



MARITIME

# Role of digital technologies in the implementation of the SEEMP

## European Shipping Week

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27 February 2017

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# What is the purpose of the SEEMP?

- A mechanism for a company and/or a ship to **improve the energy efficiency** of a ship's operation
- A management tool to assist a company in **managing the ongoing environmental performance** of its vessels
- It should be an integral element of broader company management systems
- **Onboard administrative burdens should be limited**



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# Elements of performance improvement relevant for digital solutions

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- *Planning*
  - Ship: determine and understand the ship's **current status of energy usage**.
  - Company: coordination with other stakeholders (e.g. just in time arrival),
  - Set SMART goals
- *Implementation*
  - defining tasks and assigning them to qualified personnel
  - record keeping of what is implemented – used for evaluation later on
- *Monitoring,*
  - monitor the goals set: **continuous and consistent data collection**
  - monitoring should be carried out as far as possible by shore staff
- *Self-evaluation and improvement*
  - what types of measures can/cannot function effectively
  - comprehend the **trend of the efficiency improvement**

# Synergies with IMO Data Collection System and EU Monitoring, Reporting and Verification

## Reporting needs EU-MRV:

*For each ship >5.000 GT and for each voyage to, within and from EU ports*

1. port of departure / arrival
2. amount and emission factor for each type of fuel consumed in total [...]
3. CO<sub>2</sub> emitted
4. distance travelled
5. time spent at sea
6. cargo carried
7. transport work

Separate monitoring plan until **Aug. 2017**

MRV: Monitoring, Reporting & Verification



## Reporting needs IMO-DCS:

*For each ship >5.000 GT and for the year*

1. amount and emission factor for each type of fuel consumed in total [...]
2. distance travelled
3. Hours underway
4. DWT (as cargo proxy)
5. Transport work

Monitoring plan part of SEEMP in **2018**

DCS: Data Capturing Scheme

# Benefits of a Performance Management system

## Transparency

- Prove to your customers, financing bodies and other stakeholders that operations are under control
- Build visible line of defence against fuel claims
- Allows fact based collaboration between departments and with industry partners (suppliers, customers)

## Compliance

- Makes you compliant with existing (ESI, CSI, CCWG) & upcoming environmental reporting (EU MRV / IMO DCS)
- Improves TMSA scores in chapters 1A, 10A and E by providing KPI monitoring and external benchmarking

## Cost position

- Saves fuel oil (or costs for fuel claims) costs and avoids engine breakdowns
- Identifies fuel saving technologies to invest in
- Reduces reporting effort for crew and manual data management efforts ashore
- Changes behaviour of shore and vessel teams towards more efficient operations

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# Example: Weekly report to crew: summary of performance with deviation from target & benchmarking with sister vessels

## Vessel Performance Report - Insaill

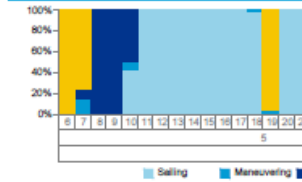
Week: 23, 2015 From: Jun 1, 2015 To: Jun 7, 2015

Week 22

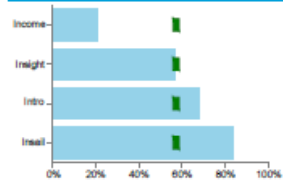
### Key figures

- 1 Vessels
- 21 Events
- 27.1 FOC/day [MT/day]
- 0.090 FOC/NM [MT/NM]
- 8.3 EEOI rolling 365 [g/(NM\*MT)]

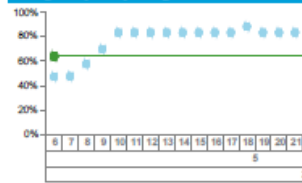
### Operational profile - Insaill



### Cargo capacity usage



### Cargo capacity usage - Insaill

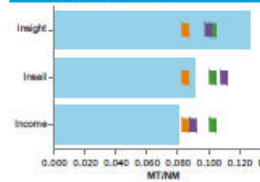


## Consumption - Insaill

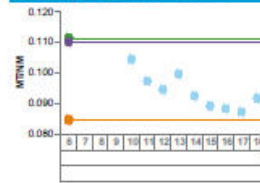
Week: 23, 2015 Operational mode: Sailing

