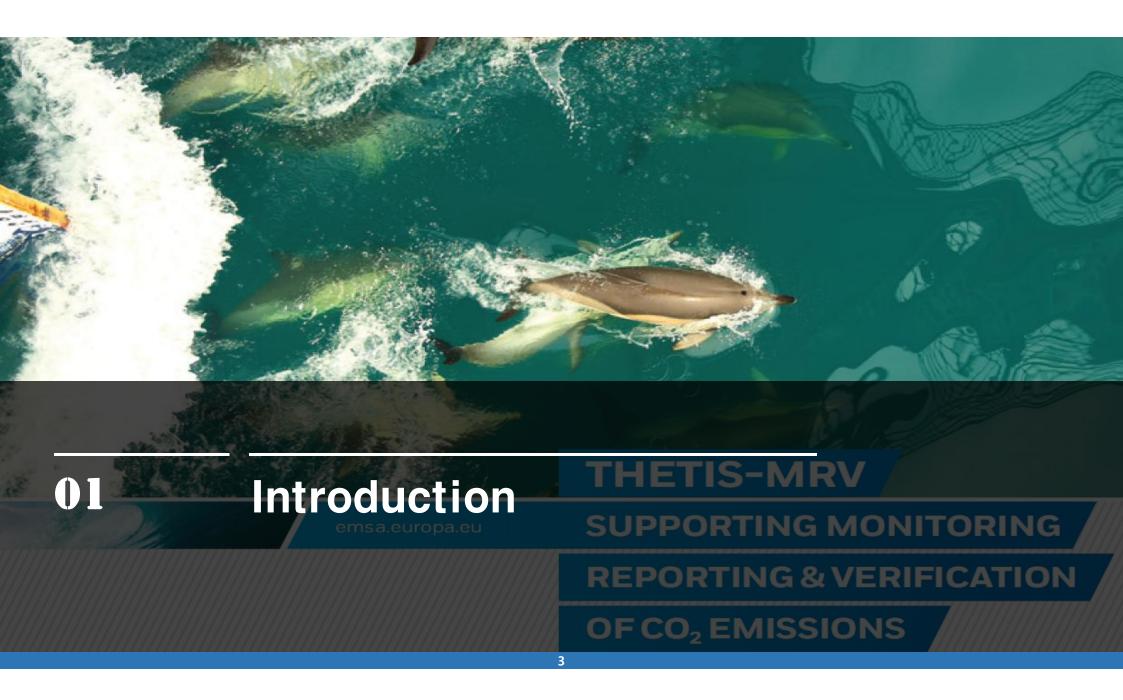




CONTENTS

- 1. Introduction
- 2. By Company Data Input
- 3. By Company Emission Report
- 4. By Verifier Misstatement or Non-conformity
- 5. By Company Corrective Actions
- 6. By Verifier Verification Report and Document of Compliance





Korean Register | Accredited Verifier

KR is the accredited EU MRV verifier for all scope of verification and monitoring methods

Verification Scope

- Assessment of Monitoring Plans
- Verification of Emissions Reports

> Monitoring Methods Scope

- Bunker fuel delivery note (BDN) and periodic stocktakes on board
- Bunker fuel tank monitoring on board
- Flow meters for applicable combustion process
- Direct CO2 emission measurement



Accredited by DAkkS (Germany Accreditation Body)



Deutsche Akkreditierungsstelle GmbH

Signatory to the Multilateral Agreements of EA, ILAC and IAF for Mutual Recognition

Accreditation

The Deutsche Akkreditierungsstelle GmbH attests that the verification body

KOREAN REGISTER of Shipping 36, Myeongji ocean city 9-ro, Gangseo-gu, Busan 46762 Republic of Korea

is competent under the terms of DIN EN ISO 14065:2013 for

Verification of Greenhouse Gases from Maritime Transport according to Art. 16 of EU-Regulation 2015/757 of the European Parliament and of the council of the 29th April 2015 on the monitoring, reporting and the verification of the carbon dioxide emissions from maritime transport and amending directive 2009/16/EC including Delegated Acts/Commission Implementing Regulations 2016/1927, 2016/1928, 2016/2071 and 2016/2072.

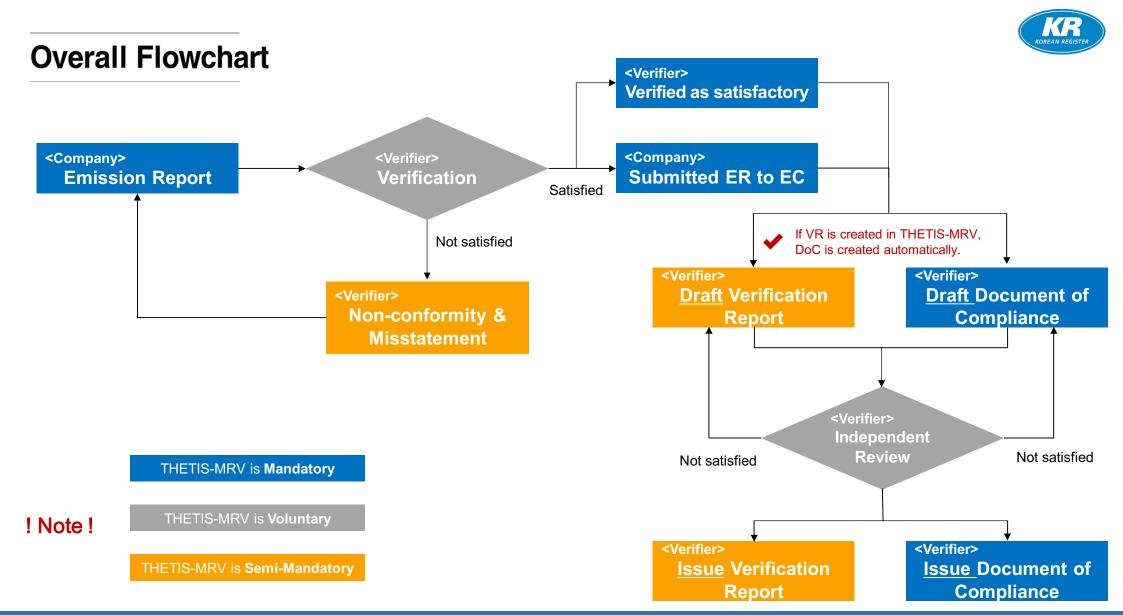
The accreditation certificate is valid until 01.05.2022. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 1 page.

