An Roinn Iompair
Department of Transport

Marine Notice No. 59 of 2024

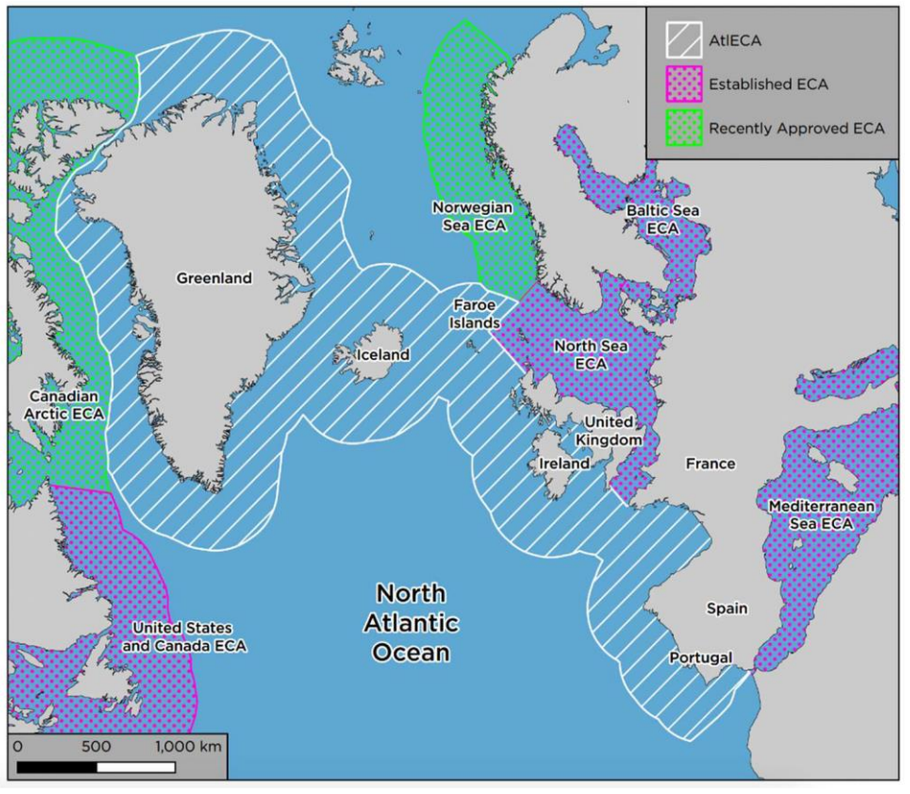
Proposed Northeast Atlantic Emission Control Area (ECA)

Public Consultation

1. Background

The Department of Transport is proposing to join with other interested states to progress the adoption of a new Emission Control Area (ECA) in the Northeast Atlantic Ocean at the International Maritime Organization (IMO) in early 2025. This new ECA would join up with existing ECAs in the Atlantic Ocean, the North Sea, the Baltic Sea, the Mediterranean Sea and the Norwegian Sea, Figure 1 below. If adopted the requirements of the Northeast Atlantic ECA will likely enter force in 2027. From that date all ships subject to the International Convention for the Prevent of Pollution from Ships (MARPOL) Annex VI and operating in the Northeast Atlantic ECA will be required to use on board fuel oils with a sulphur content of maximum 0.10% m/m in accordance with MARPOL Annex VI, regulation 14, or use alternative emission reduction and control technologies to comply with the emission standard. Additionally, marine diesel engines fitted in ships constructed after the date of adoption with power greater than 130 kW and operating in this proposed ECA must meet IMO Tier III standards. Interested parties are therefore invited to submit their views on this proposal.

Figure 1



2. Details of the proposed ECA

In developing this initiative, Ireland has been working with other coastal states in the Northeast Atlantic Ocean, including Greenland, Iceland, the Faroe Islands, the United Kingdom, France, Spain, and Portugal since late 2022 to explore the potential for an ECA in the Northeast Atlantic for Nitrogen Oxides (NOx), Sulphur Oxides (SOx) and Particulate Matter (PM). These are chemicals associated with shipping emissions and can be harmful to human and ecosystem health.

