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Implementation of Shipping MRV Regulation

European Sustainable Shipping Forum Subgroup on Shipping MRV Monitoring

Monitoring Plan

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CE Delft
Committed to the Environment

MARENA

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1. Introduction and Background
Purpose and scope of the monitoring plan

The monitoring plan (**MP**) **is a fundamental document:**
It lays down the detailed monitoring rules to be followed when monitoring the CO_2 emissions and other relevant information data tailored **per ship**. The MP needs to reflect the **nature and functioning of the ship**.

Most elements of topics described in this Working Paper are included based on the requirements of Article 6 of the Regulation. **Article 6 specifies in the elements to be included in the MP.**

Monitoring plans serve as **manuals for the ship operators' tasks** with respect to monitoring and reporting of CO_2 emissions. In case of a change of responsibility for MRV, valuable information related to data and work flows is preserved in the MP. Monitoring plans should be developed in a manner which **limits the (onboard) administrative burden** later on to the minimum necessary – to save valuable time.

- The MP demonstrates how the ship's monitoring, reporting and verification system is **compliant with the EU MRV Regulation**.
- The MP compiles all relevant **information** on how the ship's MRV system works.
- The MP provides sufficient information to allow for **efficient verifications** – for both the shipping company and the verifier.

2. Basic data (1/4)
Identification of the ship

1) Name	Name as known to the company and/or as carried on the ship's hull	***4) Type***	Ship type acc. to MARPOL Annex VI, Ch. 1, Reg. 2, incl. Statcode L. 5
2) IMO number	Unique seven digit IMO number as shown on the ship's hull	***5) Size***	Deadweight tonnage and gross tonnage
3) Port	Port of registry and the home port (at which the ship is based)	***6) Age***	Year of construction (keel laying date)
Open description field	Open description field for additional identification parameters of the ship (e.g. if relevant for fuel consumption in case of special type of activity (such as considering extensive cargo tank cleaning, ice-class etc.))		
Additional information	Ship-owner, ship builder, lightweight, Flag State and Classification Society		

Questions for discussion

Do you agree with the suggested additional information on the ship identification to be added to the template?

Should there be an open description field?

2. Basic data (2/4)

Details of the company & contact person

Company details	**Name and address** of the **company (natural or legal person)** which is responsible for the ship's MRV compliance.
Contact details	**Name, position and contact details** of responsible **natural person(s)** within the company. In case of several contact persons: O**ne person needs to carry overall responsibility for compliance** with the EU MRV Regulation within the company.

2. Basic data (3/4)
Emission sources, fuel types & emission factors

Emission sources

Information about all emission sources which are installed onboard the ship. Apart from the **main engine** this may include **auxiliary engines, gas turbines, boilers and inert gas generator(s)**.

- name, type
- technical description of type
- performance/power
- year of installation
- identification number (in case of several identical emission sources)

Fuel types used

Overview of fuel types that the ship uses and might use, e.g.

- HFO
- LFO
- MDO/MGO
- Hybrid Fuels
  e.g. HDME 50 (EXXONMOBIL), Fuel Oil (Chemoil), DMB (Chemoil), ULSFO (Shell), SK ULSFO (SK Energy), BP 0.1 RMD (BP), Eco Marine Fuel (Lukoil)
- LPG (Propane/Butane)
- LNG

Also needed: attribution of fuel types to emission sources

Emission factors

Use of IMO emission factors as outlined in the Circular MEPC.12/63 only.

Fuel type	IMO Values 2012/63 (t CO_2 / t fuel)
Heavy Fuel Oil (Ref.: ISO 8217 Grades RME through RMK)	3.1144
Light Fuel Oil (Ref.: ISO 8217 Grades RMA through RMD)	3.1510
Diesel/Gas Oil (Ref.: ISO 8217 Grades DMX through DMB)	3.2060
Liquefied Petroleum Gas (Propane)	3.0000
Liquefied Petroleum Gas (Butane)	3.0300
Liquefied Natural Gas	2.7500

2. Basic data (4/4)
Completeness of emission sources

Details about the systems, procedures and responsibilities used to track the completeness of the list of emission sources over the reporting period:

Title of procedure	Managing the completeness of the list of emission sources
Reference for procedure	
Brief description of procedure	
Employee/Department responsible for this procedure	
Location where records are kept	
Name of system used (where applicable)	

Questions for discussion

- Are the elements provided in the above table sufficient to properly describe the procedure to manage the completeness of the list of emission sources?
- Should this model be used for other procedures required by Article 6 (3) as well?

