

EU MRV Regulations

Requirements of EU MRV Regulations and Challenges for Shipping Companies

by ClassNK for Movena Group
Provided by EEDI Department, ClassNK, Tokyo

Monitoring - Reporting - Verification

EU MRV

- ✓ Regulation (EU) 2015/757 on the monitoring, reporting and verification of carbon dioxide (CO₂) emissions from maritime transport
- ✓ Monitoring the fuel consumed and other relevant data during voyage, starting from 1 January 2018

IMO Data Collection System ("IMO-DCS", 'IMO-MRV')

- ✓ Amendments to Chapter 4 of MARPOL Annex VI were adopted at MEPC 70, and will enter into force on 1 March 2018
- ✓ Monitoring the fuel consumed and other relevant data on energy efficiency, starting from January 2019

1. EU MRV Regulations
2. IMO DCS Regulations (“IMO-MRV”)
3. 'Challenges' for shipping companies
(EU MRV)
4. ClassNK's activities

- The Commission's 2011 White Paper on transport suggests that the EU's CO₂ emissions from maritime transport should be cut by at least 40% from 2005 levels by 2050, and if feasible by 50%. However, international shipping is not covered by the EU's current emissions reduction targets.
- In June 2013, the Commission set out a strategy for progressively integrating maritime emissions into the EU's policy for reducing its domestic greenhouse gas emissions.
- The strategy consists of 3 consecutive steps:
 - 1: Monitoring, reporting and verification of CO₂ emissions from large ships using EU ports;
 - 2: Greenhouse gas reduction targets for the maritime transport sector;
 - 3: Further measures, including market-based measures, in the medium to long term.

→ EU MRV is part of a wider EU strategy for GHG reduction

(Source: http://ec.europa.eu/clima/policies/transport/shipping/index_en.htm)

REGULATION (EU) 2015/757 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

of 29 April 2015

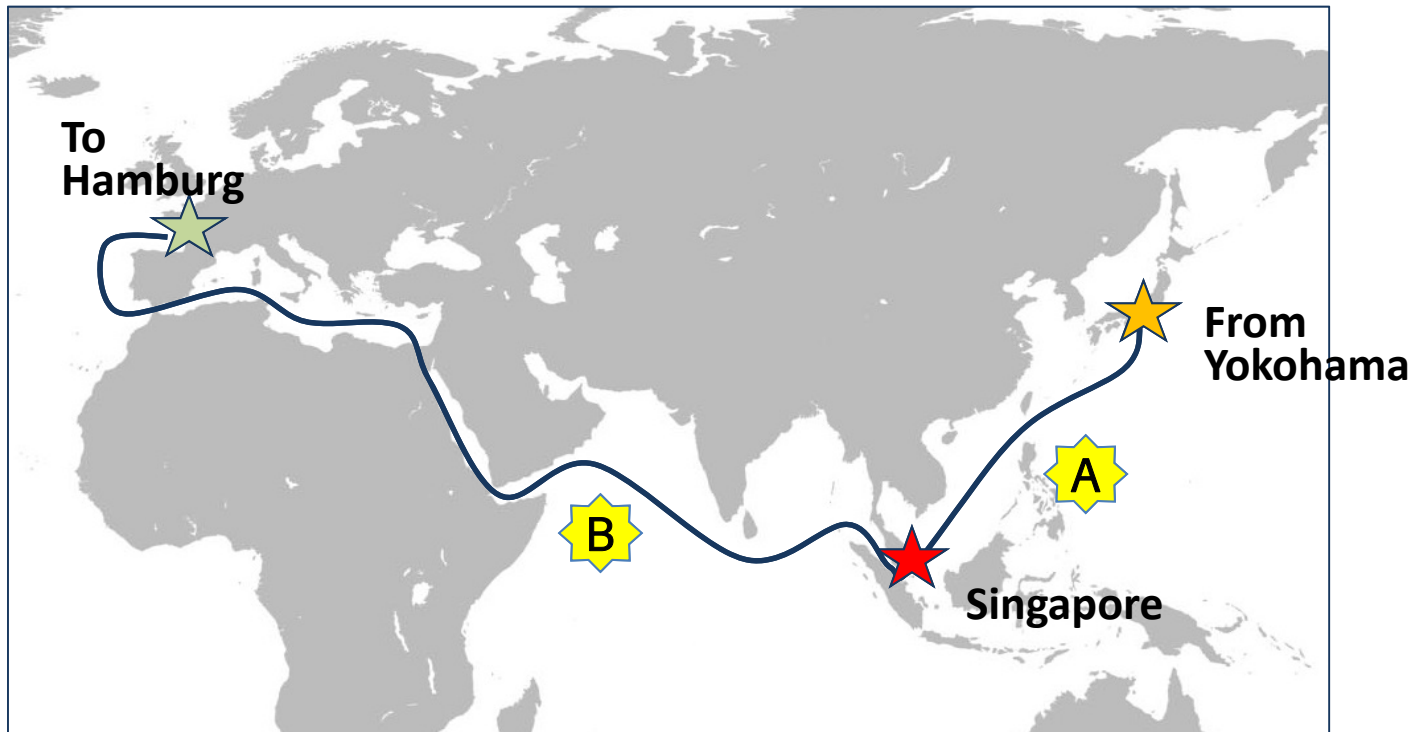
on the monitoring, reporting and verification of carbon dioxide emissions from maritime transport, and amending Directive 2009/16/EC

(Text with EEA relevance)

(Entry into force on 1 July 2015)

- Applies to ships **above 5,000 GT**, regardless of flag, conducting commercial voyages into, out of or between port of call in EU
- **Port of call** means the port where a ship stops to load/unload cargo or to embark/disembark passengers (excl. of: refueling, obtaining supplies, relieving the crew, etc.)