The prospective ECA will contribute to preventing, reducing, and controlling NOx, SOx and PM emissions from ships, pursuant to regulations 13 and 14 and Appendix III to MARPOL Annex VI (see the Annex to this Notice). Discussions have been held to develop the necessary technical, scientific, and economic case to inform decisions by the interested parties in due course.

A technical and feasibility study has been carried out by the International Council on Clean Transportation. In addition, the University of Porto has also conducted a study which focused on the deposition of pollutants (the accumulation of harmful substances on surfaces, such as the ground, plants or water bodies) and the estimated costs associated with the ECA.

The results of these studies have now been received by the Department of Transport and will form the evidence base for a proposal being prepared for consideration at the Marine Environment Protection Committee at the IMO to argue for the introduction of an ECA within Irish waters. A working paper based on the above studies is available to download here.

In 2030, if distillate fuel is used to comply with the ECA regulations, this could lead to an 82% reduction in SOx emissions, a 64% reduction in PM2.5, and a 36% reduction in black carbon emissions when compared to a scenario without ECA regulations.

The NOx regulation Tier III standards can reduce expected NOx emissions by about 3% in 2030 if they apply to ships constructed after the date of adoption of the ECA which is expected to be in 2027 or later. Ships currently operating are, in general, not expected to be required to change any engine or equipment due to the proposed establishment of the ECA. There are some exceptions and other considerations, and full details are set out in the IMO MARPOL Convention Regulation 13, annexed to this Notice.

It is estimated that the proposed ECA could prevent 118 to 176 premature deaths by 2030, with a cumulative reduction of 2,900 to 4,300 premature deaths from 2030 to 2050. The economic value of these benefits is estimated at €0.82 billion to €1.23 billion in 2030 and €19 billion to €29 billion between 2030 and 2050. On the other hand, the operational costs from fuel switching (Marine Gas Oil mix) and Tier III compliance are estimated at €472 million in 2030, sitting significantly below the total economic health benefits for the same period.

Overall, the designation of the Northeast Atlantic ECA will significantly reduce ship emissions, improve air quality, and contribute to public health and environmental protection in the Northeast Atlantic region. The economic impacts will be manageable, and the benefits to marine ecosystems, biodiversity, and human health far outweigh the costs.

3. Views of Interested Parties

Officials of the Maritime Environment Policy Division of the Department of Transport intends to continue working alongside interested parties to prepare a proposal regarding a Northeast Atlantic ECA for adoption at the IMO in April 2025**.** As a part of this process, the Department is seeking the views of all stakeholders in relation to the above topic by 11 November 2024.

4. Contact Details

Submissions or enquiries regarding the contents of this Marine Notice, or any other relevant matters, should be directed to:

- **Maritime Environment Policy Division**
  Address: Department of Transport, Leeson Lane, Dublin 2, D02 TR60
  Contact: David Mulholland
  Email: maritimeenvironmentpolicy@transport.gov.ie

25/10/2024

Encl: ***Annex*** *- Regulations 13 and 14 and Appendix III to MARPOL Annex VI (MARPOL - 2022 Consolidated Edition)*

Annex

Regulations 13 & 14 and Appendix III to MARPOL Annex VI (MARPOL - 2022 Consolidated Edition)

Regulation 13 *Nitrogen oxides (NOx)*

Application

1.1 This regulation shall apply to:

.1 each marine diesel engine with a power output of more than 130 kW installed on a ship; and

.2 each marine diesel engine with a power output of more than 130 kW that undergoes a major conversion on or after 1 January 2000 except when demonstrated to the satisfaction of the Administration that such engine is an identical replacement to the engine that it is replacing and is otherwise not covered under paragraph 1.1.1 of this regulation.

1.2 This regulation does not apply to:

.1 a marine diesel engine intended to be used solely for emergencies or solely to power any device or equipment intended to be used solely for emergencies on the ship on which it is installed, or a marine diesel engine installed in lifeboats intended to be used solely for emergencies; and

.2 a marine diesel engine installed on a ship solely engaged in voyages within waters subject to the sovereignty or jurisdiction of the State the flag of which the ship is entitled to fly, provided that such engine is subject to an alternative NOx control measure established by the Administration.

