Estimating ship performance following energy efficiency interventions using in-service data

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SCC Conference 2016 – Newcastle
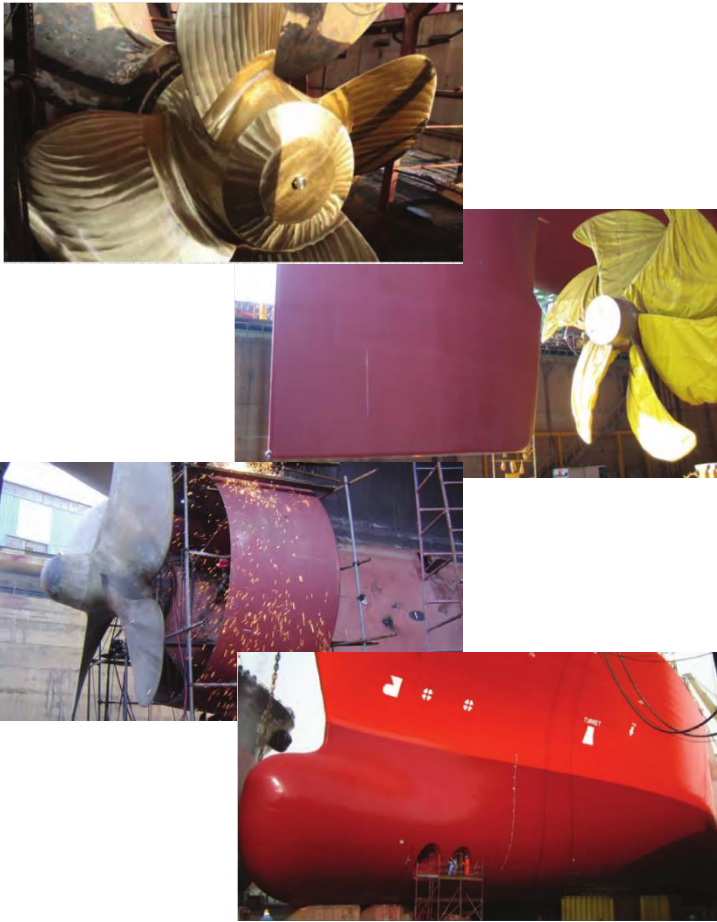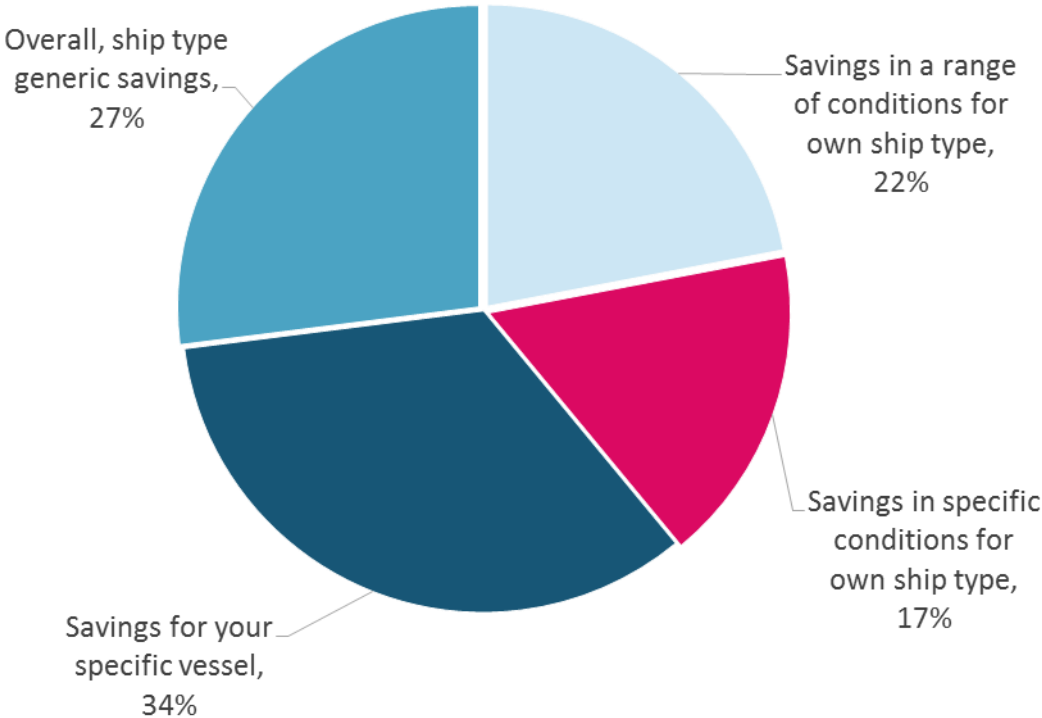
10/11/2016