Voyages to be reported



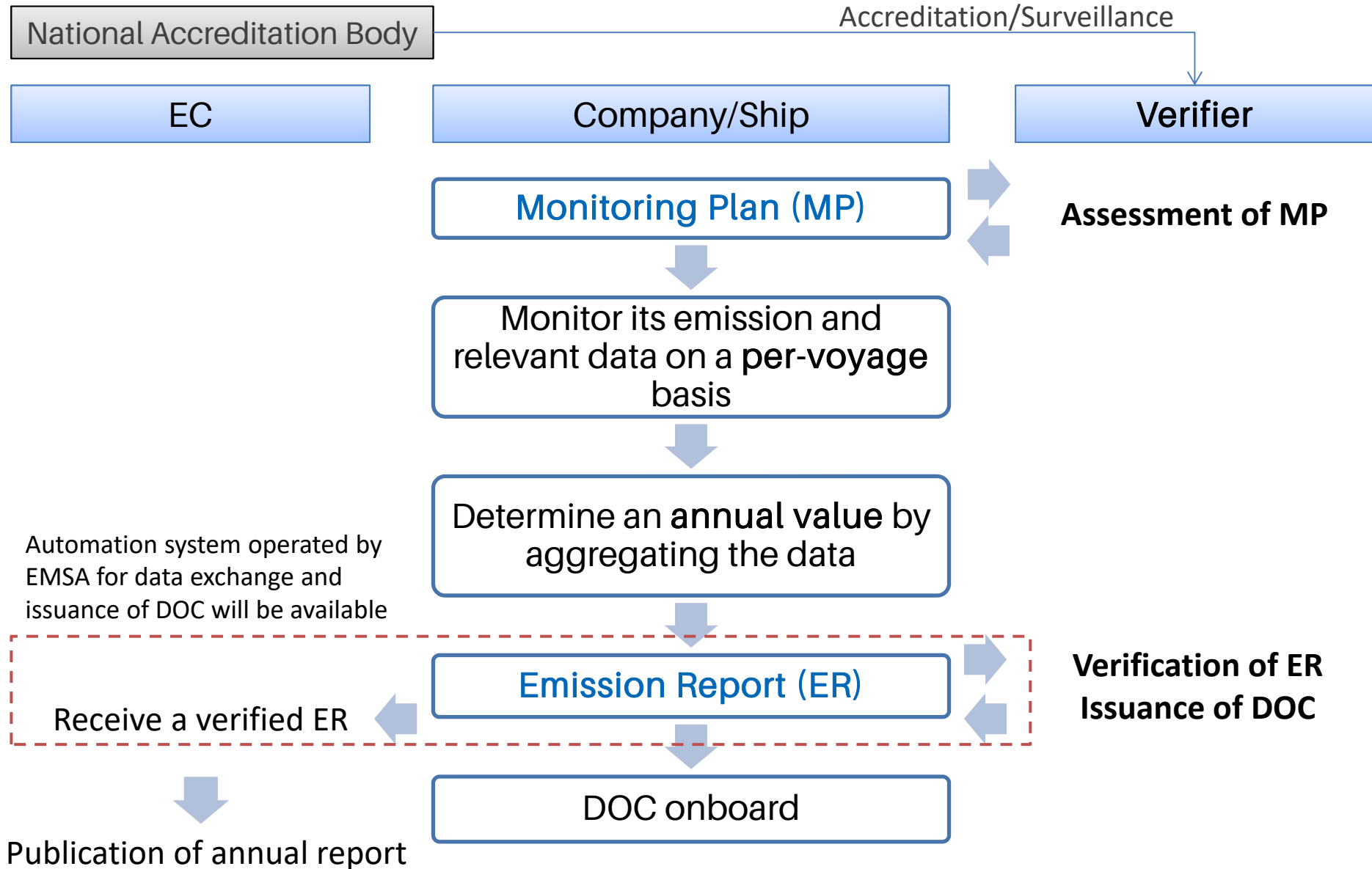
Case 1: Yokohama - loading cargo
Singapore - bunkering fuel
Hamburg - unloading cargo

