MARITIME AND PORT AUTHORITY OF SINGAPORE
SHIPPING CIRCULAR
NO. 10 OF 2020

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Applicable to: Ship owners, ship managers, operators, Masters of Singapore-registered ships and Recognised Organisations (ROs)

USE OF ELECTRONIC RECORD BOOKS UNDER THE INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM SHIPS (MARPOL) ON BOARD SINGAPORE-REGISTERED SHIPS (SRS)

1. The Marine Environment Protection Committee (MEPC), at its 74th session, adopted amendments to MARPOL Annex I, II, V and VI, and the 2009 NOX Technical Code via resolutions MEPC.314(74), MEPC.316(74) and MEPC.317(74), to enable the use of electronic record books on board ships. These amendments will enter into force on 1 October 2020.

2. The MEPC also adopted resolution MEPC.312(74) on Guidelines for the use of electronic record books under MARPOL.

3. SRS are permitted to use electronic record books under MARPOL after entry into force of the MARPOL amendments. The electronic record books shall comply with resolution MEPC.312(74), as may be amended.

4. Any of our Recognised Organisations[1] (ROs) are authorised to approve electronic record books used on board Singapore-registered ships in accordance with resolution MEPC.312(74). Upon satisfactory approval, our ROs may issue a "Declaration of Electronic Record Book" to the ship on behalf of the Singapore Administration accordingly. Any change of the electronic record books on board an SRS, including version upgrade, shall warrant the issuance of a new "Declaration of Electronic Record Book".

5. The electronic record book shall only be officially used after the ship is issued with a "Declaration of Electronic Record Book".

[1] ABS, BV, CCS, DNV GL, KR, LR, ClassNK, RINA

6. Ship owners and managers who use electronic record books on board their ships should ensure that their crew are familiar with the use, maintenance and safekeeping of the electronic record books.

7. As there will be ports that may not accept the use of electronic record books, SRS calling to these ports should maintain appropriate hardcopy MARPOL records. Printouts of electronic records are accepted by the Administration as "certified true copies" of the entries made in the electronic record book, provided that each entry is physically signed by the Officer in Charge and each completed page is physically signed by the Master.

8. Any queries to this circular should be directed to shipping@mpa.gov.sg.

GOH CHUNG HUN
DIRECTOR OF MARINE
MARITIME AND PORT AUTHORITY OF SINGAPORE

Encl:

a) Resolution MEPC.314(74) - Amendments to MARPOL Annexes I, II and V
b) Resolution MEPC.316(74) - Amendments to MARPOL Annex VI
c) Resolution MEPC.317(74) - Amendments to NO_x Technical Code 2008
d) Resolution MEPC.312(74) - Guidelines for the use of electronic record books under MARPOL
e) FAQ – Use of MARPOL Electronic Record Books on board Singapore registered ships (SRS)

ANNEX 3

RESOLUTION MEPC.314(74)
(adopted on 17 May 2019)

AMENDMENTS TO THE ANNEX OF THE INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM SHIPS, 1973, AS MODIFIED BY THE PROTOCOL OF 1978 RELATING THERETO

Amendments to MARPOL Annexes I, II and V

(Electronic Record Books)

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee conferred upon it by international conventions for the prevention and control of marine pollution from ships,

RECALLING ALSO article 16 of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL), which specifies the amendment procedure and confers upon the appropriate body of the Organization the function of considering and adopting amendments thereto,

HAVING CONSIDERED, at its seventy-fourth session, proposed amendments to MARPOL Annexes I, II and V concerning Electronic Record Books, which were circulated in accordance with article 16(2)(a) of MARPOL,

1 ADOPTS, in accordance with article 16(2)(d) of MARPOL, amendments to MARPOL Annexes I, II and V, the text of which is set out in the annex to the present resolution;

2 DETERMINES, in accordance with article 16(2)(f)(iii) of MARPOL, that the amendments shall be deemed to have been accepted on 1 April 2020 unless prior to that date, not less than one third of the Parties or Parties the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have communicated to the Organization their objection to the amendments;

3 INVITES the Parties to note that, in accordance with article 16(2)(g)(ii) of MARPOL, the said amendments shall enter into force on 1 October 2020 upon their acceptance in accordance with paragraph 2 above;

4 REQUESTS the Secretary-General, for the purposes of article 16(2)(e) of MARPOL, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Parties to MARPOL;

5 REQUESTS ALSO the Secretary-General to transmit copies of the present resolution and its annex to Members of the Organization which are not Parties to MARPOL.

ANNEX

AMENDMENTS TO MARPOL ANNEXES I, II AND V

(Electronic Record Books)

MARPOL ANNEX I

REGULATIONS FOR THE PREVENTION OF POLLUTION BY OIL

Regulation 1 – Definitions

1 A new paragraph 39 is added as follows:

"39 *Electronic Record Book* means a device or system, approved by the Administration, used to electronically record the required entries for discharges, transfers and other operations as required under this Annex in lieu of a hard copy record book."