1.3 Notwithstanding the provisions of paragraph 1.1 of this regulation, the Administration may provide an exclusion from the application of this regulation for any marine diesel engine that is installed on a ship constructed, or for any marine diesel engine that undergoes a major conversion, before 19 May 2005, provided that the ship on which the engine is installed is solely engaged in voyages to ports or offshore terminals within the State the flag of which the ship is entitled to fly.

Major conversion

2.1 For the purpose of this regulation, *major conversion* means a modification on or after 1 January 2000 of a marine diesel engine that has not already been certified to the standards set forth in paragraph 3, 4, or 5.1.1 of this regulation where:

.1 the engine is replaced by a marine diesel engine or an additional marine diesel engine is installed, or

.2 any substantial modification, as defined in the revised NOx Technical Code 2008, is made to the engine, or

.3 the maximum continuous rating of the engine is increased by more than 10% compared to the maximum continuous rating of the original certification of the engine.

2.2 For a major conversion involving the replacement of a marine diesel engine with a non-identical marine diesel engine, or the installation of an additional marine diesel engine, the standards in this regulation at the time of the replacement or addition of the engine shall apply. In the case of replacement engines only, if it is not possible for such a replacement engine to meet the standards set forth in paragraph 5.1.1 of this regulation (Tier III, as applicable), then that replacement engine shall meet the standards set forth in paragraph 4 of this regulation (Tier II), taking into account the guidelines developed by the Organization.*

*Refer to the *2013 Guidelines as required by regulation 13.2.2 of MARPOL Annex VI in respect of non-identical replacement engines not required to meet the Tier III limit* (resolution MEPC.230(65)).

2.3 A marine diesel engine referred to in paragraph 2.1.2 or 2.1.3 of this regulation shall meet the following standards:

.1 for ships constructed prior to 1 January 2000, the standards set forth in paragraph 3 of this regulation shall apply; and

.2 for ships constructed on or after 1 January 2000, the standards in force at the time the ship was constructed shall apply.

Tier I†

3 Subject to regulation 3 of this Annex, the operation of a marine diesel engine that is installed on a ship constructed on or after 1 January 2000 and prior to 1 January 2011 is prohibited, except when the emission of nitrogen oxides (calculated as the total weighted emission of NO_2) from the engine is within the following limits, where n = rated engine speed (crankshaft revolutions per minute):

.1 17.0 g/kWh when n is less than 130 rpm;

.2 $45 \cdot n^{(-0.2)}$ g/kWh when n is 130 or more but less than 2,000 rpm;

.3 9.8 g/kWh when n is 2,000 rpm or more.

† Refer to *Guidelines for the application of the NOx Technical Code relative to certification and amendments of Tier I engines* (MEPC.1/ Circ.679).

Tier II

4 Subject to regulation 3 of this Annex, the operation of a marine diesel engine that is installed on a ship constructed on or after 1 January 2011 is prohibited, except when the emission of nitrogen oxides (calculated as the total weighted emission of NO_2) from the engine is within the following limits, where n = rated engine speed (crankshaft revolutions per minute):

.1 14.4 g/kWh when n is less than 130 rpm;

.2 $44 \cdot n^{(-0.23)}$ g/kWh when n is 130 or more but less than 2,000 rpm;

.3 7.7 g/kWh when n is 2,000 rpm or more.

Tier III

5.1 Subject to regulation 3 of this Annex, in an emission control area designated for Tier III NOx control under paragraph 6 of this regulation (NOx Tier III emission control area), the operation of a marine diesel engine that is installed on a ship is prohibited:

.1 except when the emission of nitrogen oxides (calculated as the total weighted emission of NO_2) from the engine is within the following limits, where n = rated engine speed (crankshaft revolutions per minute):

.1 3.4 g/kWh when n is less than 130 rpm;

.2 $9 \cdot n^{(-0.2)}$ g/kWh when n is 130 or more but less than 2,000 rpm;

.3 2.0 g/kWh when n is 2,000 rpm or more;

when:

.2 that ship is constructed on or after:1 January 2016 and is operating in the North American Emission Control Area or the United States Caribbean Sea Emission Control Area;

.3 1 January 2021 and is operating in the Baltic Sea Emission Control Area or the North Sea Emission Control Area;

.4 That ship is operating in a NOx Tier III emission control area other than an emission control area described in paragraph 5.1.2 of this regulation and is constructed on or after the date of adoption of such an emission control area, or a later date as may be specified in the amendment designating the NOx Tier III emission control area, whichever is later.