Registration number of the certificate: D-VS-20824-01-00

Berlin, 02.05.2017

Sea notes overles

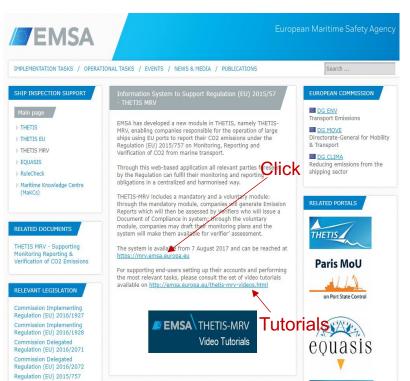
Ma Stubenrauch



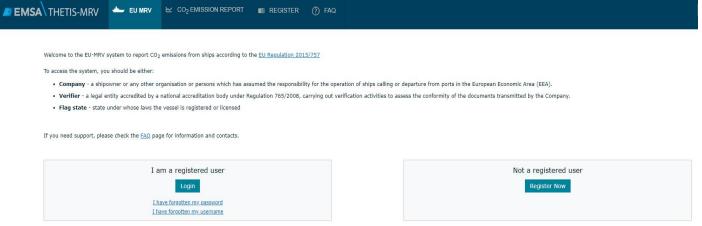


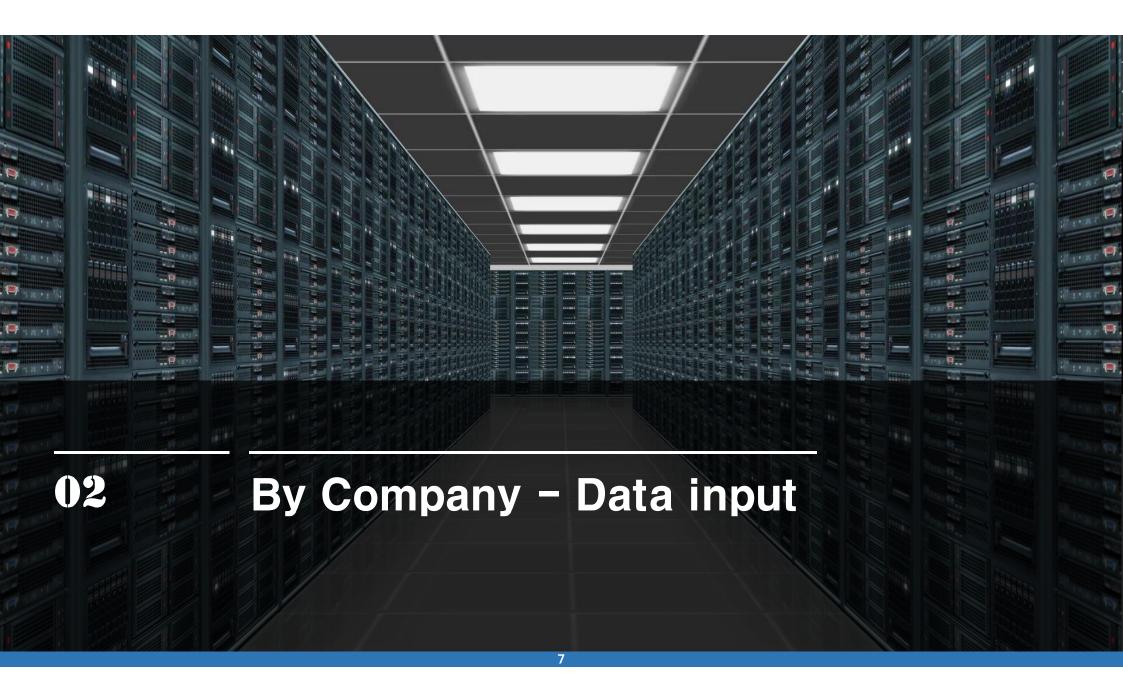
THETIS-MRV

http://emsa.europa.eu/ship-inspection-support/thetis-mrv.html



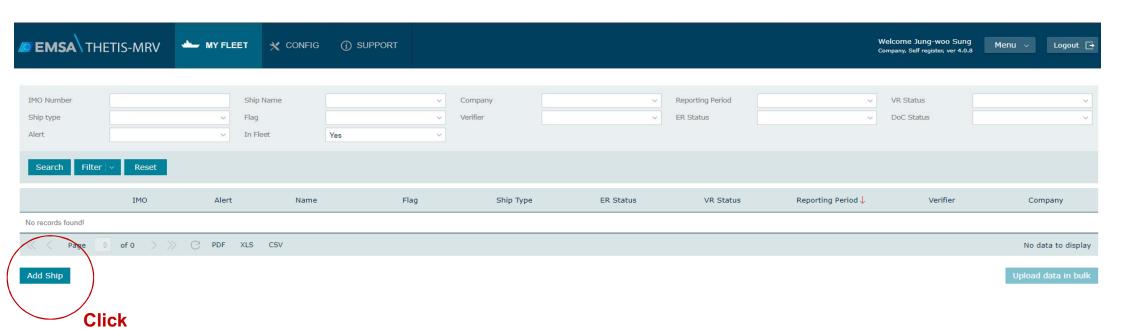
https://mrv.emsa.europa.eu/





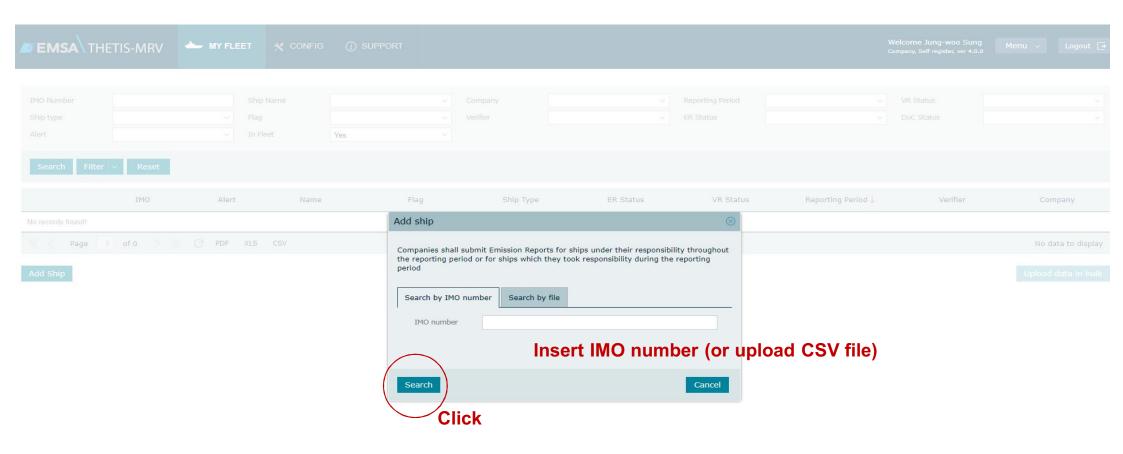


Registration



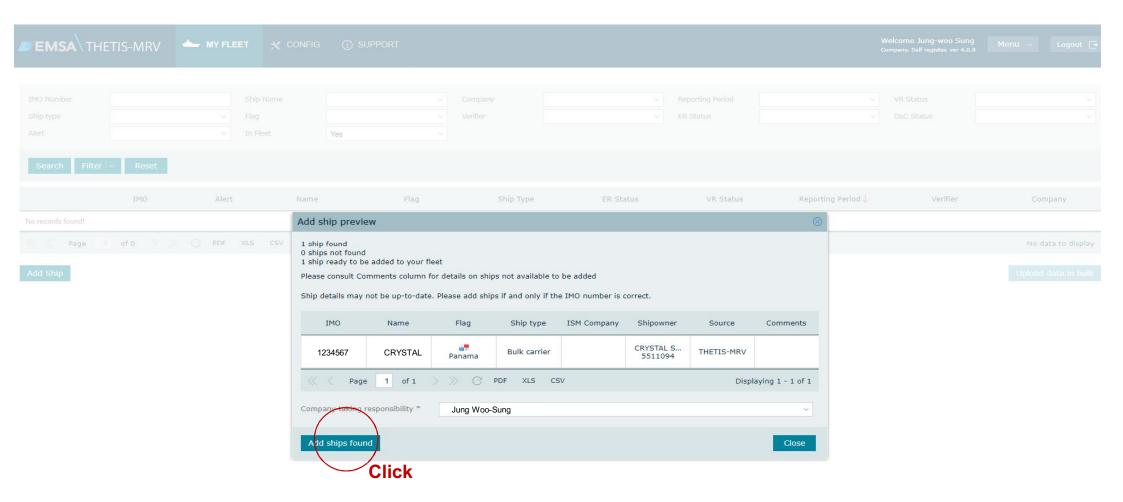


Registration





Registration



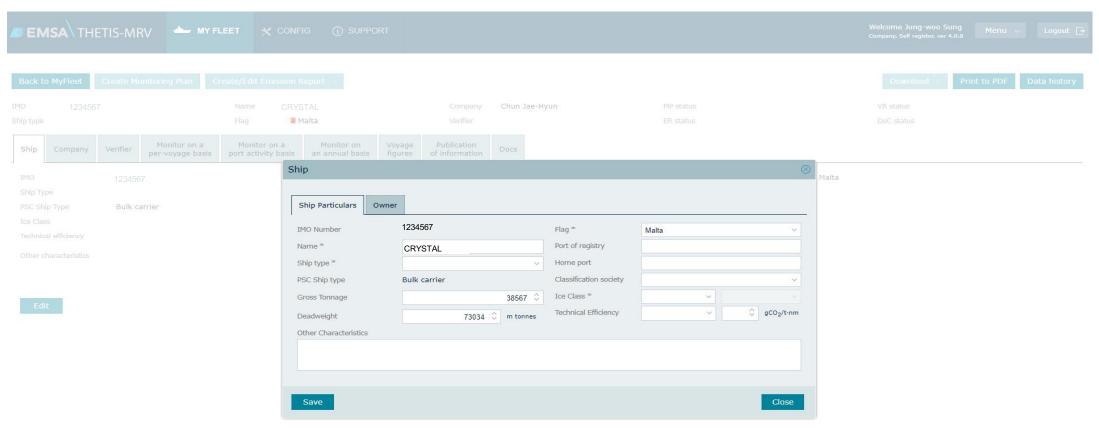






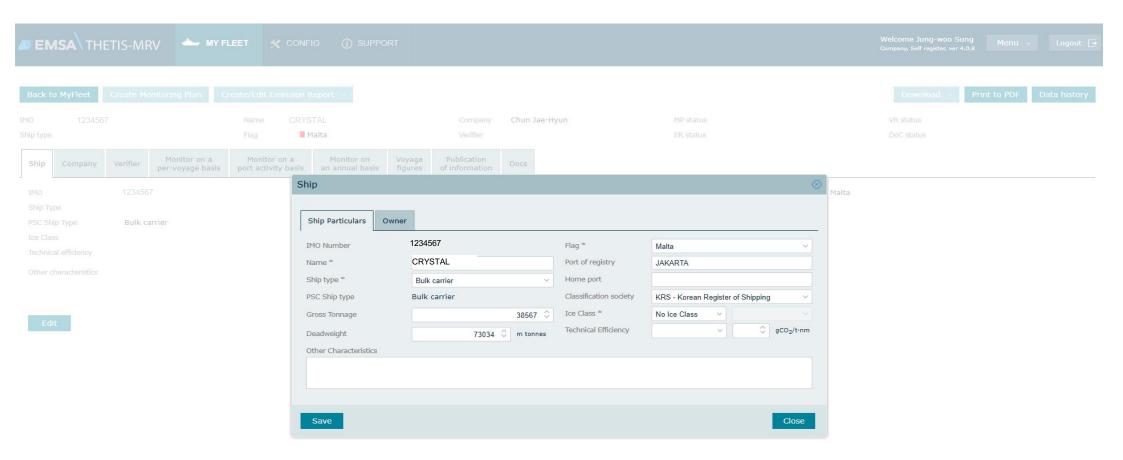




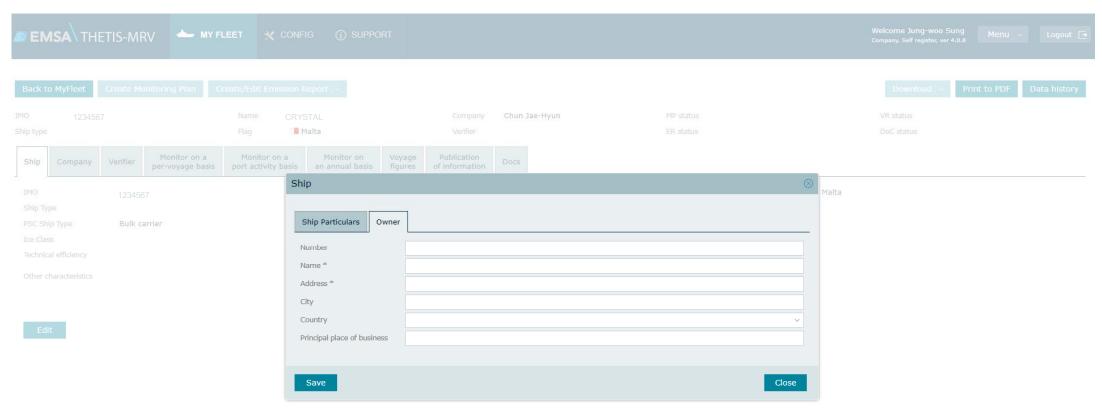


Insert ship's information



