International marine coatings

Passion for performance

Performance Monitoring – A Tiered Approach

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Performance Monitoring – A Tiered Approach

During the first workshop in Oslo, Dr. Gareth Prowse suggested that a tiered approach as used in previous ISO submissions would be more appropriate for this submission

- A tiered approach takes into account the principal of “Best Available Technology not Entailing Excessive Cost” (BATNEEC)
  - What is appropriate to expect the ship operator to do within their cost constraints?
  - Developing legislation which increases the operating cost burden to ship operator will not be welcomed
  - This is the guiding principal behind SEEMP and voluntary EEOI

Performance Monitoring – A Tiered Approach

- Proposal for this standard would be to consider the options to the ship operator for different levels of investment
  - Investment needs to consider installation costs, hardware costs, running/upkeep costs as well as labour in terms of operation and use

Performance Monitoring – A Tiered Approach

Proposal is to have four tiers with sub-levels within each tier split according to investment versus output

- Tier 1 – Levels 1 & 2
- Tier 2 – Levels 1 & 2
- Tier 3 – Levels 1 & 2
- Tier 4 – Levels 1 & 2

Performance Monitoring – A Tiered Approach

Tier 1	LEVEL 1
Data Requirements	**Frequency**
Draft Trim Speed Power etc…	1 per day
Potential Outputs	
Charter party information Broad trends on key parameters Effect of technologies (if large enough)	
Positive	**Negative**
Nothing new No additional costs	Limited datasets Analysis sensitivity

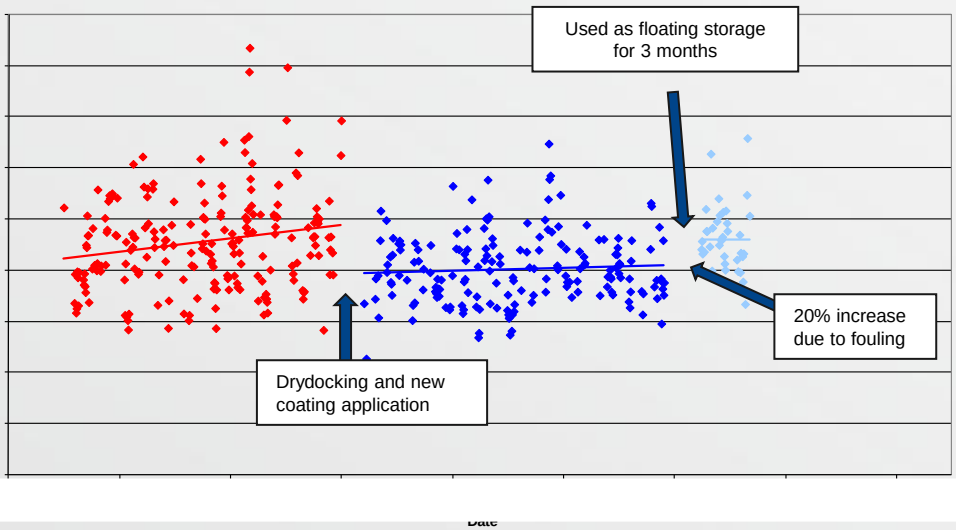
Performance Monitoring – A Tiered Approach

Tier 1	LEVEL 2
Data Requirements	**Frequency**
Draft Trim Speed Power etc… Linked with GPS weather and oceanographic data	1 per day
Potential Outputs	
Charter party information Broad trends on key parameters Effect of technologies (if large enough)	
Positive	**Negative**
More accurate weather data (removing subjectivity of wave height, frequency and direction) Improved analysis	Limited datasets Extra cost of accurate weather data

Tier 1 Level 1 Example

Noon reports are easily dismissed as ineffective but

- They are an essential daily record of vessel performance
- With correct crew training ensuring accurate data collection can provide an insight into performance
- If handled correctly, can give indications of macro-effects:



