



**INTERTANKO**

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**Practical Considerations  
for Selecting Electronic  
Record Book (ERB)  
Products and Suppliers**

**V1**



**INTERTANKO**

# **Practical Considerations for Selecting Electronic Record Book (ERB) Products and Suppliers**

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## 1. Introduction

The International Maritime Organisation (IMO) in 2019 adopted the Guidelines for the use of Electronic Record Books under MARPOL (Resolution MEPC.312(74)) (IMO Guidelines), which state that: *‘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.’*

At the same time as adopting the Guidelines, the IMO also adopted consequential amendments to MARPOL Annexes I, II and V (Resolution MEPC.314(74)) and MARPOL Annex VI (Resolutions MEPC.316(74) and MEPC.317(74)) which enter into force on 1 October 2020.

The amendments to each annex of MARPOL define an Electronic Record Book (ERB) as:

*...a device or system, approved by the Administration, used to electronically record the required entries for discharges, transfers and other operations...in lieu of a hard copy record book.*

Each MARPOL record book listed below may now be held on board in the form of an ERB, subject to approval by the Administration and taking into account the IMO’s Guidelines:

- Oil Record Book, Parts I and II (MARPOL Annex I, regulations 17.1 and 36.1);
- Cargo Record Book (MARPOL Annex II, regulation 15.1);
- Garbage Record Book, Parts I and II (MARPOL Annex V, regulation 10.3);
- Ozone-depleting Substances Record Book (MARPOL Annex VI, regulation 12.6);
- recording of the tier and on/off status of marine diesel engines (MARPOL Annex VI, regulation 13.5.3);
- Record of Fuel Oil Changeover (MARPOL Annex VI, regulation 14.6); and
- Record Book of Engine Parameters (NOx Technical Code, paragraph 6.2.2.7).

## 2. Objective

The IMO Guidelines provide an explanation of the necessary design and structure of the ERBs intended for use on board. Several suppliers have now launched ERBs onto the market with INTERTANKO Member companies testing many of the more advanced options. As experience with the various platforms and products on the market grows, it has become clear that no two systems are alike and that each product tends to provide different advantages/solutions for different types of tanker owner and manager. This is largely contingent on fleet size, product integration with current software options and the Administration’s preferred options and requirements for ERBs.

With such a wide range of platforms on the market, coupled with a variety of company-specific requirements, INTERTANKO’s Environment Committee felt that sharing the Member experiences and knowledge it has gathered in the form of a guidance document would benefit Members when considering which options may be useful for their company.

The decision on whether to adopt an electronic platform for mandatory and non-mandatory record books lies with the company. However, while there are many benefits to introducing ERBs, it is also widely recognised that the major hurdle to the successful and complete introduction of ERBs in place of paper record books will be the global acceptance of ERBs by port State authorities. INTERTANKO will continue to urge member State

## 2. Objective

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governments at the IMO of the need for this global acceptance and encourages feedback from its Members on both the operational as well as the compliance aspects associated with implementing ERBs within their company.

## 3. ISO's Standard for ERBs

The International Standards Organization (ISO) released its document on '*Electronic record books for ships — Technical specifications and operational requirements*', ISO 21745:2019, at the end of 2019. The document specifies the minimum technical and operational requirements for ERBs to be used on ships, establishing requirements for the design and testing of ERBs by manufacturers. However, it also provides detailed technical guidance on key ERB performance elements including system database backup and recovery, data storage, tampering avoidance and the system's integration with other bridge electronic equipment. As such, it is worthwhile reviewing this document in conjunction with the IMO's Guidelines and as part of the information gathering and due diligence prior to contacting the suppliers.

## 4. Possible benefits of using ERBs

Some of the main benefits of introducing ERB software include:

- assisting with the record keeping aspects of MARPOL and consequently streamlining the administrative burden associated with Flag Administration requirements;
- assisting with port State control inspections where ERBs are accepted by port State authorities;
- eliminating clerical errors and mistakes; and,
- assisting ship staff with monitoring and ensuring compliance by positive validation and prompts when necessary.

The latter two points should assist in preventing regulatory violations.

Depending on the software package and how this is implemented within the company, including the interface between ship(s) and shore, additional benefits may include:

- a real time visibility of activities on board, which can lead to...
- an improved transparency and awareness of the daily operations conducted on board, which may in turn allow...
- the establishment of more clear and accurate statistics and trends; and...
- the possibility of conducting remote audits.