Regulation 17 – Oil Record Book Part I – Machinery space operations

2 The second sentence of paragraph 1 is replaced by the following:

"The Oil Record Book, whether as a part of the ship's official logbook, as an electronic record book which shall be approved by the Administration taking into account the Guidelines developed by the Organization*, or otherwise, shall be in the form specified in appendix III to this Annex."

3 In the second sentence of paragraph 4, the words "or group of electronic entries" are inserted after the words "each completed page".

Regulation 36 – Oil Record Book Part II – Cargo/ballast operations

4 The second sentence of paragraph 1 is replaced by the following:

"The Oil Record Book Part II, whether as a part of the ship's official logbook, as an electronic record book which shall be approved by the Administration taking into account the Guidelines developed by the Organization*, or otherwise, shall be in the Form specified in appendix III to this Annex."

5 In the second sentence of paragraph 5, the words "or group of electronic entries" are inserted after the words "each completed page".

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

MARPOL ANNEX II

REGULATIONS FOR THE CONTROL OF POLLUTION OF NOXIOUS LIQUID SUBSTANCES IN BULK

Regulation 1 – Definitions

6 A new paragraph 22 is added as follows:

"22 *Electronic Record Book* means a device or system, approved by the Administration, used to electronically record the required entries for discharges, transfers and other operations as required under this Annex in lieu of a hard copy record book."

Regulation 15 – Cargo Record Book

7 The existing paragraph 1 is replaced by the following:

"Every ship to which this Annex applies shall be provided with a Cargo Record Book, whether as a part of the ship's official logbook, as an electronic record book which shall be approved by the Administration taking into account Guidelines developed by the Organization*, or otherwise, in the form specified in appendix II to this Annex."

8 In the first sentence of paragraph 4, the words "or group of electronic entries" are inserted after the words "each page".

MARPOL ANNEX V

REGULATIONS FOR THE PREVENTION OF POLLUTION BY GARBAGE FROM SHIPS

Regulation 1 – Definitions

9 A new paragraph 19 is added as follows:

"19 *Electronic Record Book* means a device or system, approved by the Administration, used to electronically record the required entries for discharges, transfers and other operations as required under this Annex in lieu of a hard copy record book."

Regulation 10 – Placards, garbage management plans and garbage record-keeping

10 The second sentence of the chapeau of paragraph 3 is replaced by the following:

"The Garbage Record Book, whether as a part of the ship's official logbook, or as an electronic record book which shall be approved by the Administration taking into account the Guidelines developed by the Organization*, or otherwise, shall be in the form specified in appendix II to this Annex:"

11 In the second sentence of paragraph 3.1, the words "or group of electronic entries" are inserted after the words "each completed page".

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

ANNEX 5

RESOLUTION MEPC.316(74)
(adopted on 17 May 2019)

AMENDMENTS TO THE ANNEX OF THE PROTOCOL OF 1997 TO AMEND THE INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM SHIPS, 1973, AS MODIFIED BY THE PROTOCOL OF 1978 RELATING THERETO

Amendments to MARPOL Annex VI

(Electronic Record Books and EEDI regulations for ice-strengthened ships)

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee conferred upon it by international conventions for the prevention and control of marine pollution from ships,

RECALLING ALSO article 16 of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocols of 1978 and 1997 relating thereto (MARPOL), which specifies the amendment procedure and confers upon the appropriate body of the Organization the function of considering amendments thereto for adoption by the Parties,

HAVING CONSIDERED, at its seventy-fourth session, proposed amendments to MARPOL Annex VI concerning Electronic Record Books and EEDI regulations for ice-strengthened ships, which were circulated in accordance with article 16(2)(a) of MARPOL,

1 ADOPTS, in accordance with article 16(2)(d) of MARPOL, amendments to MARPOL Annex VI, the text of which is set out in the annex to the present resolution;

2 DETERMINES, in accordance with article 16(2)(f)(iii) of MARPOL, that the amendments shall be deemed to have been accepted on 1 April 2020 unless prior to that date, not less than one third of the Parties or Parties the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have communicated to the Organization their objection to the amendments;

3 INVITES the Parties to note that, in accordance with article 16(2)(g)(ii) of MARPOL, the said amendments shall enter into force on 1 October 2020 upon their acceptance in accordance with paragraph 2 above;

4 REQUESTS the Secretary-General, for the purposes of article 16(2)(e) of MARPOL, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Parties to MARPOL;

5 REQUESTS ALSO the Secretary-General to transmit copies of the present resolution and its annex to Members of the Organization which are not Parties to MARPOL.

ANNEX

AMENDMENTS TO MARPOL ANNEX VI

(Electronic Record Books and EEDI regulations for ice-strengthened ships)

Regulation 2 – Definitions

1 Paragraph 42 is replaced by the following:

"42 *Polar Code* means the International Code for Ships Operating in Polar Waters, consisting of an introduction, parts I-A and II-A and parts I-B and II-B, adopted by resolutions MSC.385(94) and MEPC.264(68), as may be amended, provided that:

.1 amendments to the environment-related provisions of the introduction and chapter 1 of part II-A of the Polar Code are adopted, brought into force and take effect in accordance with the provisions of article 16 of the present Convention concerning the amendment procedures applicable to an appendix to an annex; and

.2 amendments to part II-B of the Polar Code are adopted by the Marine Environment Protection Committee in accordance with its Rules of Procedure."

