EU MRV overview, update & solution

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Content

- EU MRV Overview
- Preparation of monitoring plan, assessment and verification
- Monitoring during reporting period
- Verification of annual data

Brief introduction on EU MRV regulation

Regulation (EU) 2015/757

Delegated & Implemented acts

- 2016/2071 : Shipping Emissions monitoring methods
- 2016/1928 : Shipping Emissions Cargo Carried
- 2016/1927 : Shipping Emissions Templates
- 2016/2072 : Shipping Emissions Verification & Accreditation

Emission reduction strategy EU MRV

Geographical scope of EU MRV

All voyages calling at an EEA member state

EU Member states jurisdiction

Gibraltar is an EU port

EEA Member states (EEA = All EU states + Norway , Iceland)

EEA outermost regions:

Acores, Canary Islands, French Guiana, Guadeloupe, Madeira, Martinique, Mayotte, Reunion and Saint Martin

Exceptions: Some EU member states' territories are

Not part of EU territory i.e. Greenland….

EU MRV timeline

If a Ship does carry out any EEA-related voyage during a whole reporting period, a valid DOC is not required For the following year from 30th June till the year after 29th June.

Accredited verifier

- Verifiers need to be accreditated as per ISO standard 14065
- Listof NAB accreditation bodies for verifiers is available in the following linkhttp://www.european-accreditation.org/document/eu-mrv-list-nab
- Any accredited verifier can be chosen by the company for verification purpose
- In order to be a verifier classification societies also need to get

Accredited by the NAB as per the ISO standard

Main functions of verifier

1. Assessment of monitoring plan
2. Verification of Annual emission report
3. Issuance of verification report after successful assessment of annual emission report
4. Notifying EC and Flag state relevant information

Road to preparing ship specific MP

Choose a suitable format for MRV documentation, ICT system, excel, word etc

- An automated system is preferred as it will cut down verification time.

Avoid redundant submission to verifier

- Identify information which are common i.e. Company specific information, Data gap, management responsibility

Select a representative ship from a group of ships

- Select an approved verifier
- Submit for assessment
- You can use the assessed version to other ships for preparation of ship specific MP
- Use assessed MP for sister ships

Verification time cost money!

Monitoring plan

- A monitoring plan need to be prepared corresponding to the model Available in Annex I of Implementing Regulation (EU)2016/1927

Structure of the Monitoring plan can be different but it must include All mandatory items from the above model

Where applicable reference can be made to existing procedure from SEEMP, line plan, GA plan, relevant manual etc.

Components of MP

- Part A – Revision record sheet (Ship specific)
- Part B – Basic data (Ship + Company specific)
- Part C – Activity data (Ship specific)
- Part D – Data gaps (Company Specific)
- Part E – Management (Company specific)
- Part F – Further information

Part A – Revision record sheet

- Ship specific revision record

- MP is a controlled document and accessibility and version
  Control need to be established carefully and demonstrated
  It is also important to ensure ship has the latest version of the MP

VEEMS provimde a fully automated version control system and
Automatic updating of MP of relevant ship

Part B (Basic data)

EU MRV MODULE

ShipName : ALNILAM

Revision Record	Basic Data	Activity Data	Data Gaps	Management	Further Information	Additional Information

B.BasicData

- Table B.1. Identification Of The Ship
- Table B.2. Company Information
- Table B.3. Emission Sources And Fuel Types Used
- Table B.4. Emission factors
- Table B.5. Procedures, systems and responsibilities used to update the completeness of emission sources

Part B

- B1 – Identification of ship – Accountable entity

- B2 – Company information – Ship owner/Manager/bareboat charterer which has assumed the responsibility for the operation of the ship – Responsible for compliance

Part B

- B3 Emission sources and fuel types

Emission sources to be considered are:
Main Engines
Auxiliary Engines
Boilers
Gas Turbines
IGG

Fuel Types: For regular vessels HFO, LFO,DO/GO

Incinerator need not be Considered as an emission source

Part B4 Emission factor

Table B.4. Emission factors

Fuel type	IMO emission factors (in tonnes of CO2/ tonne fuel)
Heavy Fuel Oil(Reference: ISO 8217 Grades RME through RMK)	3.114
Light Fuel Oil(Reference: ISO 8217 Grades RMA through RMD)	3.151
Diesel/Gas Oil (Reference: ISO 8217 Grades DMX through DMB)	3.206
Liquefied Petroleum Gas (Propane)	3
Liquified Petroleum Gas (Butane)	3.03
Liquified Natural Gas	2.75
Methanol	1.375
Ethanol	1.913
Other fuel with non-standard emission factor	

Table C – Activity data

EU MRV MODULE

ShipName : ALNILAM

Revision Record	Basic Data	Activity Data	Data Gaps	Management	Further Information	Additional Information

C. Activity Data

Table C.1. Conditions of exemption related to Article 9(2)

Table C.2. Monitoring Of Fuel Consumption

Table C.3. List of voyages

Table C.4. Distance travelled

Table C.5. Amount of cargo carried & Number of passengers

Table C.6. Time spent at sea

C.2 Monitoring of fuel consumption

- C.2.1 Measurement Method used

There are four methods available to choose from:

Method A - (BDN & periodic stock takes of fuel tanks

Method B – Fuel tank monitoring

Method C – Flowmeter

Method D – Direct Emission measurement
(Reliable system is still not available)

As the emission record will be Published in public domain by EU, it is important to choose the most accurate method economically viable.