## 5. Criteria to consider when selecting the ERB product

The following criteria may be used when making an initial assessment for introducing ERB software and making a decision on what product is most appropriate for the company. There are a wide range of products and platforms available on the market, which often come with considerable marketing and sales claims. It is therefore important to take adequate time to establish the basic requirements of the ERB within the company and ensure that each product under consideration is logically reviewed and assessed in detail before any

decision is taken. The possibility of adapting products to the company's needs should also be explored with suppliers, especially for owners with larger fleets where a tailored approach may be devised.

### 5.1 Consultation with the Administration

The IMO has amended each Annex of MARPOL to allow Administrations to authorise and approve the use of ERBs. Many Administrations have welcomed the introduction of ERBs and have reviewed and recommended certain types of products and platforms, which may as a consequence limit the options available to your company. Consideration should be given to the requirements that may be put in place by the Administration and to explore whether they have issued additional guidance and requirements for approving ERBs for use on board.

Selecting a supplier that has already worked with the major Administrations may assist with system approvals and reduce the administrative burden for the company and supplier compared to introducing a new product or platform that requires review and approval by the Administration. There is also a risk that a system that has been introduced without the prior or early approval of the Administration may fail to attain approval.

### 5.2 Consider which systems will be included in the electronic migration

At the time of writing, the Oil Record Book (ORB) Part I is the more widely available and well-researched ERB product on the market. Some suppliers are promoting the availability of all MARPOL record books on an electronic platform<sup>1</sup> but it is advisable to confirm, based on evidence from the supplier, that the product has been fully completed and tested. Due to the likelihood that other MARPOL logbooks will be brought to market in electronic format, the supplier should be required to ensure that future system integration with other record books and systems will be possible, i.e. check for certainty over the futureproofing of the software being offered by the supplier. If software is under development, check what the exact deadline is for availability of the software so that it fits the project planning within your own company.

At present, the most common ERBs being marketed include:

- Oil Record Book: Part I
- Oil Record Book: Part II
- Cargo Record Book MARPOL Annex II
- Garbage Record Book

Some suppliers, including engine and equipment manufacturers, are offering and developing options which will integrate the IMO-listed ERBs into other data-gathering and reporting platforms. As a long-term objective and from company to company this may be a useful consideration, however, there are some wider implications associated with using the data gathered through automated systems as well as interconnecting such systems.

For example, a link between an e-ORB on bunkering with other measurement and recording systems for the EU MRV<sup>2</sup> and/or IMO DCS<sup>3</sup> could lead to discrepancies. In this example, systems used for measuring and recording could be as simple as manual measurements (tank gauging) and manual reporting (noon-reports) or as sophisticated as using automatic options such as a Mass Flow Meter (MFM) or in-tank sensors for direct recording measurements for multiple reports. However, errors in the measurement systems from the likes of fuel leaks and recirculation could lead to wider discrepancies in the measuring and/or recording systems for the EU MRV and/or IMO DCS.

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<sup>1</sup> Refer to the list of IMO record books provided in section 1 of this document.

<sup>2</sup> European Union (EU) MRV Regulation (Regulation (EU) 2015/757 on the monitoring, reporting and verification of carbon dioxide emissions from maritime).

<sup>3</sup> IMO's Data Collection System for fuel oil consumption of ships, Resolution MEPC.278(70)

Furthermore, expanding the project brief to include the possible integration of additional data systems (software) as well as new monitoring and sensor systems (hardware) may delay the implementation of the ERBs and increase the resources required by the company to make any such integration a success.

Additional ERBs are coming onto the market to assist with the likes of MARPOL Annex VI-related record books as well as record books for biofouling and ballast water management. Again, the adoption of further electronic platforms for recording and collating data generated onboard should be carefully considered on a company-by-company basis. The issues of biofouling and ballast water management both offer useful examples to consider in this respect:

- i. Biofouling record books are mandatory on a national basis (for example, New Zealand and California) and reference the standard format offered in the IMO's voluntary guidelines, *2011 Guidelines for the control and management of ships' biofouling to minimize the transfer of invasive aquatic species*. As such, some owners are opting to maintain biofouling records using the IMO's standardised format in electronic form which can then incorporate other biofouling-related operations such as standardised diving reports, drydock maintenance, niche area maintenance and performance monitoring tools.
- ii. While the Ballast Water Management Convention (BWM Convention) is not referenced in the ERB Guidelines, it does not prevent the option for maintaining the ballast water record book in an electronic format. There are some advantages to doing this, including the possibility of being able to generate ballast water reporting forms from information already added to the record book as opposed to creating a new report. However, it should be noted that in the absence of a single, agreed ballast water record book format and international standardised guidance on entries, any solution used will need to remain flexible with the likely possibility of future changes to formatting and record keeping interpretations at the IMO level.

