocol) these mechanisms should adopt. The Parties will also need to advise the secretariat as to how these control measures may best be developed.

21. When considering this matter, the secretariat would like to draw to the attention of the Parties to the Protocol the reservation with regard to incineration at sea expressed by several Contracting Parties to the London and Oslo Conventions. These Contracting Parties opposed the adoption of legal

controls for incineration at sea, since they believed that these controls might be seen as encouraging and prolonging a practice which they considered acceptable only on an interim basis until alternative, appropriate methods of land-based disposal were developed. The Parties may also wish to discuss if the particular regional sensitivities of the Mediterranean Sea Area would permit incineration at sea in the Mediterranean Sea without harmful effects on the marine environment.

ANNEX 1

INCINERATION AT SEA

Resolution adopted on 12 October 1978

THE THIRD CONSULTATIVE MEETING,

RECALLING Article I of the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, which provides that Contracting Parties shall individually and collectively promote the effective control of all sources of pollution of the marine environment,

HAVING NOTED the use of incineration at sea as a means of disposal of wastes containing highly toxic substances and the consequent risks of marine and atmospheric pollution which may result from this process,

DESIRING to prevent such pollution and to minimize the risk of hazards to other vessels or interference with other legitimate uses of the sea which could arise from incineration operations at sea,

RECOGNIZING present methods of incineration at sea as being an interim method of disposal of wastes pending the development of environmentally better solutions, considering at all times the best available technology,

AFFIRMING that the intention of the adoption of mandatory provisions for the control of incineration at sea is not to increase the amounts and kinds of wastes or other matter incinerated at sea for which there are available practical alternative land-based methods of treatment, disposal or elimination,

REAFFIRMING that, in accordance with Article IV(3) of the Convention, Contracting Parties can apply additional regulations for incineration at sea on a national basis,

NOTING that Article VIII of the Convention encourages Contracting Parties, within the framework of regional conventions, to develop further agreements reflecting the conditions of the geographical area concerned,

RECALLING the decision of the Second Consultative Meeting that provisions for the control of incineration at sea should be implemented by Contracting Parties on a mandatory basis in the form of a legal instrument adopted within the framework of the Convention (LDC II/11, Annex II),

HAVING CONSIDERED the proposed amendments to the Annexes of the Convention for the control of incineration at sea contained in the Report of the Ad Hoc Group of Legal Experts on Dumping,

ADOPTS the following amendments to the Annexes to the Convention in accordance with Articles XIV(4)(a) and XV(2) thereof:

- (a) addition of a paragraph 10 to Annex I;
- (b) addition of a paragraph E to Annex II; and
- (c) addition of an Addendum to Annex I, containing Regulations for the Control of Incineration of Wastes and Other Matter at Sea,

the texts of which are set out in Attachment to this Resolution,

ENTRUSTS the Inter-Governmental Maritime Consultative Organization with the task of ensuring, in collaboration with the Governments of France, Spain, the Union of Soviet Socialist Republics and the United Kingdom, that the texts of the above Amendments are drawn up by 1 December 1978 in all official languages of the Convention with the linguistic consistency in each text, which would then become the authentic text of the Annexes to the Convention in the English, French, Russian and Spanish languages;

RESOLVES that for the purposes of Articles XIV(4)(a) and XV(2) of the Convention, 1 December 1978 shall be treated as the date of the adoption of the amendments;

REQUESTS the Secretary-General of the Organization to inform Contracting Parties of the above-mentioned amendments,

REQUESTS the Ad Hoc Group on Incineration at Sea to prepare draft Technical Guidelines for the Control of Incineration of Wastes and Other Matter at Sea with a view to adoption by the Fourth Consultative Meeting;

INVITES Contracting Parties to implement, as an interim measure, the existing Technical Guidelines (LDC II/11, Annex II, with amendments (IAS/9, Annex IV)) and the notification procedure set out in Annex 2 to LDC III/12.

Attachment

AMENDMENTS TO ANNEXES TO THE CONVENTION
ON THE PREVENTION OF MARINE POLLUTION
BY DUMPING OF WASTES AND OTHER MATTER
CONCERNING INCINERATION AT SEA

The following paragraph shall be added to Annex I:

10. Paragraphs 1 and 5 of this Annex do not apply to the disposal of wastes or other matter referred to in these paragraphs by means of incineration at sea. Incineration of such wastes or other matter at sea requires a prior special permit. In the issue of special permits for incineration the Contracting Parties shall apply the Regulations for the Control of Incineration of Wastes and Other Matter at Sea set forth in the Addendum to this Annex (which shall constitute an integral part of this Annex) and take full account of the Technical Guidelines on the Control of Incineration of Wastes and Other Matter at Sea adopted by the Contracting Parties in consultation.