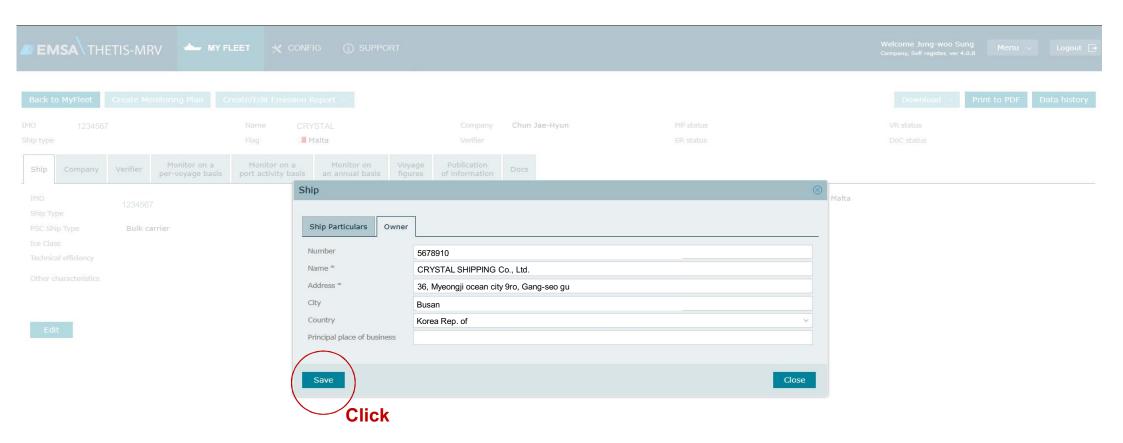






Insert owner's information









Edit



Company info

Edit



Confirm the company's information and edit it if necessary

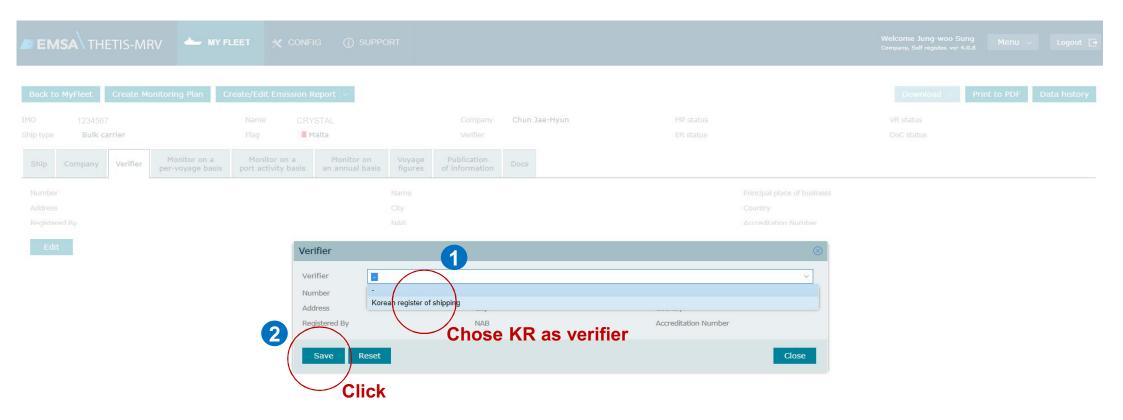


Verifier info





Verifier info



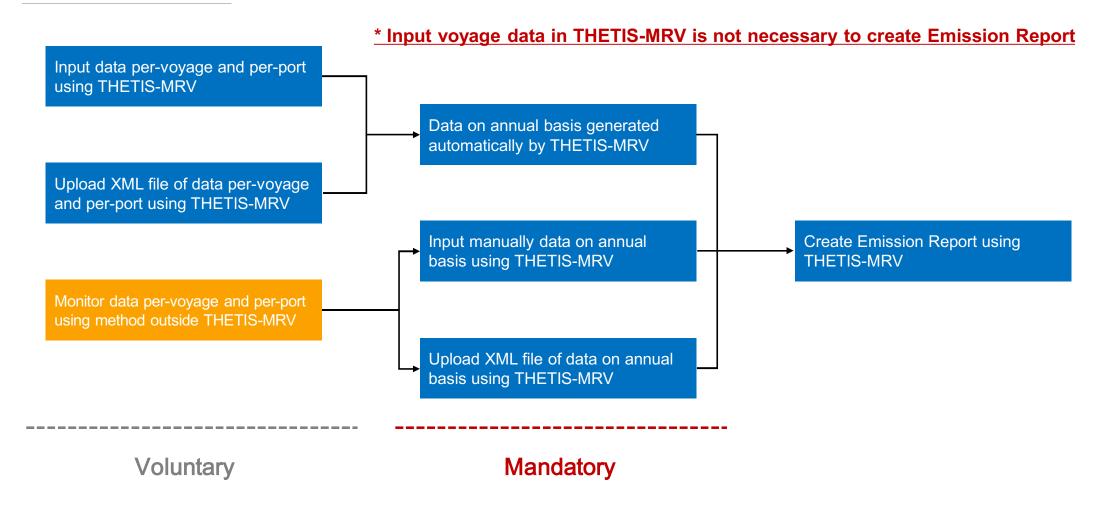


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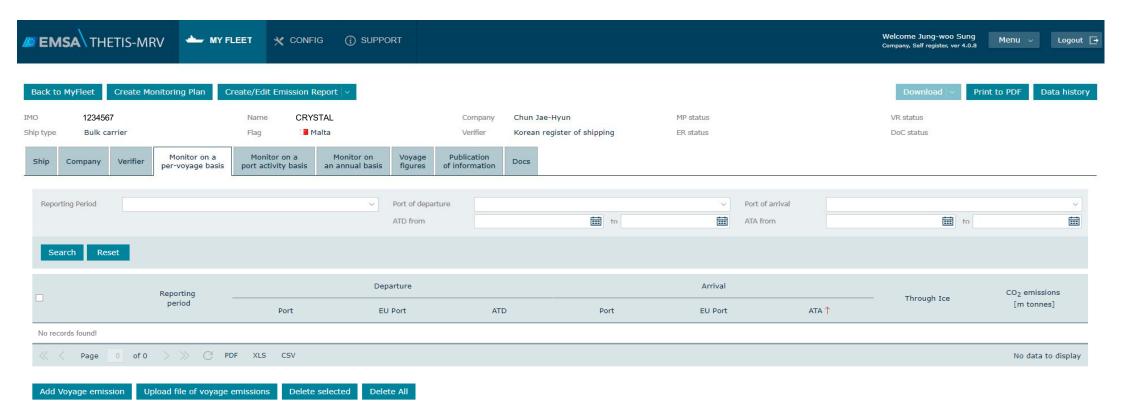


| Options of emission report



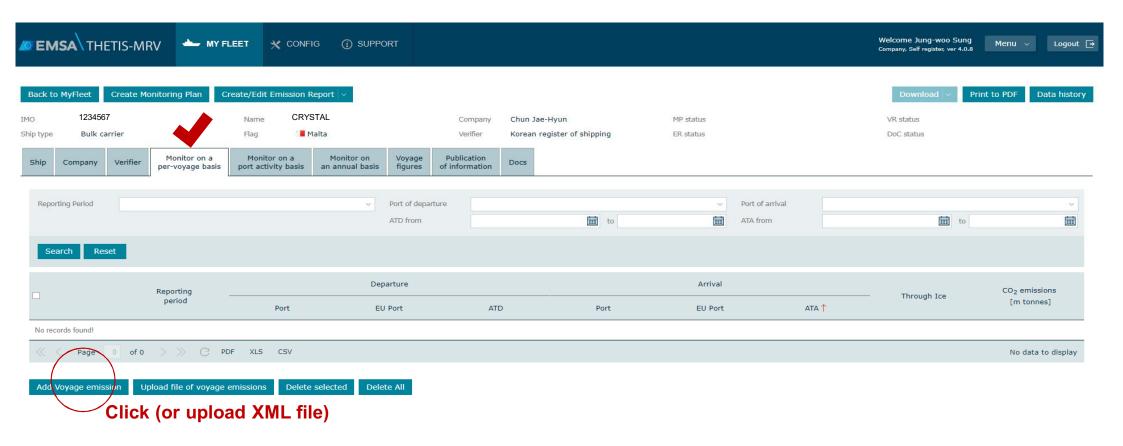


I On a per-voyage basis

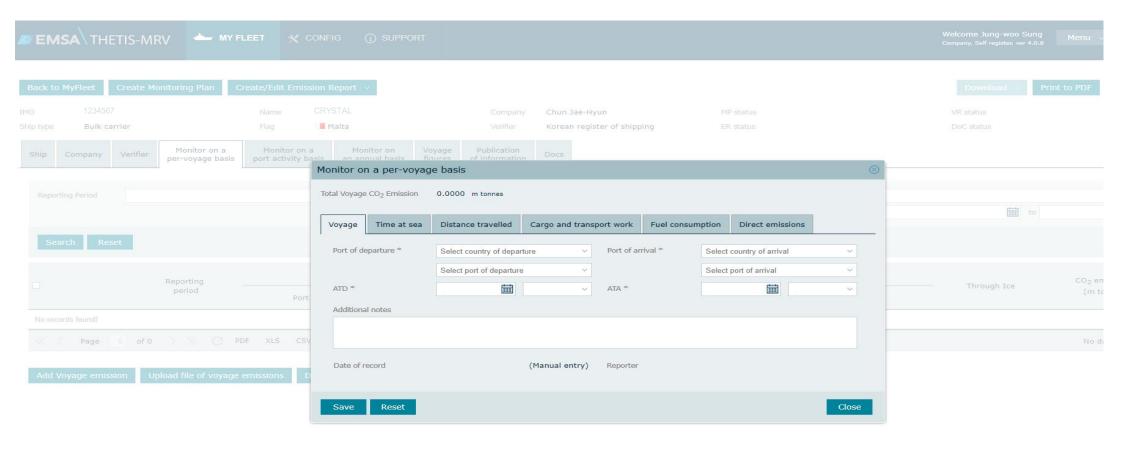


Creating "Monitor on a per-voyage basis" and "Monitor on a port activity basis" is voluntary, while "Monitor on an annual basis" is mandatory to create Emission Report.