2 A new paragraph 51 is added as follows:

"51 *Electronic Record Book* means a device or system, approved by the Administration, used to electronically record the required entries for discharges, transfers and other operations as required under this Annex in lieu of a hard copy record book."

Regulation 12 – Ozone-depleting substances

3 In the second sentence of paragraph 6, the words "recording system" are replaced by "record book ".

4 A new sentence is inserted at the end of paragraph 6 as follows:

"An electronic recording system referred to in regulation 12.6, as adopted by resolution MEPC.176(58), shall be considered an electronic record book, provided the electronic recording system is approved by the Administration on or before the first International Air Pollution Prevention (IAPP) Certificate renewal survey carried out on or after 1 October 2020, but not later than 1 October 2025, taking into account the Guidelines developed by the Organization*"

Regulation 13 – Nitrogen oxides (NO_x)

5 In paragraph 5.3, the words "or electronic record book*, " are inserted after the words "shall be recorded in such logbook".

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

Regulation 14 – Sulphur oxides (SO_x) and particulate matter

6 In the last sentence of paragraph 6, the words "or electronic record book ," are inserted after the words "shall be recorded in such logbook".

Regulation 19 – Application

7 In the last sentence of paragraph 3, the words "cargo ships having ice-breaking capability" are replaced by the words "category A ships as defined in the Polar Code".

Appendix I
Form of International Air Pollution Prevention (IAPP) Certificate (Regulation 8)

8 In the introductory paragraph of Appendix I, the words "by resolution MEPC.176(58) in 2008" are deleted.

Appendix VIII
Form of International Energy Efficiency (IEE) Certificate

9 In the introductory paragraph, the words "by resolution MEPC.203(62)" are deleted.

Appendix X
Form of Statement of Compliance – Fuel Oil Consumption Reporting

10 In the introductory paragraph, the word "by" between "Pollution" and "Ships" in the first sentence is replaced by the word "from".

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

ANNEX 6

RESOLUTION MEPC.317(74)
(adopted on 17 May 2019)

AMENDMENTS TO THE NOx TECHNICAL CODE 2008

(Electronic Record Books and Certification requirements for SCR systems)

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee conferred upon it by international conventions for the prevention and control of marine pollution from ships,

RECALLING ALSO article 16 of the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocols of 1978 and 1997 relating thereto (MARPOL), which specifies the amendment procedure and confers upon the appropriate body of the Organization the function of considering and adopting amendments thereto,

RECALLING FURTHER regulation 13 of MARPOL Annex VI which makes the Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines ("the NOx Technical Code 2008") mandatory under that Annex,

HAVING CONSIDERED, at its seventy-fourth session, draft amendments to the NOx Technical Code 2008 related to Electronic Record Books and certification requirements for SCR systems, which were circulated in accordance with article 16(2)(a) of MARPOL,

1 ADOPTS, in accordance with article 16(2)(d) of MARPOL, amendments to the NOx Technical Code 2008, as set out in the annex to the present resolution;

2 DETERMINES, in accordance with article 16(2)(f)(iii) of MARPOL, that the amendments shall be deemed to have been accepted on 1 April 2020, unless prior to that date not less than one third of the Parties or Parties, the combined merchant fleets of which constitute not less than 50% of the gross tonnage of the world's merchant fleet, have communicated to the Organization their objection to the amendments;

3 INVITES the Parties to note that, in accordance with article 16(2)(g)(ii) of MARPOL, the said amendments shall enter into force on 1 October 2020 upon their acceptance in accordance with paragraph 2 above;

4 REQUESTS the Secretary-General, for the purposes of article 16(2)(e) of MARPOL, to transmit certified copies of the present resolution and the text of the amendments contained in the annex to all Parties to MARPOL;

5 REQUESTS ALSO the Secretary-General to transmit copies of the present resolution and its annex to the Members of the Organization which are not Parties to MARPOL.

ANNEX

AMENDMENTS TO THE NO_x TECHNICAL CODE 2008

(Electronic Record Books and Certification requirements for SCR systems)

Chapter 1 – General

1.3 Definitions

1 A new paragraph 1.3.20 is added as follows:

"1.3.20 *Electronic Record Book* means a device or system, approved by the Administration, used to electronically record the entries required under this Code in lieu of a hard copy record book. "

Chapter 2 – Surveys and certification

2.2 Procedures for pre-certification of an engine

2 Paragraph 2.2.5.1 is replaced by the following:

".1Where a NO_x-reducing device is to be included within the EIAPP certification, it must be recognized as a component of the engine, and its presence shall be recorded in the engine's Technical File. The applicable test procedure shall be performed and the combined engine/NO_x-reducing device shall be approved and pre-certified by the Administration taking into account Guidelines developed by the Organization*. However, the pre-certification in accordance with the procedure not involving the testing for the combined engine/NO_x-reducing device on a test bed as given by the Guidelines developed by the Organization is subject to the limitations given in paragraph 2.2.4.2."