Research Context

- Increasing environmental pressure

- Economic slow down

- Excess tonnage

- Low fuel prices

Fuel Efficiency Retrofits

Communication of fuel savings (n = 71)

- Overall, ship type generic savings, 27%
- Savings in a range of conditions for own ship type, 22%
- Savings in specific conditions for own ship type, 17%
- Savings for your specific vessel, 34%

Retrofit Performance Measurement

- Long term in-service data collection

- ISO 19030

- Speed loss as a performance indicator

ISO/TC 8/SC 2
Date: 2015-09-30
ISO/DIS 19030-1
ISO/TC 8/SC 2/WG 7
Secretariat ANSI

Ships and marine technology — Measurement of changes in hull and propeller performance — Part 1: General principles

Elément introductif — Elément central — Partie 1: Titre de la partie

Warning

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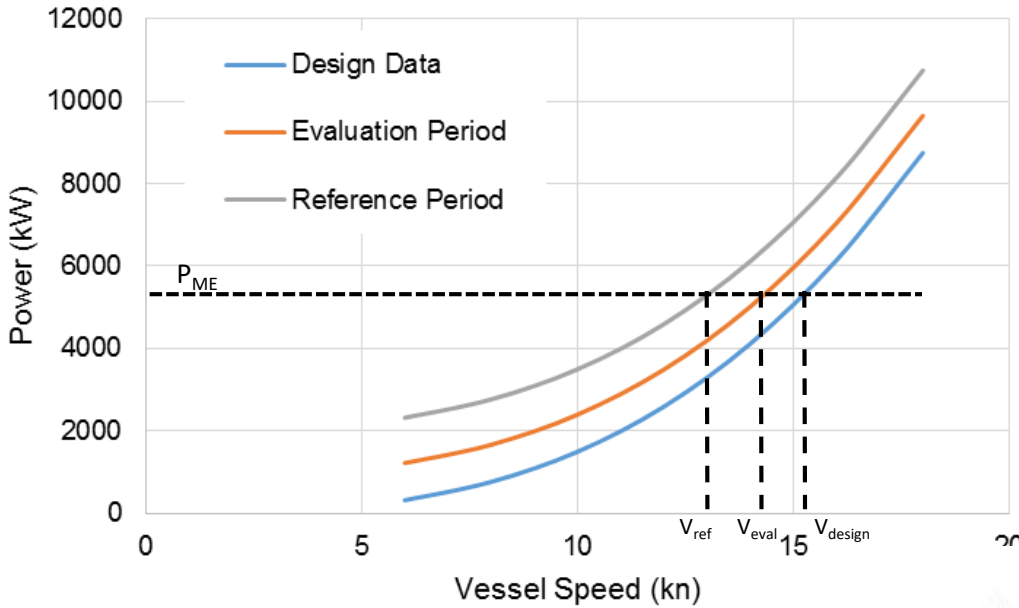
Recipients of this draft are invited to submit, their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Document type: International Standard
Document subtype:
Document stage: (40) Enquiry
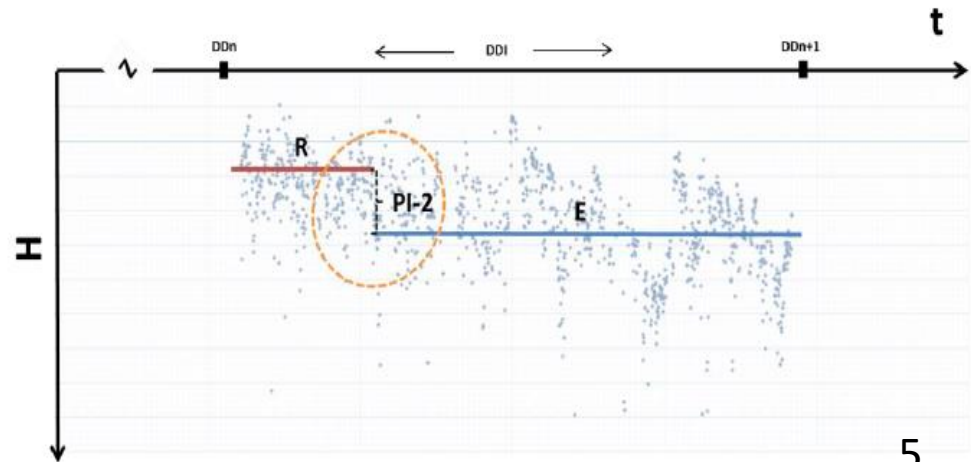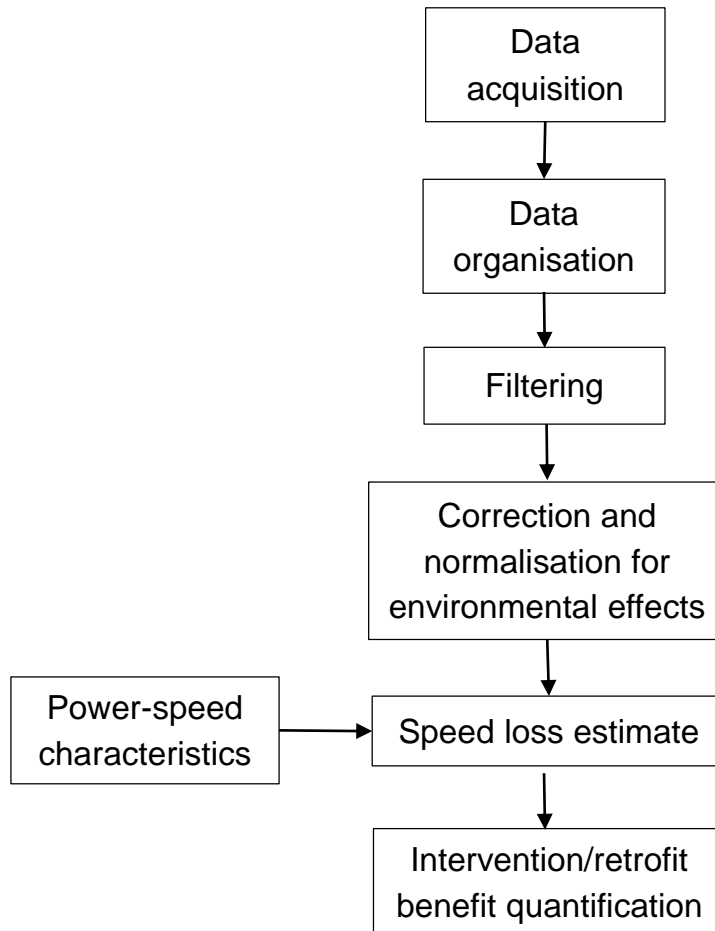
ISO 19030 Overview