⇒ (A + B) to be reported as one voyage

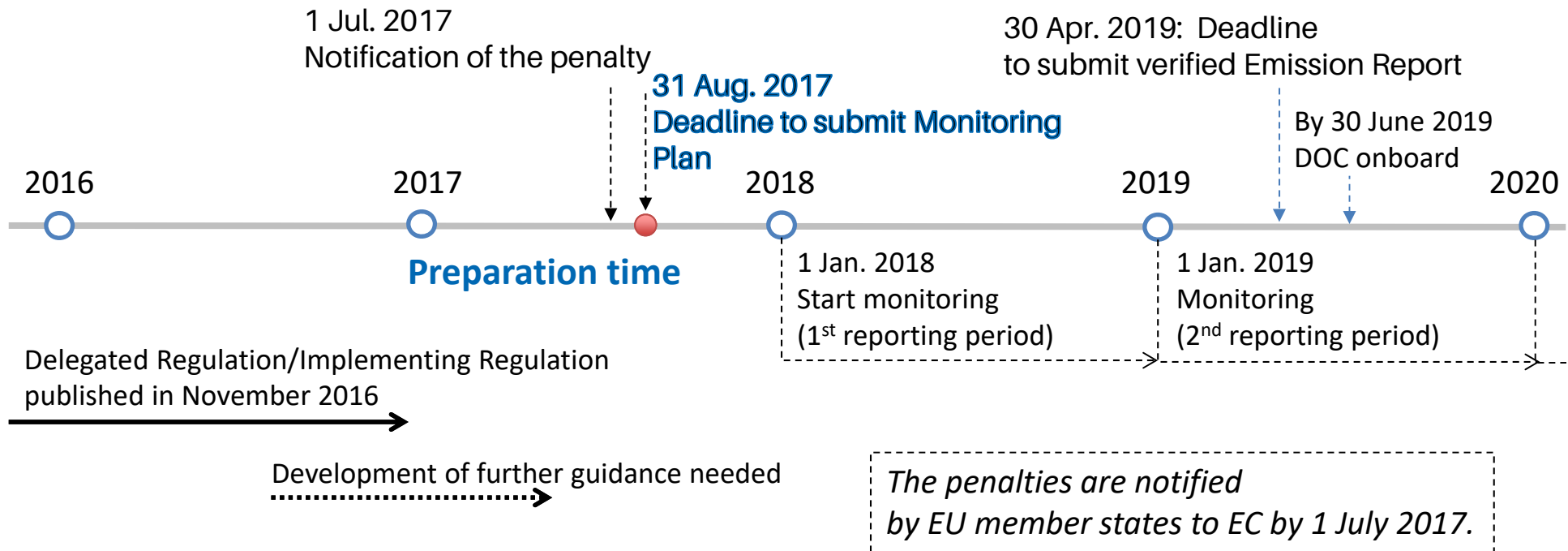
Case 2: Yokohama - loading cargo
Singapore - unloading/loading cargo
Hamburg - unloading cargo

⇒ only B to be reported

EU MRV Process



Implementation timeline



Key Dates:

- <31 Aug. 2017 – Monitoring Plan (MP) to be submitted to verifier (ClassNK)
- From 1 Jan. 2018 – monitor ship emissions and relevant data
- By 30 April of each year, starting in 2019 – submit a verified Emission Report (ER) to EC/Flag State(for EU flag)
- By June of each year, starting in 2019 – ships will have to retain a valid DOC

- Monitoring Plan is a plan for each ship indicating the method chosen to monitor and report CO₂ emissions and other relevant information.
- Monitoring plan is to be drawn up by referring the template which is provided with the Implementing regulation.
- After establishment of Monitoring Plan, Company is required to check regularly, at least annually, the effectiveness of the monitoring plan. MP has no expiration date. In case that a monitoring plan is modified, modifications of monitoring plan shall be subject to assessment by the verifier.

Structure of Monitoring Plan

- Identification of the ship/company
- Identification of CO₂ emission sources on board the ship, and the fuel type used
- Description of the procedures for monitoring voyages, fuel consumption and activity data
- Methodology for closing data gaps
- Procedures for quality control
- Description of data flows
- Identification of responsibilities

Emission sources to be considered

- Main engines
- Auxiliary engines
- Boilers
- Gas turbines
- Inert gas generators



Monitoring parameters

Per-voyage basis

- Port of departure/arrival including the date and hour
- Amount and emission factor for each type of fuel consumed in total
- CO₂ emitted ($\Sigma\text{FOC} \times \text{emission factor}$)
- Distance travelled
- Time spent at sea
- Cargo carried
- Transport work (cargo \times distance)




Annual basis

- Amount and emission factor for each type of fuel consumed in total
- Total aggregated CO₂ emitted
- Aggregated CO₂ emissions from all voyages in/out and between EU ports
- CO₂ emissions which occurred within EU ports at berth
- Total distance travelled
- Total time spent at sea
- Total transport work and Average energy efficiency

Monitoring methods of the fuel consumption

- A) Bunker Delivery Note (BDN) and periodic stock-takes of fuel tanks
- B) Bunker fuel tank measurements on board
- C) Flow meters applicable combustion process
- D) Direct CO₂ emission measurement

 **Bunker Delivery Note**

MARPOL Annex VI requires that the following information be included in the bunker delivery note provided to the receiving ship. There is no specific format for a bunker delivery note. Bunker suppliers may therefore use their own stationery provided that all the required information is included.