Chapter 6 – Procedures for demonstrating compliance with NO_x emission limits on board

6.2.2 Documentation for an engine parameter check method

3 In paragraph 6.2.2.7.1, after the words "a record book", the words "or electronic record book**" are inserted.

Appendix I
Form of EIAPP Certificate

4 In the introductory paragraph, the words "by resolution MEPC.176(58) in 2008" are deleted.

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"* Refer to the *2017 Guidelines addressing additional aspects to the NO_x Technical Code 2008 with regard to particular requirements related to marine diesel engines fitted with selective catalytic reduction (SCR) systems*, adopted by resolution MEPC.291(71), as amended (resolution MEPC.313(74)).

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

ANNEX 1

RESOLUTION MEPC.312(74)
(adopted on 17 May 2019)

GUIDELINES FOR THE USE OF ELECTRONIC RECORD BOOKS UNDER MARPOL

THE MARINE ENVIRONMENT PROTECTION COMMITTEE,

RECALLING Article 38(a) of the Convention on the International Maritime Organization concerning the functions of the Marine Environment Protection Committee conferred upon it by international conventions for the prevention and control of marine pollution from ships,

NOTING resolutions MEPC.314(74), MEPC.316(74) and MEPC.317(74), by which it adopted amendments to MARPOL Annexes I, II, V and VI and the Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines (NO_x Technical Code 2008), respectively, to enable the use of electronic record books,

RECOGNIZING the need to develop guidance for the use of electronic record books,

HAVING CONSIDERED, at its seventy-fourth session, the draft Guidelines for the use of electronic record books under MARPOL, prepared by the Sub-Committee on Pollution Prevention and Response, at its fifth session,

1 ADOPTS the *Guidelines for the use of electronic record books under MARPOL*, the text of which is set out in the annex to this resolution;

2 INVITES Governments to apply the Guidelines as soon as possible, or when the above-mentioned amendments to MARPOL Annexes I, II, V and VI and the NO_x Technical Code 2008 enter into force;

3 AGREES to keep the Guidelines under review in light of experience gained.

ANNEX

GUIDELINES FOR THE USE OF ELECTRONIC RECORD BOOKS UNDER MARPOL

1 INTRODUCTION

1.1 A key element of the International Convention for the Prevention of Pollution from Ships (MARPOL) regulations is the recording of discharges associated with the prevention of pollution from ships. A number of MARPOL Annexes require the recording of particular discharges.

1.2 The format for the recording of discharges under MARPOL is provided in the appendixes to the relevant MARPOL Annexes. Traditionally, the format of these record books has been provided in hard copy by the Administration. However, as companies and shipowners increasingly focus on ways to operate in an environmentally responsible manner and aim to reduce the heavy burden associated with paperwork through electronic means, the concept of operational logs in an electronic format has become a popular consideration.

1.3 It is considered that this approach to recording and reporting should be encouraged as it may have many benefits for the retention of records by companies, crew and officers.

1.4 It is expected that as companies and shipowners increasingly explore electronic record keeping, flag State Administrations will be requested to approve electronic recording systems (henceforth referred to as an electronic record book). This guidance aims to provide standardized information on approving an electronic record book to ensure the obligations of MARPOL are met and that there is a consistent approach to approving such systems.

2 APPLICATION

2.1 These Guidelines are only applicable to the use of electronic record books on board to meet the requirements of the following record books and recording requirements under the MARPOL Annexes and the Technical Code on Control of Emission of Nitrogen Oxides from Marine Diesel Engines (NO_x Technical Code):

.1 Oil Record Book, parts I and II (MARPOL Annex I, regulations 17.1 and 36.1);

.2 Cargo Record Book (MARPOL Annex II, regulation 15.1);

.3 Garbage Record Book, parts I and II (MARPOL Annex V, regulation 10.3);

.4 Ozone-depleting Substances Record Book (MARPOL Annex VI, regulation 12.6);

.5 recording of the tier and on/off status of marine diesel engines (MARPOL Annex VI, regulation 13.5.3);

.6 Record of Fuel Oil Changeover (MARPOL Annex VI, regulation 14.6); and

.7 Record Book of Engine Parameters (NO_x Technical Code, paragraph 6.2.2.7).

2.2 The use of an electronic record book to record operational logs is an alternative method to a hard copy record book. The electronic record book may allow ships to utilize their technology to reduce administrative burdens and contribute to on board environmental initiatives, e.g. reduction of paper use.

2.3 These Guidelines do not provide information on the management of electronic access to, or electronic versions of, certificates and other documents that do not log continuous operations of a ship.

2.4 These Guidelines do not address the exchange of information from a ship to a company headquarters or other body, as this exchange is not a requirement of record books under MARPOL.

2.5 If a shipowner decides to use an electronic record book to record operational logs, instead of a hard copy record book, the following guidance should be taken into consideration by the Administration when approving the electronic record book for use.

