



## Collecting Data for Evaluation of Vessel Performance

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Navigating Ecotankers Conference, 27<sup>th</sup> March 2014

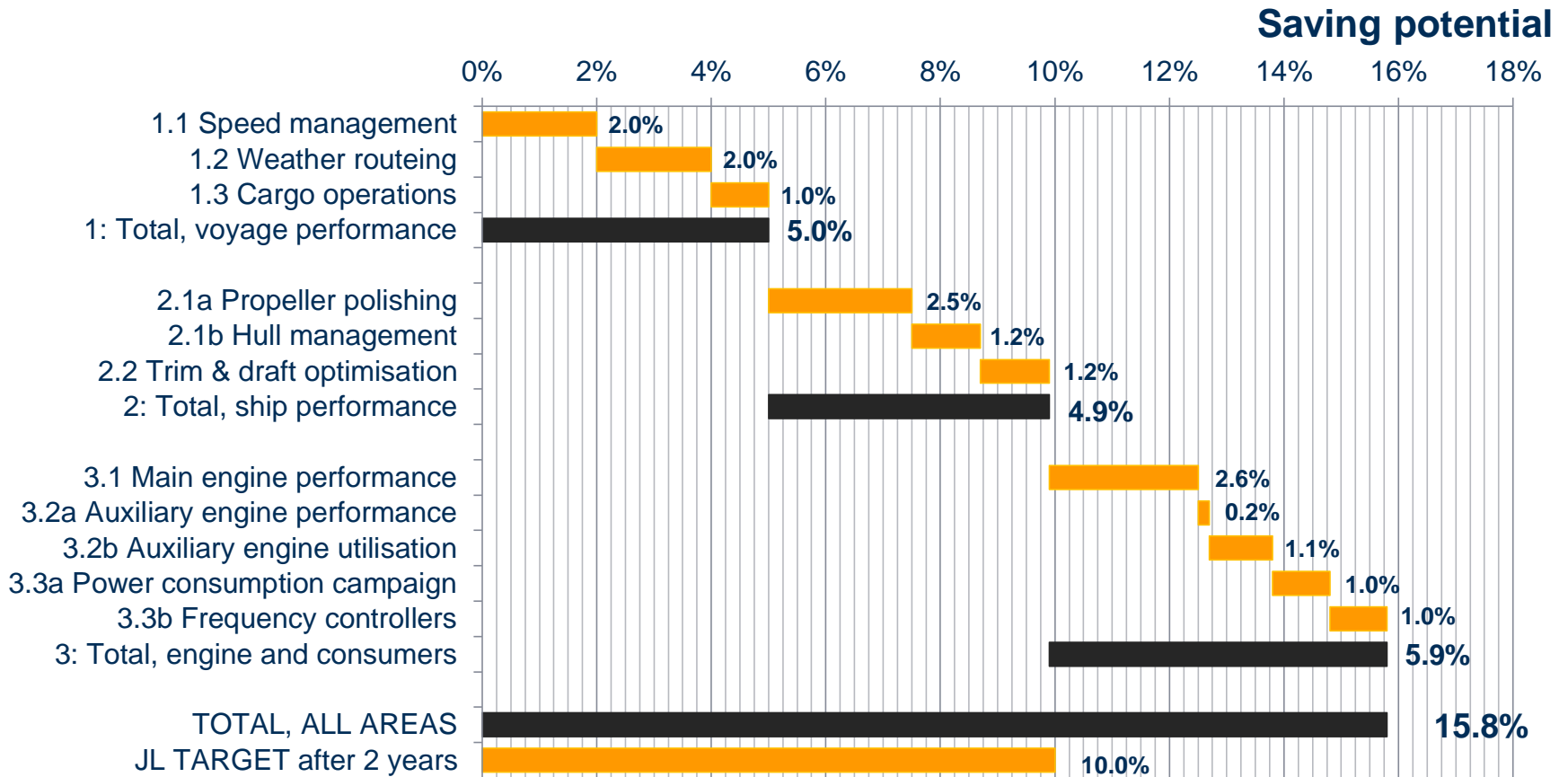


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# Energy Efficiency Project - REJUICE