Method C could be the most desired method

A combination of different method can be chosen.

C.2 Monitoring of fuel consumption

- C.2.6 Method for determination of density

Lab test result, in absence BDN

C.2.7 Level of uncertainty associated with fuel monitoring

Default method

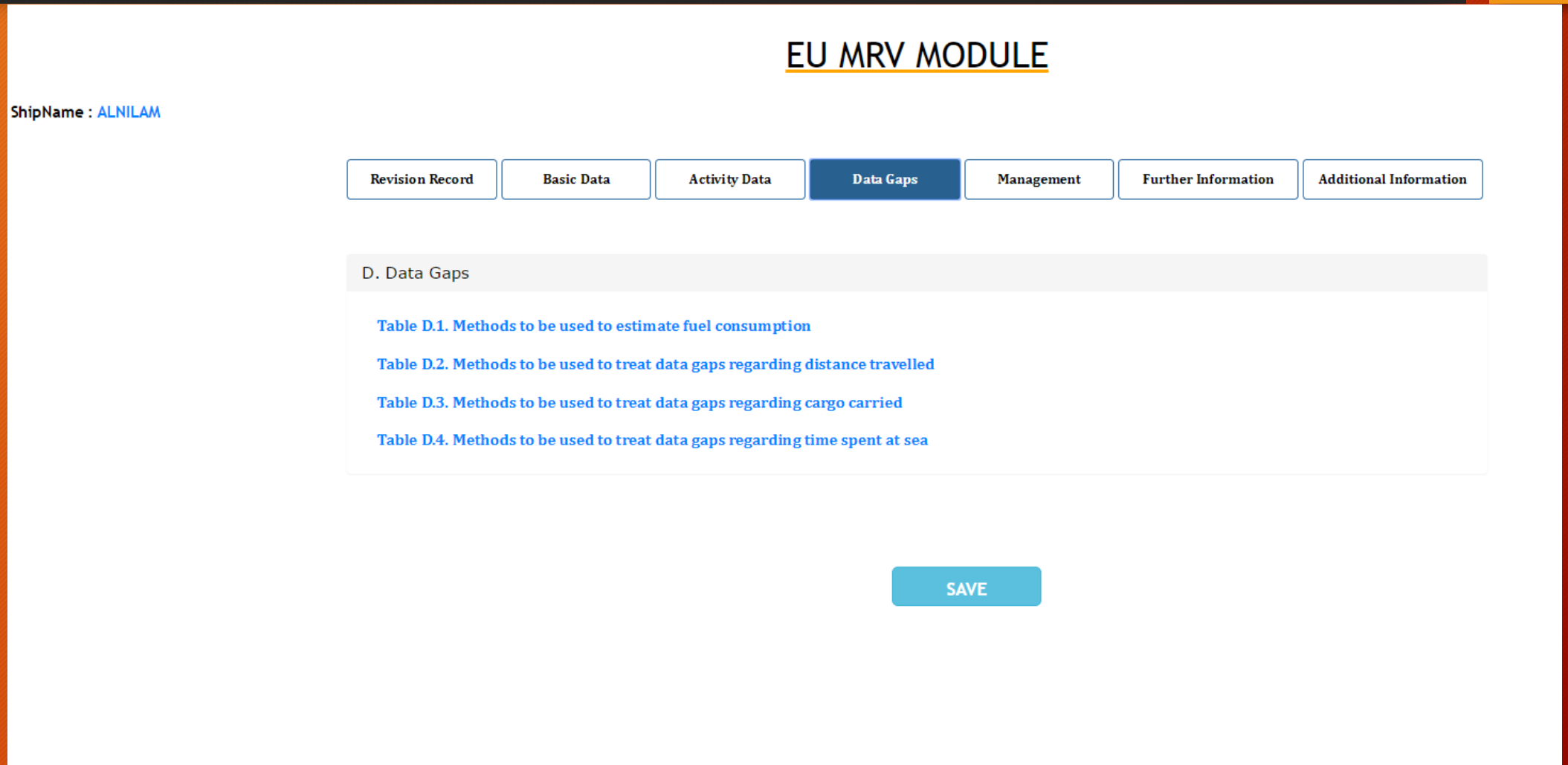
C.3 List of voyage

1. A voyage is a journey between two consecutive ports of call.
2. A port of call is considered when a ship stops to load/unload cargo.
3. Calling a port for the sole purpose of bunkering, repair, STS operation outside port etc are not considered as a ports of call
4. An EU MRV voyage is when at-least one of the two ports in a voyage is a port from EEA
5. Ballast voyages also need to be accounted in EU MRV aggregation similar to Laden voyages.

