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Introduction to Annex 6 of International MARPOL convention (Air Pollution)

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معرفی ضمیمه ۶ کنوانسیون بین‌المللی جلوگیری از آلودگی ناشی از کشتیها (آلودگی هوا)

شماره: ۹۰/۳۶۸۹/ق م

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All respectful ICS Customers & Surveyors

With my gratitude, respectfully,
As you may know, requirements related to air pollution prevention have been applied through MARPOL convention annex VI. This annex has been made mandatory from May 2005 internationally and from August 2008 for Iranian flag.

Certainly, more precise implementation of these regulations requires deeper comprehension of surveyors and customers. As a result, Convention & Legislation Department plans to issue a series of publications on this topic during this year.

Within this TI, an overview of MARPOL Annex VI has been presented, including convention contents, general regulations, documentation, certification and survey program.

The electronic file of this document could be found at the following address:

\\server\ICS Organization\Convention and LegislationDepartment\Publications\TECH\2012

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کلیه مشتریان و بازرسان محترم موسسه

با سلام و احترام

همانگونه که مستحضر هستید الزامات مربوط به جلوگیری آلودگی هوا توسط کشتیها در قالب ضمیمه شماره ۶ از کنوانسیون مارپول از تاریخ اردیبهشت ماه سال ۱۳۸۴ به صورت بین‌المللی و از تاریخ هفتم شهریورماه ۱۳۸۷ برای پرچم ایران لازم‌الاجرا شده است.

درک صحیح و عمیق الزامات مربوط به این ضمیمه توسط مشتریان و بازرسان موسسه کمک شایانی به اجرای درست مقررات خواهد نمود. در همین راستا، واحد کنوانسیونها و مقررات دریایی، طی سال جدید میلادی اطلاعیه‌های فنی مرتبط با این موضوع را جهت آشنایی مشتریان و بازخوانی بازرسان موسسه انتشار خواهد نمود.

در اطلاعیه پیش رو به معرفی کلیات این ضمیمه اعم از مفاد کنوانسیون، مرور الزامات، مدارک مورد نیاز، صدور گواهینامه و روال کلی بازرسی پرداخته است.

نسخه الکترونیکی بخشنامه مذکور در شبکه داخلی موسسه با آدرس ذیل قابل دسترسی می‌باشد:

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عبدالله جمالی

مدیریت واحد کنوانسیونها و مقررات دریایی
موسسه رده بندی ایران

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1. Preface

This Technical Information depicts a brief overview on International regulation for Air Pollution Prevention IAPP from ships (MARPOL annex VI).

Additionally, for more information, the following documents are enclosed to this issue:

- Annex 6 Convention
- IAPP & EIAPP Certificate form
- Outcomes of MEPC 62nd meeting
- NO_x technical code 2008

2. Introduction

In 1997 a new annex was added to the International Convention for the Prevention of Pollution from Ships (MARPOL). The Regulations for the Prevention of Air Pollution from Ships (Annex VI) seek to minimize airborne emissions from ships (SO_x, NO_x, ODS, VOC) and their contribution to global air pollution and environmental problems. Annex VI entered into force on 19 May 2005 ratified by 25 States, representing 50 % of the world tonnage. A revised Annex VI was adopted in October 2008 which entered into force on 1 July 2010.

Further amendments and resolutions in relation with this annex, will be entered into force during 2012 and 2013.

3. Application

The requirements of this annex are applicable to:

- **Every ship of 400 gross tonnage and above and every fixed and floating drilling rig and other platforms**

Furthermore, the emissions due to the following cases are excepted from the requirements:

- **Any emission necessary for the purpose of securing the safety of a ship or saving life at sea; or**
- **Any emission resulting from damage to a ship or its equipment**
- **Trials for Ship Emission Reduction and Control Technology Research**

- **Emissions from Sea-bed Mineral Activities**

4. Requirements

IAPP regulations specify the requirements for the following areas:

4.1 Ozone Depleting Substances (ODS)

ODS are the chlorofluorocarbons (CFC) and halons used respectively in older refrigeration and fire-fighting systems and portable equipment. ODS were also used as the blowing agent in some insulation foams. Hydro chlorofluorocarbons (HCFC) were introduced as an intermediate replacement for CFCs but are themselves still classed as ODS.