The following paragraph shall be added to Annex II:

E. In the issue of special permits for the incineration of substances and materials listed in this Annex, the Contracting Parties shall apply the Regulations for the Control of Incineration of Wastes and Other Matter at Sea set forth in the Addendum to Annex I and take full account of the Technical Guidelines on the Control of Incineration of Wastes and Other Matter at Sea adopted by the Contracting Parties in consultation, to the extent specified in these Regulations and Guidelines.

ADDENDUM

REGULATIONS FOR THE CONTROL OF INCINERATION OF
WASTES AND OTHER MATTER AT SEA

PART I

REGULATION 1

Definitions

For the purposes of this Addendum:

- (1) "Marine incineration facility" means a vessel, platform, or other man-made structure operating for the purpose of incineration at sea.
- (2) "Incineration at sea" means the deliberate combustion of wastes or other matter on marine incineration facilities for the purpose of their thermal destruction. Activities incidental to the normal operation of vessels, platforms or other man-made structures are excluded from the scope of this definition.

REGULATION 2

Application

- (1) Part II of these Regulations shall apply to the following wastes or other matter:
 - (a) those referred to in paragraph 1 of Annex I;
 - (b) pesticides and their by-products not covered in Annex I.
- (2) Contracting Parties shall first consider the practical availability of alternative land-based methods of treatment, disposal or elimination, or of treatment to render the wastes or other matter less harmful, before issuing a permit for incineration at sea in accordance with these Regulations. Incineration at sea shall in no way be interpreted as discouraging progress towards environmentally better solutions including the development of new techniques.
- (3) Incineration at sea of wastes or other matter referred to in paragraph 10 of Annex I and paragraph E of Annex II, other than those referred to in paragraph (1) of this Regulation, shall be controlled to the satisfaction of the Contracting Party issuing the special permit.
- (4) Incineration at sea of wastes or other matter not referred to in paragraphs (1) and (3) of this Regulation shall be subject to a general permit.
- (5) In the issue of permits referred to in paragraphs (3) and (4) of this Regulation, the Contracting Parties shall take full account of all applicable provisions of these Regulations and the Technical Guidelines on the Control of Incineration of Waste and Other Matter at Sea for the waste in question.

PART II

REGULATION 3

Approval and Surveys of the Incineration System

(1) The incineration system for every proposed marine incineration facility shall be subject to the surveys specified below. In accordance with Article VII(1) of the Convention, the Contracting Party which proposes to issue an incineration permit shall ensure that the surveys of the marine incineration facility to be used have been completed and the incineration system complies with the provisions of these Regulations. If the initial survey is carried out under the direction of a Contracting Party a special permit, which specifies the testing requirements, shall be issued by the Party. The results of each survey shall be recorded in a survey report.

(a) An initial survey shall be carried out in order to ensure that during the incineration of waste and other matter combustion and destruction efficiencies are in excess of 99.9 per cent.

(b) As a part of the initial survey the State under whose direction the survey is being carried out shall:

- (i) approve the siting, type and manner of use of temperature measuring devices;
- (ii) approve the gas sampling system including probe locations, analytical devices, and the manner of recording;
- (iii) ensure that approved devices have been installed to automatically shut off the feed of waste to the incinerator if the temperature drops below approved minimum temperatures;
- (iv) ensure that there are no means of disposing of wastes or other matter from the marine incineration facility except by means of the incinerator during normal operations;
- (v) approve the devices by which feed rates of waste and fuel are controlled and recorded;
- (vi) confirm the performance of the incineration system by testing under intensive stack monitoring, including the measurements of O_2 , CO, CO_2 , halogenated organic content, and total hydrocarbon content using wastes typical of those expected to be incinerated.

(c) The incineration system shall be surveyed at least every two years to ensure that the incinerator continues to comply with these Regulations. The scope of the biennial survey shall be based upon an evaluation of operating data and maintenance records for the previous two years.

(2) Following the satisfactory completion of a survey, a form of approval shall be issued by a Contracting Party if the incineration system is found to be in compliance with these Regulations. A copy of the survey report shall be attached to the form of approval. A form of approval issued by a Contracting Party shall be recognized by other Contracting Parties unless there are clear grounds for believing that the incineration system is not in compliance with these Regulations. A copy of each form of approval and survey report shall be submitted to the Organization.

(3) After any survey has been completed, no significant changes which could affect the performance of the incineration system shall be made without approval of the Contracting Party which has issued the form of approval.

REGULATION 4

Wastes Requiring Special Studies

(1) Where a Contracting Party has doubts as to the thermal destructibility of the wastes or other matter proposed for incineration, pilot scale tests shall be undertaken.

(2) Where a Contracting Party proposes to permit incineration of wastes or other matter over which doubts as to the efficiency of combustion exist, the incineration system shall be subject to the same intensive stack monitoring as required for the initial incineration system survey. Consideration shall be given to the sampling of particulates, taking into account the solid content of the wastes.