C.5 Amount of cargo carried

Ship Type	Cargo to be monitored per ship type
Oil tankers, chemical tankers, gas carriers, bulk carriers, refrigerated cargo ships and combination carriers	Actual mass of the cargo on-board
LNG carriers	Volume of cargo on discharge
Pax ships	Number of passengers
Ro-ro ships	Occupied lane-meters * default weight OR, nb of cargo units * default weight OR, actual mass of the cargo on-board
Container ships	Actual mass of the cargo OR, nb of TEU * default weight
Ro-pax	Passengers: number of pax Freight: same Ro-ro ships
Con-ro ships	Volume of cargo on-board
Vehicle carriers and general cargo ships	Mass of cargo and / or deadweight carried

D. Data gaps


EU MRV MODULE
ShipName : ALNILAM
Revision Record
Basic Data
Activity Data
Data Gaps
Management
Further Information
Additional Information
D. Data Gaps
Table D.1. Methods to be used to estimate fuel consumption
Table D.2. Methods to be used to treat data gaps regarding distance travelled
Table D.3. Methods to be used to treat data gaps regarding cargo carried
Table D.4. Methods to be used to treat data gaps regarding time spent at sea
SAVE

D. Data Gaps (some example from veems)

BELLATRIX

Distribution of Total Report Time for Selcted period by Report Type

Port Arrival	8.93 hrs
Port Departure	11.89 hrs
Port Noon	4.91 hrs
Sea Report	97.86 hrs

123.6 days reporting time out of **132** calender days

Report Level Break Down

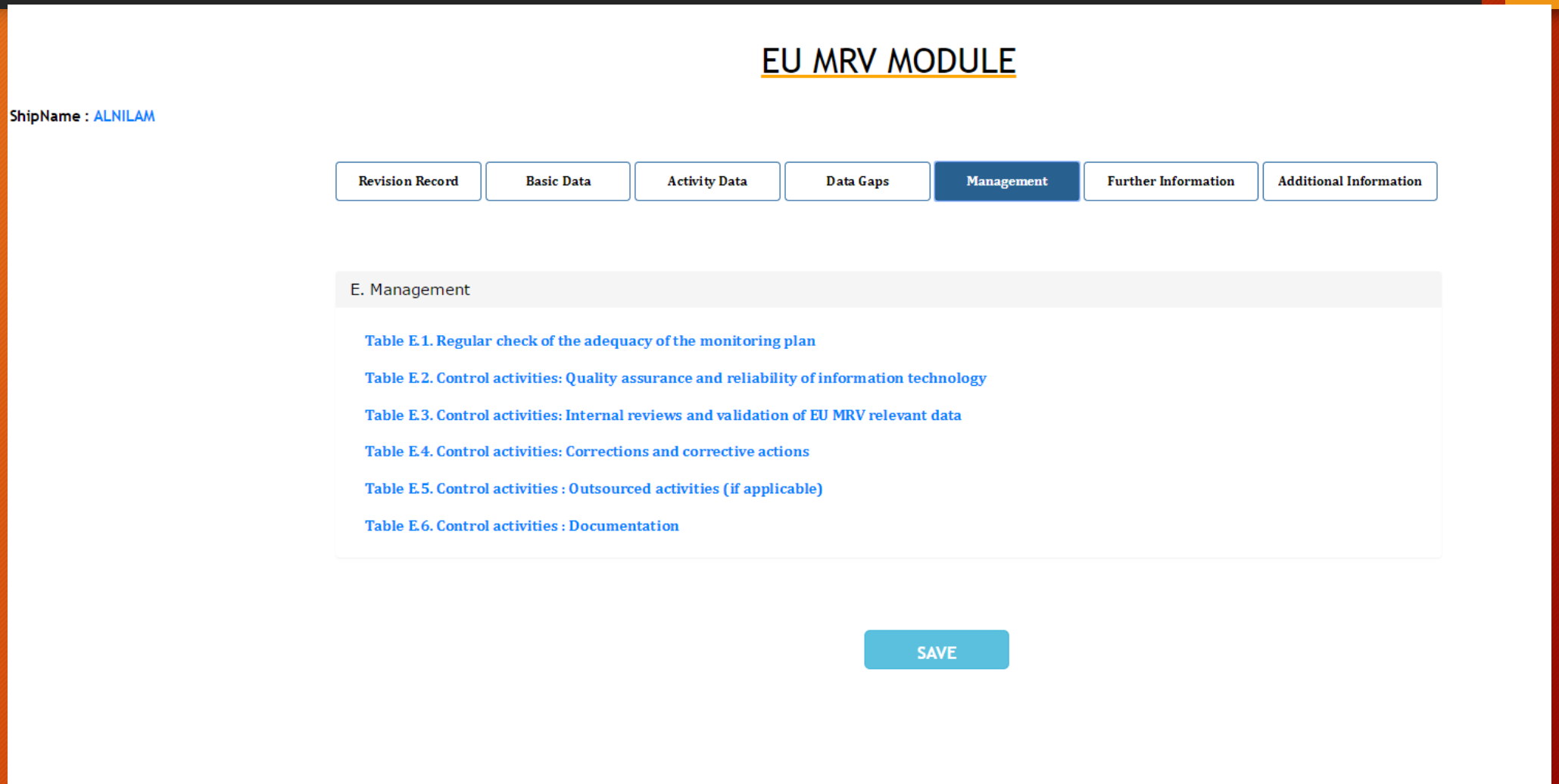
Voyage Basis Break Down of Reported Days