$$V_d = 100.\frac{V_m - V_e}{V_e}$$

Methodology

Data

- Primary and secondary measurements

- Frequency

- Meta-data regarding interventions

- Filtering/normalisation

- Evaluation and reference period

- Uncertainty

Uncertainty

- Variables affecting efficiency:
  - Data frequency
  - Delivered power and vessel speed proxies
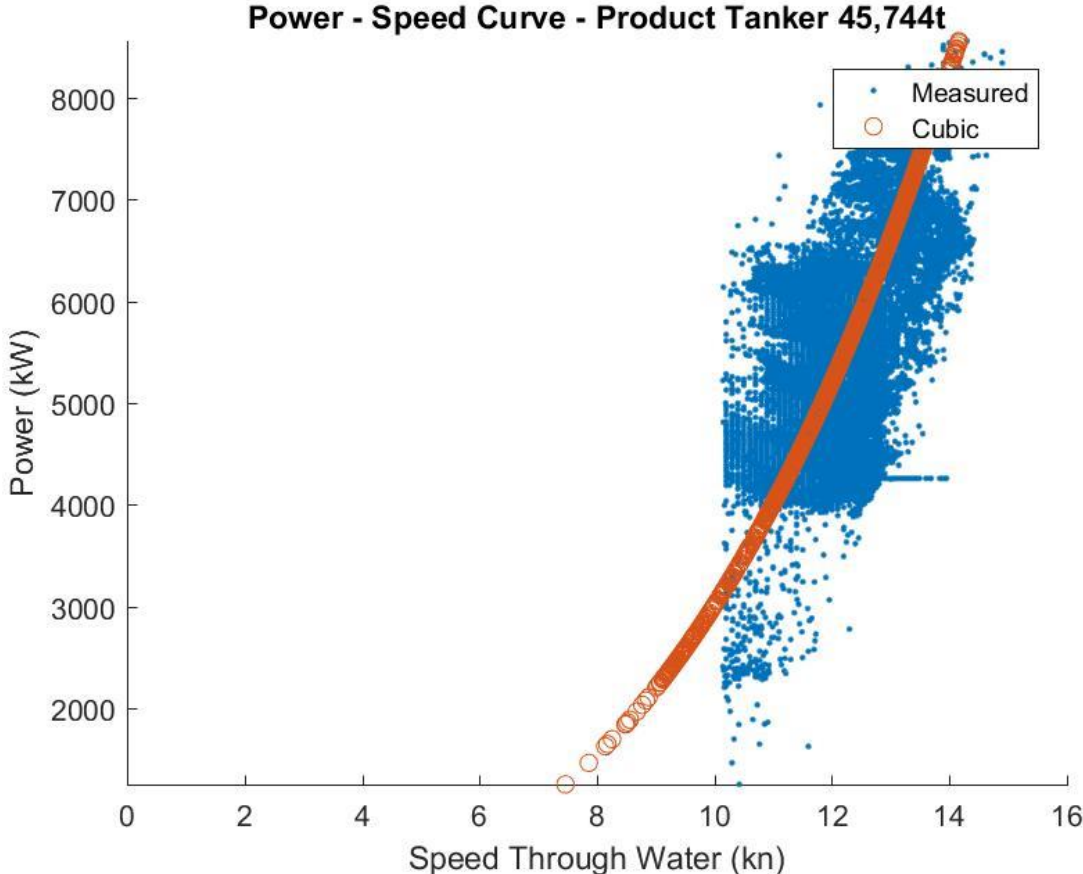 - Evaluation period length