3. Activity data (1/3)
Fuel consumption of the ship

.	**Methodology** used to **measure fuel consumption** of each emission source (including a description of the measurement equipment used)
A, B	Procedures for measuring **fuel uplifts and fuel in tanks**
B, C, D	Description of the **measurement instruments** involved
All	Procedures for recording, retrieving, transmitting and **storing information** regarding measurements
A, B, C	Determination of **density**

3. Activity data (2/3)
List of voyages, distance travelled and time at sea

Details about the systems, procedures and responsibilities used to ensure the completeness of the **list of voyages** (included/excluded from EU MRV)

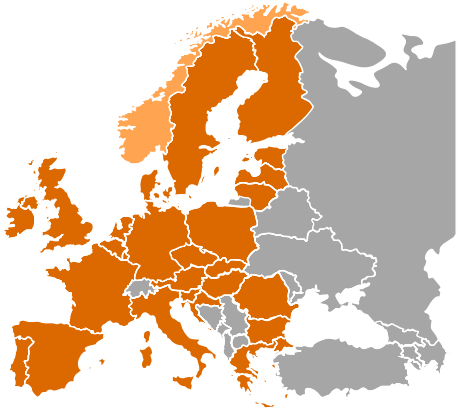
determination and documentation of the **distance per voyage**

a) Real distance travelled

b) Most direct route between port of departure and port of arrival with use of conservative correction factor

- and the **time spent at sea** between the port of departure and the port of arrival

over the reporting period.



Additional information on the procedures, formulae and data sources used for calculation when navigating through ice can be included.

3. Activity data (3/3)

Amount of cargo carried & Number of passengers

Amount of cargo

Transport work =

distance travelled * cargo carried

In the monitoring plan:

Information on **how the amount of cargo carried will be compiled and calculated**, in line with the resulting final version of the working paper related to Cargo Parameters.

Number of passengers

Transport work =

distance travelled * passengers carried

In the monitoring plan:

Details about the procedures, responsibilities and data sources for **determining and recording the number of passengers**, if applicable, and in line with the resulting final version of the working paper related to Cargo Parameters.

4. Quality and availability of data (1/3)
Uncertainty

Uncertainty =

- **'the range within which the actual value of reported measurements is expected to lie, given a specific level of assurance'**
- **'… confidence interval around the mean value comprising 95 % of inferred values …'**

In the monitoring plan:

Description of the **procedure** in place to ensure that the total uncertainty of fuel measurements is consistent with the requirements of the MRV Regulation and of guidance documents provided by the EC.

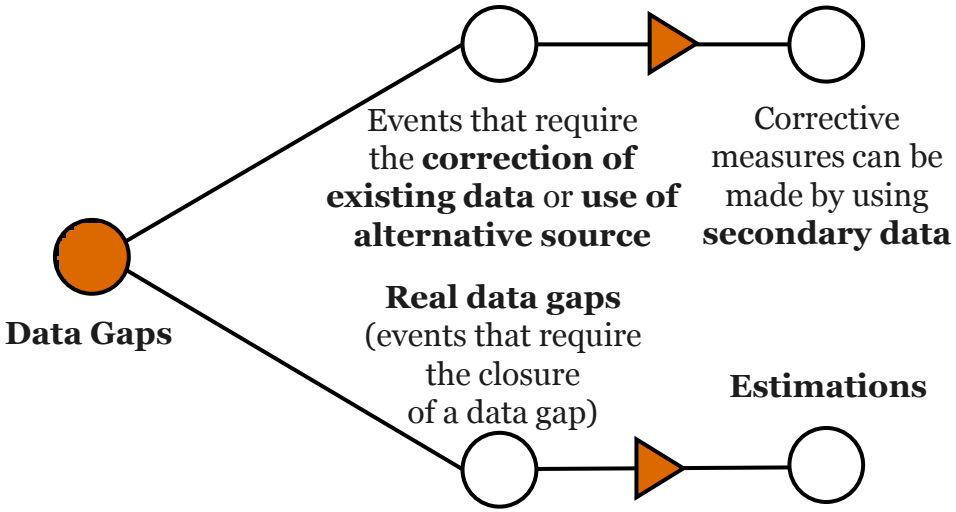
Estimated **uncertainty associated** with the monitoring methods used (default values permitted).

4. Quality and availability of data (2/3)
Data Gaps

Data Gap =

Case where data relevant for the determination of ship emissions is missing

- Operator shall use surrogate data **calculated in accordance with an alternative method.**



4. Quality and availability of data (3/3)
Method to be used to treat data gaps

Estimation of fuel consumption

Three possible methods to estimate fuel consumption in the case of data gaps:

1) Estimated consumption **per kW** of power (according to manufacturer)
2) Fuel consumption in time period = ∑ (Specific fuel consumption of main engines per hour at **75% load**) * (24 h operation) * (no. of days in period)
3) Methodologies applied and described in the 2nd and 3rd **IMO** GHG studies

Question for discussion

- Should a formula be offered in the template and if yes, which one(s)?

Other parameters

Brief description of the method to treat data gaps regarding **other parameters** than fuel consumption (i.e. list of voyages, distance, total time spent at sea, cargo carried, number of passengers) if applicable.