Based on consultant report, various focus areas was identified in 2012

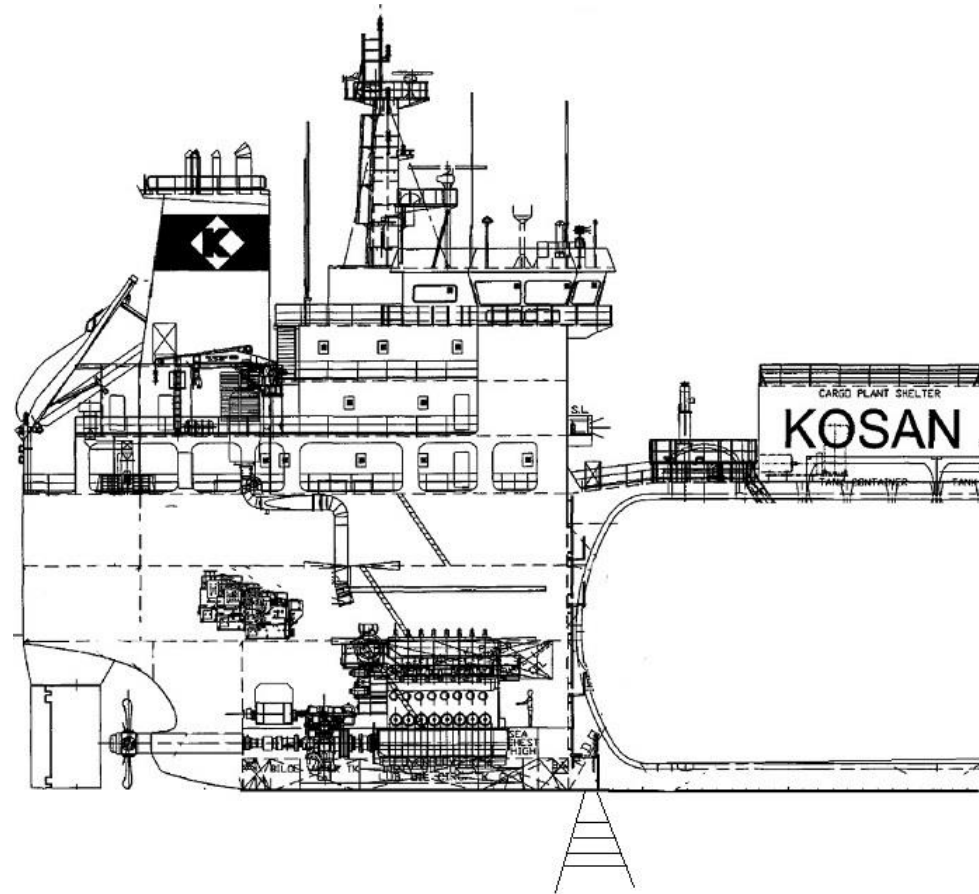




# Data Needed for Performance Analysis

Required data to evaluate performance and effect of REJUICE tasks

 REJUICE	Unit	Input	Output
ME Performance	Main Engine	Fuel	Torque Power
Aux Performance Aux utilisation	Auxiliary Engines	Fuel	Power
Trim and Draft Hull maintenance Propeller maint.	Propulsion	Torque Weather	Speed
Cargo operations	Cargo plant	Power	Temperature Pressure
Cargo operations	PSA plant	Power	Nitrogen Dry air



# Collection of Performance Data

Since 2008 Lauritzen Kosan has used a semi-automated system to collect data based on noon-reports

**J. Lauritzen Performance Program - JLVP**  
**Performance Report Form - version 2.26**  
 Daily Reporting Form for **Greta Kosan**

**SUBMIT BY EMAIL**

Vessel status:  
 Sea passage  
 Port, anchorage or manoeuvring

This report is to be used every 24-hour regardless of vessel status. When vessel changes state between Sea passage/port, manoeuvring or anchorage / sea passage, a new report will have to be submitted. Please use the radio buttons in the top right corner to select vessel state.