5.2 The standards set forth in paragraph 5.1.1 of this regulation shall not apply to:

.1 a marine diesel engine installed on a ship with a length (*L*), as defined in regulation 1.19 of Annex I to the present Convention, of less than 24 meters when it has been specifically designed, and is used solely, for recreational purposes; or

.2 a marine diesel engine installed on a ship with a combined nameplate diesel engine propulsion power of less than 750 kW if it is demonstrated, to the satisfaction of the Administration, that the ship cannot comply with the standards set forth in paragraph 5.1.1 of this regulation because of design or construction limitations of the ship; or

.3 a marine diesel engine installed on a ship constructed prior to 1 January 2021 of less than 500 gross tonnage, with a length (*L*), as defined in regulation 1.19 of Annex I to the present Convention, of 24 meters or over when it has been specifically designed, and is used solely, for recreational purposes.

5.3 The tier and on/off status of marine diesel engines installed on board a ship to which paragraph of this regulation applies which are certified to both Tier II and Tier III or which are certified to Tier II only shall be recorded in such logbook or electronic record book* as prescribed by the Administration at entry into and exit from a NOx Tier III emission control area, or when the on/off status changes within such an area, together with the date, time and position of the ship.

*Refer to *Guidelines for the use of electronic record books under MARPOL* (resolution MEPC.312(74)

5.4 Emissions of nitrogen oxides from a marine diesel engine subject to paragraph 5.1 of this regulation that occur immediately following building and sea trials of a newly constructed ship, or before and following converting, repairing, and/or maintaining the ship, or maintenance or repair of a Tier II engine or a dual fuel engine when the ship is required to not have gas fuel or gas cargo on board due to safety requirements, for which activities take place in a shipyard or other repair facility located in a NOx Tier III emission control area,

are temporarily exempted provided the following conditions are met:

.1 the engine meets the Tier II NOx limits; and

.2 the ship sails directly to or from the shipyard or other repair facility, does not load or unload cargo during the duration of the exemption, and follows any additional specific routing requirements indicated by the port State in which the shipyard or other repair facility is located, if applicable.

5.5 The exemption described in paragraph 5.4 of this regulation applies only for the following period:

.1 for a newly constructed ship, the period beginning at the time the ship is delivered from the shipyard, including sea trials, and ending at the time the ship directly exits the NOx Tier III emission control area(s) or, with regard to a ship fitted with a dual fuel engine, the ship directly exits the NOx Tier III emission control area(s) or proceeds directly to the nearest gas fuel bunkering facility appropriate to the ship located in the NOx Tier III emission control area(s);

.2 for a ship with a Tier II engine undergoing conversion, maintenance or repair, the period beginning at the time the ship enters the NOx Tier III emission control area(s) and proceeds directly to the shipyard or other repair facility, and ending at the time the ship is released from the shipyard or other repair facility and directly exits the NOx Tier III emission control area(s) after performing sea trials, if applicable; or

.3 for a ship with a dual fuel engine undergoing conversion, maintenance or repair, when the ship is required to not have gas fuel or gas cargo on board due to safety requirements, the period beginning at the time the ship enters the NOx Tier III emission control area(s) or when it is degassed in the NOx Tier III emission control area(s) and proceeds directly to the shipyard or other repair facility, and ending at the time when the ship is released from the shipyard or other repair facility and directly exits the NOx Tier III emission control area(s) or proceeds directly to the nearest gas fuel bunkering facility appropriate to the ship located in the NOx Tier III emission control area(s).

Emission control area

6 For the purposes of this regulation, a NOx Tier III emission control area shall be any sea area, including any port area, designated by the Organization in accordance with the criteria and procedures set forth in appendix III to this Annex. The NOx Tier III emission control areas are:

.1 the North American Emission Control Area, which means the area described by the coordinates provided in appendix VII to this Annex;

.2 the United States Caribbean Sea Emission Control Area, which means the area described by the coordinates provided in appendix VII to this Annex;

.3 the Baltic Sea area as defined in regulation 1.11.2 of Annex I of the present Convention; and

.4 the North Sea area as defined in regulation 1.14.6 of Annex V of the present Convention.