Name and IMO number of receiving ship:

Port:

Date of commencement of delivery:

Name, address and telephone number of marine fuel of supplier:

Product name(s)	Quantity (metric tons)	Density at 15°C (kg/m ³) Fuel oil should be tested in accordance with ISO 3675	Sulphur content (% m/m) Fuel oil should be tested in accordance with ISO 8754

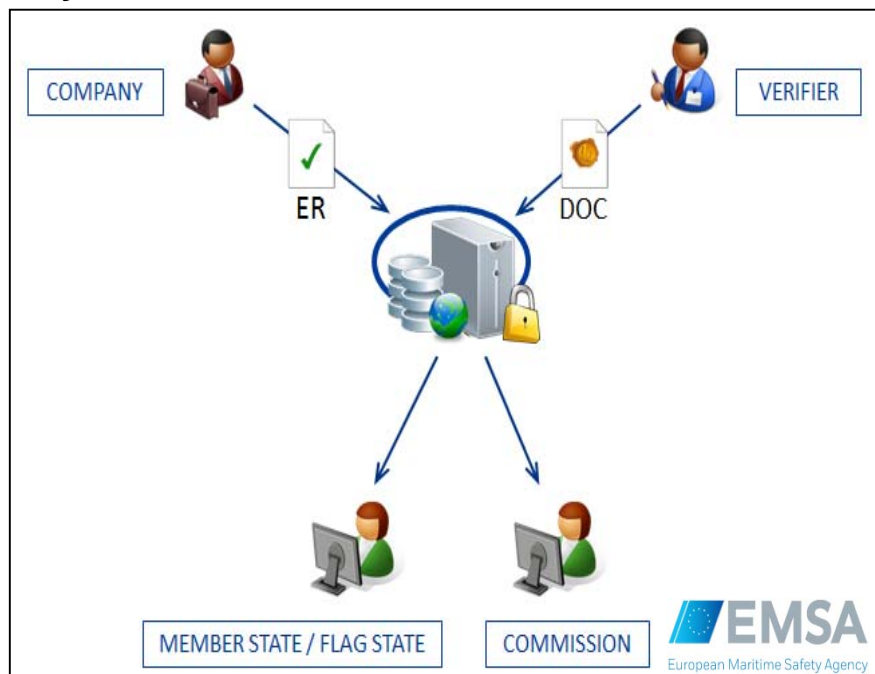


MRV – Monitoring of cargo carried

Ship category	Parameters to determine the 'cargo carried'
Oil tanker	Mass of the cargo on board
Chemical tanker	Mass of the cargo on board
LNG carrier	Volume of the cargo on discharge
Gas carrier	Mass of the cargo on board
Bulk carrier	Mass of the cargo on board
General cargo ship	Deadweight carried*
Refrigerated cargo ship	Mass of the cargo on board
Vehicle carrier	Mass of the cargo on board (actual, cargo units or lane meters x default values)
Combination carrier	Mass of the cargo on board
Ro-pax ship	Number of passengers and Mass of the cargo on board
Container/ro-ro	Volume of the cargo on board
Passenger ship	Number of passengers
Ro-ro ship	Number of cargo units or lane meters multiplied by default values of their weight
Container ship	Total weight of the cargo or the amount of TEU x default values
Other ship type	Mass of the cargo on board or Deadweight carried*

* Deadweight carried = displacement × water density – lightweight – fuel onboard at the departure of laden voyage

- From 2019, by 30 April of each year, company will be required to submit Emission Report which has been verified as satisfactory by verifier to EC and flag state.
- For the purpose of submitting the emission report, companies shall use the electronic version of the template available in the THETIS MRV automated Union information system operated by EMSA ('THETIS MRV').



Structure of Emission Report

- Identification of the ship
- Identification of the company
- Identification of the verifier that assessed emission report
- Information on the monitoring method used and related level of uncertainty
- Results from annual monitoring of the parameters

Scope of verification activities

- Assess the conformity of the Monitoring Plan
- Verify the conformity of the Emission Report
- Ensure that emissions and other relevant data have been determined in accordance with the Monitoring Plan
 - In particular, assess the reliability, credibility and accuracy of the monitoring systems by conducting:
 - ✓ Risk assessment
 - ✓ Site visits
- Upon satisfactory verification of the emission report, the verifier will then issue the verification report and DOC (Document of Compliance)



Obligations and principle for verifiers

- Independence and impartiality
- Accredited by National Accreditation Body (NAB) in accordance with Regulation (EC) No 765/2008

MRV - Verification procedures

- Detailed verification requirements is stipulated in the 'Delegated Acts'.
- The elements of verification for EU MRV are based on existing GHG verification system, 'ISO 14064/65'.
- Verification is to a level of **reasonable assurance** and with the **materiality level [5%]** to be agreed as a delegated act.
- * The reported value is to be within 5% deviation from the true value.

Note: In the case of ships that have failed to comply with the requirements for two or more consecutive reporting periods, the port authority of the EU Member State may issue an expulsion order.