3 DEFINITIONS

For the purposes of these Guidelines, the following definitions apply to the extent consistent with MARPOL:

.1 **Administration:** means the Government of the State under whose authority the ship is operating. With respect to a ship entitled to fly a flag of any State, the Administration is the Government of that State. With respect to fixed or floating platforms engaged in exploration and exploitation of the seabed and subsoil thereof adjacent to the coast over which the coastal State exercises sovereign rights for the purposes of exploration and exploitation of their natural resources, the Administration is the Government of the coastal State concerned.

.2 **Audit Logging:** means logs recording user activities, exceptions and information security events, where logs are kept for an agreed period to assist in future investigations and access control monitoring (ISO/IEC 27001:2006). The time and date for the log should be Universal Co-ordinated Time (UTC) derived from ship's time.

.3 **Backup:** means to make a duplicate copy of a file, program, etc. as a safeguard against loss or corruption of the original. The specific properties of the backup such as its format, frequency, storage location, retention period, are unique to each business organization and should be defined in accordance with a Business Continuity Plan.

.4 **Business Continuity Plan:** means a collection of procedures and information that is developed, compiled and maintained in readiness for use in the event of an emergency or disaster.

.5 **Company:** means the Owner of the ship or any other organization or person such as the Manager or the Bareboat Charterer, who has assumed the responsibility for the operation of the ship from the shipowner and who on assuming such responsibility has agreed to take over all the duties and responsibility imposed.

.6 **Credentials:** means data that is transferred to establish the claimed identity of an entity. (ISO 7498-2). Examples of credentials include a unique code/password, electronic key, digital certificate, hardware key, biometric data (e.g. fingerprint).

.7 **Cryptography:** means the discipline which embodies principles, means and methods for the transformation of data in order to hide its information content, prevent its undetected modification and/or prevent its unauthorized use (ISO 7498-2).

.8 **Data:** means a re-interpretable representation of information in a formalized manner suitable for communication, interpretation or processing (ISO/IEC 2382-1).

.9 **Digital certificate:** means a cryptographic transformation (see "cryptography") of a data unit in an asymmetric (public key) cryptosystem, using a Digital Signature to unite an identity with a public key.

.10 **Digital signature:** means data appended to, or a cryptographic transformation (see "cryptography") of, a data unit that allows a recipient of the data unit to prove the source and integrity of the data unit and protect against forgery e.g. by the recipient (ISO 7498-2).

.11 **Document:** means books, manuals, plans, instructions and similar media that are not certificates and are used to convey a ship's information.

.12 **Electronic record book:** means a device or system used to electronically record the entries for discharges, transfers and other operations as required under MARPOL Annexes and the NO_X Technical Code.

.13 **Functional Unit:** means an entity of hardware, software, or both, capable of accomplishing a specified purpose ISO/IEC 2382-1:1993 Information technology-Vocabulary- Part 1: Fundamental terms, definition 10.01.40.

.14 **Graphic character:** means a character, other than a *control character*, that has a visual representation and is normally produced by writing, printing or displaying (ISO 2382-4).

.15 **IEC 60092 (series):** means standards published by the International Electrotechnical Commission (IEC) on Electrical Installations on Ships.

.16 **IEC 60533:** means standard published by the International Electrotechnical Commission (IEC) on Electrical and Electronic Installations on Ships – Electromagnetic Compatibility.

.17 **Offline:** means usage #1. Pertaining to the operation of a functional unit when not under the direct control of the system with which it is associated. Offline units are not available for immediate use on demand by the system. Offline units may be independently operated. Usage #2. Pertaining to equipment that is disconnected from a system, is not in operation, and usually has its main power source disconnected or turned off.

.18 **Portable Document Format (PDF):** means a digital form for representing documents that enables users to exchange and view electronic documents easily and reliably, independent of the environment in which they were created and the environment in which they are viewed or printed (ISO 32000).

.19 **Port:** means any port, terminal, offshore terminal, ship and repair yard or roadstead which is normally used for the loading, unloading, repair and anchoring of ships, or any other place at which a ship can call.

.20 **Key:** means a sequence of symbols that controls the operation of encipherment and decipherment (see "cryptography").

.21 **Private key:** means (in a public key cryptosystem) that key of a user's key pair which is known only by that user (ISO/IEC 9594-8).

.22 **Public key:** means (in a public key cryptosystem) that key of a user's key pair which is publicly known (ISO/IEC 9594-8).

.23 **Role Based Access Control (RBAC):** means a control mechanism that provides different access levels to guarantee that individuals and devices can only gain access to and perform operations on network elements, stored information, and information flows for which they are authorized (ISO/IEC 27033-2:2012).

.24 **Shipowner:** means one who owns or operates a ship, whether a person, a corporation or other legal entity, and any person acting on behalf of the owner or operator.

.25 **Signature:** means the handwritten means of identifying the signer of a document or an electronic equivalent which is uniquely and securely linked to an individual.

.26 **Standardized:** means the prescription of an authoritative rule, principle, means of judgement or estimation, criterion, measure of correctness, measure of perfection or some definite degree of any quality that determines what is adequate for a purpose.