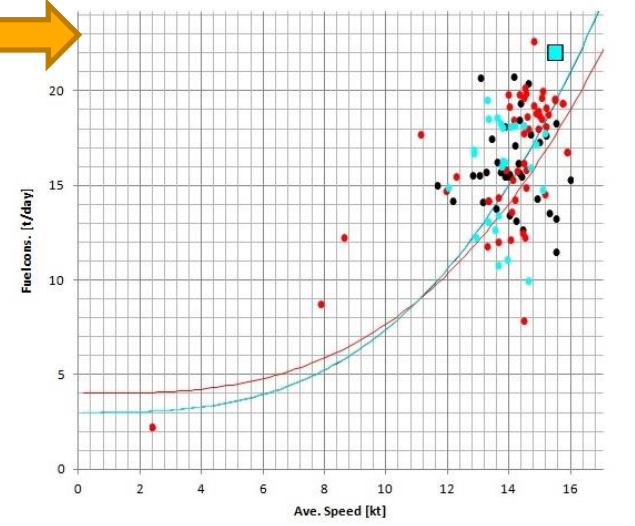
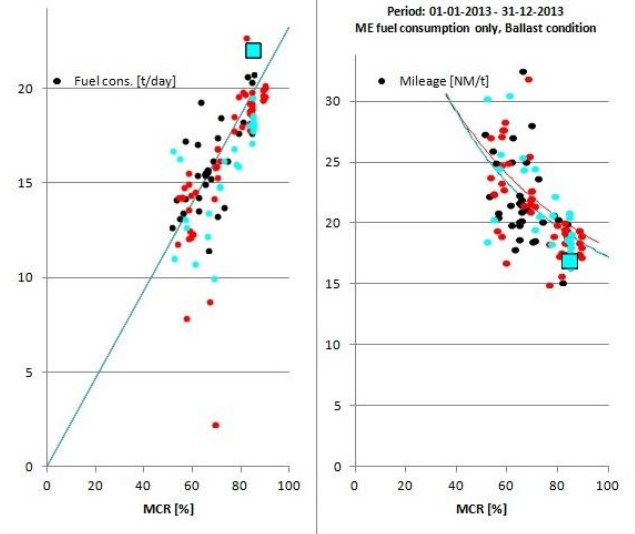
Use the tool-tips (hold the mouse still over the box) incorporated in all the text and numeric boxes.  
 Please conduct all readings with the highest possible accuracy - please take into consideration that some of the values needs to be represented by an average over the report period.

If any problems or in doubt about anything, please contact nau@lauritzenkosan.com

**When submitting:**  
 1. Fill in the fields  
 2. Press the button "SUBMIT BY EMAIL"  
 3. A new e-mail editor window will pop up with e-mail address, subject and a file attached. **No need for changing anything. ONLY ATTACH ONE(1) FILE PER E-MAIL, AND THE FILE MUST BE IN .XML FORMAT**  
 4. Press "SEND" and the report is on the way