The control in this regulation typically covers items such as small, domestic type, refrigerators, air conditioners and water coolers.

No CFC or halon containing system or equipment is permitted to be installed on ships constructed on or after 19 May 2005 and no new installation of the same is permitted on or after that date on existing ships. Similarly, no HCFC containing system or equipment is permitted to be installed on ships constructed on or after 1 January 2020 and no new installation of the same is permitted on or after that date on existing ships.

Existing systems and equipment are permitted to continue in service and may be recharged as necessary. However, the deliberate discharge of ODS to the atmosphere is prohibited. When servicing or decommissioning systems or equipment containing ODS the gases are to be duly collected in a controlled manner and, if not to be reused onboard, are to be landed to appropriate reception facilities for banking or destruction. Any redundant equipment or material containing ODS is to be landed ashore for appropriate decommissioning or disposal. The latter also applies when a ship is dismantled at the end of its service life.

Additionally, for ships with ODS containing systems or equipment and which are required to have an IAPP Certificate, an ODS Record Book is to be maintained in which is recorded any related supply, recharging, repair, discharge or disposal operations.

4.2 Nitrogen oxides (NO_x)

Each diesel engine (Ex. main diesel engine, auxiliary generator diesel engine) with a power output of more than 130 kW which are installed on a ship constructed on or after January 1st, 2000 should comply with regulation of emission. In this regard, regulation 13 describes a speed-related IMO NO_x limit (from 17 gNO₂/kWh to 9.8 gNO₂/kWh depending on rated engine speed or an exhaust gas cleaning system which provides an equivalent NO_x reduction).

Moreover, in relation with these requirements, IMO has published the NO_x technical code as a reference for implementing the regulation and provision related to issuance of EIAPP (certificate of engines). The engines (parent, group or individual) which can meet the requirements are certified after testing by administrations or by the authorized societies acting on behalf of them.

All certified engines are delivered with an individual Technical File that contains the engine's specifications for compliance with the NO_x regulation, and the applicable onboard verification procedure. The certification process includes an emission test for compliance with the NO_x requirements on the manufacturer's test bed.

The procedure flowchart enclosed to this TI although we found it necessary to publish a particular TI for NO_x and its related certificates in future.

4.3 Sulphur Oxides (SO_x)

MARPOL annex VI Regulation 14 limits the maximum sulphur content of fuel to 4.5%.

This limitation is changed to 3.5% after January 1st 2012 and will be changed to 0.5% after 2020 (or 2025, depending on the outcome of a review in 2018.)

In SO_x Emission Control Areas (SECAs) Sulphur limit in fuel is 1% until July 1st 2015 when it changes to 0.1%.

Instead of limiting the sulphur content to 1.0% a scrubber can be used to reduce sulphur emissions to 4 g SO_x/kWh. This limit will change when the sulphur limit drops.

Low and high sulphur fuel has to be stored in different tanks. Different grades of cylinder oils may have to be carried if operating with low sulphur fuel for any length of time to prevent excessive calcium deposits and resultant liner wear. If low sulphur fuels are used, high wear rates may be experienced with fuel injection equipment.

To document the sulphur content in the fuel, a new bunker delivery note is required, accompanied by a representative sample of the fuel oil delivered, as specified in Regulation 18 (containing the required detail and information). The mentioned sample should be obtained by proper device and procedure.

Ships using separate fuel oils entering or leaving an Emission Control Area must carry a written procedure showing how the fuel oil change-over 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 prior to entry into an Emission Control Area. This report shall be recorded in the Oil Record Book or approved log book.

4.4 Volatile Organic Compound (VOC)

This regulation only *applies to tankers*. However, this regulation also applies to gas carriers only if the types of loading and

containment system allow safe retention of non-methane VOCs on board or their safe return ashore.

There are two aspects of VOC control within this regulation. In the first aspect, control on VOC emitted to the atmosphere in respect of certain ports or terminals is achieved by a requirement to utilize a vapour emission control system (VECS).