(Verification process under ISO 14064-1)





- Verifier will conduct site visits at the time of:
 - Assessment of monitoring plan
 - Verification of emission report
- Location of site visit (office vs. ship)
 - Location is determined on the basis of the results of the **risk assessment**, taking into consideration the place:
 - where **critical mass of relevant data is kept**, and
 - where **data-flow activities are carried out**
- Site visits may be **waived** when one of below conditions is fulfilled:
 - Verifier has sufficient understanding of the ship's monitoring and reporting system operated by the company
 - The nature and level of complexity of the ship's monitoring and reporting system are limited
 - All information can be obtained remotely
 - ClassNK wants to limit the burden for shipping companies to a minimum possible in compliance w/regulation



- By 30 June each year, the Commission will make publicly available the information on CO₂ emissions reported, including the following information.
 - Identification of the ship
 - EEDI or EIV (Estimated Index Value), where applicable
 - Annual CO₂ emissions
 - Annual total fuel consumption
 - Annual average fuel consumption and CO₂ emissions per distance travelled
 - Annual average fuel consumption and CO₂ emissions per distance travelled and cargo carried
 - Annual total time spent at sea in voyages
 - The method applied for monitoring
 - The date of issue and the expiry date of the Document of Compliance
 - Identification of the verifier that assessed the emission report
 - Any other information monitored and reported on a voluntary basis
- The Commission will publish an annual report on CO₂ emissions and other relevant information from maritime transport, including aggregated and analyzed results, per size, type of ships, activity, or any other category deemed relevant.

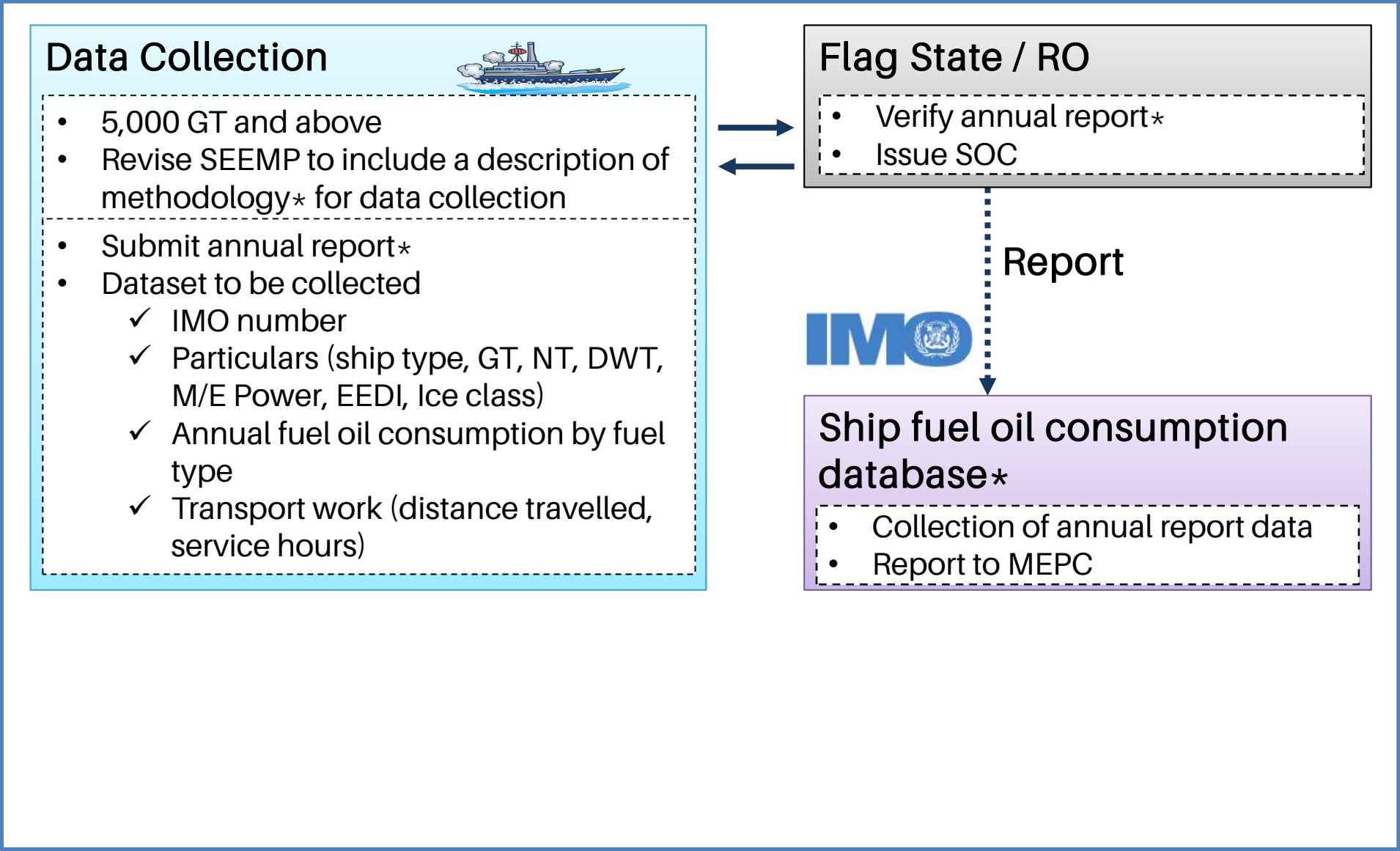
EU MRV - International cooperation

In the event that an international agreement on global MRV is reached, if appropriate, there will be an adjustment of the EU MRV regulation in accordance with the review clause (Article 22).