Marine diesel engines installed on a ship constructed prior to 1 January 2000

7.1 Notwithstanding paragraph 1.1.1 of this regulation, a marine diesel engine with a power output of more than 5,000 kW and a per cylinder displacement at or above 90 L installed on a ship constructed on or after 1 January 1990 but prior to 1 January 2000 shall comply with the emission limits set forth in paragraph 7.4 of this regulation, provided that an approved method* for that engine has been certified by an Administration of a Party and notification of such certification has been submitted to the Organization by the certifying Administration.† Compliance with this paragraph shall be demonstrated through one of the following:

.1 installation of the certified approved method, as confirmed by a survey using the verification procedure specified in the approved method file, including appropriate notation on the ship's IAPP Certificate of the presence of the approved method; or

.2 certification of the engine confirming that it operates within the limits set forth in paragraph 3, 4, or 5.1.1 of this regulation and an appropriate notation of the engine certification on the ship's IAPP Certificate.

*Refer to the *2014 Guidelines on the approved method process* (resolution MEPC.243(66)).

† Refer to the *2014 Guidelines in respect of the information to be submitted by an Administration to the Organization covering the certification of an approved method as required under regulation 13.7.1 of MARPOL Annex VI* (resolution MEPC.242(66)).

7.2 Paragraph 7.1 of this regulation shall apply no later than the first renewal survey that occurs 12 months or more after deposit of the notification in paragraph 7.1. If a shipowner of a ship on which an approved method is to be installed can demonstrate to the satisfaction of the Administration that the approved method was not commercially available despite best efforts to obtain it, then that approved method shall be installed on the ship no later than the next annual survey of that ship that falls after the approved method is commercially available.

7.3 With regard to a marine diesel engine with a power output of more than 5,000 kW and a per cylinder displacement at or above 90 L installed on a ship constructed on or after 1 January 1990, but prior to 1 January 2000, the IAPP Certificate shall, for a marine diesel engine to which paragraph 7.1 of this regulation applies, indicate one of the following:

.1 an approved method has been applied pursuant to paragraph 7.1.1 of this regulation.

.2 the engine has been certified pursuant to paragraph 7.1.2 of this regulation.

.3 an approved method is not yet commercially available as described in paragraph 7.2 of this regulation; or

.4 an approved method is not applicable.

7.4 Subject to regulation 3 of this Annex, the operation of a marine diesel engine described in paragraph 7.1 of this regulation is prohibited, except when the emission of nitrogen oxides (calculated as the total weighted emission of NO2) from the engine is within the following limits, where *n* = rated engine speed (crankshaft revolutions per minute):

.1 17.0 g/kWh when *n* is less than 130 rpm;

.2 $45 \cdot n^{(-0.2)}$ g/kWh when *n* is 130 or more but less than 2,000 rpm; and

.3 9.8 g/kWh when *n* is 2,000 rpm or more.

7.5 Certification of an approved method shall be in accordance with chapter 7 of the revised NOx Technical Code 2008 and shall include verification:

.1 by the designer of the base marine diesel engine to which the approved method applies that the calculated effect of the approved method will not decrease engine rating by more than 1.0%, increase fuel consumption by more than 2.0% as measured according to the appropriate test cycle set forth in the revised NOx Technical Code 2008, or adversely affect engine durability or reliability; and

.2 that the cost of the approved method is not excessive, which is determined by a comparison of the amount of NOx reduced by the approved method to achieve the standard set forth in paragraph 7.4 of this regulation and the cost of purchasing and installing such approved method.*

* The cost of an approved method shall not exceed 375 Special Drawing Rights/metric tonne NO_x calculated in accordance with the cost-effectiveness (*Ce*) formula below:

$$Ce = \frac{\textit{Cost of approved method} \cdot 10^{6}}{\textit{Power}\ (\text{kW}) \cdot 0.768 \cdot 6{,}000\ (\text{hours/year}) \cdot 5\ (\text{years}) \cdot \Delta NO_x\ (\text{g/kWh})}$$

Refer to *Definitions for the cost-effectiveness formula in regulation 13.7.5 of the revised MARPOL Annex VI* (MEPC.1/Circ.678).

Certification

8 The revised NOx Technical Code 2008 shall be applied in the certification, testing and measurement procedures for the standards set forth in this regulation.