The second aspect of this regulation requires that all tankers carrying crude oil have an approved and effectively implemented ship specific VOC Management Plan covering at least the points given in the regulation. Guideline in respect of the development of these plans is given by resolution MEPC.185 (59) and related technical information on systems and operation of such arrangements is given by circular MEPC.1/Circ.680.

4.5 Shipboard Incineration

The requirements of the regulation divide into two sections. Regulations 16.1 – 16.4 cover onboard incineration in general and hence is potentially applicable to all ships whereas regulations 16.6 – 16.9 are specific only to incinerators installed on ships constructed on or after 1 January 2000 or to units installed on existing ships on or after that date.

4.6 Fuel Oil Availability and Quality

In general this regulation is not directed to ships, rather to fuel oil suppliers and their control by the appropriate authorities.

Regulations 18.6 and 18.8.1 have specific ship (for those that are required to have IAPP Certificates) related actions concerning the retention onboard of the bunker delivery notes, and the retention, under the ship's control. These requirements apply irrespective of whether or not compliance with regulation 14 - SOx and particulate matter emission control - is complied with by means of bunkering fuel oils which do not exceed the stated limits.

The other aspect of regulation 18 which may have an effect on ship owners is the fuel oil availability clause, regulation 18.2 which provides for the situation where there is a local non-availability of the required fuel oil – essentially fuel oil which does not meet the required maximum sulphur limit as given in regulation 14.

In sum, Regulations 18.1, 18.3, 18.4, 18.5 and 18.9 refer to the local control of fuel oil suppliers while regulations 18.7, 18.8 and 18.10 refer to the application of port State controls.

5. IAPP Survey Scheme

Diagram 1, illustrates the survey scheme for IAPP.

6. Overview of IAPP regulations and requirements

Diagram 2, has summarized the requirements of IAPP. In addition, list of Annex VI Chapters and regulations is briefly gathered in the boxes in the last part of this TI.

7. Reference

- MARPOL
- IMO website

Survey time line:

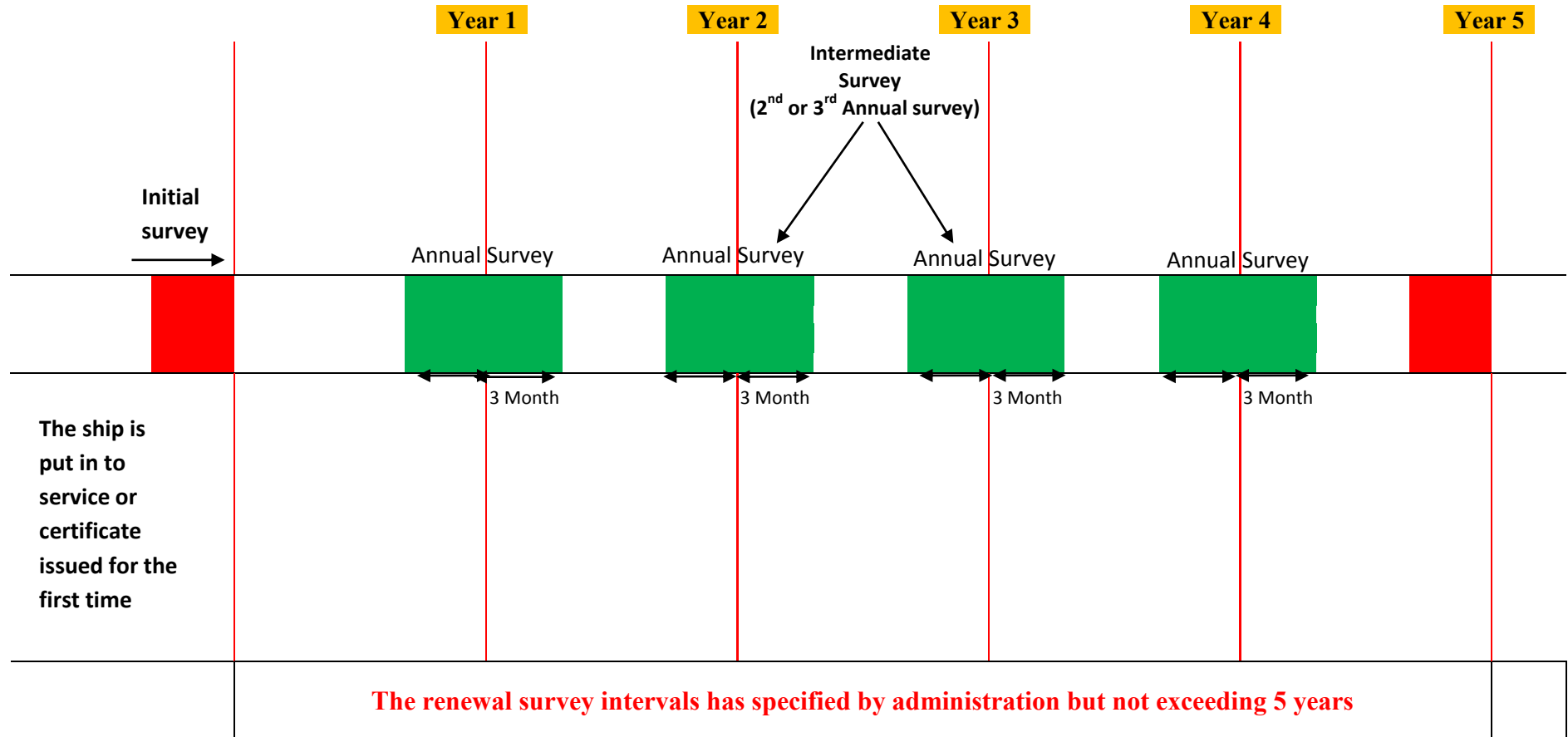


Diagram 1. IAPP Survey Scheme

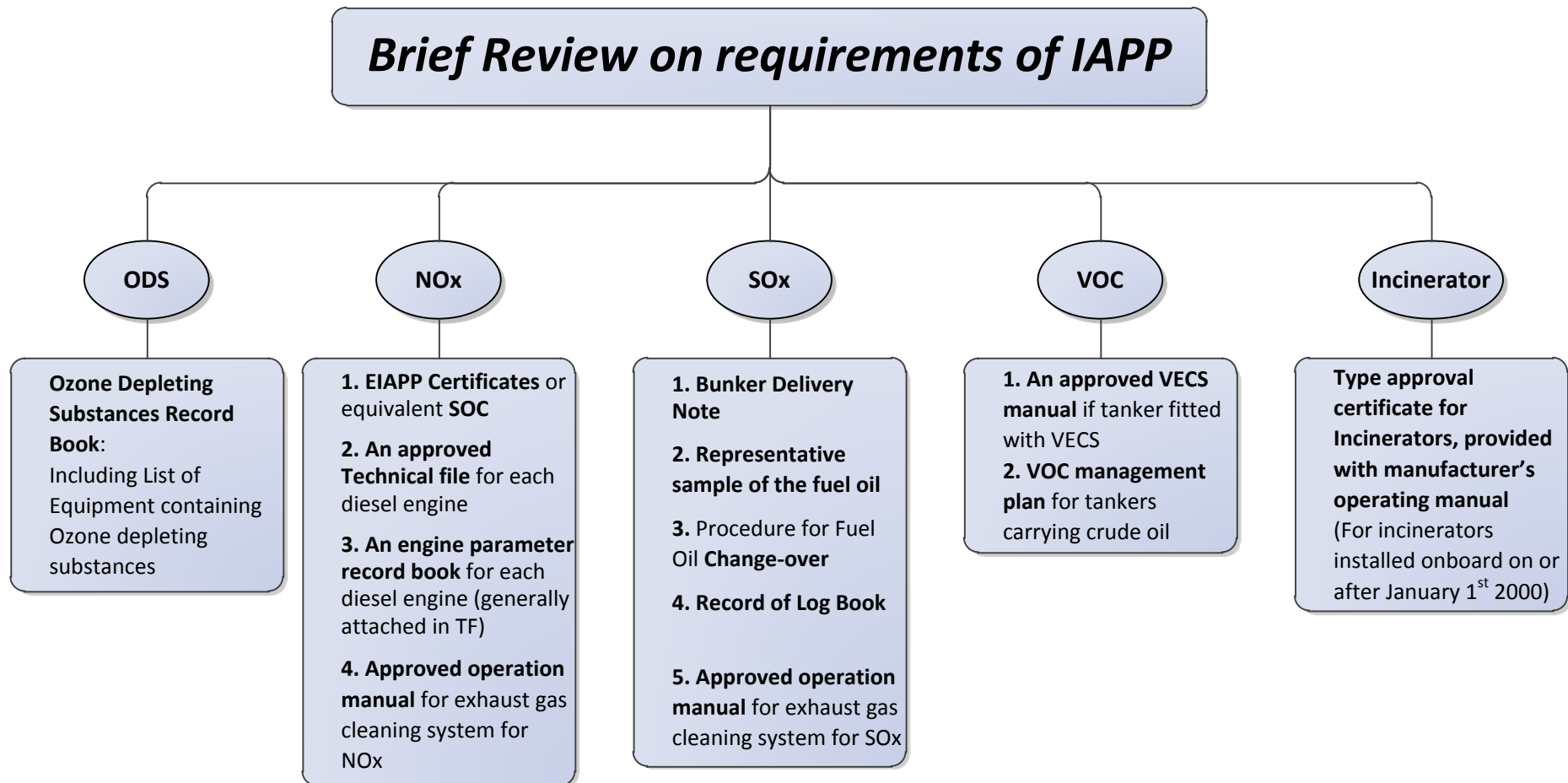


Diagram 2. Overview of IAPP requirements

CHAPTER I:
GENERAL

- Reg. 1:** Application
- Reg. 2:** Definitions
- Reg. 3:** Exceptions and Exemptions
- Reg. 4:** Equivalents

CHAPTER II:
SURVEY, CERTIFICATION AND
MEANS OF CONTROL

- Reg. 5:** Surveys
- Reg. 6:** Issue or endorsement of Certificates
- Reg. 7:** Issue of a Certificate by another Party
- Reg. 8:** Form of Certificates
- Reg. 9:** Duration and Validity of Certificates
- Reg. 10:** Port State Control on Operational Requirements
- Reg. 11:** Detection of Violations and Enforcement

CHAPTER III:
REQUIREMENTS FOR CONTROL OF
EMISSIONS FROM SHIPS

- Regulation 12:** Ozone Depleting Substances
- Regulation 13:** Nitrogen Oxides (NO_x)
- Regulation 14:** Sulphur Oxides (SO_x) and Particulate Matter
- Regulation 15:** Volatile Organic Compounds (VOCs)
- Regulation 16:** Shipboard Incineration
- Regulation 17:** Reception Facilities