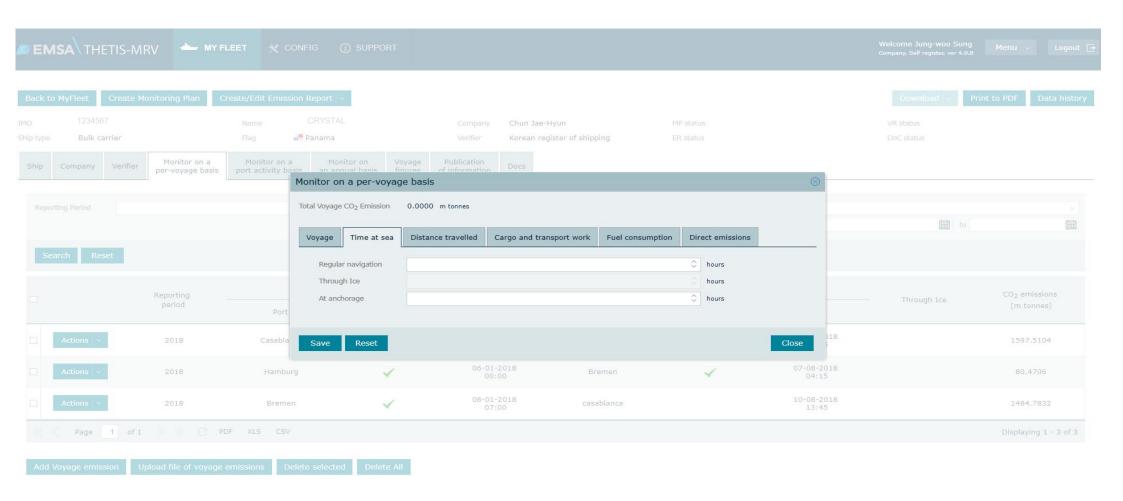




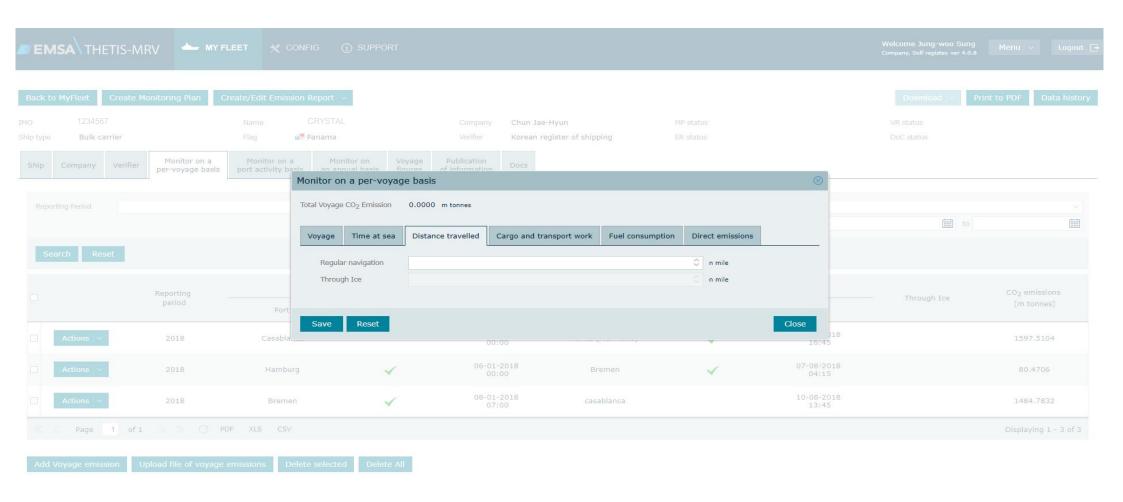




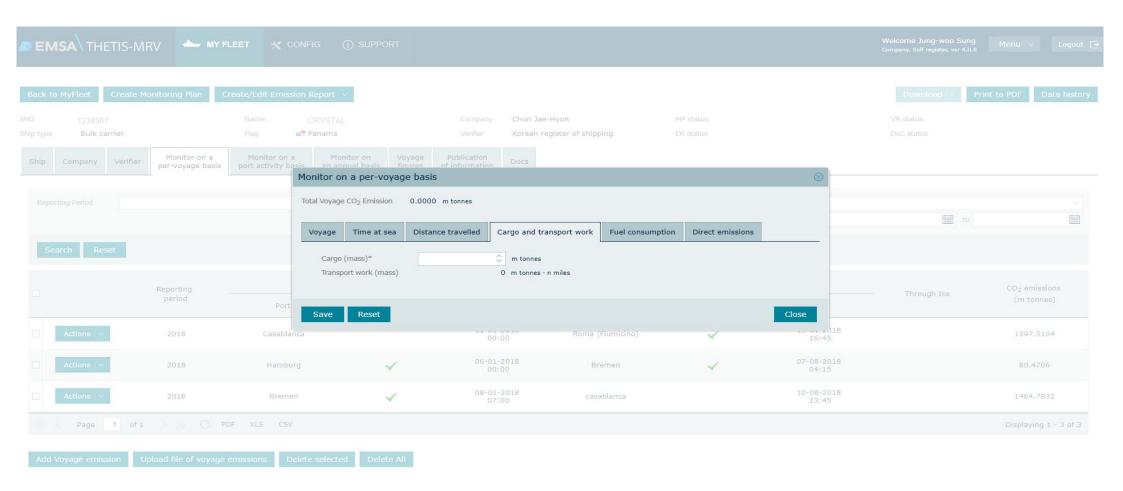




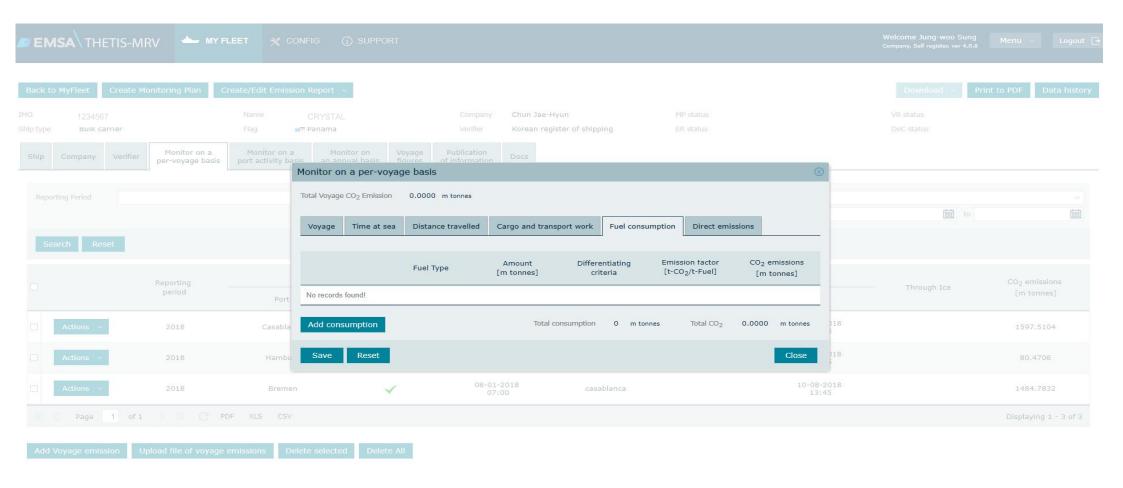




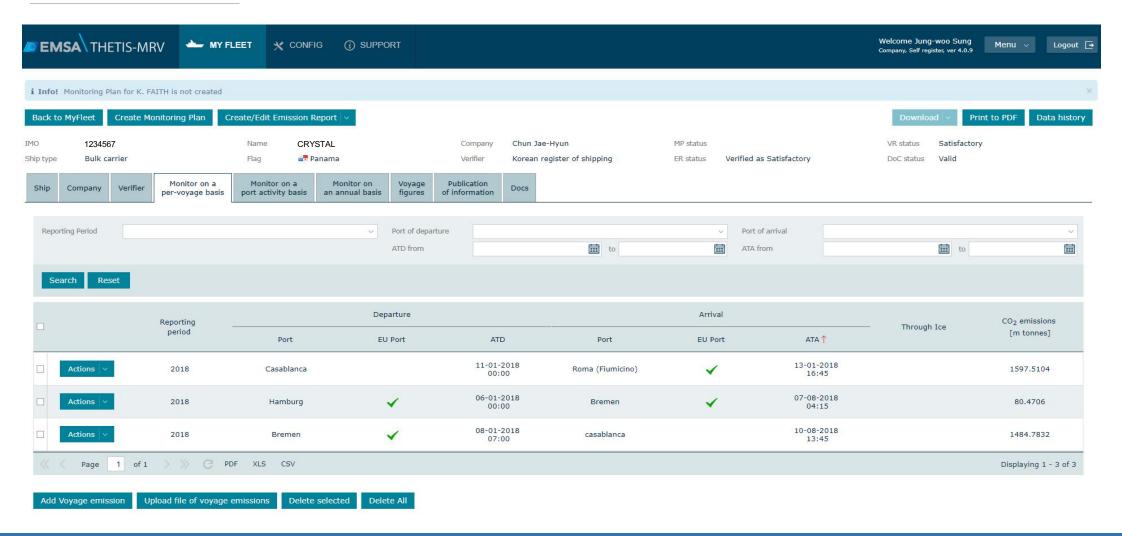




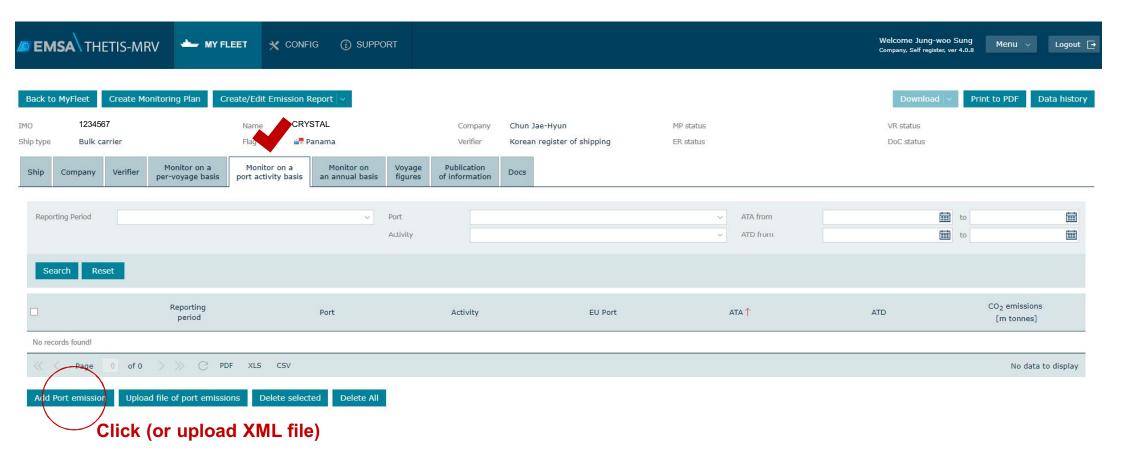




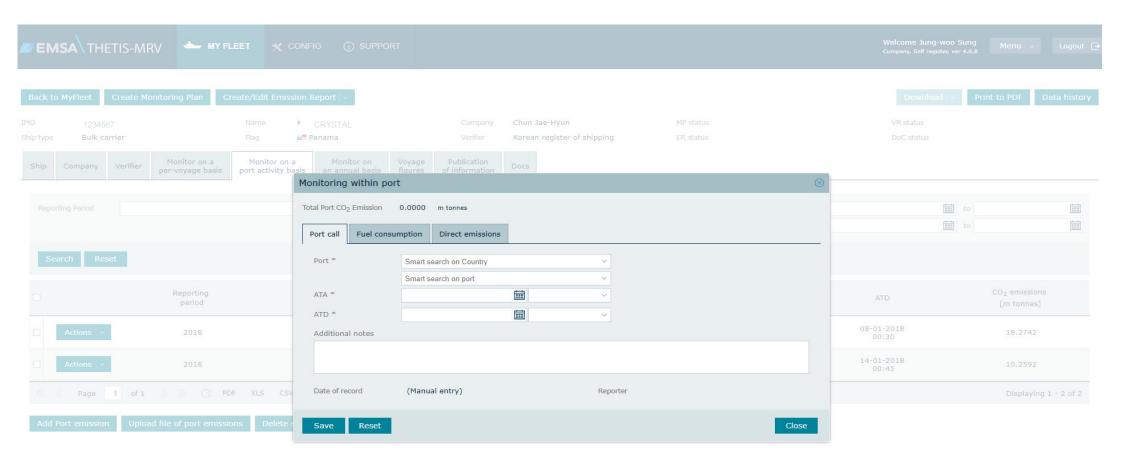




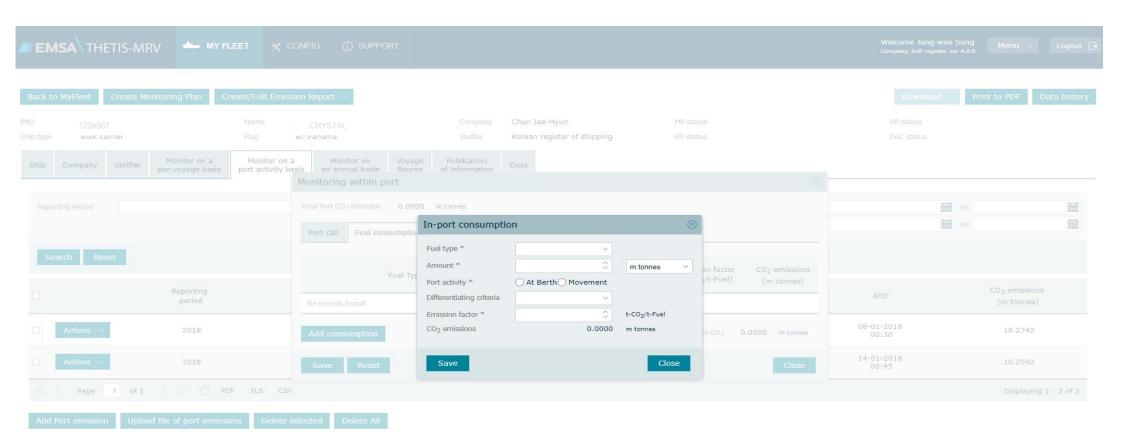




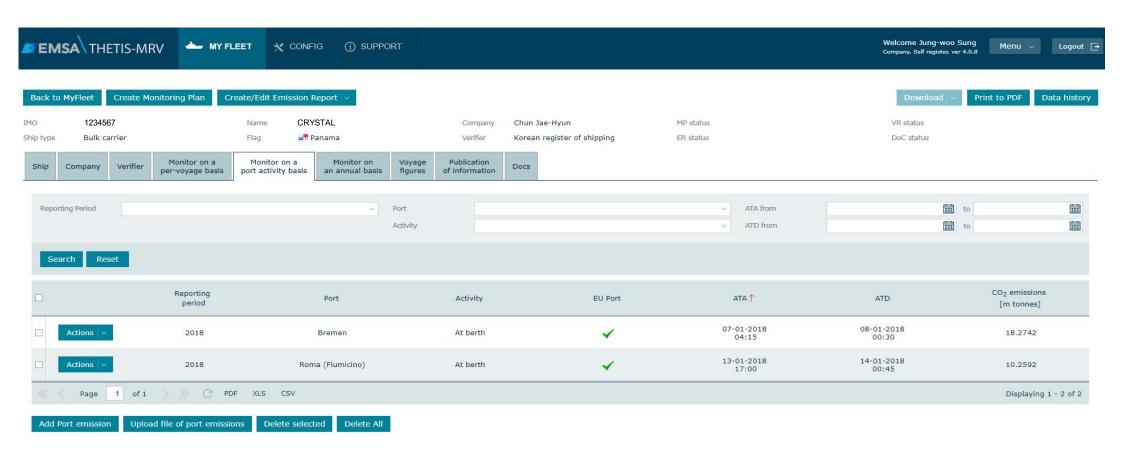






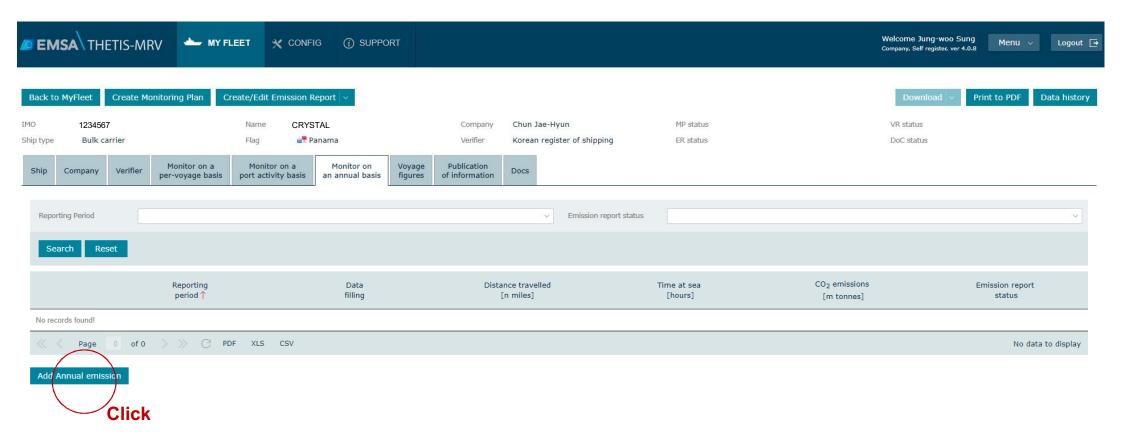








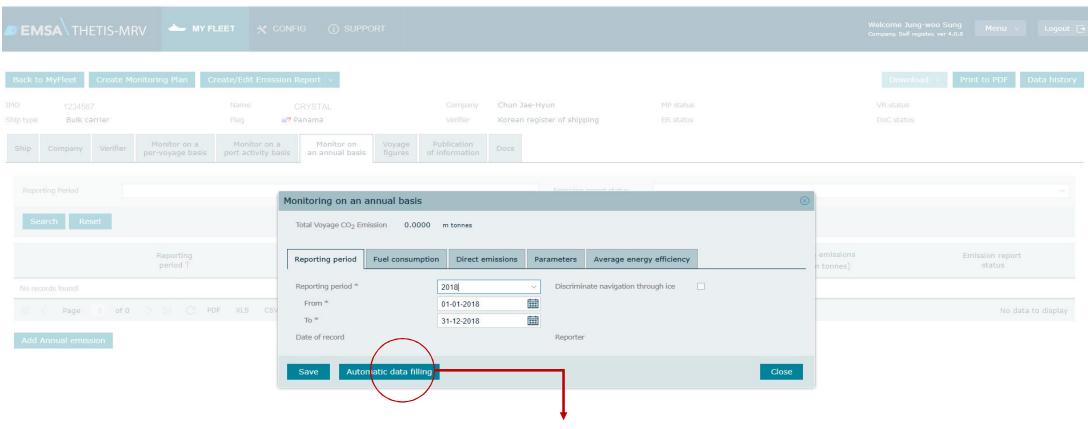
☐ On an annual basis





On an annual basis

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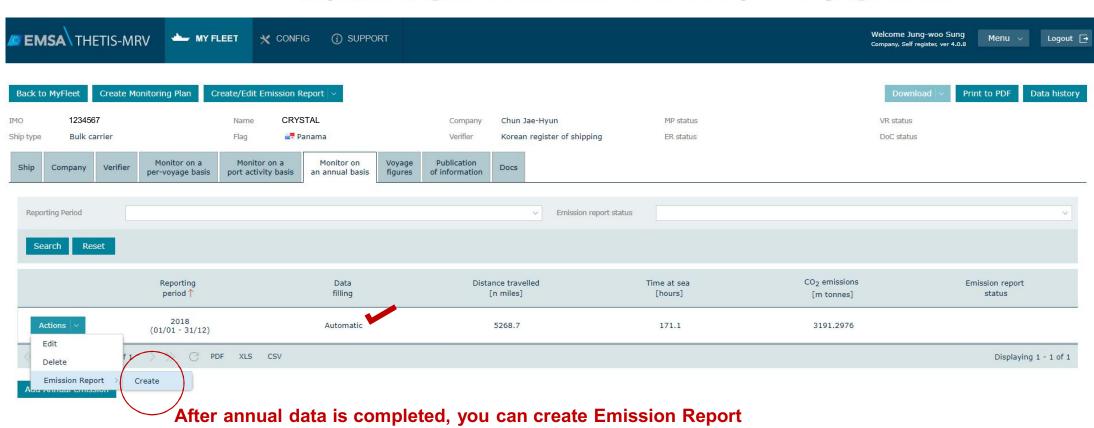


Generated automatically based on data on a per-voyage basis in THETIS-MRV