.27 **Storage (device):** means a functional unit into which data can be placed, in which they can be retained, and from which they can be retrieved (ISO/IEC 2382-1:1993 Information technology – Vocabulary – Part 1: #;Fundamental terms).

4 SYSTEM SPECIFICATIONS

4.1 Ability of the electronic record book to meet regulations under MARPOL

4.1.1 The use and output presentation of any electronic record book approved by an Administration should satisfy the requirements of all relevant regulations under MARPOL.

4.1.2 As MARPOL specifies the recording of a range of information for specific circumstances, an approved system should only allow a complete entry to be saved for verification by the master. For example, for a MARPOL Annex V discharge at sea, the entry should not be able to be saved without the entry of the latitude and longitude of the discharge. It is suggested that where possible, technology which can automatically input required data be installed to ensure accuracy. In the case of equipment failure, manual input should be allowed and the change of the source of data recorded. The automatic data value inputs should be protected by measures aimed at preventing attempts at manipulation or falsification. The system should automatically record any attempts to manipulate or falsify any data.

4.1.3 To assist with consistent recording of data such as dates and positions, the system should be developed to display entry fields and request data formats that are as consistent as possible with other electronic reporting required by IMO and other shipboard systems. Electronic record books should be presented in the form as specified in relevant MARPOL Annexes in order to assist the smooth transition from hard copy record books to electronic ones.

4.1.4 In order to comply with MARPOL requirements, an electronic record book should have the capability to retain all records made for the minimum period as specified in each Annex of MARPOL. The capability to produce a hard copy of verified records for the master to certify as a true copy, upon request from relevant authorities, should also be provided.

4.2 Updates to the electronic record book

As MARPOL and its Annexes continue to evolve, it is essential that all approved electronic record books are reviewed and appropriately updated to ensure relevant MARPOL amendments are incorporated in the electronic record book. Any updates should not cause loss of existing records, nor make them unreadable, and the system should continue to present all records in the form specified by MARPOL. Updates to the system should be completed prior to the entry into force of the relevant MARPOL amendments.

4.3 Security and accountability of the electronic record book

4.3.1 To ensure the security of an electronic record book, it is critical that the system implements Role Based Access Control. At a minimum, all access to the application should use a unique personal login identifier and password for each user. This level of security ensures that the user making entries into the application is accountable for any false entries or omissions.

4.3.2 MARPOL requires the signature of the relevant officer entering a record. As such, the electronic record book should implement Audit Logging. Audit Logging should record a user code, identifying symbol, such as a graphic character, or an equivalent identifier against each entry to uniquely identify the user and whether the user provided accessed or amended an entry.

4.3.3 Electronic signatures applied to an electronic record book should meet authentication standards, as adopted by the Administration.

4.3.4 Records and entries should be protected by measures aimed at preventing and detecting attempts at unauthorized deletion, destruction or amendment. After an entry is saved by the user, the system should secure the information against unauthorized or untraceable changes. Any change(s) to the entry by the same user or a different user should be automatically recorded and made visible both in the system and in any output presentation or printed versions of the electronic record book. The entry should appear in the list of entries in a format that makes it clear that the entry has been amended. To create transparency of changes to saved or verified entries, it is essential that the system is designed to retain both the original entry and the amendment(s).

4.3.5 If an entry requires amendment, it is recommended that the reason and user identifier, for the officer making the amendment, be recorded for verification by the master. The original entries and all amendments should be retained and visible.

4.3.6 MARPOL also requires that information in the record book be verified (e.g. regulation 17 of MARPOL Annex I requires that each page of the Oil Record Book be signed by the master of the ship). For verification of a single or series of saved entries by the master, the electronic record book should have an additional authentication factor to allow verification. This additional authentication factor should be in the form of additional credentials supplied by the master at the time of verification.

4.3.7 The electronic record book should also be able to log and identify the entries made, amended or verified by time. This will assist in identifying those situations where actions requiring an entry are undertaken over days or weeks and all entered at one time, where such an approach to making entries is consistent with MARPOL (e.g. regulation 10 of MARPOL Annex V requires entries to be "promptly recorded" and "signed for on the date of discharge or incineration" by the officer in charge).

4.3.8 To provide for different stages of the data entry and approval process, the electronic record book should provide a status field for each entry that clearly determines the verification stage of the entry. For example, when an entry has been saved in the system by the user, the entry should reflect a term such as "pending" or "awaiting verification". Once the master has verified an entry, a term such as "verified" should be automatically reflected.

4.3.9 If an entry is amended after the master has verified it, the electronic record book should automatically return the entry to "pending" or "re-verification" notifying the master that the entry requires re-verification.

4.3.10 To ensure that entries are verified in a timely manner, the system should provide a reminder that verification by the master is required. It is recommended that where possible, verifications occur prior to arrival in port. Entries not verified should be accompanied by comments advising of the reason for non-verification.