(3) The minimum approved flame temperature shall be that specified in Regulation 5 unless the results of tests on the marine incineration facility demonstrate that the required combustion and destruction efficiency can be achieved at a lower temperature.

(4) The results of special studies referred to in paragraphs (1), (2) and (3) of this Regulation shall be recorded and attached to the survey report. A copy shall be sent to the Organization.

REGULATION 5

Operational Requirements

(1) The operation of the incineration system shall be controlled so as to ensure that the incineration of wastes or other matter does not take place at a flame temperature less than 1250 degrees centigrade, except as provided for in Regulation 4.

(2) The combustion efficiency shall be at least 99.95 ± 0.05 per cent based on:

$$\text{Combustion efficiency} = \frac{C_{\text{CO}_2} - C_{\text{CO}}}{C_{\text{CO}_2}} \times 100$$

where C_{CO_2} = concentration of carbon dioxide in the combustion gases

C_{CO} = concentration of carbon monoxide in the combustion gases.

- (3) There shall be no black smoke nor flame extension above the plane of the stack.
- (4) The marine incineration facility shall reply promptly to radio calls at all times during the incineration.

REGULATION 6.

Recording Devices and Records

- (1) Marine incineration facilities shall utilize recording devices or methods as approved under Regulation 3. As a minimum, the following data shall be recorded during each incineration operation and retained for inspection by the Contracting Party who has issued the permit:
- (a) continuous temperature measurements by approved temperature measuring devices;
 - (b) date and time during incineration and record of waste being incinerated;
 - (c) vessel position by appropriate navigational means;
 - (d) feed rates of waste and fuel - for liquid wastes and fuel the flow rate shall be continuously recorded; the latter requirement does not apply to vessels operating on or before 1 January 1979;
 - (e) CO and CO₂ concentration in combustion gases;
 - (f) vessel's course and speed.
- (2) Approval forms issued, copies of survey reports prepared in accordance with Regulation 3 and copies of incineration permits issued for the wastes or other matter to be incinerated on the facility by a Contracting Party shall be kept at the marine incineration facility.

REGULATION 7

Control over the Nature of Wastes Incinerated

A permit application for the incineration of wastes or other matter at sea shall include information on the characteristics of wastes or other matter sufficient to comply with the requirements of Regulation 9.

REGULATION 8

Incineration Sites

- (1) Provisions to be considered in establishing criteria governing the selection of incineration sites shall include, in addition to those listed in Annex III to the Convention, the following:

(a) the atmospheric dispersal characteristics of the area - including wind speed and direction, atmospheric stability, frequency of inversions and fog, precipitation types and amounts, humidity - in order to determine the potential impact on the surrounding environment of pollutants released from the marine incineration facility, giving particular attention to the possibility of atmospheric transport of pollutants to coastal areas;

(b) oceanic dispersal characteristics of the area in order to evaluate the potential impact of plume interaction with the water surface;

(c) availability of navigational aids.

(2) The co-ordinates of permanently designated incineration zones shall be widely disseminated and communicated to the Organization.

REGULATION 9

Notification

Contracting Parties shall comply with notification procedures adopted by the Parties in consultation.

* * *

ANNEX II

NOTIFICATION OF SPECIAL PERMITS TO INCINERATE
WASTES AND OTHER MATTER AT SEA

The Organization shall be notified immediately following issuance of a special permit to incinerate wastes or other matter at sea. The form of report for notification is given in the Appendix.

APPENDIX

The notification shall contain the following information for each special permit:

- (a) issuing authorities;
- (b) date issued;
- (c) period for which the permit is valid;
- (d) country of origin of wastes and port of loading;
- (e) total quantity of wastes (in metric units) covered by the permit;
- (f) form in which the waste is presented (bulk or containers; in the latter case, also size and labelling);
- (g) composition of the waste (physical form; specific gravity; viscosity; water content; principal organic components; organohalogens; main inorganic components; (radioactive or not) solids in suspension; caloric value; other properties such as, if necessary, toxicity and persistence; specify whether the analysis relates to dry or wet weight; give the above-mentioned information in ppm in the case of low concentrations);
- (h) industrial process giving rise to the waste;
- (i) name of the marine incineration facility and state of registration;
- (j) area of incineration (geographical location; distance from the nearest coast);
- (k) expected frequencies of incineration;
- (l) special conditions such as to the operation of the marine incineration facility outside those specified in the Regulations or Technical Guidelines.