Whatever agreement is reached on the limitation in scope of the electronic migration, a foundation should be established which will allow the system to be regularly upgraded, improved and expanded in the future. See 5.5 for further consideration on futureproofing the system.

### 5.3 Evaluating potential suppliers

A healthy relationship between the supplier and the company will help with future developments and assist in fixing any potential bugs and issues. This is important as the industry develops the products and its understanding of ERBs. During the early period of maturity for the ERB industry, suppliers will also be keen to develop products that are proven and tested with leading industry companies.

As the market for ERBs grows, suppliers will naturally market their products based on the release of the IMO's Guidelines and the dates included in the MEPC Resolutions which advise on the changes to MARPOL. As has been seen when regulatory deadlines overlap with marketing solutions, suppliers may be tempted to suggest that the product is a mandatory requirement. Ensuring that the supplier knows precisely what the ERB Guidelines contain and the meaning of the amendments to MARPOL should offer some confidence that they understand the IMO Guidelines in their entirety. This is a useful first step in opening exchanges with ERB suppliers.

While the IMO's Guidelines provide a summary of the legal elements associated with the use of ERBs, there is also a detailed summary of ERB technical elements and system specifications. These should also be fully understood by the supplier and can therefore be used to check the supplier's depth of knowledge and understanding.

A similar approach should also be undertaken in terms of the supplier's knowledge and understanding of the technical elements included in the ISO's Standard for ERBs, as summarised above.

### 5.4 Evaluate the ship and company's IT/BT system and infrastructure

It is crucial to know the compatibility of the IT systems available on board with any external software or hardware. As such, it will be important to ensure that the company's IT/BT specialists are involved at an early stage in discussions.

In the early exchanges with your IT/BT department, there needs to be clarity on the company's needs and expectations in terms of data refreshing processes, location for storing data and rights of access to data in the system. This will include agreeing on the options for online/offline data access and input, as well as data validation, data backup, protection and transmission. Useful details in this area are included in the IMO Guidelines under the sections on 'security and accountability' as well as 'storage of data recorded'. As a minimum, these sections of the IMO Guidelines should be provided to the company's IT/BT department.

In addition to managing the data, agreement will need to be reached with the IT/BT department on how the electronic signature is to be managed. This will require the establishment of a clear procedure for the management of the electronic signature. Reference to the IMO Guidelines is useful again for this element of the design, but importantly consultation with the Administration will also be required before agreeing on the final solution and associated management procedures.

### 5.5 Evaluate the system design requirements

A reputable ERB supplier will seek specific information in order to build an intelligent system. For an e-ORB Part I, as an example, the supplier will likely request:

- A copy of the IOPP Certificate;
- The tanks capacity tables including innage/ullage tables; and,
- Drawings for the oily bilge water system including details on the oily water separator (OWS) system and fuel oil transfers.

Based on the information provided to the supplier, setting up an intelligent system may vary from a few days to a few weeks, depending on the system complexity and resources available to the supplier.

During the phases of building, testing and review, it will be important to have an accurate schedule from the supplier on the final roll-out. Things will change as the system is developed and with these changes, new ideas will be brought into play. These may require looking at alternative arrangements and even equipment on board to smoothen the ERB integration. For example, GPS, fuel meter installation and the recalibration of tank tables.

The feedback and customisation process is a crucial point and will influence significantly the use of any software. It needs to be clear who will make the customisation as preparations and verifying the accuracy of data may take a considerable amount of time. In the latter respect, there needs to be careful verification of the operations and the transfers that can be carried out onboard through the review of the piping diagrams. Some suppliers might not be able to provide this level of service or may not have the necessary expertise.

As this is a dynamic feature it may require an update on several occasions. It is crucial under the Plan Do Check Act (PDCA) concept to establish with the supplier how they will update or correct any future system needs or issues. An important element in this need for updates relates to the likely possibility that, with an increased acceptance by port State authorities around the world, the ERB regulatory landscape will change over time.



For example, some IMO member States welcome the concept of moving from paper to electronic record books but other States are seeking increased security of the system to avoid tampering. The implication is that in the future, systems may require upgrading to allow for enhanced security measures to be incorporated in order to meet national standards and a possible change in the IMO's guidance or the introduction of mandatory standards. Some countries are already considering the possibility of introducing stricter signature and verification technology such as finger scan or retina identification technology in order to determine who made an entry in a record book and to help avoid password infringements.

Any subsequent changes to the systems being integrated into the ERB will also require a consequential update of the project's Management of Change.