Case Study

- Fleet of 21 crude/product carriers, 10 minute frequency data

- Assessing performance after dry docking interventions including hull cleaning, prop cleaning and new coatings
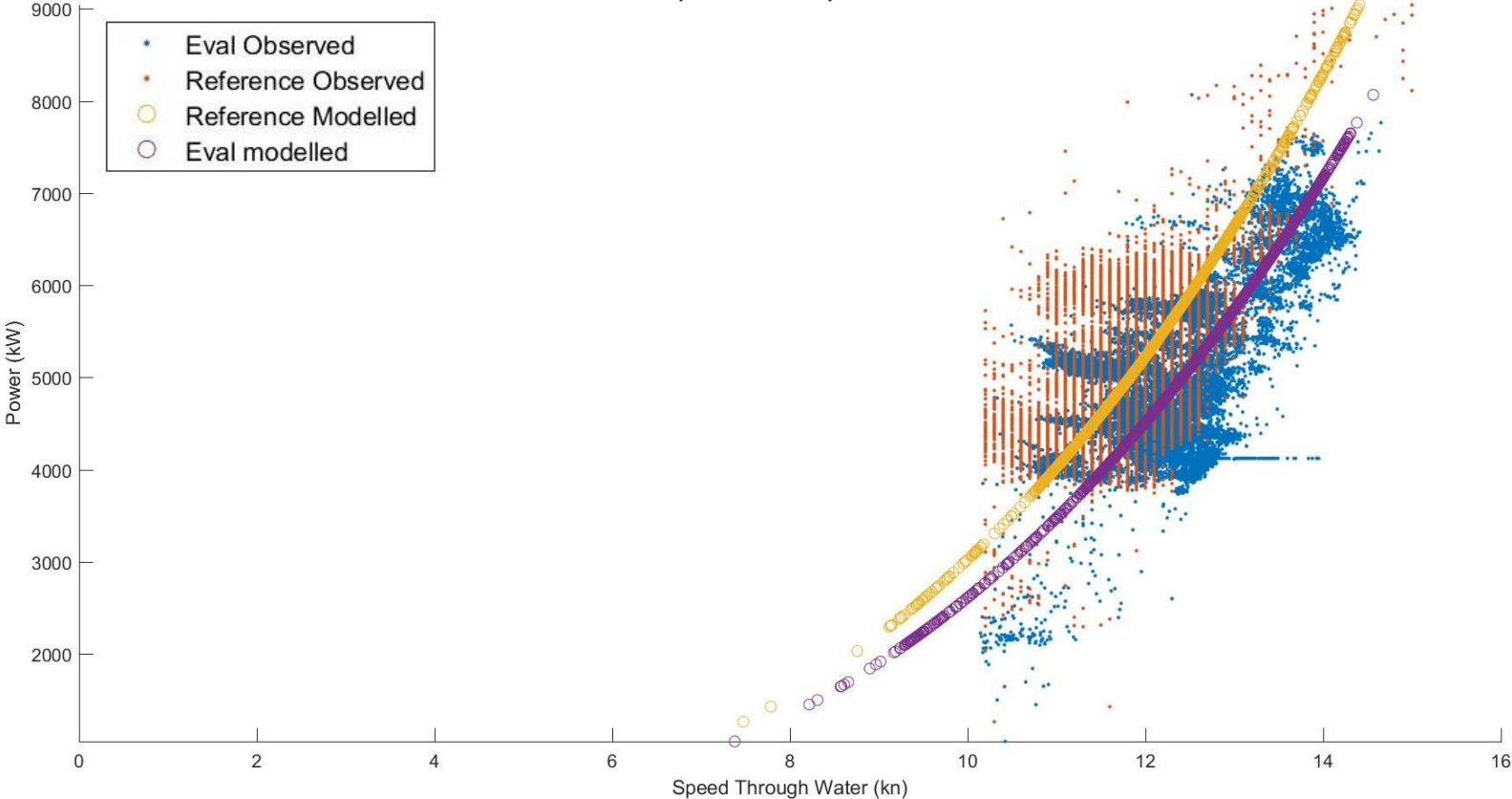
Applied Methodology