Week 22

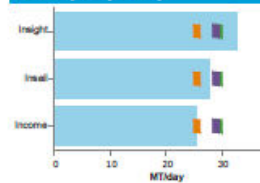
### HFO equiv. per NM



### HFO equiv. per NM - Insaill



### HFO equiv. per day



### HFO equiv. per day - Insaill

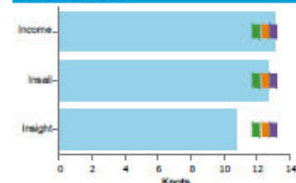


## Speed - Insaill

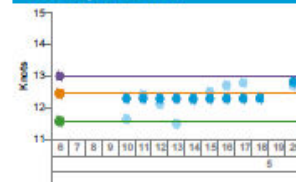
Week: 23, 2015 Operational mode: Sailing

Week 22

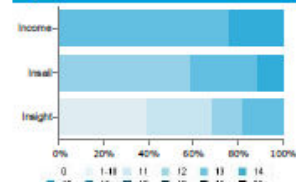
### Vessel speed



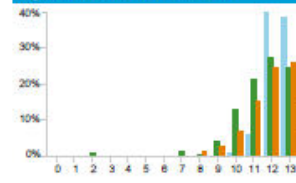
### Vessel speed - Insaill



### Speed distribution



### Speed distribution - Insaill



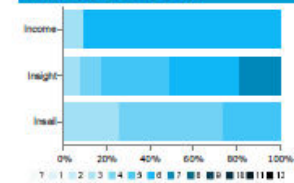
## Weather - Insaill

Week: 23, 2015 Operational mode: Sailing

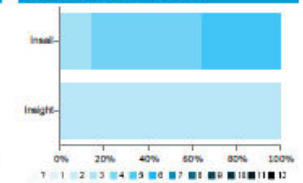
Week 22

Week 23

### Wind force distribution



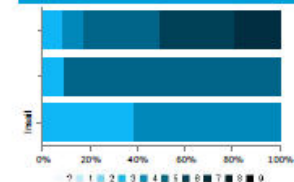
### Wind force distribution



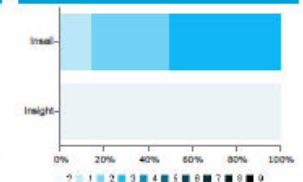
### Wind force - Insaill



### Sea state distribution



### Sea state distribution



### Sea state - Insaill



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# Example: end of voyage push e-mail report

## Voyage report

**Voyage number:** 622  
**Departure date/time [UTC]:** 2016-06-01 06:06  
**Arrival date/time [UTC]:** 2016-07-27 12:07  
**Departure port:** DOCAU  
**Arrival port:** DEHAM



## Voyage summary

Measures	Total voyage	Sailing condition at < 5 Bft
Distance [NM]	16,267	8,872
Time [h]	1,338	548
SOG [kn]	12.2	16.2
Wind force median [Bft]	4	4
Sea state median [Douglas]	3	3
Current speed in vessel direction [knots]	-0.1	-0.1
Nominal slip [%]	12.5%	12.4%
Total HFO-equiv. FOC [MT]	3,330	1,739
ME HFO-equiv. FOC/NM [MT]	0.156	0.160
ME HFO-equiv. FOC/day [MT]	45.6	62.3
AE/B HFO-equiv. FOC/day [MT]	14.2	13.9
ME load [% MCR]	33.8%	35.1%
AE running hours per day [h]	40.7	46.4
ME SFOC [g/kWh]	212.2	202.3
AE SFOC [g/kWh]	257.3	225.7
EEOI [g/(NM*MT)]	19.3	18.9
	<b>HFO</b>	<b>MDG/MGO</b>
Bunker remaining on board at end of voyage [MT]	838	319