- Regulation 18:** Fuel Oil Availability and Quality

CHAPTER IV:
REGULATIONS ON ENERGY
EFFICIENCY FOR SHIPS

- Regulation 19:** Application of this chapter
- Regulation 20:** Attained Energy Efficiency Design Index
- Regulation 21:** Required EEDI
- Regulation 22:** Ship Energy Efficiency Management Plan (SEEMP)
- Regulation 23:** Promotion of technical cooperation and transfer of technology relating to the improvement of energy efficiency of ships

APPENDICES:
I to VIII

- APPENDIX I** Form of International Air Pollution Prevention (IAPP) Certificate
- APPENDIX II** TEST CYCLES AND WEIGHTING FACTORS
- APPENDIX III** CRITERIA AND PROCEDURES FOR DESIGNATION OF EMISSION CONTROL AREAS
- APPENDIX IV** TYPE APPROVAL AND OPERATING LIMITS FOR SHIPBOARD INCINERATORS
- APPENDIX V** Information to be included in the bunker delivery note
- APPENDIX VI** FUEL VERIFICATION PROCEDURE FOR MARPOL ANNEX VI FUEL OIL SAMPLES
- APPENDIX VII** Emission Control Areas
- APPENDIX VIII** Form of International Energy Efficiency (IEE) Certificate