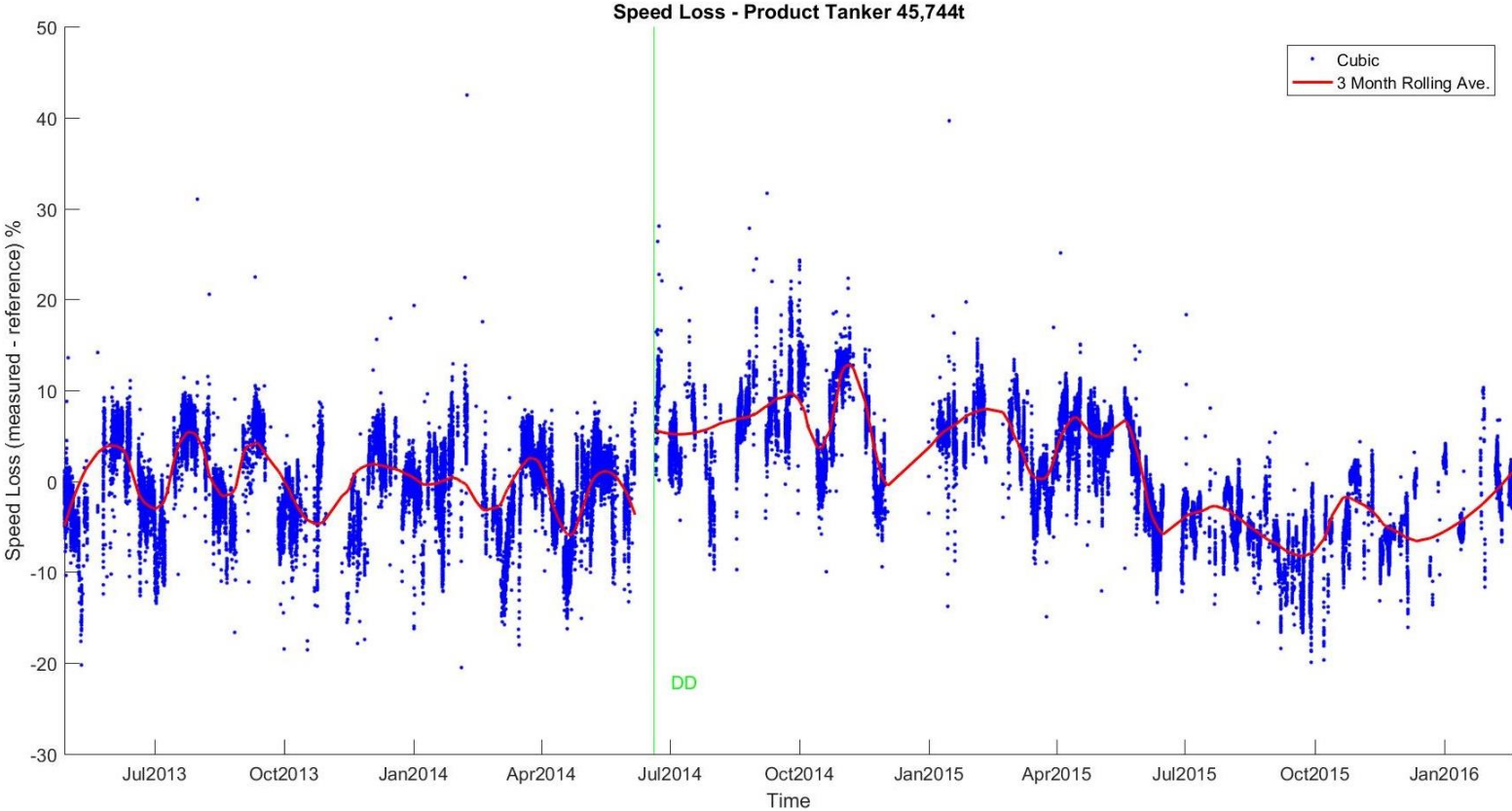Power - Speed Curve - Product Tanker 45,744t
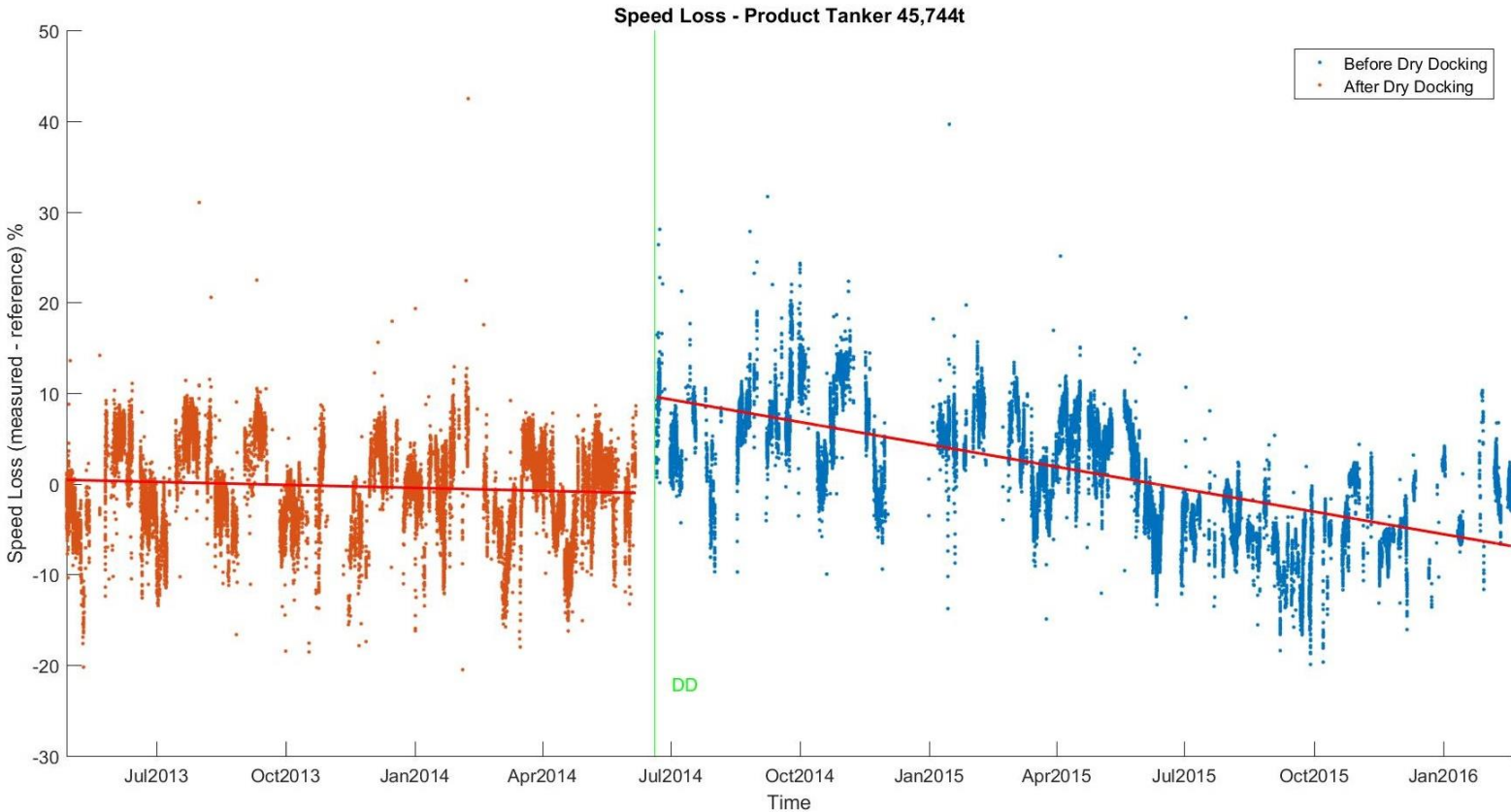
Applied Methodology

Power - Speed Curve - Product Tanker 45,744t Intervention Analysis
Intervention Date: 20-Jun-2014 - 12 reference period
Estimated performance improvement: 5.0956

Results

Results

Speed Loss - Product Tanker 45,744t

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Observations

- Poor data quality - only 20% retained after normalization and filtering

- Poor record keeping of interventions carried out

- Sensitivity of performance index to the length of evaluation and reference periods

- Challenge in isolation of benefits from particular interventions

- Understanding of what performance index is

Looking Forward

- Transparent information based on operational data related to energy efficiency interventions or retrofits

- Allow for better informed decisions for owners, financiers and the drafting of charter agreements

- Reward vessels for proven performance improvement

- Allow for independent assessment of figures quoted by technology providers

Questions?

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