4.3.11 If a recorded entry correlates with a receipt for services (such as a receipt received when waste is discharged to a reception facility), or the endorsement provided during regulatory surveys or inspections (such as endorsement of the Cargo Record Book), the electronic record book should allow this receipt or endorsement to be identified or attached to the relevant entry in the system. This receipt can be referenced in the system with a hard copy receipt or endorsement made available upon request. Alternatively, the receipt or endorsement can be attached to the entry in any form deemed acceptable by the Administration (such as a scanned copy of the original in PDF), and the original retained.

4.4 Storage of data recorded in the electronic record book

4.4.1 To create the same level of confidence as a hard copy record book, any electronic record book should form part of the Information Technology Business Continuity Plan. This includes having an appropriate method for backing up data and data recovery if the system were to fail or not be available from the ships' network. Consideration should also be given to alternate power supplies to ensure consistent access to the system. Both data recovery and power sources are essential to allow ongoing entries to be made and facilitate port State control (PSC) inspections.

4.4.2 The electronic record book should have the capability to allow automatic backup of data in the system to offline storage. Backups should ensure the offline record is updated automatically every time changes are made to entries to ensure the backing up process is not forgotten by the user.

4.4.3 The recorded data stored in the offline space should be:

.1 developed using cryptography so that unauthorized access to the information is not possible, and so that once the data has been saved it is in a read-only format with no amendments able to be made to the record (unless done so through the application or by a user with the appropriate level of authorization);

.2 in a format that can be transferred from the point of record to another storage location. Examples include a local (removable) storage peripheral device, local and remote network storage;

.3 maintained in a format that ensures the longevity and integrity of the record; and

.4 in a format that allows output presentation and printing of the record.

4.4.4 This offline record may be provided in any format deemed appropriate by the Administration and should be digitally signed by the master. The properties of the digital signature need to appear on the offline record, including the title; full name of the signer; and date and time of signing. It is recommended that the document be presented in PDF; however, an alternative format may be used. Alternative formats should allow the exchange and view of electronic documents independent of the environment in which they were created and the environment in which they are viewed or printed, in a simple way and with fidelity.

4.4.5 An electronic record book and infrastructure related to the system including computers and peripherals, should be installed in compliance with IEC 60092 and IEC 60533, where applicable.

5 DECLARATION

5.1 Any electronic system deemed to meet the above criteria should be provided with written confirmation by the Administration and carried on board the ship for the purpose of regulatory surveys or inspections. An example of a declaration can be seen in the appendix.

5.2 Delegating the assessment of the electronic record book against these Guidelines and the issuing of a declaration on behalf of the Administration by recognized organizations (ROs) is at the discretion of the Administration.

6 MARPOL INSPECTION AND ENFORCEMENT

6.1Inspection

6.1.1 An electronic record book should have the ability to meet the company verification/audit requirements (such as integration with the ships Safety Management System (International Safety Management Code)). The record book should also have the ability to meet all flag State and survey requirements. In addition, an electronic record book should meet all control provisions as set out in the relevant Annexes of MARPOL. Such a system should also meet any general requirements set out in the *Procedures for port State control, 2017* (resolution A.1119(30)), as amended, as well as support the detection of violations and enforcement of the Convention as outlined in Article 6 of MARPOL.

6.1.2 The use of and reliance upon electronic record books in no way relieves shipowners of their existing duty to accurately maintain and produce records during an inspection, as required by MARPOL. It is recommended that if a ship cannot produce the electronic record book or a declaration provided by the Administration during the PSC inspection, the PSC officer should request to view an alternative verified copy of the records or a hard copy record book for verification.

6.2 Equipment requirements during an inspection

As the electronic record book will be presented using the ships' onboard equipment, it should not be necessary for officers to carry additional equipment (e.g. electronic devices to view the records) during inspections. Officers may choose to carry additional equipment on board to aid in the verification process if the ships' onboard equipment is unavailable.

6.3 Prosecution

To accommodate current procedures when investigating illegal discharges under MARPOL, the electronic record book should allow for the specific entry, relevant page, pages or the entirety of the electronic record book to be printed at the time of an investigation and each printed page physically signed by the master to certify it as a "true copy". All printed pages should provide the following details in addition to those required under MARPOL for record books:

.1 the title and full name of the person that entered the record (in addition to the person's unique username and/or ID in the electronic record book);

.2 any changes that were made to the entries;

.3 the date and time of printing;

.4 the name and version number of the electronic record book from which the true copy was produced; and

.5 page numbering and number of pages to ensure the report is complete.

APPENDIX

EXAMPLE DECLARATION

DECLARATION OF MARPOL ELECTRONIC RECORD BOOK

Issued under the authority of the Government of:
……
(full designation of the country)

In reference to the requirements set out in the
International Convention for the Prevention of Pollution from Ships (MARPOL)

Name of ship……

IMO number ……

Flag State of ship……

Gross tonnage……..

This is to declare that the electronic system designed to record entries in accordance with MARPOL Annex(es) …….. installed on board the ship listed above has been assessed by this Administration to meet the relevant requirements as set out in MARPOL and is consistent with the Guidelines developed by the International Maritime Organization (IMO).