Departure Time	Origin Port	Destination Port	Arrival Time	
Grand Total				123.6 Days
2/Jan/2017 19:54:00	TIANJIN	SHANGHAI	5/Jan/2017 09:40:00	3.5 Days

Report Level Break Down

Report Serial	Start Time	End Time	
Grand Total			3.50
PD17010022	1/2/2017 12:35:00	1/2/2017 21:18:00	0.36
SR17010117	1/2/2017 21:18:00	1/3/2017 04:00:00	0.28
SR17010118	1/3/2017 04:00:00	1/4/2017 04:00:00	1.00
SR17010119	1/4/2017 04:00:00	1/4/2017 07:30:00	0.15

E. Management responsiblity



Monitoring during reporting period

Annual report submission to verifier and assessment of annual report

2. When considering the verification of the emissions report and of the monitoring procedures applied by the company, the verifier shall assess the reliability, credibility and accuracy of the monitoring systems and of the reported data and information relating to CO_2 emissions, in particular:

(a) the attribution of fuel consumption to voyages;

(b) the reported fuel consumption data and related measurements and calculations;

(c) the choice and the employment of emission factors;

(d) the calculations leading to the determination of the overall CO_2 emissions;

(e) the calculations leading to the determination of the energy efficiency.

3. The verifier shall only consider emissions reports submitted in accordance with Article 12 if reliable and credible data and information enable the CO_2 emissions to be determined with a reasonable degree of certainty and provided that the following are ensured:

(a) the reported data are coherent in relation to estimated data that are based on ship tracking data and characteristics such as the installed engine power;

(b) the reported data are free of inconsistencies, in particular when comparing the total volume of fuel purchased annually by each ship and the aggregate fuel consumption during voyages;

(c) the collection of the data has been carried out in accordance with the applicable rules; and

(d) the relevant records of the ship are complete and consistent.

Verification procedure

Verification procedures

1. The verifier shall identify potential risks related to the monitoring and reporting process by comparing reported CO_2 emissions with estimated data based on ship tracking data and characteristics such as the installed engine power. Where significant deviations are found, the verifier shall carry out further analyses.

2. The verifier shall identify potential risks related to the different calculation steps by reviewing all data sources and methodologies used.

3. The verifier shall take into consideration any effective risk control methods applied by the company to reduce levels of uncertainty associated with the accuracy specific to the monitoring methods used.

4. The company shall provide the verifier with any additional information that enables it to carry out the verification procedures. The verifier may conduct spot-checks during the verification process to determine the reliability of reported data and information.

5. The Commission shall be empowered to adopt delegated acts in accordance with Article 23, in order to further specify the rules for the verification activities referred to in this Regulation. When adopting these acts, the Commission shall take into account the elements set out in Part A of Annex III. The rules specified in those delegated acts shall be based on the principles for verification provided for in Article 14 and on relevant internationally accepted standards.

Key points

- The monitoring plan need to be carefully prepared and implemented uniformly
- Monitoring plan is ship specific. Each ship will have its own monitoring plan.
- However, it is not necessary to go through complete assessment process for each ship but to prepare a representative template and then that can be applied to other ships.
- A company can choose any accredited verifiers.
- A fuel measurement method that gives the best possible accuracy may be beneficial as ship efficiency data will be available in public domain which is likely to be used in benchmarking.
- A suitable automated information and communication technology is likely to be more

Cost effective in the long run saving time and money by reducing verification time.