

Ship Energy Performance Framework

Case Study: Bulk Carrier Propulsion Performance

Tier 2: Performance Health Check



CASE

The ship manager of a Kamsarmax bulk carrier requested analysis of the vessel's performance to identify potential degradation.

METHODOLOGY

Utilizing the vessel's design information, ABS created a computational propulsive performance model, considering the increase in resistance due to wind and waves according to industry-published methodologies, e.g., ISO 15016. This enabled the derivation of the propulsion power and fuel consumption estimation of the vessel in any seaway and loading condition.

Having established the baseline that estimates the vessel's performance under various environmental and loading conditions, a comparison with actual measurements, appropriately processed, was then carried out. In this case, the ship manager provided noon reports.

DELIVERABLES

A report with the information utilized, the applied methodology, and the results in tabular and graphical format.

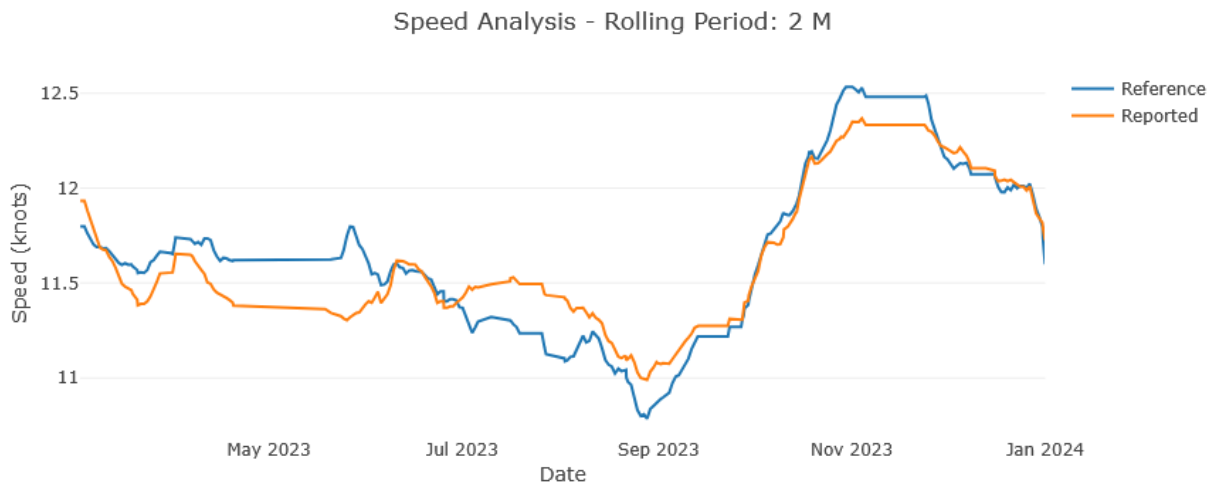


Figure 1: Speed analysis – comparison of measurements with baseline model.

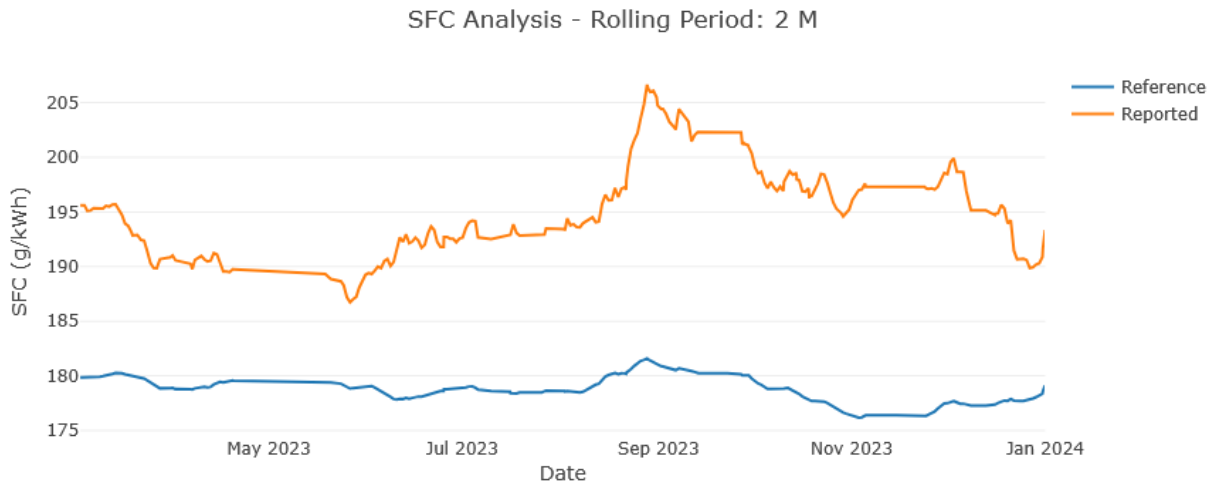


Figure 2: Specific fuel consumption analysis – comparison of measurements with main engine shop tests.

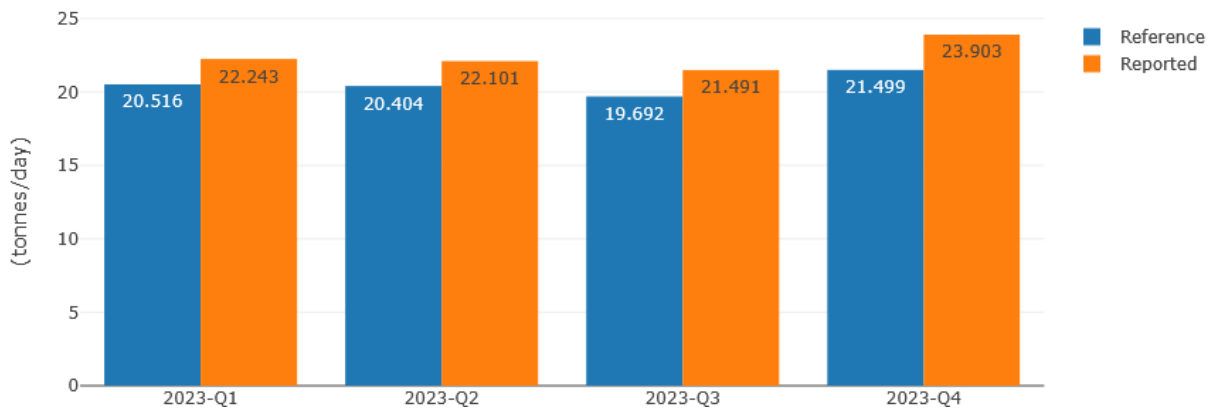


Figure 3: Quarterly report on M/E fuel consumption with comparison against baseline model.

CONCLUSION AND RECOMMENDATIONS

- This analysis applies to a variety of data sources, ranging from low-frequency (e.g., through noon reports) to high-frequency measurements (e.g., from onboard sensors).
- Judging vessel performance requires analysis of both fuel consumption and speed/power. This can reveal whether inefficiencies are traced to the main engine or hull/propeller condition, which in turn can trigger improvement actions.
- To perform the analysis of in-service measurements, a vessel performance model and measurements processing should be established. This preparation step does not have to be repeated, rendering the repetition of the analysis at frequent subsequent intervals straightforward.

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