On an annual basis

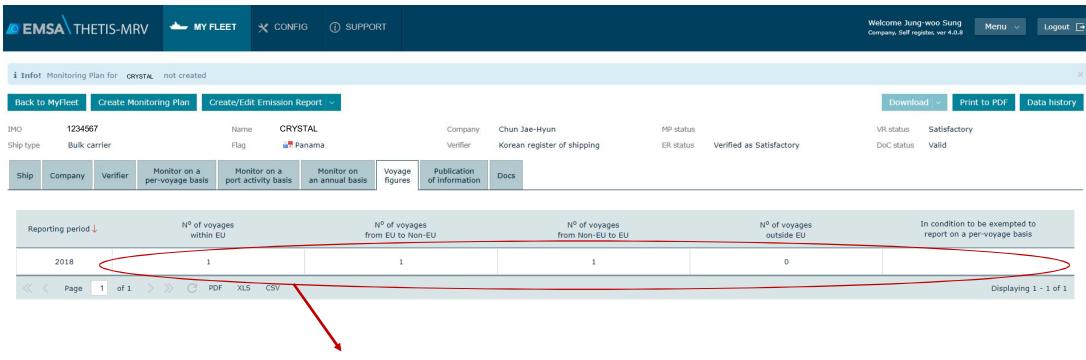
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On an annual basis

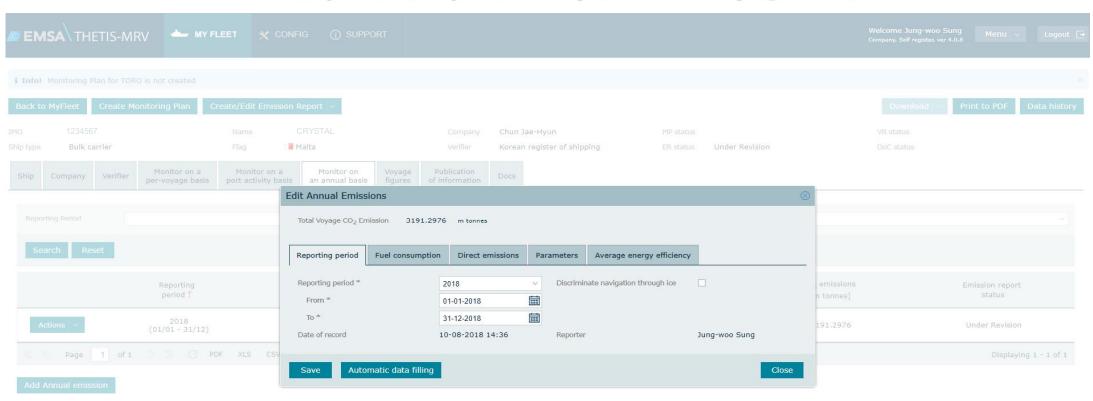
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This information of voyage is automatically shown only when input data of voyage basis in THETIS-MRV

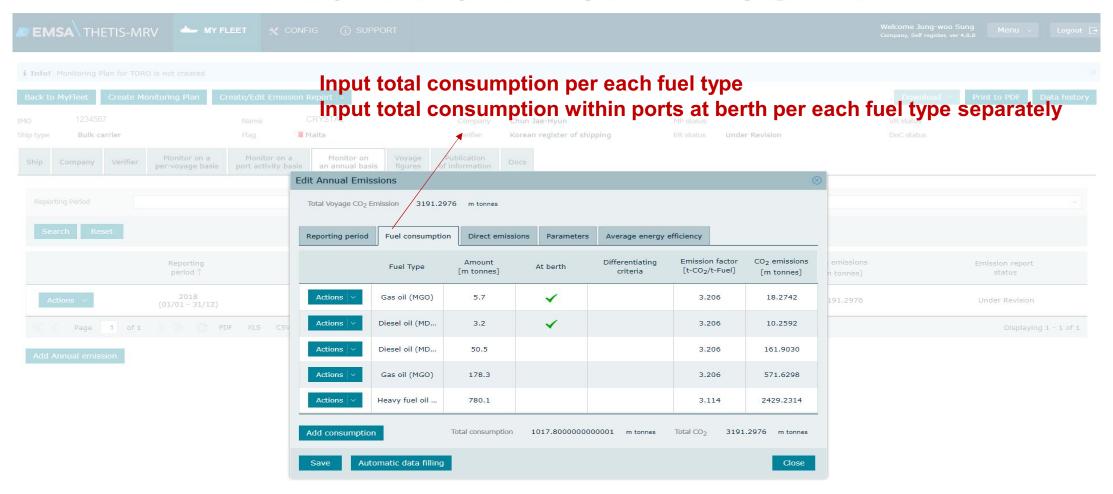


On an annual basis



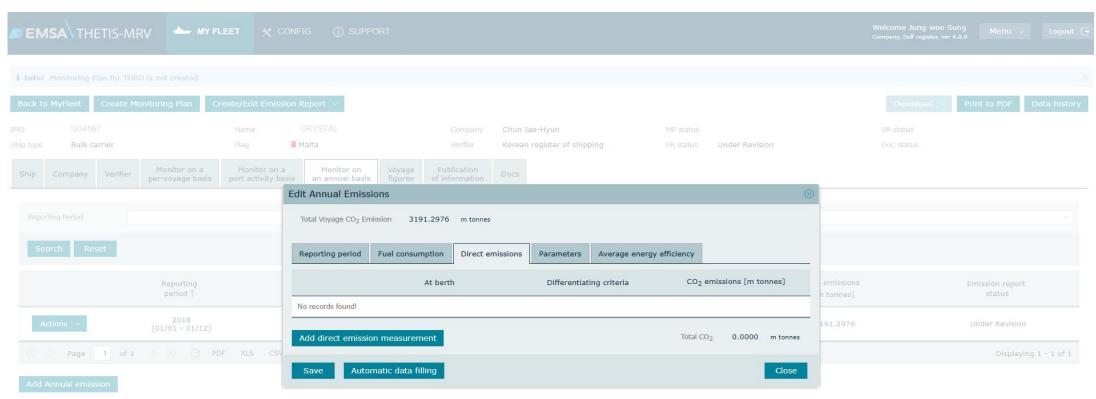


On an annual basis



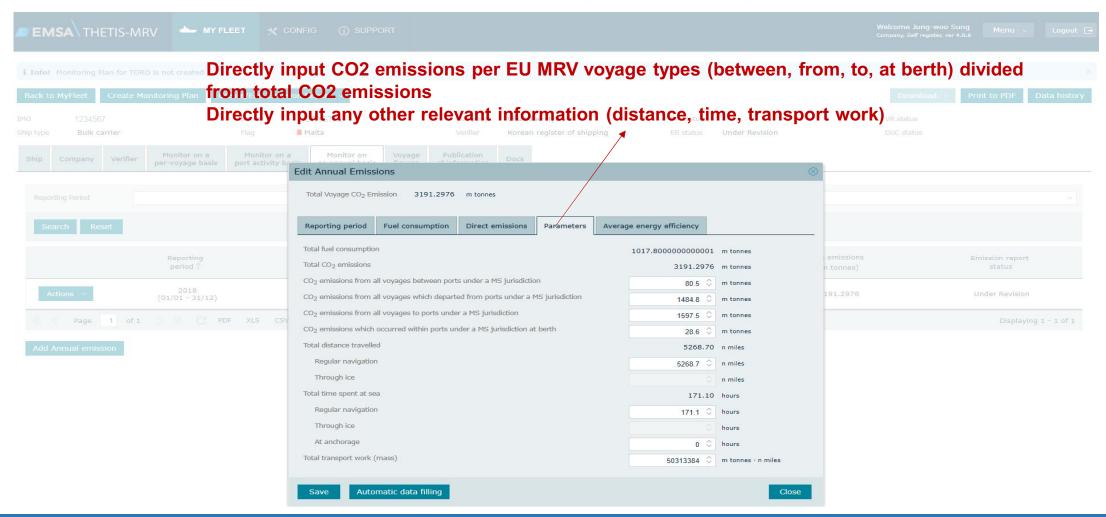


On an annual basis



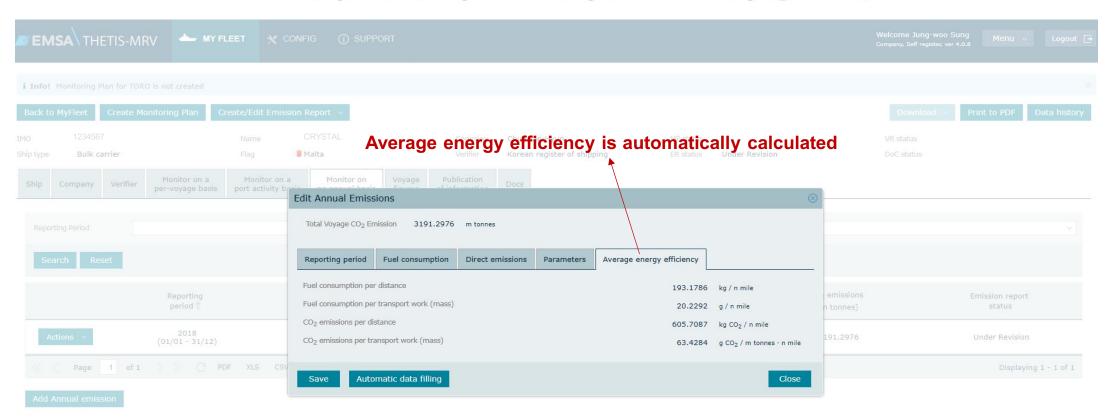


On an annual basis





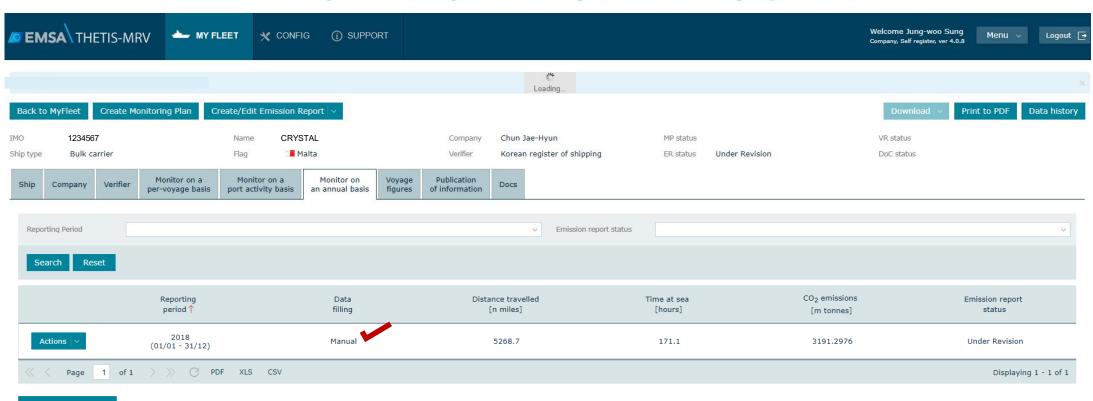
On an annual basis





On an annual basis

- (Option 2) input directly (without voyage data)