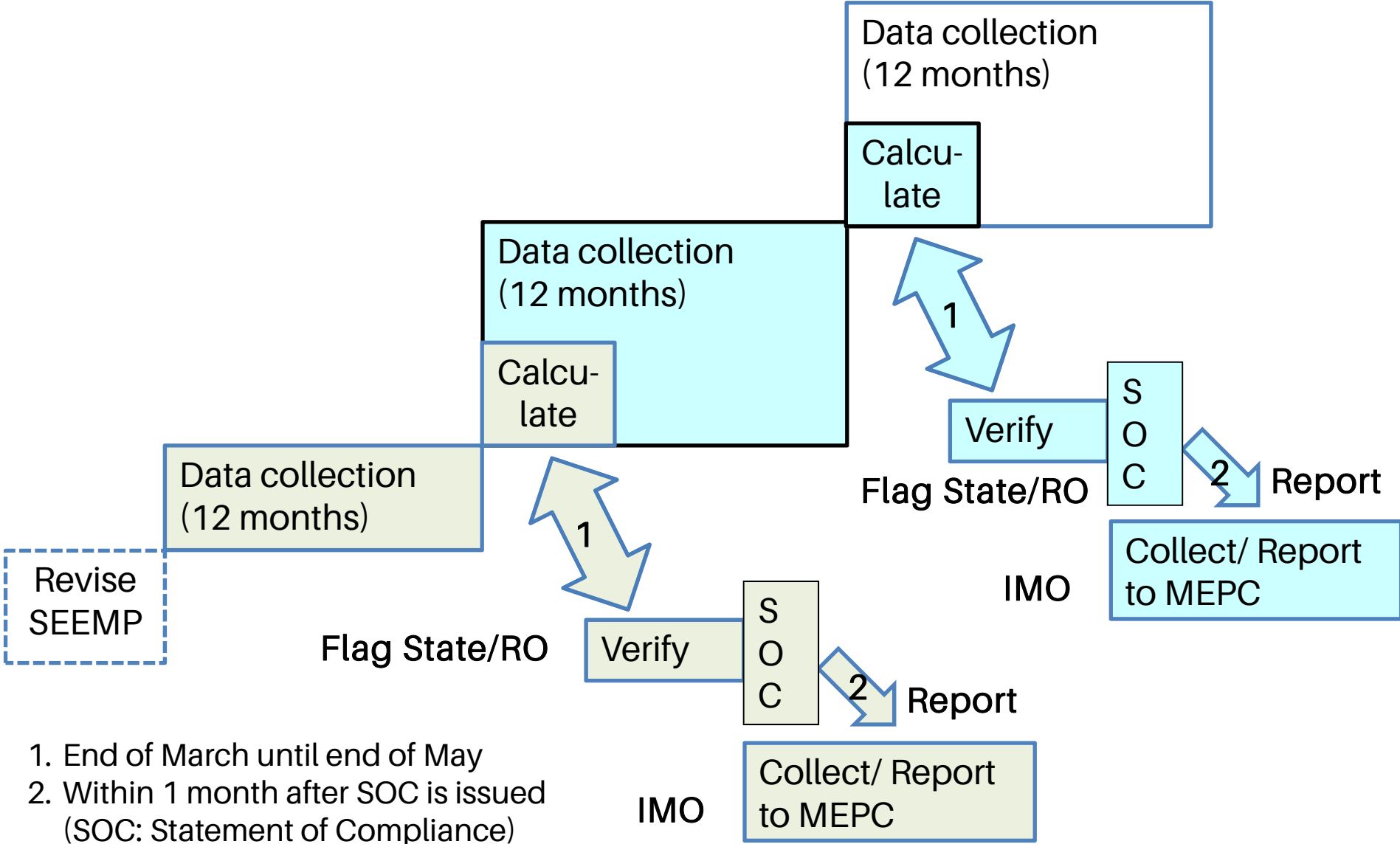
	2015	2016	2017	2018	2019	2020
EU 	Adoption April Entry into force July		Submission of MP By August	Start monitoring		
IMO 	Draft amendments (MARPOL Annex VI) Approval MEPC68 May IEE-WG1 Sep.	Amendments to MARPOL Annex VI Adoption MEPC69 April	MEPC70 October	MEPC71 June Entry into force 1 March	Start data collection MEPC72 Feb. MEPC73 October MEPC74 June	

- IMO is in the process of developing its global MRV Data Collection System for fuel oil consumption of ships, to address CO₂ emissions from international shipping.

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IMO Data Collection System



1. End of March until end of May
2. Within 1 month after SOC is issued (SOC: Statement of Compliance)

Diff. between EU MRV, IMO-DCS

	EU MRV	IMO-DCS
Monitoring Plan	Monitoring Plan (template)	SEEMP
Data range for monitoring	Per-voyage	Not specified
Data of cargo carried	Actual amount of cargo	Deadweight (design)
Verification	Robust verification procedures based on ISO 14064	Practical verification procedures considering the administrative burden (under discussion)
Verifier	Verifier accredited by European national accreditation bodies	Administration or RO
Centralized database	'THETIS MRV' operated by EMSA	Ship fuel oil consumption database managed by IMO
Publication	Annual reporting data including the individual ship information will be made available to the public	Anonymized data will be made available to IMO Member States

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Definition of 'company'

In the EU MRV, the company has a legal responsibilities...