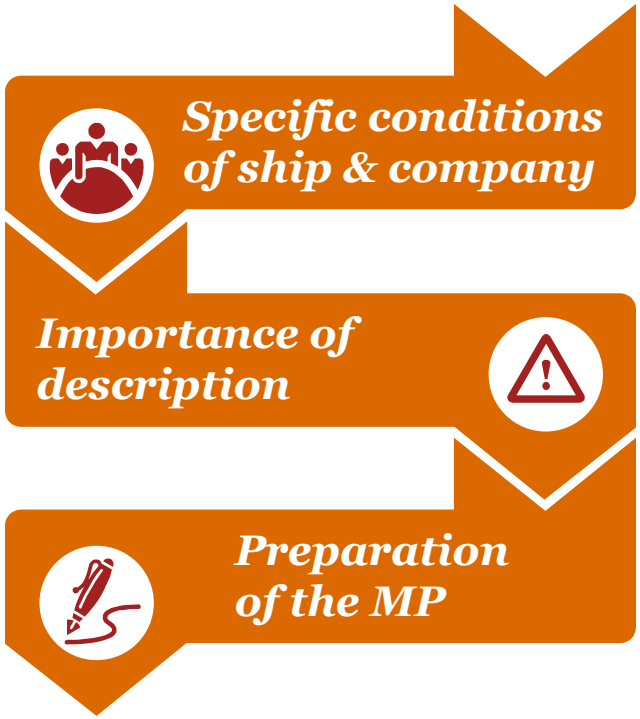
It should include a **back-up solution for <u>each</u> parameter**.

Question for discussion

- Should standard methods for different parameters be offered in the template and if yes, which ones?

5. Management (1/3)
Background

Comprehensive management activities and a purposeful internal control system support overall compliance with the MRV Regulation and should therefore be outlined in the monitoring plan.



- character of management systems and activities varies between ships and companies
- large differences in range of documented controls

- management chapter is the key to tailor the MP in a way that accommodates the individual conditions
- experience shows that a descriptions of management activities helps avoid errors significantly and set up the individual MRV system in a structured manner

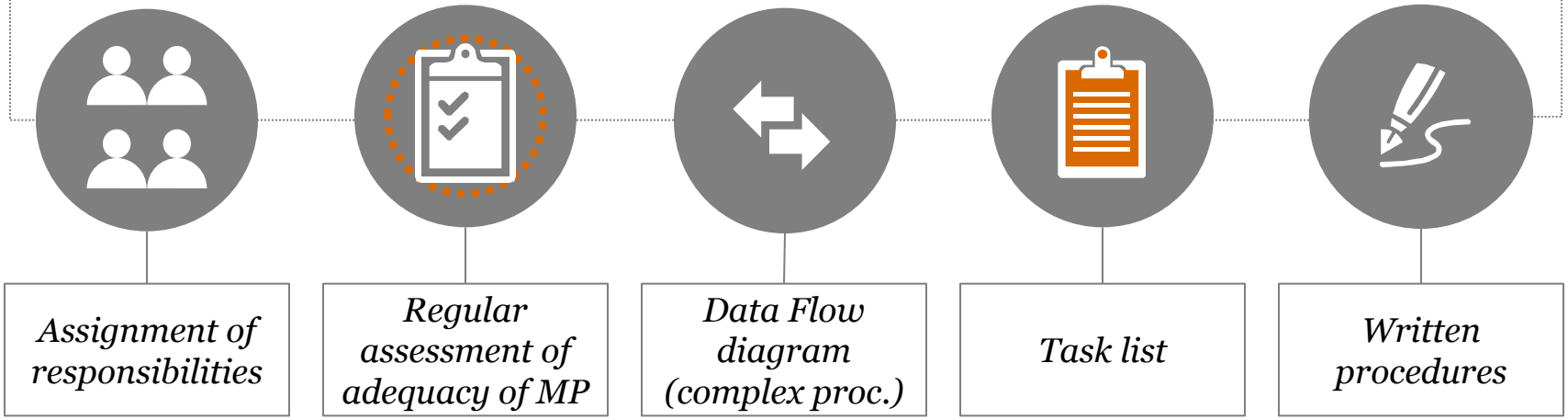
- chapter on management activities should be kept short
- focus on MRV purpose only
- existing management systems can be referred to.

5. Management (2/3)
General responsibilities and data flow activities

General responsibilities
- Appointment of roles and tasks in the process
- Use of existing management systems, e.g. ISO 14001 or ISO 50001 for description

Management

Data flow activities
- Description of how data are produced, collected, processed and stored in a controlled way to ensure compliance with the EU MRV Regulation
- Free format (no specific template provided/required)



5. Management (3/3)
Control activities, corrections and corrective actions

Control activities

Two elements of an effective control system:

1) Performance of a **risk assessment**
2) **Control activities** for mitigating the risks identified.

Aspects that should be covered in the **MP**:

- Quality assurance of the measuring equipment and the IT system
- Internal reviews and validation of data
- Control of outsourced activities

Corrections and corrective actions

Aspects that should be covered in the **MP**:

- Description of the **procedures used to handle corrections and corrective actions** related to the monitoring and reporting process.
- Keeping of records and **documentation** including the management of document versions

6. Further information
Additional individual information

- **Revision record sheet** to record all the details of the revision & modification history.
- **Additional information on the MRV matter** considered relevant for the ship and essential management procedures.
- (Individual) **abbreviations, acronyms or definitions** used in completing the monitoring plan to ensure understanding for third parties.

Thank you.