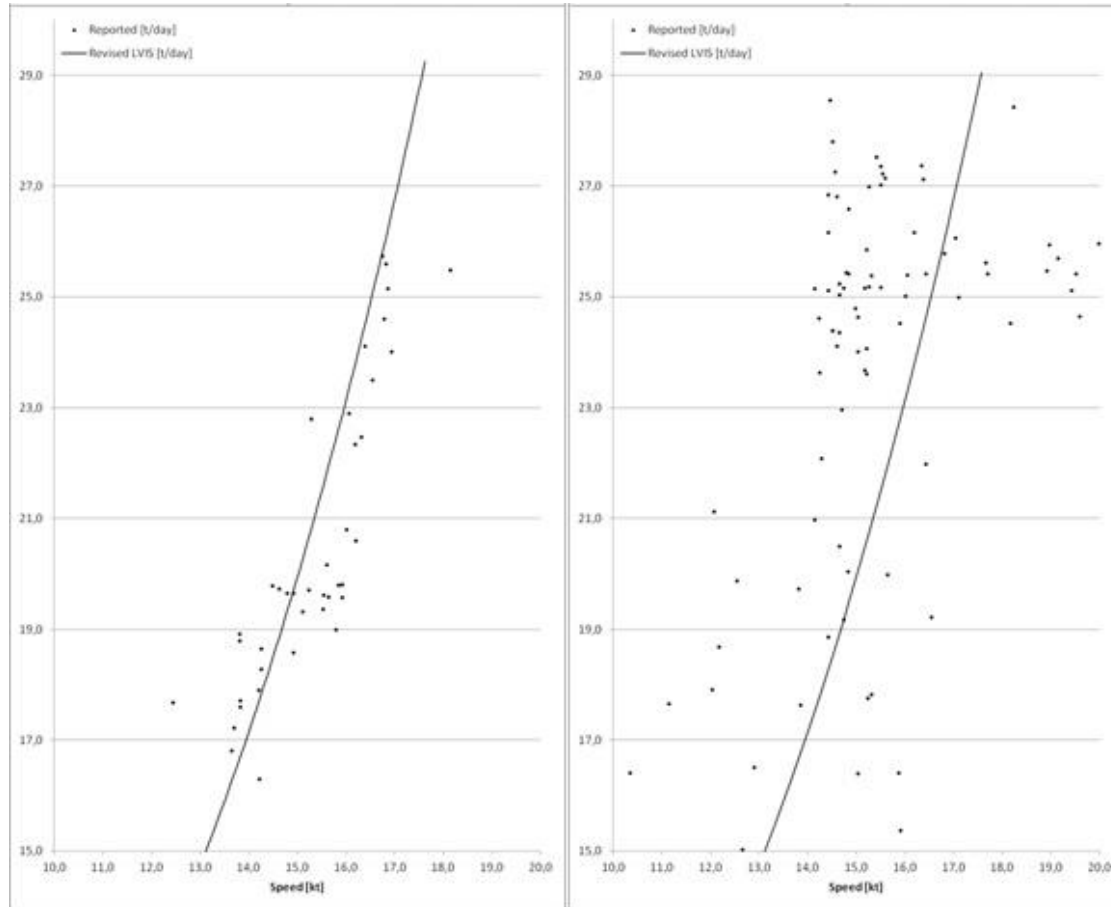
**Submitting Process**

<b>Initial</b>	Reporting Date [YYYY-MM-DD] 2014-03-26	Voyage Number	
	Reporting Time [HH:MM] 14:47	Person Reporting [name]	
<b>Status</b>	Draught Fore [m]	Vessel Condition	Type of Cargo
	Draught Aft [m]	Total Amount Of Ballast [mts]	Total Amount Of Cargo [mts]
<b>Coverage</b>	Hours At Sea [h]	Distance Sailed Through Water (LOG) [NM]	Hours in SECA area [h]
	Hours in port/manoeuvring [h]	Distance Sailed Over Ground (GPS) [NM]	
<b>Weather</b>	Apparent Wind Velocity [m/s]	Wind Angle Relative To Bow [degree of bow]	Sea Water Temp [°C]
	Sea State [jt]	Wave Angle Relative To Bow [degree of bow]	<input type="checkbox"/> Speed Trial
<b>Machine</b>	ME Average Load [% of MCR]	ME Turbocharger speed [rpm]	Propeller speed [rpm]
	ME Cylinder Lube Oil Cons. [kg]	ME Fuel Rack Index AVG [mm]	Propeller Pitch [%]
			ME speed [RPM]
<b>Power</b>	Shaft Generator produced [kWh]	Auxiliary 1 produced [kWh]	Cargo plant 1 consumed [kWh]
		Auxiliary 2 produced [kWh]	Cargo plant 2 consumed [kWh]
		Auxiliary 3 produced [kWh]	Cargo plant 3 consumed [kWh]
<b>Oil consumption</b>	Oil Type		
	Energy [MJ]		
	Sulphur Content [%SO2]		
	Consumed by ME [mts]		
	Consumed AUX's [mts]		
	Consumed Boiler [mts]		
<b>Remarks</b>			