* * *

ANNEX III

"CODE OF PRACTICE FOR THE INCINERATION OF WASTES AT SEA"

1. Introduction

- 1.1 The incineration of wastes at sea by Contracting Parties to the Oslo Convention must be carried out in such a way that the incineration products and the unburnt residues which are "dumped" are in accordance with the Oslo Convention and Annexes I, II and III of the Convention.
- 1.2 Although the Commission has concluded that incineration at sea does come within the scope of the Convention, specific guidelines on the controls required on the disposal of wastes by incineration at sea are not included in the Convention. Consequently, the Commission has agreed that a code of practice should be drawn up, which could be immediately implemented on a voluntary basis.
- 1.3 The technical guidelines in this document have been drafted with this objective and are based on the existing scientific knowledge on the incineration process and on a knowledge of current technology. Although the state of knowledge on the incineration of liquid organochlorine wastes in existing vessels has enabled specific guidelines to be drawn up covering the incineration of these wastes, there remain types of waste where knowledge is insufficient at present. Scientific work is, however, proceeding in several countries and consequently these guidelines should need to be kept under review as the results of further research and investigation become available.
- 1.4 Additionally, it is important not to exclude the development of new techniques provided that it can be clearly shown that they improve the efficiency of destruction.
- 1.5 In applying this Code of Practice, the practicability of alternative means of waste handling should be taken into account and the national authority should satisfy itself that more appropriate means of destroying, disposing of or recycling the waste in question are not available, before permission for incineration at sea is given.

2. Definition of "Incineration at Sea"

For the purpose of this Code of Practice, incineration at sea is defined as:

"Any deliberate combustion of wastes, loaded on board a ship, platform or structure, with a view to their thermal destruction at sea".

3. Scope of the Code of Practice

- 3.1 The combustion of a waste at sea must be controlled to safeguard a number of uses of the marine environment as laid down in Annex III of the Convention. Thus, the practice of incineration and the residues from it must not harm marine life nor must they interfere with shipping, fishing, recreation, mineral extraction, desalination, fish and shellfish culture, areas of special scientific importance and other legitimate uses of the sea.

- 3.2 Additionally, the "Guidelines with regard to Incineration at Sea", adopted by the Commission at its Third Meeting, recognize the risks of pollution of coastal regions by incineration operations from ships.
- 3.3 In order to achieve these objectives it is necessary to adhere to technical guidelines on the following aspects:
- (a) the specifications, controls and approval of the incinerator;
 - (b) the control over the nature of the wastes incinerated;
 - (c) the selection of the site of incineration;
 - (d) the control on the ship and its operation;
 - (e) methods of ensuring compliance with regulations;
 - (f) forms of report to the Commission.
4. Controls and Approval of the Incinerator
- 4.1 The Contracting Parties will issue the permits for the incineration of waste on board incineration ships. In order to do so they will license the incineration ships on the basis of the technical criteria contained in this Code of Practice and on additional technical criteria set up by the Commission on the recommendation of SACSAs. When they have licensed a ship they will inform the other Contracting Parties through the secretariat. Prior to any issuing of permits they consult the secretariat on the other licences which may have been granted to the incineration ships concerned by other Contracting Parties.
- 4.2 When licensing an incineration ship the Contracting Parties should consider, as a minimum, the following characteristics of the incinerator:
- (a) Method of introducing the waste into the incinerator (e.g. whether via burners separately or in admixture with fuel, whether in containers or in bulk);
 - (b) Temperature of the incinerator during normal operation and the relationships between wall and flame temperatures at different points in the incinerator;
 - (c) Maximum feed rate of waste to the incinerator;
 - (d) Normal air feed rate to the incinerator;
 - (e) Minimum temperature at which waste can be fed to the incinerator, the location of the controlling thermocouples and the details of the system whereby these control the input of waste;

- (f) Dimensions of the incinerator and location of waste, fuel and air input devices; temperature measuring devices and other control devices;
- (g) Details of the mechanism for burning solid waste (if installed on the vessel);
- (h) Minimum residence time of waste in the incinerator combustion chamber.
- 4.3 Before an incineration ship is actually put into service, the licensing authority of a Contracting Party (or Parties) shall carry out a survey to ensure that the ship complies with the approved specifications.
- 4.4 Periodic surveys, at intervals of not more than two years, should be carried out by the licensing Contracting Party to ensure that the incinerator continues to comply with the technical guidelines and criteria.
- 4.5 After any survey has been completed, no significant change which could affect the performance of the incineration system should be made without approval from the licensing authority. Following the satisfactory completion of the survey a form of approval should be issued if the incineration system is found to be in compliance with the technical guidelines and criteria by the licensing authority.
- 4.6 The Contracting Parties will inform the Commission of the surveys carried out; copies of the forms of approval will be sent to the Secretary. The Secretary shall arrange for the data to be evaluated by SACS and for a recommendation to be made to the Commission.
5. Technical Specifications for the Incinerator
- 5.1 Means of Introducing the Waste into the Incinerator
- 5.1.1 The rate and quantity of liquid waste and fuel which is fed to the combustion system should be measured and recorded by a suitable continuous flow measuring device.
- 5.1.2 Until such devices are installed on existing vessels, an interim method of control should be based on a continuous display of the waste and fuel pump status supplemented by manual checks of the amount of waste burnt every hour, to be recorded in the ship's Log.
- 5.1.3 Where solid wastes are burnt, the rate of input should also be recorded.
- 5.2 Control of the Air Feed to the Incinerator
- 5.2.1 The amount of air entering the incinerator must be sufficient to ensure that a minimum of 3 per cent excess oxygen is present in the combustion gases near the incinerator stack exit.
- 5.2.2 The requirement to provide excess air should be monitored by a continuous automatic oxygen analyser to record the oxygen concentration. The position of the gas sampling probe within the incinerator should be approved by the licensing authority.