Definition of the 'company' in the EU MRV regulation (Article 3)

'company' means the shipowner or any other organisation or person, such as the manager or the bareboat charterer, which has assumed the responsibility for the operation of the ship from the shipowner.

Duties for the company under EU MRV:

- ✓ Management of the official logbook and oil record book
- ✓ Retention of the management procedures for fuel oil bunkering
- ✓ Management of the record for operational data of the ship
- ✓ Management of the list of emission sources
- ✓ Management of the measuring and recording procedures for the amount, temperature and density of fuel oil on board
- ✓ Retention of the bunker delivery note
- ✓ Retention of the documents for cargo carried
- ✓ Management of the flow meters +++



- 'Ship management companies' are usually addressing almost the above procedures.
- Therefore, the involvement of 'ship management companies' is necessary for the completion of EU MRV verification.

Challenge: Activity

Currently actions undertaken by the company/crew

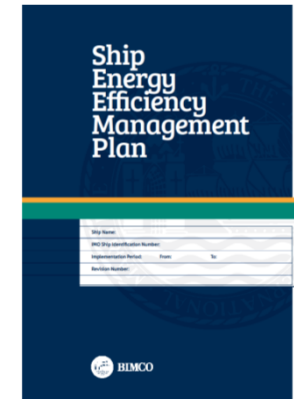
- SEEMP
- Noon report / Abstract Log
- Ship performance monitoring and analysis for fuel saving
- Energy Management System (ISO50001) +++



<http://www.monohakobi.com/>

Difference between current procedures and MRV regulation

- Data accuracy - reporting data needs to be robust enough to meet a reasonable level of assurance verification
- Data transparency - monitoring data needs to record, compile and aggregate in a transparent manner for verification



(Source: BIMCO)

Control activities is required to enhance the data accuracy and its procedure should be covered in the monitoring plan:

- ✓ Quality assurance of the measuring equipment and the IT system
- ✓ Internal reviews and validation of data
- ✓ Control of outsourced activities (if applicable)
- ✓ Documentation



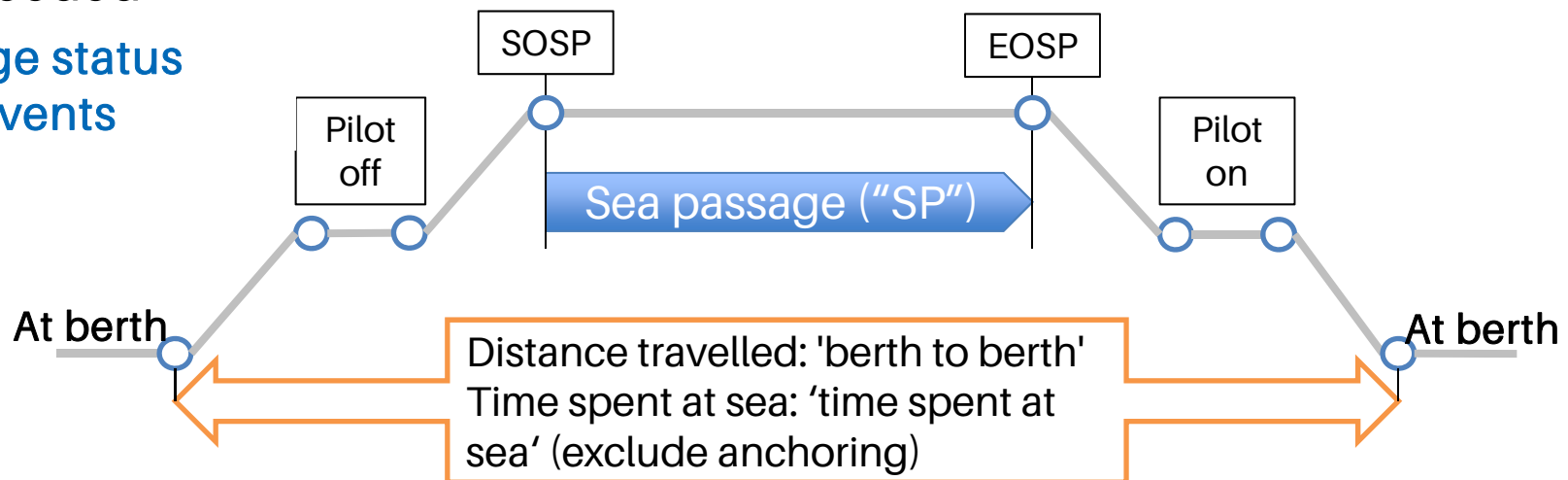
Challenge: Voyage data collection

Accurate monitoring and reporting the relevant data on a per-voyage basis will be required in accordance with the definitions and requirements of EU MRV.

For instance:

- ✓ Sorting the voyages into EU-related for aggregating the data
- ✓ Distance travelled from 'berth to berth' needs to be monitored
- ✓ Fuel consumed during berth or anchoring needs to be measured and recorded separately from those in the voyage
- ✓ At fuel consumption measurement, the conversion of the amount from volume to mass by using actual temperature and density values is needed

Voyage status and events



Challenge: Data gap

Procedure to treat the **data gap** - Company will be requested to determine the method to be used to estimate fuel consumption and other parameters when data is missing, and it should be outlined in the Monitoring Plan.