## Example of not-so-accurate Performance Data

Data based on reporting's from two sister ships compared to average for all sister vessels (line)



Left is reasonable, right is difficult to conclude on:

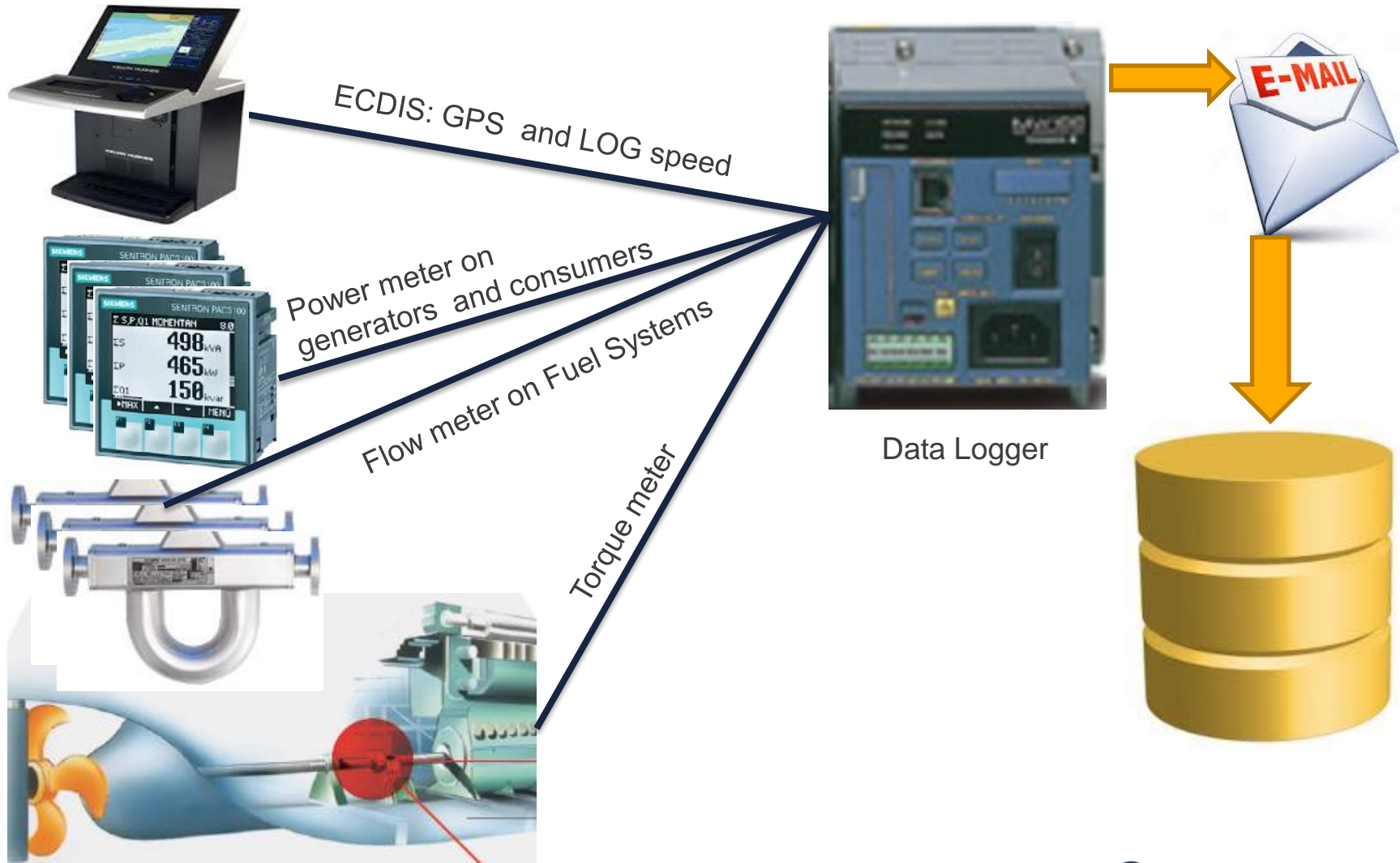
Doing everything between 14 and 20 kt with a consumption of 26 t/day?