5.2.3 Although existing incinerator vessels employ a fixed air input rate, future incinerator vessels may use a variable air feed, in which case this rate should be recorded.

5.3 Definition of Control Temperatures and the Method of their Recording

5.3.1 During the incineration of wastes, the flame temperature must be at least 1200°C, and should normally be in the range of 1300 - 1600°C.

5.3.2 The measurement of the flame temperature will, however, be based on the temperature readings of thermocouples in the furnace wall having a relationship to the flame temperature which is unique to each incinerator. The licensing authority should therefore establish the relationship between the readings of each wall thermocouple and the flame temperature, and define the position and type of thermocouples which are to act as control thermocouples.

The number of control thermocouples should not be less than three, but the wall temperature should be registered by as many thermocouples as are necessary for the effective control of the operation of the furnace.

5.3.3 There has to be an automatic waste-feed cut-out control which would operate if, during the incineration of waste, one of the registered wall temperatures is 1100°C, unless the licensing authority, on the basis of the established relationship between the wall and flame temperatures, defines another value.

5.3.4 From the starting up of the furnace until the end of the incineration the temperature readings of the control thermocouples should be measured and recorded at least every 15 minutes.

5.4 Residence Time of Incinerator

The calculated minimum residence time of the waste in the furnace corresponding to an average flame temperature of 1200°C should be approximately one second or more.

5.5 Efficiency of the Incinerator

5.5.1 The incinerator should destroy the waste as completely as possible. Because it is difficult to measure the degree of destruction continuously, optimum technical specifications must be specified for this purpose. However, these technical specifications depend on the incineration technique chosen, and it is important not to exclude the development of new techniques provided that it can be clearly shown that they are equally efficient.

5.5.2 The efficiency with which the waste is burnt in the incinerator should be based on:

- (i) the combustion efficiency, which should be at least 99.9 per cent based on:

$$\text{combustion efficiency} = \frac{C_{\text{CO}_2} - C_{\text{CO}}}{C_{\text{CO}_2}} \times 100$$

where: C_{CO_2} = concentration of carbon dioxide in the combustion gases

C_{CO} = concentration of carbon monoxide in the combustion gases

(ii) the destruction efficiency, which is based on a determination of the amount of the organochlorine substances added to the furnace which is not destroyed.

- 5.5.3 The routine measurement of the combustion efficiency should be made using automatic analysers for carbon monoxide and carbon dioxide in the combustion gases based on a gas sampling point and analytical apparatus approved by the licensing authority.
- 5.5.4 The measurement of the destruction efficiency requires further technological development before it can be used routinely or on periodic surveys. However, it is considered that the destruction efficiency of the incinerator should be determined on a new incinerator vessel before it is put into regular operation, and this destruction efficiency must be at least equal to the combustion efficiency of the incinerator (i.e. 99.9 per cent).
- 5.5.5 These efficiency standards come from experience gained with EDC tars and commonly found chlorinated hydrocarbons; for example, chlorinated aliphatic compounds and mono-, di- and tri-substituted chlorinated benzenes and phenols.
- 5.5.6 The standards for combustion and destruction efficiency mentioned should be reviewed if new data or technological developments become available. If the waste to be incinerated has characteristics different from those generally referred to in paragraph 5.5.5, SACSA should recommend other parameters, e.g. for solid matter, to be controlled in the exhaust gases from the incinerator.
- 5.5.7 Although the primary controls on the effectiveness of incineration are through paragraphs 3.3 (a) to (e), an additional operational guideline is that there should be no continuous or intermittent flame extension above the plane of the stack or presence of black smoke. In the future it may be possible to routinely measure the total particulate matter in the combustion gases.
- 5.5.8 Where a licensing authority proposes to licence the incineration of solid wastes or organohalogen wastes over which doubts as to the efficiency of combustion exist, the incineration operation should be subject to the intensive stack monitoring associated with the initial vessel survey (i.e. including the measurement of O_2 , CO , CO_2 , halogenated organic content, total hydrocarbon content), plus the monitoring of total particulate matter emitted in the combustion gases. Examples of substances over which doubts exist as to the efficiency of combustion, are given in Appendix I.