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

<For example>

Fuel consumption

- ✓ Back-up monitoring method should be applied; or
- ✓ Standard estimation method to fill the gaps should be developed by using the specification of engines, etc. (in a conservative manner)

Other parameters (distance travelled, time spent at sea and cargo carried)

- ✓ Standard estimation method to fill the gaps should be developed by using the secondary data, etc.

Note: Best practice and guidance documents for gap filling approach will be developed by EC at a later stage

Company will be required to control and keep the relevant documents for verification
(→ it is related to the location of site visits)

- ✓ copies of logbook
- ✓ copies of oil record book
- ✓ copies of bunkering documents (BDN)
- ✓ copies of documents containing information about the amount of cargo carried (e.g. Bill of Lading)

Bunker Delivery Note

Australian Government
Australian Maritime Safety Authority

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Port:

Date of commencement of delivery:

Name, address and telephone number of marine fuel oil supplier:

Product name(s)	Quantity (metric tons)	Density at 15°C (kg/m ³) Fuel oil should be tested in accordance with ISO 3675	Supplier content (% net) Fuel oil should be tested in accordance with ISO 8754

BILL OF LADING - SHORT FORM

Bill of Lading Number

SHIP FROM [Name] [Street Address] [City, ST ZIP Code] SID No.:

Carrier [Name]

Information to be provided for verification

*	Document	In advance	During verification		
			Provided	Provided upon request	Provided upon request for a sample of voyages
R	List of voyages carried out by the ship in question during the reporting period	✓			
R	Copy of the monitoring plan to be assessed by the verifier	✓			
R	Copy of the emission report from the previous year (if the verifier is different)	✓			
R	Copies of the official logbook and the oil record book (if separate)		✓		✓
R	Copies of bunkering documents		✓		✓
R	Copies of documents containing information about the number of passengers transported, amount of cargo carried, distance travelled and time spent at sea for the ship's voyage during the reporting period		✓		✓
A	Overview of IT landscape showing the data-flow			✓	
A	Evidence of the maintenance and accuracy/uncertainty of measurement equipment/flow meters (e.g. calibration certificates)			✓	
A	Extract of fuel consumption activity data from flow meters			✓	✓
A	Copy of evidence of fuel tank meter readings			✓	✓
A	Extract of activity data from direct emission measurement systems			✓	✓
A	Any other information relevant to the verification			✓	

* R= Required, A= Required if applicable

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Experience

- Verification for Clean Shipping Index (CSI)
- Certification service on GHG (ISO 14064)
 - ✓ ClassNK conducts independent verification of Ino Marine Service's GHG emissions from the 50 or so vessels it manages and the office based on reasonable assurance

Activity

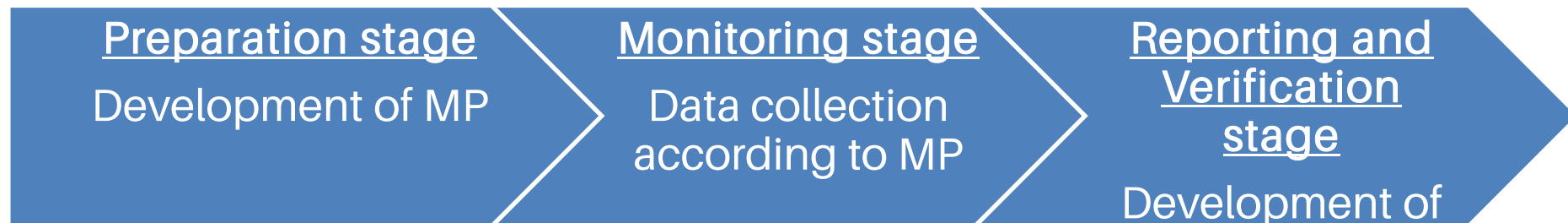
- ClassNK participates to the expert meetings on EU MRV formed in ESSF (European Sustainable Shipping Forum)
- ClassNK is working with NAB in EU towards the accreditation as a verifier
- Information service to the customer
 - ✓ Technical Information (TEC-1031* in June 2015)
 - ✓ Seminars (planning)

Approach

Through our involvement and extensive knowledge, ClassNK will provide a reasonable, practical and cost efficient MRV solution for the shipping industry in close cooperation w/MOVENA (Bremen/Shanghai/Busan)

* http://www.classnk.or.jp/hp/en/tech_info/tech_sear.aspx

Our solution for shipping companies



- ✓ Weather News Inc. (WNI), a voyage planning service provider, will provide a total support service to shipping companies in compliance with EU MRV, in addition to their current services
- ✓ ClassNK will develop a verification scheme for WNI's service



- ✓ ClassNK will provide a verification and certification service for EU MRV (Certification Service Planning Department (QPD) will act as role of verifier)
- ✓ ClassNK will provide software tool to facilitate the data handling and reporting for verification, as own service

Contact information

For further information or enquiries in regard to this subject, please check the websites CLASSNK.DE or IMO-DCS.COM or contact:

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