Doing 15 kt with a consumption of everything between 16 and 28 t/day?

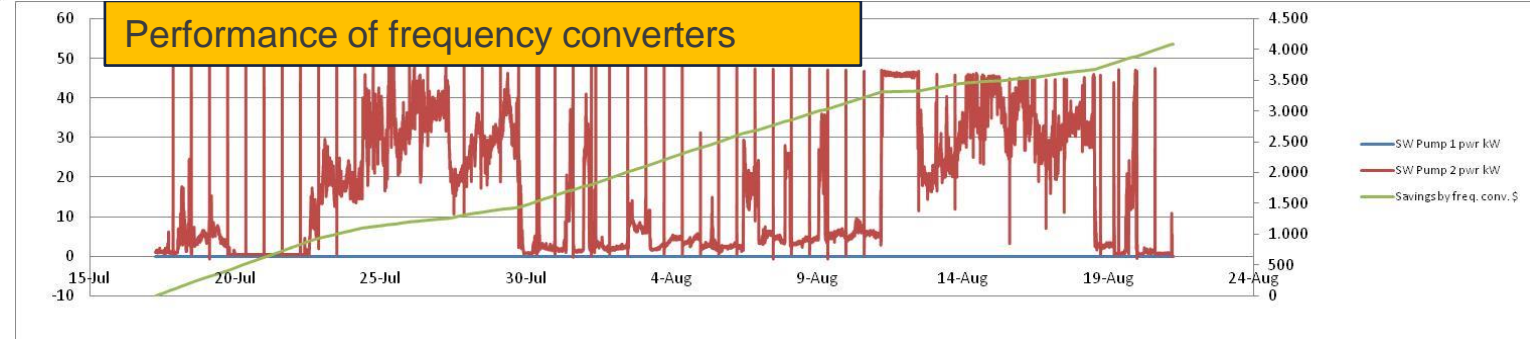
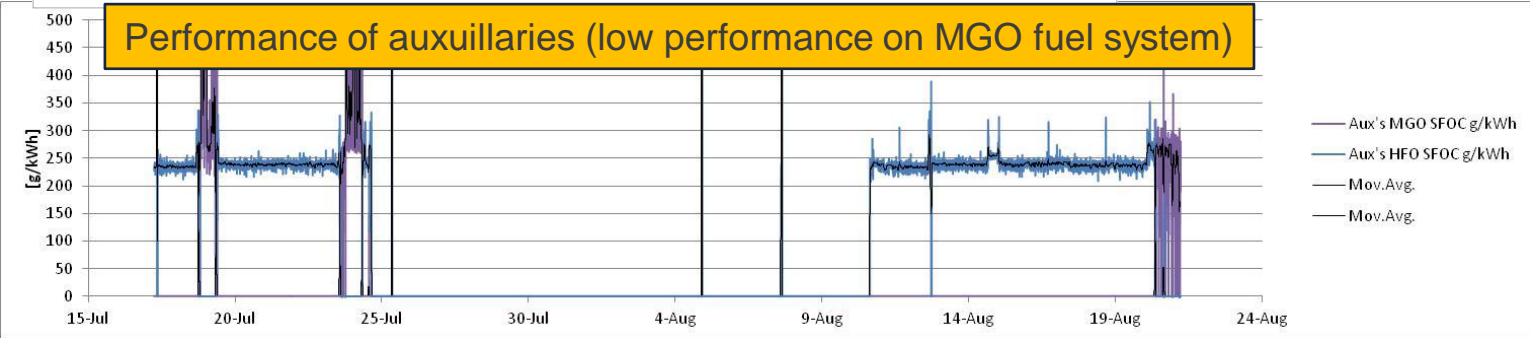
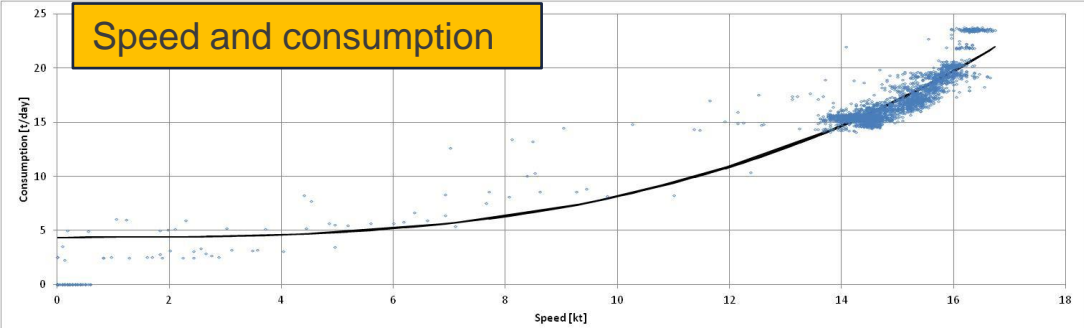