5.5.9 When a Contracting Party considers that incineration at sea of a certain waste with a lower efficiency than 99.9 per cent is acceptable because of the absence of alternative disposal methods, the "prior consultation procedure" should be used.

6. Control over the Nature of the Waste Incinerated

6.1 Every incineration operation at sea should be subject to a permit, issued by the licensing authority, in which the wastes to be incinerated should be specified.

6.2 Before issuing a permit relating to the incineration of waste at sea in an approved incinerator, the information on the characteristics of the waste listed in Appendix II will be required.

6.3 In determining whether to grant a permit, the licensing authority may, if necessary, analyse representative samples of the waste at the producer's premises. Samples may be taken from storage tanks when a number of wastes are mixed before loading on to the ship.

6.4 In deciding whether or not to approve the incineration of a waste in an approved incinerator, the licensing authority shall ensure that the following requirements are met:

(a) The incineration of wastes which, when incinerated, are likely to result in the introduction into the sea of substances listed in Annex I of the Convention is prohibited, except where the products or substances enter the marine environment as a result of incineration as "trace contaminants". As regards organochlorinated compounds, this requirement is considered to be met if the guidelines of paragraph 5 are complied with. For the other substances listed in Annex I the Commission shall define "trace contaminants" for the purposes of incineration at sea.

(b) The amounts of other incombustible residues (such as substances listed in Annex II of the Convention) emitted in the combustion gases shall not cause harmful effects on the marine environment and shall not exceed any level which may be set by the Commission.

(c) Where a Contracting Party has any doubts about the propriety of issuing a permit for a waste to be incinerated, the "prior consultation procedure" for incineration operations should be used.

7. Selection of the Sites of Incineration

7.1 The appropriate national authorities define the sites in which wastes may be incinerated. The Commission will recommend the use of common incineration sites.

7.2 In selecting these incineration sites, the Contracting Parties should take the following into account:

(a) the area's geographical position, depth of water and distance from the nearest coast;

- (b) its location in relation to biologically sensitive areas, breeding, spawning and fishing grounds, shellfish breeding grounds or passage areas of living resources in adult or juvenile phases, including the migratory routes of pelagic fish;
- (c) its location in relation to other sensitive areas including beaches and other amenity areas, areas of population, shipping, recreation, mineral extraction, desalination, and other areas of special importance and other legitimate uses of the sea;
- (d) types and quantities of wastes proposed to be incinerated;
- (e) existence of areas where other incineration activities take place;
- (f) the atmospheric dispersal characteristics of the area (including such parameters as wind speed and direction, atmospheric stability, frequency of inversions and fog, precipitation types and amounts, humidity, etc.) in order to determine the potential impact on the surrounding environment of pollutants released from the incineration vessel, giving particular attention to the possibility of atmospheric transport of pollutants to coastal areas;
- (g) oceanic dispersal characteristics of the area (e.g. effects of currents, tides, wind, horizontal transport and vertical mixing) in order to evaluate the potential impact of pollutants introduced into the ocean through atmospheric plume interaction with the water surface;
- (h) the possible presence of submarine cables or pipelines if the vessel is to anchor in the incineration area;
- (i) the necessity of co-ordination with other Contracting Parties.

8. General Controls on the Vessel and its Operation

8.1 Disposal of Residues

- 8.1.1 There must be no means of discharging liquid wastes from the vessel's tanks except by means of the incinerator during normal operations. Consequently, where facilities to empty the tanks exist on an incinerator vessel, these should be sealed by the national authority at the port of loading. Breaking of the seal to discharge wastes at sea should subsequently be justified by the master of the vessel on the grounds of force majeure (Article 8 (1)).
- 8.1.2 In consultation with the national authorities, tank washings should be incinerated at sea in accordance with these guidelines or discharged to port facilities.
- 8.1.3 In the combustion of containerized solid wastes, certain residues may remain as ash in the incinerator which may require periodic removal. Such residues should not be removed from the incinerator except while the vessel is in harbour, where they should be removed for safe disposal on land. They should not be dumped in the sea from the incinerator vessel.

8.2 The Loading of Wastes

- 8.2.1 Liquid wastes should not be transferred from barges or other vessels outside harbour limits.
- 8.2.2 Solid wastes in damaged containers should not be taken on board.
- 8.2.3 Unless the regulations in the "International Maritime Dangerous Goods Code" prescribe otherwise, containerized solid waste should be stowed on the tween-decks or in the lower hold for new incinerator vessels. With existing incinerator vessels where storage below deck is not possible, containers stored on deck must be held securely within special enclosures to be approved by the licensing authority.
- 8.2.4 Measures should also be taken to ensure that containers loaded on board are adequately labelled and that they and their contents can only be discharged via the incinerator.