### 5.6 Evaluate the end-user requirements

With one of the primary benefits of introducing ERBs being the reduction in administrative burden of the seafarers onboard, it is important from the outset to identify whether the system is user friendly for the end user. With this in mind, the system should be developed with the minimum complexity for ease of use onboard.

To increase confidence and assist with feedback for training and implementation on board, it is preferable to establish a system that allows for the provision of individual user login identities. This should be coupled with the ability of the system to automatically store all entries so that in the event of a system failure or error, all the required data can still be made available (for example, in a separate file) or accessible from the shore-side system. This form of backup should provide the user with confidence in the system and eradicate the fear of data loss or errors.

In terms of user errors, it is important to identify whether an ERB system being offered by the supplier is intuitive or not. There are different systems available ranging from editable PDFs to intelligent systems that in turn will prevent incorrect entries and raise alarms in the event of an incorrect or unusual data entry. Some systems incorporate an alarm that is triggered by a mismatch in terms of operational sequences or quantities being recorded. Other systems are able to generate an alert when, for example, a Remaining on Board (ROB) value that is higher than the tank capacity is recorded by the user or incorrect tanks are recorded in the entries.

Editable PDFs are commonly offered as entry-level ERBs but their flexibility is limited when more sophisticated solutions may help prevent data entry errors, provide data entry assistance/prompts to users and incorporate user feedback.

### 5.7 Evaluate and assess the training package offered

As noted above, a move towards a digital approach to the log book is a change that will impact the crew most of all. A well prepared and documented introduction for those on board will facilitate the ERB platform implementation and eventually determine its success. Moving from paper to digital record books will require a different approach to record keeping. As such, the drafting of the training package by the supplier should commence during the development of the system and be carried out in coordination with the company. Allocate a sufficient amount of time to generate high-quality and thorough Computer Based Training (CBT) packages with a structured approach that will help the crew with their familiarisation in the use of digital documents and record keeping. Developing the training at the same time as integrating the system itself can help identify potential gaps in training at an early stage.

### 5.8 Evaluate the opportunities for continuous improvement

In a wider context, the introduction of ERBs and onboard digitalisation may open broader opportunities for continuous improvement. With a fully evolved and implemented ERB platform, the company should be able to improve its capability to monitor operations on board. Being able to extract data from the system may allow for the development of detailed trends that could assist in identifying not only gaps in training, as suggested above, but also operational processes. This extends to the use of company-based dashboards to assist with

operational key performance indicators and even ship-to-ship comparisons. With the provision of accurate and real-time data from the ship, the possibility of introducing remote audits can also be considered by the company.

Some suppliers recognise these benefits and are providing data analysis tools and graphics to facilitate on-board monitoring. However, it is important to evaluate what is being offered by the supplier as the default will likely need to be adjusted to meet the company's requirements. A standard set of statistics should be made available by the supplier which will allow the company to decide whether they fulfil its needs and expectations.

## References

1. Guidelines for the use of Electronic Record Books under MARPOL (IMO Resolution MEPC.312(74)).
2. Electronic record books for ships – Technical specifications and operational requirements, ISO 21745:2019.

**INTERTANKO London**  
**St Clare House**  
**30-33 Minories**  
**London EC3N 1DD**  
**United Kingdom**  
**Tel: +44 20 7977 7010**  
**Fax: +44 20 7977 7011**  
**[london@intertanko.com](mailto:london@intertanko.com)**

**INTERTANKO Oslo**  
**Nedre Vollgate 4**  
**5th floor**  
**PO Box 761 Sentrum**  
**N-0106 Oslo**  
**Norway**  
**Tel: +47 22 12 26 40**  
**[oslo@intertanko.com](mailto:oslo@intertanko.com)**

**INTERTANKO Asia**  
**70 Shenton Way**  
**#20-04 Eon Shenton**  
**079118**  
**Singapore**  
**Tel: +65 6333 4007**  
**Fax: +65 6333 5004**  
**[singapore@intertanko.com](mailto:singapore@intertanko.com)**

**INTERTANKO North America**  
**801 North Quincy Street - Suite 500**  
**Arlington, VA 22203**  
**USA**  
**Tel: +1 703 373 2269**  
**Fax: +1 703 841 0389**  
**[washington@intertanko.com](mailto:washington@intertanko.com)**

**INTERTANKO Athens**  
**Karagiorgi Servias 2**  
**Syntagma**  
**Athens 10 562**  
**Greece**  
**Tel: +30 210 373 1772/1775**  
**[athens@intertanko.com](mailto:athens@intertanko.com)**

**[www.intertanko.com](http://www.intertanko.com)**



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