9 The procedures for determining NOx emissions set out in the revised NOx Technical Code 2008 are intended to be representative of the normal operation of the engine. Defeat devices and irrational emission control strategies undermine this intention and shall not be allowed. This regulation shall not prevent the use of auxiliary control devices that are used to protect the engine and/or its ancillary equipment against operating conditions that could result in damage or failure or that are used to facilitate the starting of the engine.

Regulation 14

Sulphur oxides (SOx) and particulate matter

General requirements

1 The sulphur content of fuel oil used or carried for use on board a ship shall not exceed 0.50% m/m.

2 The worldwide average sulphur content of residual fuel oil supplied for use on board ships shall be monitored taking into account the guidelines developed by the Organization.†

† Refer to the *2020 Guidelines for monitoring the worldwide average sulphur content of fuel oils supplied for use on board ships* (resolution MEPC.326(75)).

Requirements within emission control areas

3 For the purpose of this regulation, an emission control area shall be any sea area, including any port area, designated by the Organization in accordance with the criteria and procedures set forth in appendix III to this Annex. The emission control areas under this regulation are:

.3 the Baltic Sea area as defined in regulation 1.11.2 of Annex I of the present Convention;

.4 the North Sea area as defined in regulation 1.14.6 of Annex V of the present Convention;

.5 the North American Emission Control Area, which means the area described by the coordinates provided in appendix VII to this Annex; and

.6 the United States Caribbean Sea Emission Control Area, which means the area described by the coordinates provided in appendix VII to this Annex.

4 While a ship is operating within an emission control area, the sulphur content of fuel oil used on board that ship shall not exceed 0.10% m/m.

5 The sulphur content of fuel oil referred to in paragraph 1 and paragraph 4 of this regulation shall be documented by its supplier as required by regulation 18 of this Annex.

6 Those ships using separate fuel oils to comply with paragraph 4 of this regulation and entering or leaving an emission control area set forth in paragraph 3 of this regulation shall carry a written procedure showing how the fuel oil changeover is to be done, allowing sufficient time for the fuel oil service system to be fully flushed of all fuel oils exceeding the applicable sulphur content specified in paragraph 4 of this regulation prior to entry into an emission control area. The volume of low sulphur fuel oils in each tank as well as the date, time and position of the ship when any fuel oil changeover operation is completed prior to the entry into an emission control area or commenced after exit from such an area shall be recorded in such logbook or electronic record book* as prescribed by the Administration.

* Refer to *Guidelines for the use of electronic record books under MARPOL* (resolution MEPC.312(74)).

7 During the first 12 months immediately following entry into force of an amendment designating a specific emission control area under paragraph 3 of this regulation, ships operating in that emission control area are exempt from the requirements in paragraphs 4 and 6 of this regulation and from the requirements of paragraph 5 of this regulation insofar as they relate to paragraph 4 of this regulation.

In-use and onboard fuel oil sampling and testing

8 If the competent authority of a Party requires the in-use or onboard sample to be analysed, it shall be done in accordance with the verification procedure set forth in appendix VI to this Annex to determine whether the fuel oil being used or carried for use on board meets the requirements in paragraph 1 or paragraph 4 of this regulation. The in-use sample shall be drawn taking into account the guidelines developed by the Organization.† The onboard sample shall be drawn taking into account the guidelines developed by the Organization.‡

† Refer to the *2019 Guidelines for on board sampling for the verification of the sulphur content of the fuel oil used on board ships* (MEPC.1/Circ.864/Rev.1).
‡ Refer to the 2020 Guidelines for on board sampling of fuel oil intended to be used or carried for use on board a ship (MEPC.1/Circ.889)

9 The sample shall be sealed by the representative of the competent authority with a unique means of identification installed in the presence of the ship's representative. The ship shall be given the option of retaining a duplicate sample.

In-use fuel oil sampling point

10 For each ship subject to regulations 5 and 6 of this Annex, sampling point(s) shall be fitted or designated for the purpose of taking representative samples of the fuel oil being used on board the ship taking into account the guidelines developed by the Organization.†

† Refer to the *2019 Guidelines for on board sampling for the verification of the sulphur content of the fuel oil used on board ships* (MEPC.1/Circ.864/Rev.1)

11 For a ship constructed before 1 April 2022, the sampling point(s) referred to in paragraph 10 shall be fitted or designated not later than the first renewal survey as identified in regulation 5.1.2 of this Annex on or after 1 April 2023.