# Automated Data Logging

High Frequency Simultaneous Data Sampling without occupying the crew

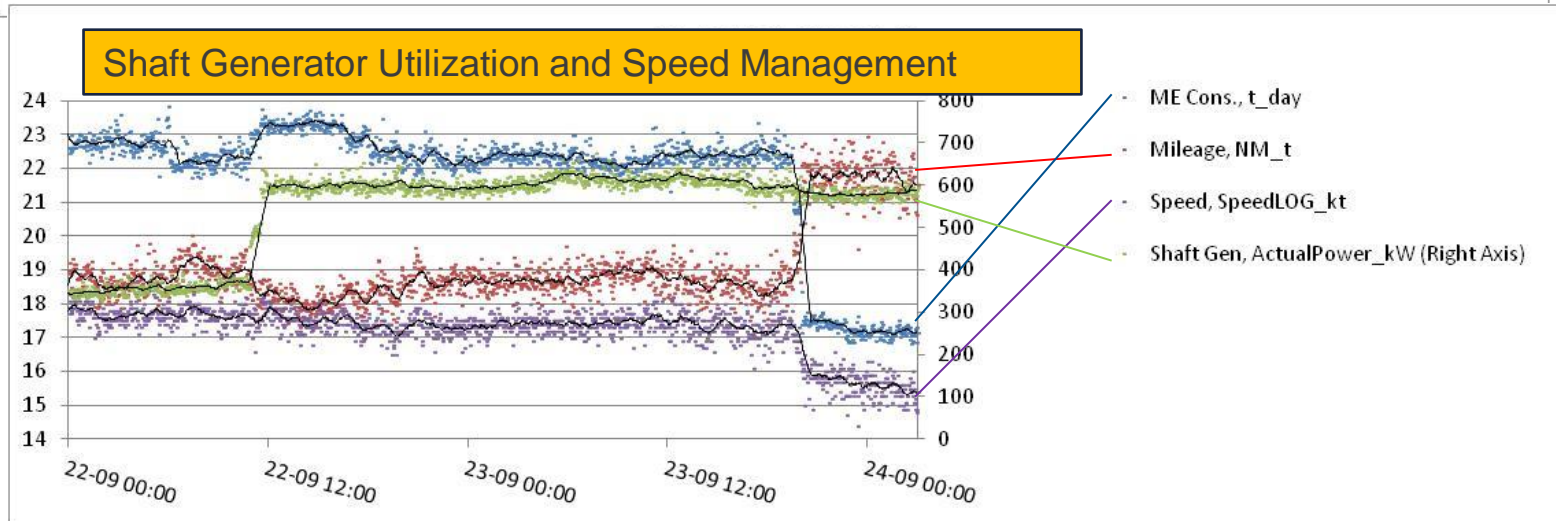
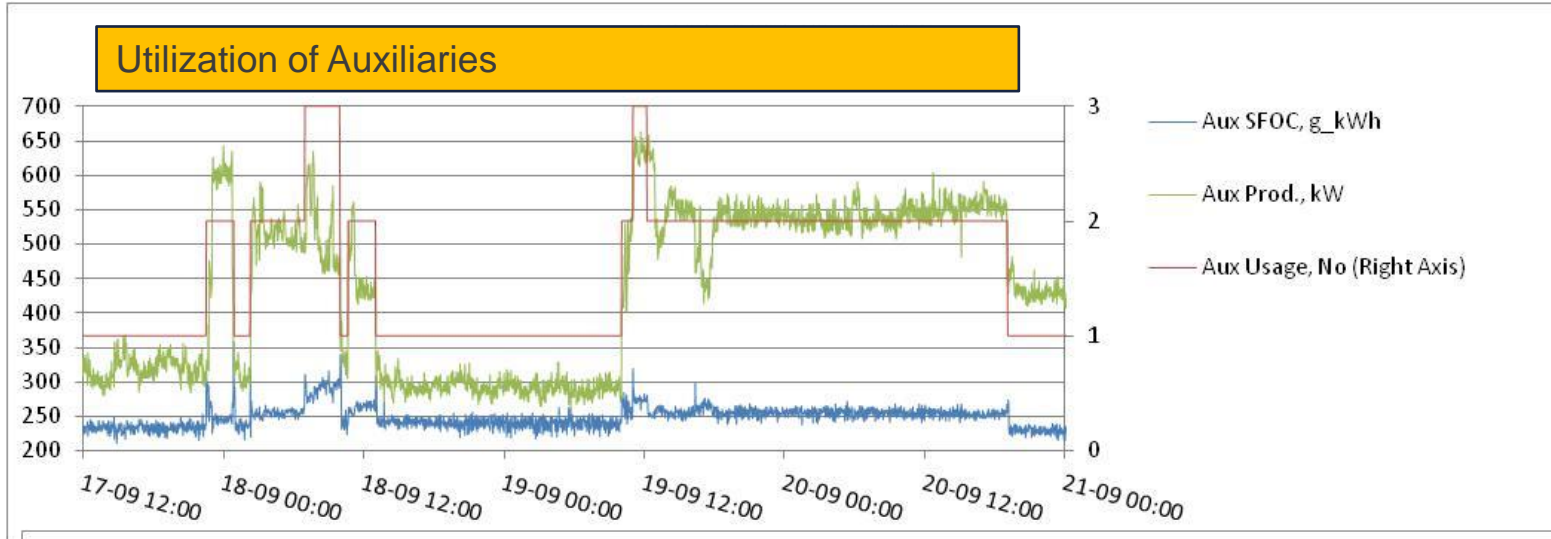


# Examples of Performance Graphs 1/2





## Examples of Performance Graphs 2/2



# Establishment of Performance Awareness

*What does it take*

- Reliable data that both Crew and Managers trust
  - High accuracy meters
  - Elimination of the human factor
- Transparency
  - Possible to Monitor 24/7 for all involved parties
  - Reliable comparison between sister vessels
- Bonus linked KPI's
  - Good experiences from KPI's related to vetting observations



# Questions?

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