Add Annual emission

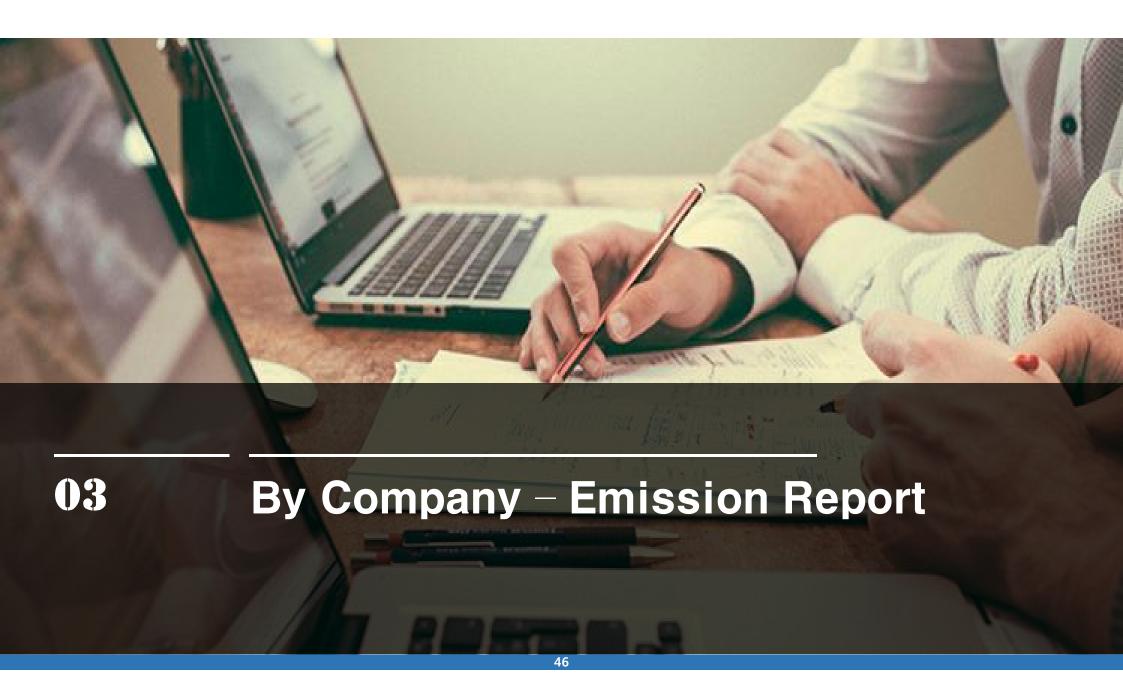


On an annual basis

- (Option 2) input directly (without voyage data)

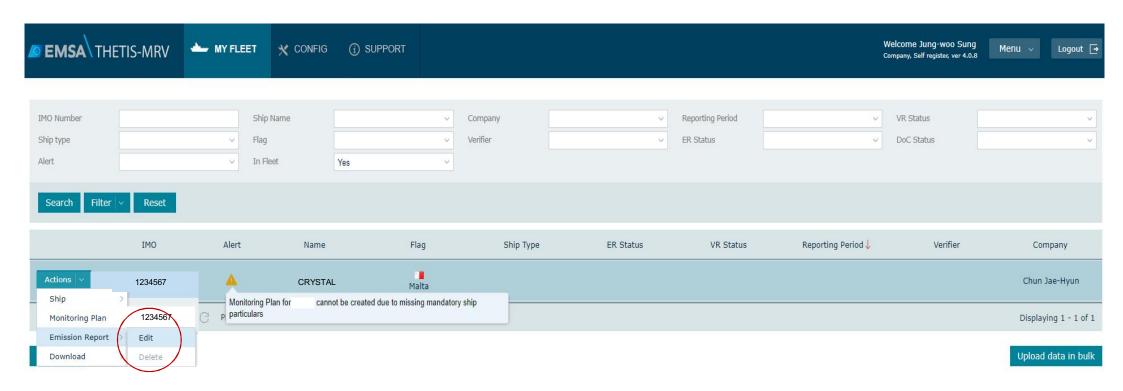


No information in voyage figures when input data of annual basis only





Emission Report





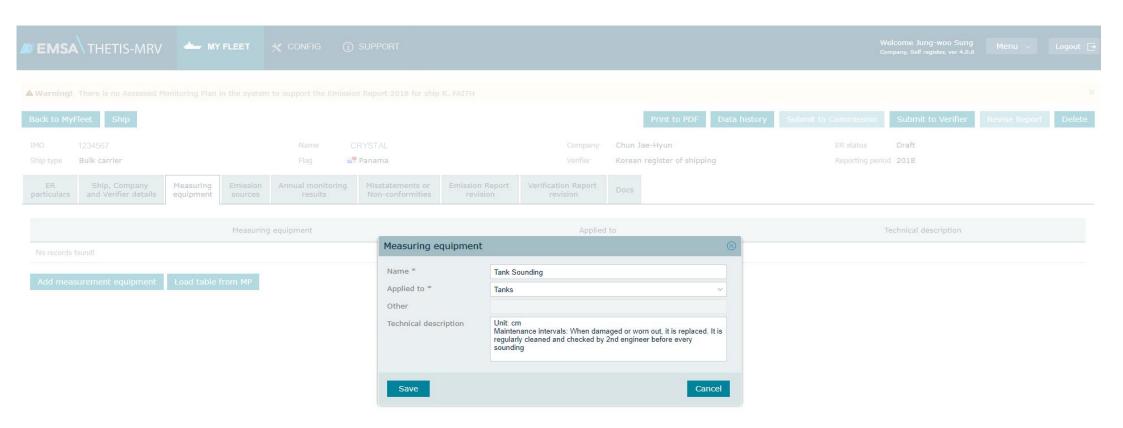
Emission Report



If MP is not created in THETIS-MRV, you need to input directly "Measuring equipment" and "Emission sources"