8.3 Prevention of Hazards to other Vessels

- 8.3.1 In licensing the incineration of wastes on approved incineration vessels, the licensing authority should have regard to the need to avoid hazards to other vessels by selecting a proper location of the incineration zones concerned and by ensuring that the relevant maritime authorities are notified of the vessel's date of sailing and intended schedule, as well as its intended movements during incineration (whether underway, at anchor, etc.).
- 8.3.2 The co-ordinates of permanently designated incineration zones and recommended off-shore incineration routes should be widely promulgated to maritime interests including the marking on navigational charts at the discretion of coastal administrations.
- 8.3.3 Regular radio warnings should be broadcast during the period of incineration. The vessel shall respond promptly to radio calls from other vessels or shore stations at all times during the incineration.

8.4 Construction of the Incinerator Vessel

- 8.4.1 For the carriage of liquid wastes, the incinerator vessel must carry a valid "Certificate of Fitness" as is required under the IMCO Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk.
- 8.4.2 The incinerator vessels should comply with the requirements for a Type II ship of the IMCO Code and should adhere to such other provisions as may be defined on the carriage of dangerous chemicals.
- 8.4.3 It must be possible to seal the valves of the pipes from the waste tanks to the furnace and from the waste tanks to the manifold.

9. Methods of Ensuring Compliance with Regulations

9.1 Any vessel used for the incineration of wastes at sea should provide for photographic or other methods to be approved by the licensing authority of recording essential control variables during each voyage. These records should be reviewed by the national authorities which have granted the incineration permits.

9.2 These records should provide independent confirmation of the following parameters by recording automatically (at a frequency of at least every 15 minutes):

- Wall temperature measurements of approved control thermocouples;
- The oxygen concentration in combustion gases;
- The date and time of incineration;
- The vessel position by appropriate navigational means (e.g. LORAN or DECCA NAVIGATION SYSTEMS);
- The status of waste, fuel and air pumps (i.e. on/off).

9.3 Additionally, a number of records are to be maintained for inspection by licensing authorities. These are:

- Records of the CO and CO₂ concentration in combustion gases;
- Ship's course and speed (if applicable);
- Meteorological conditions, e.g. wind speed and direction;
- The tank from which waste is taken;
- The rate of waste input to the furnace;
- Copies of incineration permits issued by the licensing authority;
- Future parameters which may be required subject to satisfactory technical development with regard to measurements, destruction efficiency and total particulate matter in the combustion gases.

10. Notifications

10.1 The secretariat should be notified immediately following the issuing of a permit to incinerate waste at sea. The form of report for notification is given in Appendix III.

10.2 Before 30 June in each year, each Contracting Party shall submit to the secretariat information on the amounts of waste incinerated in the preceding year. The form of report to be used is given in Appendix IV.

11. Area of Jurisdiction

This Code of Practice shall be applied by Contracting Parties to the sea area of the Oslo Convention. If Contracting Parties authorize the incineration of waste outside the Convention area, they shall not apply lower standards than adopted for the Convention area and shall comply with other agreements.

12. Amendments to the Code of Practice

The Commission shall exercise a general supervision of the working of this Code of Practice. For this purpose it shall be the duty of the Commission to:

- (a) receive and consider the records of permits issued and of incineration operations carried out in accordance with this Code of Practice,
- (b) keep under review and to recommend such amendments, additions or deletions to this Code of Practice as may be thought necessary to ensure compliance with the provisions of the Convention.

PRELIMINARY LIST OF SUBSTANCES OVER WHICH DOUBTS EXIST AS TO THE EFFICIENCY
OF COMBUSTION

- PCBs
- PCTs
- Hexachlorobenzene
- DDT and derivatives
- Chlorodioxins

INFORMATION OF RELEVANCE TO APPLICATIONS FOR A PERMIT FOR INCINERATION OF
WASTE AT SEA

- (a) Quantities of substances to be incinerated in each operation. Frequency of incineration operations (daily, weekly, monthly).
- (b) Form in which the waste is to be incinerated, i.e. solids, sludge, liquid, in bulk or in containers. When waste is packed in containers, give the shape, size and nature of the containers.
- (c) Origin of waste, i.e. industrial processes and/or type of production from which it comes.
- (d) Composition of the waste (detailed analysis including, as necessary, data on toxicity, persistence and other properties such as reactivity). Information should relate to the following substances:

(Specify whether the analysis relates to dry or wet weight. For low concentrations, give the above information in ppm.)

- principal organic compounds
- organohalogens
- other components, e.g.
 - Hg Be
 - Cd Cr
 - As Ni
 - Pb V
 - Cu Fe
 - Zn Organosilicons

- (e) Physical properties of the waste:

- specific gravity;
- pH (if relevant);
- ash content;
- calorific value;
- solids in suspension;
- viscosity;
- flashpoint;

Other properties which may be of interest to authorities (gel point, vapour pressure, freezing/melting point, solubility, physical stability, etc.)