## Voyage statistics - 622 -

Voyage leg [Port from - to]	Voyage leg start	Voyage leg end	Mean draft [m]	Trim [m]	Cargo [MT]	Wind force median [Bft]	Current speed in vessel direction [knots]	Sea state median [Douglas]
DOCAU - DEHAM	2016/06/01 18:42	2016/06/02 10:00	12.1	0.4	34,876	5		3
NLRM - DEHAM	2016/06/02 10:00	2016/06/03 17:12	10.2	1.4	24,246			
DEHAM - GBLGP	2016/06/03 17:12	2016/06/06 05:54	11.0	1.0	30,633	4	-0.1	3
GBLGP - BEANR	2016/06/06 05:54	2016/06/08 03:30	10.6	0.5	29,216	4		3
BEANR - DOCAU	2016/06/08 03:30	2016/06/19 00:06	11.8	0.6	35,402	4	0.1	3
DOCAU - COCTG	2016/06/19 00:06	2016/06/21 08:48	11.4	0.5	32,694	5	-0.2	4
COCTG - PAMIT	2016/06/21 08:48	2016/06/23 15:06	11.4	0.6	33,421	3	0.0	2
PAMIT - PECLL	2016/06/23 15:06	2016/06/28 20:24	11.3	0.5	33,420	3	0.1	3
PECLL - CLVAP	2016/06/28 20:24	2016/07/03 00:00	9.6	0.9	22,789	4	0.2	4
CLVAP - PECLL	2016/07/03 00:00	2016/07/08 04:24	9.7	0.5	23,034	3	0.1	3
PECLL - PAMIT	2016/07/08 04:24	2016/07/12 19:54	11.5	0.2	34,660	4	0.2	4
PAMIT - COCTG	2016/07/12 19:54	2016/07/14 19:00	11.6	1.0	34,842	4	-0.1	4
COCTG - DOCAU	2016/07/14 19:00	2016/07/17 16:18	11.5	1.0	34,071	5	-0.2	4
DOCAU - NLRM	2016/07/17 16:18	2016/07/27 12:24	12.0	0.2	36,220	4	0.1	4
<b>622 - total</b>			<b>11.2</b>	<b>0.6</b>	<b>31,986</b>	<b>4</b>	<b>0.1</b>	<b>3</b>

## Speed and consumption

Voyage leg [Port from - to]	Distance [NM]	Duration [hours]	Avg speed [sailing] [knots]	Nominal slip [%]	HFO-equiv. FOC [MT]	HFO-equiv. FOC per NM [sailing] [MT/NM]	HFO-equiv. FOC per day [MT]
DOCAU - DEHAM	0	15			9.5		14.9
NLRM - DEHAM	304	31	20.2	7.2%	67.9	0.222	52.2
DEHAM - GBLGP	416	61	12.1	9.7%	72.2	0.118	28.6
GBLGP - BEANR	194	46	11.9	15.1%	43.9	0.113	23.1
BEANR - DOCAU	4,031	261	17.3	13.9%	830.6	0.205	76.5
DOCAU - COCTG	622	57	13.6	9.7%	91.0	0.136	38.5
COCTG - PAMIT	284	54	11.5	12.3%	53.5	0.124	23.6
PAMIT - PECLL	1,450	125	15.5	13.7%	271.7	0.179	52.0
PECLL - CLVAP	1,301	100	16.0	12.4%	230.2	0.171	55.5
CLVAP - PECLL	1,302	124	14.7	9.7%	213.9	0.154	41.3
PECLL - PAMIT	1,418	112	17.2	10.0%	295.1	0.192	63.5
PAMIT - COCTG	290	47	8.7	13.8%	70.1	0.196	35.7
COCTG - DOCAU	622	69	11.8	17.1%	122.3	0.174	42.4
DOCAU - NLRM	4,034	236	18.1	12.4%	957.6	0.234	97.3
<b>622 - total</b>	<b>16,267</b>	<b>1,338</b>	<b>16.0</b>	<b>12.5%</b>	<b>3,329.5</b>	<b>0.195</b>	<b>59.7</b>

# Thank you for your attention!

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