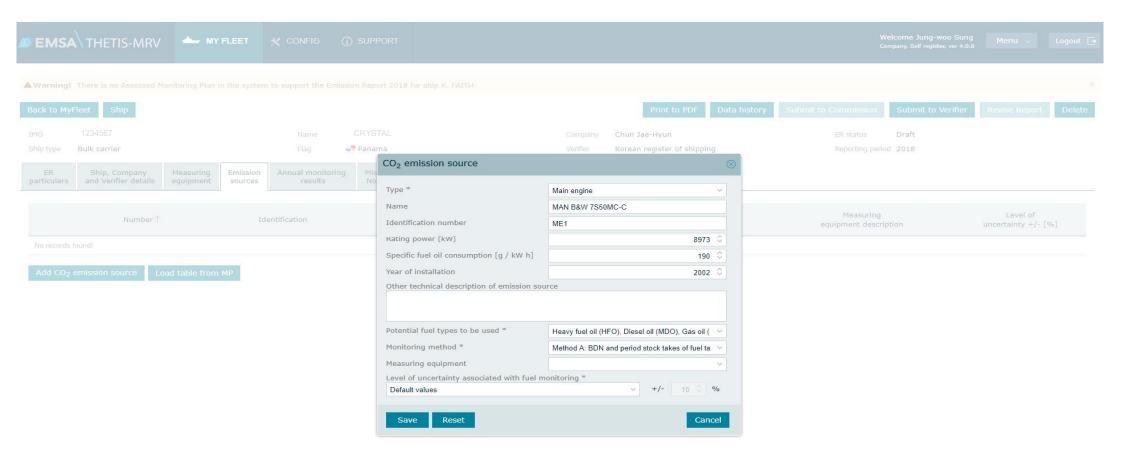


Emission Report | Measuring equipment



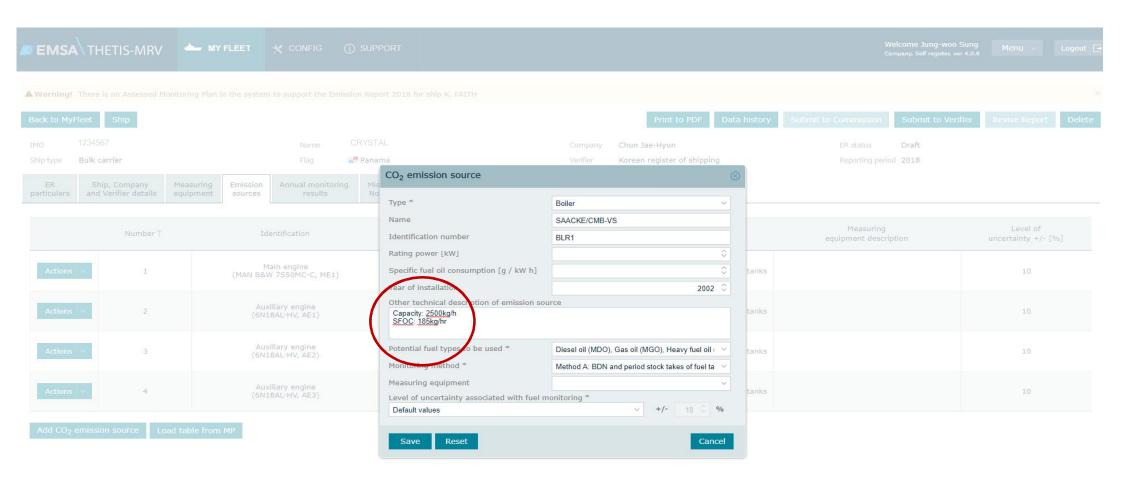


Emission Report | Emission source



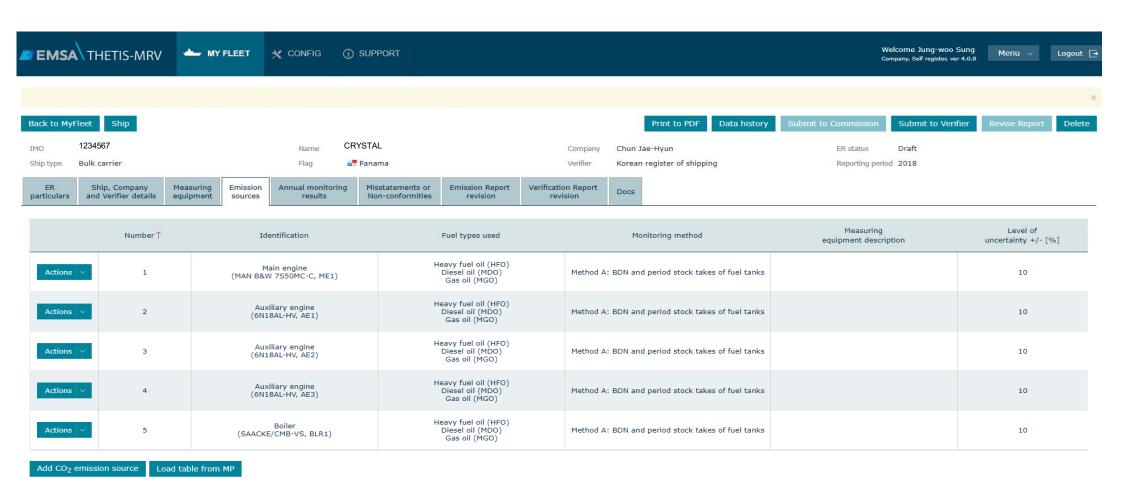


Emission Report | Emission source

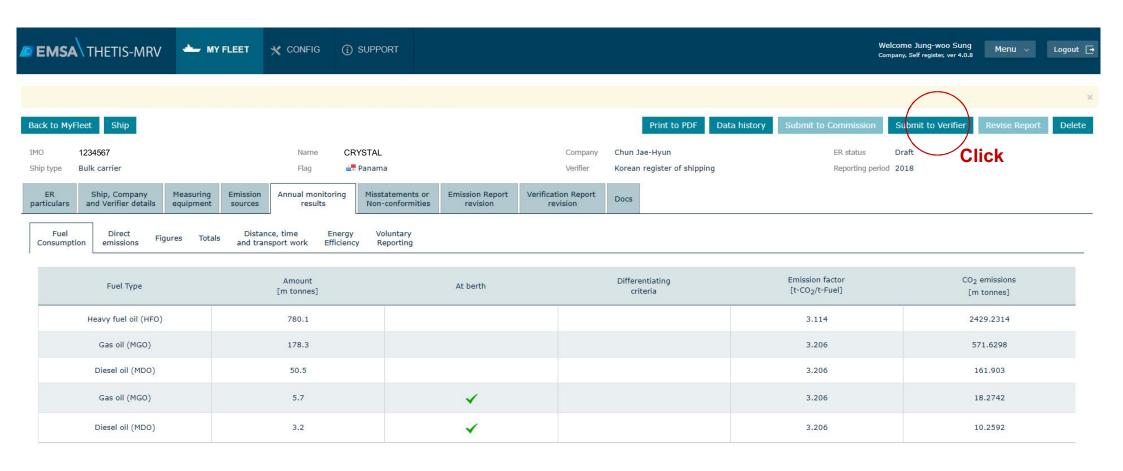




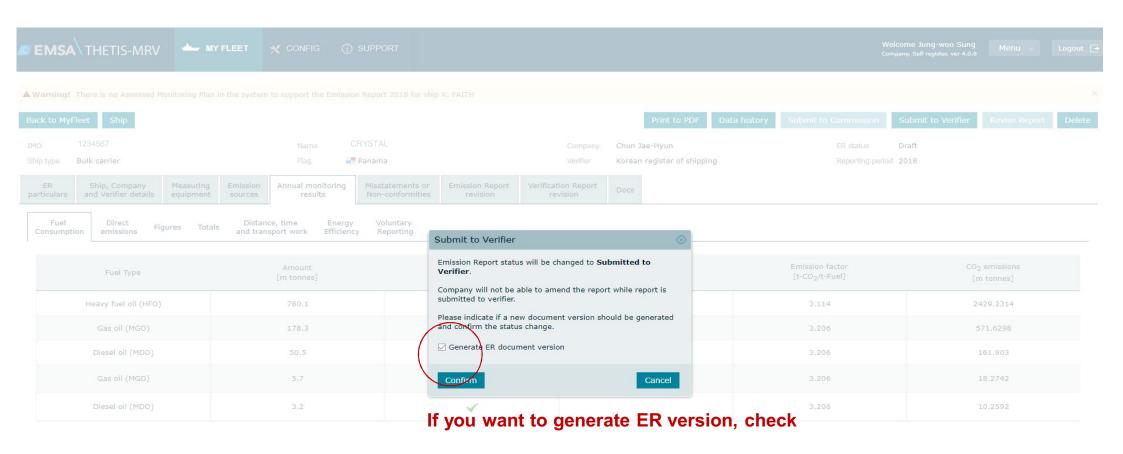
Emission Report | Emission source



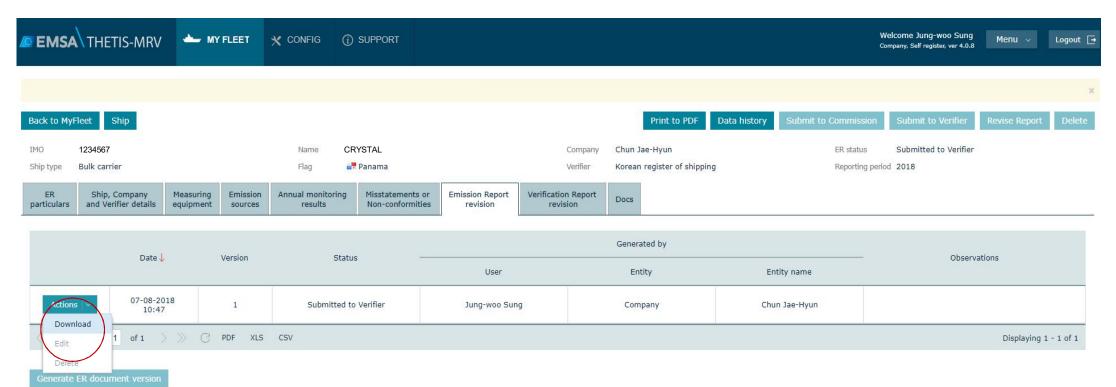












You can download and see the ER



Chun Jae-Hyun 36, Myugogh,gocj, Busan, Korea, Republic of kinjgh@kr.gk

h@kr.gk 70 Chun Jae-Hyun 36, Myugogh, gocj, Busan, Korea, Republic of kinjgh@kr.gk Chun Jae-Hyun 36, Myugogh,gocj, Busan, Korea, Republic of kinigh@kr.gk

CRYSTAL EMISSION REPORT

In accordance with EU Regulation 2015/757 as amended

PART A - SHIP AND COMPANY IDENTIFICATION

SHIP PARTICULARS

IMO	1234567	Name	CRYSTAL
Ship category	Bulk carrier	Port of registry	PANAMA
Ice class	No Ice Class	Home port	
Technical efficien	nov		

SHIPOWNER

Name	CRYSTAL Shipping	Principal place of business	Korea, Republic of	
Address	19th Floor, 24, Toegye-ro, Jung-gu	City, Country	Seoul, Korea, Republic of	
COMPANY (IS	M_COMPANY)			
Name	Chun Jae-Hyun	Principal place of business	dd	
Address	36, Myugogh,gocj	City, Country	Busan, Korea, Republic of	

COMPANY CONTACT PERSON

Name ,	Email	kinjgh@kr.gk	
Address	Telephone	+82-70	

PART B - VERIFICATION

K. FAITH Emission Report, version 1, 07/08/2018

VERIFIER

Korean register of shipping	Principal place of business	Busan
36, Myeongji ocean city 9-ro, Gangseo	City, Country	Busan, Korea, Republic of
gu,	National accreditation body	DAkkS
Busan, 618-814, Republic of Korea		
D-VS-20824-01-00		
	36, Myeongji ocean city 9-ro, Gangseo gu, Busan, 618-814, Republic of Korea	36, Myeongji ocean city 9-ro, Gangseo City, Country gu, National accreditation body Busan, 618-814, Republic of Korea D-V5-20824-01-00

PART C - EMISSION SOURCES, MONITORING METHOD(S) AND LEVEL OF UNCERTAINTY

Number	Identification	Monitoring method	Level of uncertainty +/- [%]
1	Main engine(MAN B&W 7S50MC- C,ME1)	Method A: BDN and period stock takes of fuel tanks	10
2	Boller(SAACKE/CMB-VS,BLR1)	Method A: BDN and period stock takes of fuel tanks	10
3	Auxillary engine(6N18AL-HV,AE3)	Method A: BDN and period stock takes of fuel tanks	10
4	Auxiliary engine(6N18AL-HV,AE1)	Method A: BDN and period stock takes of fuel tanks	10
5	Auxillary engine(6N18AL-HV,AE2)	Method A: BDN and period stock takes of fuel tanks	10

PART D - ANNUAL MONITORING

FUEL CONSUMPTION AND CO, EMITTED

CO emissions calculations based on fuel consumption

Fuel type	Amount [m tonnes]	At berth	Differentiating Criteria	Emission factor [t-CO ₂ /t-Fuel]	CO ₂ emissions [m tonnes]
HFO	780.1			3.114	2429.2314
MGO	178.3			3.206	571.6298
MDO	50.5			3.206	161.9030
MGO	5.7	-		3.206	18.2742
MDO	3.2			3.206	10.2592

Total Fuel consumption and CO₂ emissions

K. FAITH Emission Report, version 1, 07/08/2018

Page 1 of 3

Value
1017.8 m tonnes
3191.2976 m tonnes
80.4706 m tonnes
1484.7832 m tonnes
1597.5104 m tonnes
28.5334 m tonnes

DISTANCE TRAVELLED, TIME SPENT AT SEA AND TRANSPORT WORK

Parameter	Value	
Total distance travelled	5268.7 n miles	
Regular navigation	5268.7 n miles	
Total time spent at sea	171.1 hours	
Regular navigation	171.1 hours	
At anchorage	0 hours	
Total transport work (mass)	50313383.98 m tonnes · n miles	

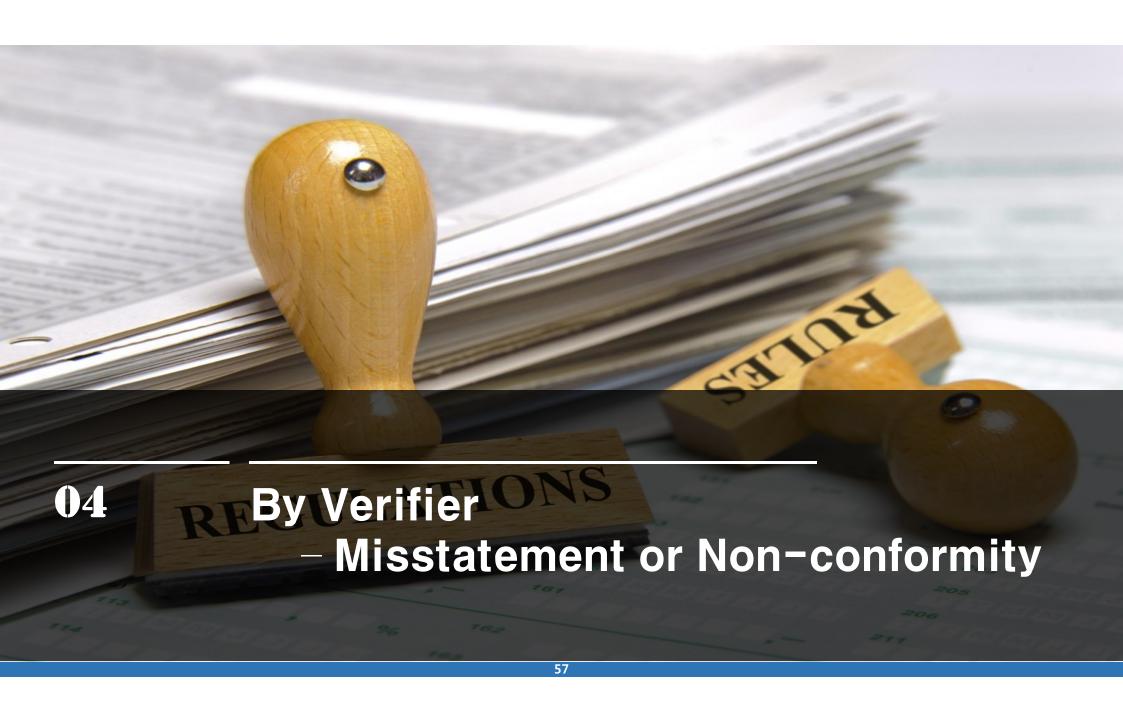
ENERGY EFFICIENCY

Parameter	Value	
Fuel consumption per distance	193.1786 kg / n mile	
Fuel consumption per transport work (mass)	20.2292 g / m tonnes - n miles	
CO ₂ emissions per distance	605.7087 kg CO ₂ / n mlle	
CO ₂ emissions per transport work (mass)	63.4284 g CO ₂ / m tonnes · n miles	