- (f) Chemical and physical transformation of the waste after incineration, in particular subsequent formation of new compounds, composition of ashes or unburnt residues if possible.

CONVENTION FOR THE PREVENTION OF MARINE POLLUTION BY DUMPING FROM SHIPS
AND AIRCRAFT

CODE OF PRACTICE FOR THE INCINERATION OF WASTES AT SEA

FORM OF REPORT FOR THE NOTIFICATION OF PERMITS ISSUED FOR THE INCINERATION OF
WASTES AT SEA

- I. According to paragraph 10.1 of the "Code of Practice for the Incineration of Wastes at Sea" the Oslo Commission secretariat should be notified immediately following the issue of an incineration permit.
- II. The notification should contain the following information for each permit issued:
- (a) issuing authorities
 - (b) date issued
 - (c) period for which the permit is valid
 - (d) country of origin of wastes
 - (e) port of loading
 - (f) total quantity of wastes (in metric units) covered by the permit
 - (g) form in which the waste is presented (bulk or containers). If in containers, please state:
 - size
 - labelling
 - (h) composition of the waste:
 - physical form
 - specific gravity
 - viscosity
 - water content
 - principal organic components

organohalogens

main inorganic components

whether radioactive or not

solids in suspension

calorific value

other properties (e.g. toxicity and persistence, if applicable)

specify whether the analysis relates to dry or wet weight
(in ppm in the case of low concentrations)

(i) industrial process giving rise to the waste

(j) name of the vessel(s) used

(k) area of incineration:

geographical location

distance from the nearest coast

(l) expected frequency of incineration

(m) special conditions (such as to the operation of the incinerator and/or vessel outside those conditions specified in the Code of Practice or monitoring requirements).

CONVENTION FOR THE PREVENTION OF MARINE POLLUTION BY DUMPING FROM SHIPS
AND AIRCRAFT

CODE OF PRACTICE FOR THE INCINERATION OF WASTES AT SEA

FORM OF ANNUAL REPORT ON ALL INCINERATION OPERATIONS CARRIED OUT DURING
THE YEAR 19...

- I. Incineration Area
- location: - longitude
 - latitude
- II. Wastes Incinerated
- (a) total quantity of wastes actually incinerated
- (b) total quantity of wastes licensed
- (c) estimated amount of halogenated substances released into the environment
- (d) estimated amount of inorganic substances released into the environment
- mercury
 - cadmium
 - arsenic
 - chromium
 - copper
 - lead
 - nickel
 - zinc
 - other metals/metalloids
- (e) information on controls carried out during the incineration operations
- (f) information on any research carried out during the incineration operations
- (g) other relevant information.

ANNEX IV

FORM OF REPORT FOR THE NOTIFICATION OF PERMITS
ISSUED FOR THE INCINERATION OF WASTES AT SEA

I. According to paragraph 10.1 of the "Code of Practice for the Incineration of Wastes at Sea" the Oslo Commission Secretariat should be notified immediately following the issue of an incineration permit.

II. The notification should contain the following information for each permit issued:

- (a) issuing authorities
- (b) date issued
- (c) period for which the permit is valid
- (d) country of origin of wastes
- (e) port of loading
- (f) total quantity of wastes (in metric units) covered by the permit
- (g) form in which the waste is presented (bulk or containers)
If in containers, please state:
 - size
 - labelling
- (h) composition of the waste:
 - physical form
 - specific gravity
 - viscosity
 - water content
 - principal organic components
 - organohalogens
 - main inorganic components
 - whether radioactive or not
 - solids in suspension
 - caloric value
 - other properties (e.g. toxicity and persistence, if applicable)
 - specify whether the analysis relates to dry or wet weight
(in ppm in the case of low concentrations)
- (i) industrial process giving rise to the waste
- (j) name of vessel(s) used
- (k) area of incineration:
 - geographical location
 - distance from the nearest coast
- (l) expected frequency of incineration
- (m) special conditions (such as to the operation of the incinerator and/or vessel outside those conditions specified in the Code of Practice or monitoring requirements).

ANNEX V

FORM OF ANNUAL REPORT ON ALL INCINERATION OPERATIONS
CARRIED OUT DURING THE YEAR 19 ...

I. Incineration area

location: - longitude
 - latitude

II. Wastes incinerated

- (a) total quantity of wastes actually incinerated
- (b) total quantity of wastes licensed
- (c) estimated amount of halogenated substances released into the environment
- (d) estimated amount of inorganic substances released into the environment
 - mercury
 - cadmium
 - arsenic
 - chromium
 - copper
 - lead
 - nickel
 - zinc
 - other metals/metalloids
- (e) information on controls carried out during the incineration operations
- (f) information on any research carried out during the incineration operations
- (g) other relevant information