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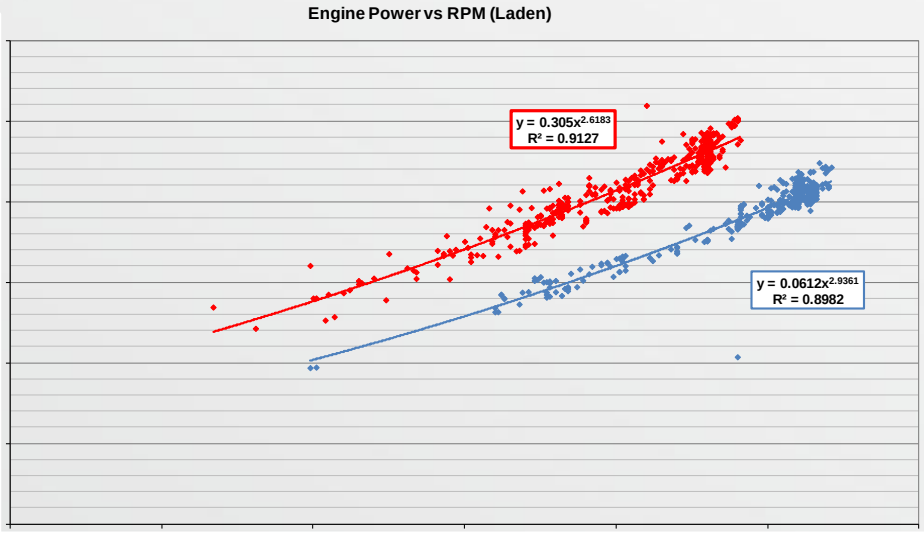

Performance Monitoring – A Tiered Approach

Tier 2	LEVEL 1
Data Requirements	**Frequency**
Draft Trim Speed Power etc…	X times per day
Potential Outputs	
Charter party information Broad trends on key parameters Effect of technologies (if large enough)	
Positive	**Negative**
Nothing new Crew training and involvement	Extra crew requirements Datasets improved but still limited

Performance Monitoring – A Tiered Approach

Tier 2	LEVEL 2
Data Requirements	**Frequency**
Draft Trim Speed Power etc… Linked with GPS weather and oceanographic data	X times per day
Potential Outputs	
Charter party information Broad trends on key parameters Effect of technologies (if large enough)	
Positive	**Negative**
More accurate weather data (removing subjectivity of wave height, frequency and direction) Improved analysis Crew training and involvement	Extra crew requirements Datasets improved but still limited

Performance Monitoring – A Tiered Approach

Tier 3	LEVEL 1
Data Requirements	**Frequency**
Draft Trim Speed Power etc…	Automated data collection Regular data transfer
Potential Outputs	
Charter party information Pro-active vessel monitoring for event planning (propeller clean, hull clean, drydocking)	
Positive	**Negative**
Significantly more data for higher degrees of accuracy and statistical testing	System upfront costs Installation costs (e.g. new sensors) Sensor reliability

Performance Monitoring – A Tiered Approach

Tier 3	LEVEL 2
Data Requirements	**Frequency**
Draft Trim Speed Power etc… Linked with GPS weather and oceanographic data	Automated data collection Regular data transfer
Potential Outputs	
Charter party information Pro-active vessel monitoring for event planning (propeller clean, hull clean, drydocking) Identification of impact of key parts of the vessel – engine, hull, propeller	
Positive	**Negative**
Significantly more data for higher degrees of accuracy and statistical testing Ability to isolate cause and effect on different key components on a vessel	System costs Installation costs (e.g. new sensors) Sensor reliability

Performance Monitoring – A Tiered Approach

Tier 4	LEVEL 1
Data Requirements	**Frequency**
Draft Trim Speed Power etc… Direct vessel data transfer	Automated data collection Immediate data transfer
Potential Outputs	
Charter party information Pro-active vessel monitoring for event planning (propeller clean, hull clean, drydocking)	
Positive	**Negative**
Significantly more data for higher degrees of accuracy and statistical testing Real-time immediate responses to performance changes	System upfront costs Installation costs (e.g. new sensors) Sensor reliability

Performance Monitoring – A Tiered Approach

Tier 4	LEVEL 2
Data Requirements	**Frequency**
Draft Trim Speed Power etc… Direct vessel data transfer Linked with GPS weather and oceanographic data	Automated data collection Immediate data transfer
Potential Outputs	
Charter party information Pro-active vessel monitoring for event planning (propeller clean, hull clean, drydocking) Identification of impact of key parts of the vessel – engine, hull, propeller	
Positive	**Negative**
Significantly more data for higher degrees of accuracy and statistical testing Real-time immediate responses to performance changes Ability to isolate cause and effect on different key components on a vessel	System upfront costs Installation costs (e.g. new sensors) Sensor reliability