Electronic Record Book Manufacturer	.....
Electronic Record Book Supplier	.....
Electronic Record Book Installer	.....
Electronic Record Book Software Name/Version	.....
Electronic Record Book is in accordance with MEPC Resolution/s	.....
Date of installation (dd/mm/yy)	.....

A copy of this declaration should be carried on board a ship fitted with this Electronic Record Book at all times.

……	……	……
NAME	SIGNATURE	DATE (dd/mm/yy)

Seal or stamp of the Authority, as appropriate

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FAQ

USE OF MARPOL ELECTRONIC RECORD BOOKS ON BOARD SINGAPORE REGISTERED SHIPS (SRS)

1) Does the use of electronic MARPOL record book require MPA's approval?

We have authorised our ROs (i.e. ABS, BV, CCS, ClassNK, DNV GL, KR, LR and RINA) to approve the use of electronic MARPOL record book on board Singapore registered ships. The approval for the use of electronic record book shall be carried out in accordance to the guidelines developed by IMO (Res. MEPC. 312(74)).

2) Can Singapore registered ship use electronic record book prior to 1st October 2020?

Yes. However, as the MARPOL amendments will only come into force on 1st October 2020, the existing hardcopy MARPOL record books are still required to be used and maintained onboard for verification by authorities.

MEPC 74 adopted amendments to MARPOL Annex I, II, and V through Resolution MEPC.314(74) to permit the use of electronic record books. The amendments will enter into force on 1st October 2020. We are amending our regulations to give effect to these amendments.

As mentioned above, Singapore registered ship may use the electronic record book prior to 1st October 2020, in parallel with the existing hardcopy record books. As the MARPOL amendments contained within our legislations are not in force yet, our ROs may issue a "Statement of Compliance or Statement of Fact" not on behalf of Singapore to the ship after verification and having approved that the electronic record book meet the Guidelines developed by IMO (Res.MEPC.312(74)). ROs may subsequently issue a "Declaration of Electronic Record Book" after 1st October 2020.

3) Is electronic record book that have been approved by our ROs in accordance to IMO Guidelines (Res.MEPC.312(74)) under another Flag required to be re-approved prior to the change of flag to Singapore registry?

MPA accepts electronic record book (ERB) that have been approved by our ROs as long as they are in accordance to Guidelines developed by IMO. In this case, re-approval is not required. ROs may re-issue the "Declaration of Electronic Record Book" on behalf of Singapore upon satisfactory completion of the change of flag survey.

Ship's ERB that have not been approved in accordance to the Guidelines developed by IMO have to be approved by our ROs before the issuance of the "Declaration of Electronic Record Book" on behalf of Singapore.

4) Can the ship manager engage any of our eight ROs, other than the RO that issues the ship's statutory certificates, to approve and issue the "Declaration of electronic record book?

Ship owner and manager of Singapore-registered ships should arrange for the same RO who is responsible for issuing the MARPOL statutory certificates to approve and issue the "Declaration of Electronic Record Book" if such electronic record books are used on board. Nevertheless, it is acceptable if the MARPOL electronic record book software used on board an SRS is type-approved by any of our eight ROs, that is not the RO who issues the MARPOL statutory certificates for the ship.

5) What are the MARPOL Record Books that can be in electronic versions?

The following MARPOL record books can be in electronic versions:

a) Oil Record Book, Part I and II (MARPOL Annex I, regulations 17.1 and 36.1);
b) Cargo Record Book (MARPOL Annex II, regulation 15.1);
c) Garbage Record Book, Part I and II (MARPOL Annex V, regulation 10.3);
d) Ozone-Depleting Substances Record Book (MARPOL Annex VI, regulation 12.6);
e) recording of the tier and on/off status of marine diesel engines (MARPOL Annex VI, regulation 13.5.3);
f) Record of Fuel Oil Changeover (MARPOL Annex VI, regulation 14.6); and
g) Record Book of Engine Parameters (NOX Technical Code, paragraph 6.2.2.7).

6) Does ship need to maintain hard copy record book after fully implementing the use of electronic record book?

There will be ports that do not accept electronic record books. Singapore registered ships calling into such ports shall continue to maintain hard copy record book or printouts of electronic records that are accepted by MPA as "certified true copies" of the entries made in the electronic record book. Each entry shall be physically signed by the Officer in Charge and each completed page is physically signed by the Master.

Please note that the USA have put in their reservation at MEPC 74[1] and does not support the use of IMO Guidelines to approve electronic record book used on board ships. Hence, they may not accept electronic record book approved under the current IMO Guidelines.

7) What is the follow up actions if the approved system (electronic record book) is defective?

The ship manager or Master shall notify the flag Administration and Classification Society when the system is defective. The Master shall apply the information technology "business continuity plan" (i.e. data recovery) and arrange for the system maker to rectify the defect at the next port of call. Meantime, alternative record keeping is to be proposed to flag Administration and Classification Society for acceptance.

[1] Please refer item 3 (Statement by the delegation of the United States) Appendix 27 of MEPC 74 report (MEPC 74/18/add.1)