ADDITIONAL VOLUNTARY REPORTING

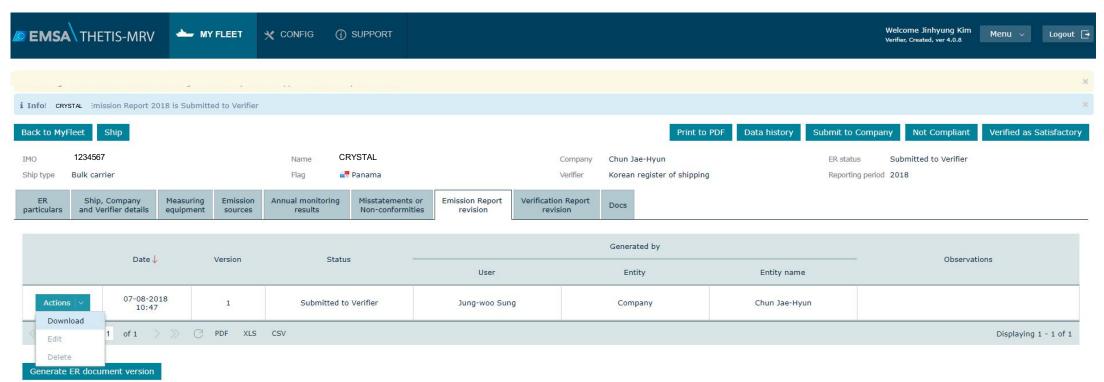
CO₂ emissions calculations based on fuel consumption

Page 2 of 3 K. FAITH Emission Report, version 1, 07/08/2018 Page 3 of 3





Verification



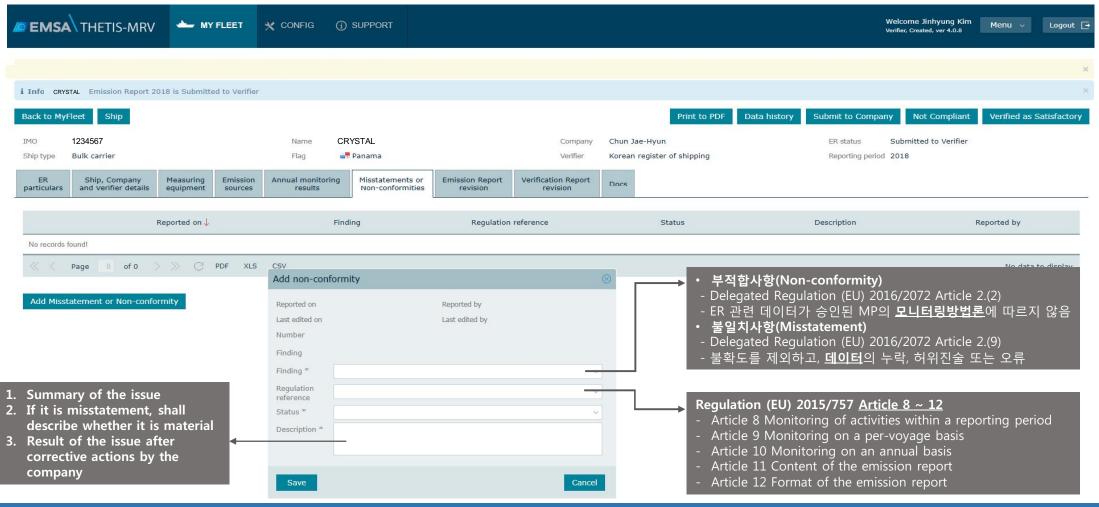
Verify ER and all data with relevant evidences provided by the company

- Evidences needs to be submitted from out of THETIS-MRV



Verification

| Misstatements or Non-conformities

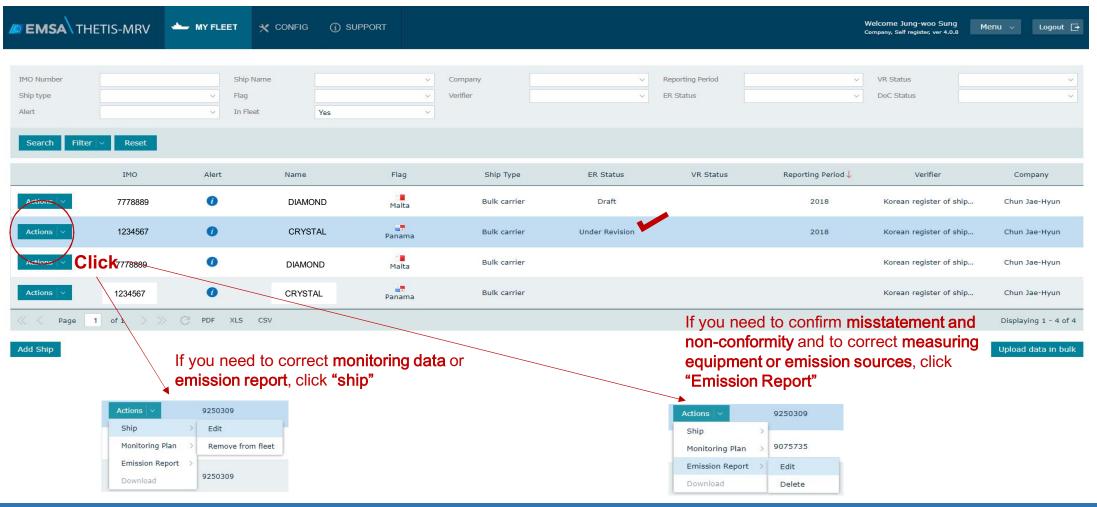


CORRECTIVE ACTION

By Company – Corrective Actions

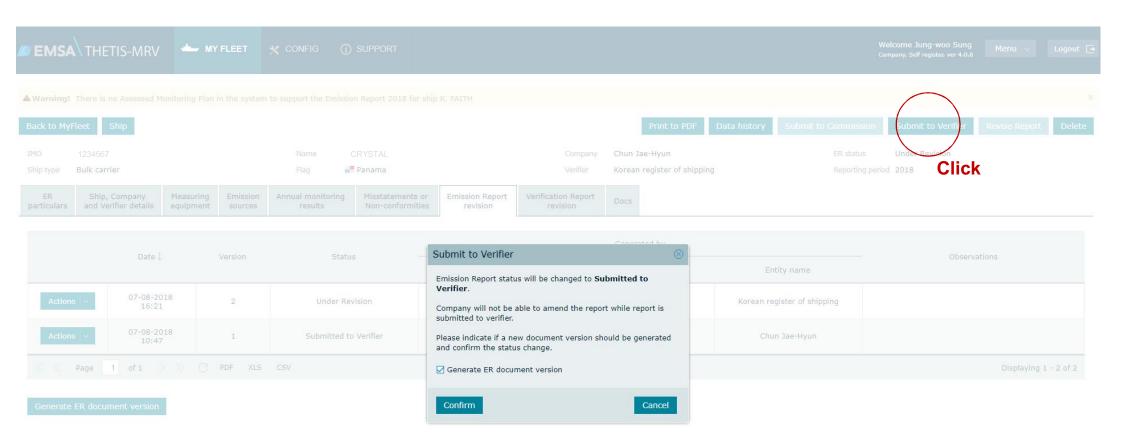


Corrective Actions



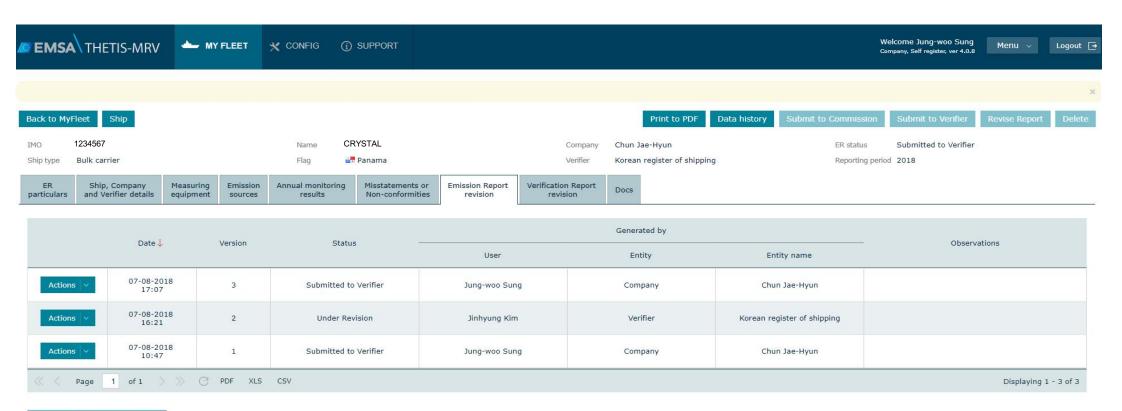


Corrective Actions





Corrective Actions



Generate ER document version





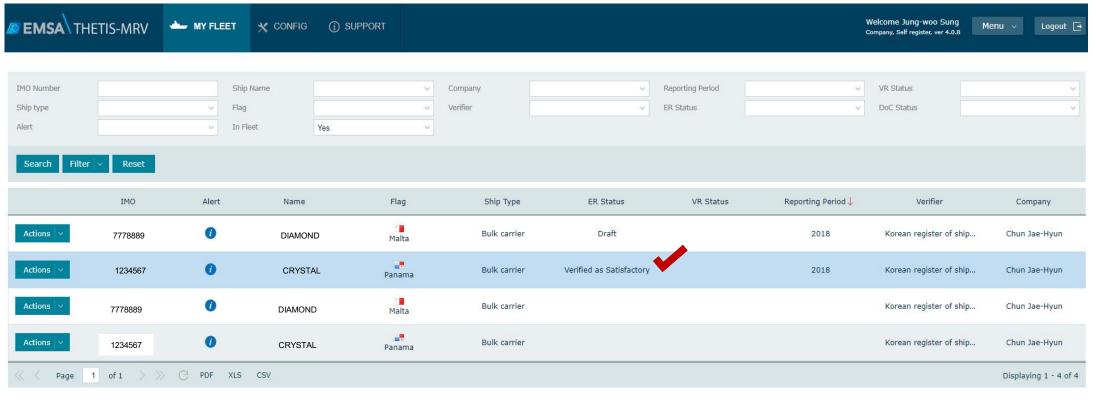
Verification opinion



Add Misstatement or Non-conformity



✓ Verification opinion



Add Ship

After ER Status is "verified as Satisfactory"

Upload data in bulk

- Company can submit ER to European Commission in THETIS-MRV
- Verifier can issue verification report and document of compliance





Korean register of shipping 36, Myeongji ocean city 9-ro, Gangseo gu,

Busan, 618-814, Republic of Korea, Busan, Korea, Republic of

CRYSTAL VERIFICATION REPORT

In accordance with EU Regulation 2015/757 as amended

This Verification Report states that the 2018 Emission Report for CRYSTAL, IMO 1234567 has been found **Satisfactory**.

SHIP PARTICULARS

IMO number 1234567
Ship category Bulk carrier
Ice class No Ice Class
Technical efficiency

Name Port of registry CRYSTAL PANAMA

Home port

COMPANY (ISM COMPANY)

Name Chun Jae-Hyun Address 36, Myugogh,gocj Principal place of business dd

City, Country

Busan, Korea, Republic of

VERIFIER

Name Address Korean register of shipping 36, Myeongji ocean city 9-ro, Gangseo

Principal place of business City, Country

Busan Busan, Korea, Republic of

National accreditation body DAkkS

Busan, 618-814, Republic of Korea

Accreditation number D-VS-20824-01-00

REFERENCES

Emission Report ER v4, 07/08/2018

2018

Reporting Period Standards used Monitoring Plan

15 December 2017, Version 1.2



Korean register of shipping 36, Myeongji ocean city 9-ro, Gangseo gu,

Busan, 618-814, Republic of Korea, Busan, Korea, Republic of

DESCRIPTIVE ELEMENTS

Summary of procedures including site visits or waiving reason

The verification team (Kim, Jin-hyung (Lead)) carried out the verification procedures including risk assessment, document review, verification of reported data and evidence, site visit.

Site visit information:

- DD/MM/YYYY
- 1 site (Busan office of ABC company)
- Kim, Jin-hyung (Lead)

OR

Site visit was waived in accordance with Article 16.4.(c) of Delegated Regulation (EU) 2016/2072.

Independent reviewer (Lee, Jae-hoon) carried out the review the complete verification process, the internal verification documentation and the draft verification report.

Summary of changes to the Monitoring Plan and activity data

Not applicable

Verification statement

KR concludes that the emission report of "Ship Name" does not contain material misstatements on the basis of the verification work undertaken.

Therefore, KR provides a verification statement as satisfactory for the emission report of "Ship Name".

Description of uncorrected misstatements and non-conformities

All issues are corrected.

Recommendations for improvement

Uncorrected misstatements and non-conformities not leading to material misstatements.

Signed		
Name	Jinhyung Kim	
Date	07/08/2018	



Document of Compliance