Tier 4 Level 4 Example

Tier 4, Level 4 gives the highest number of datapoints with highly accurate weather allowing mathematical modelling of propeller, hull and engine effects

- Highly dependent upon quality, calibration and maintenance of the sensors

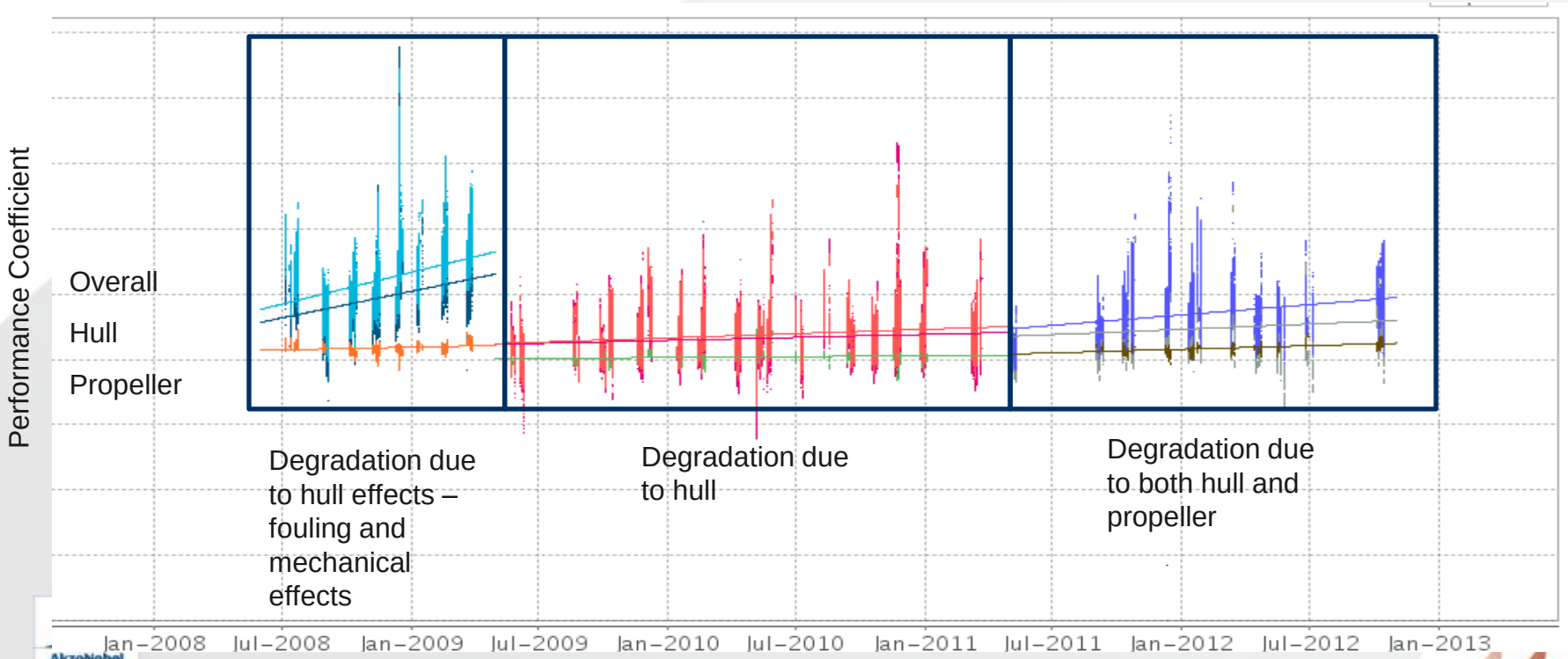

Image courtesy of BMT Argoss

Performance Monitoring – A Tiered Approach

Proposal is to have four tiers with sub-levels within each tier split according to investment versus output

		Human Dependence	Equipment Dependence	Relative Cost	Accuracy of Analysis
Tier 1	Level 1	95	5	5	10
	Level 2	70	30	10	15
Tier 2	Level 1	95	5	10	20
	Level 2	70	30	15	25
Tier 3	Level 1	20	80	100	80
	Level 2	20	80	105	95
Tier 4	Level 1	20	80	100	80
	Level 2	20	80	105	95

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