12 The requirements of paragraphs 10 and 11 above are not applicable to a fuel oil service system for a low-flashpoint fuel for combustion purposes for propulsion or operation on board the ship.

13 The competent authority of a Party shall, as appropriate, utilize the sampling point(s) which is(are) fitted or designated for the purpose of taking representative sample(s) of the fuel oil being used on board in order to verify that the fuel oil complies with this regulation. Taking fuel oil samples by the competent authority of the Party shall be performed as expeditiously as possible without causing the ship to be unduly delayed.

Appendix III

Criteria and procedures for the designation of emission control areas (regulations 13.6 and 14.3)

1 Objectives

1. The purpose of this appendix is to provide Parties with the criteria and procedures for formulating and submitting proposals for the designation of emission control areas and to set forth the factors to be considered in the assessment of such proposals by the Organization.

2. Emissions of NOx, SOx and particulate matter from ocean-going ships contribute to ambient concentrations of air pollution in cities and coastal areas around the world. Adverse public health and environmental effects associated with air pollution include premature mortality, cardiopulmonary disease, lung cancer, chronic respiratory ailments, acidification and eutrophication.

3. An emission control area should be considered for adoption by the Organization if supported by a demonstrated need to prevent, reduce and control emissions of NOx or SOx and particulate matter or all three types of emissions (hereinafter emissions) from ships.

2 Process for the designation of emission control areas

1. A proposal to the Organization for the designation of an emission control area for NOx or SOx and particulate matter or all three types of emissions may be submitted only by Parties. Where two or more Parties have a common interest in a particular area, they should formulate a coordinated proposal.

2. A proposal to designate a given area as an emission control area should be submitted to the Organization in accordance with the rules and procedures established by the Organization.

3 Criteria for designation of an emission control area

The proposal shall include:

.1 a clear delineation of the proposed area of application, along with a reference chart on which the area is marked;

.2 the type or types of emission(s) that is or are being proposed for control (i.e. NOx or SOx and particulate matter or all three types of emissions);

.3 a description of the human populations and environmental areas at risk from the impacts of ship emissions;

.4 an assessment that emissions from ships operating in the proposed area of application are contributing to ambient concentrations of air pollution or to adverse environmental impacts. Such assessment shall include a description of the impacts of the relevant emissions on human health and the environment, such as adverse impacts on terrestrial and aquatic ecosystems, areas of natural productivity, critical habitats, water quality, human health, and areas of cultural and scientific significance, if applicable. The sources of relevant data including methodologies used shall be identified;

.5 relevant information, pertaining to the meteorological conditions in the proposed area of application, to the human populations and environmental areas at risk, in particular prevailing wind patterns, or to topographical, geological, oceanographic, morphological or other conditions that contribute to ambient concentrations of air pollution or adverse environmental impacts;

.6 the nature of the ship traffic in the proposed emission control area, including the patterns and density of such traffic;

.7 a description of the control measures taken by the proposing Party or Parties addressing land-based sources of NOx, SOx and particulate matter emissions affecting the human populations and environmental areas at risk that are in place and operating concurrently with the consideration of measures to be adopted in relation to provisions of regulations 13 and 14 of Annex VI; and

.8 the relative costs of reducing emissions from ships when compared with land-based controls, and the economic impacts on shipping engaged in international trade.

3.2 The geographical limits of an emission control area will be based on the relevant criteria outlined above, including emissions and deposition from ships navigating in the proposed area, traffic patterns and density, and wind conditions.

4 Procedures for the assessment and adoption of emission control areas by the Organization

4.1 The Organization shall consider each proposal submitted to it by a Party or Parties.

4.2 In assessing the proposal, the Organization shall take into account the criteria that are to be included in each proposal for adoption as set forth in section 3 above.

4.3 An emission control area shall be designated by means of an amendment to this Annex, considered, adopted and brought into force in accordance with article 16 of the present Convention.

5 Operation of emission control areas

4.4 Parties that have ships navigating in the area are encouraged to bring to the Organization any concerns regarding the operation of the area.