

CLIPPER GALAXY: ENERGY SAVING 8.5%

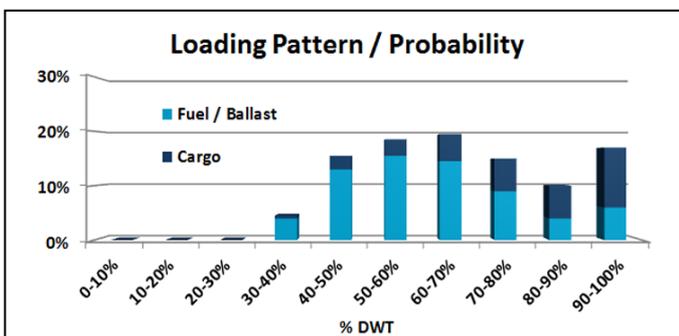
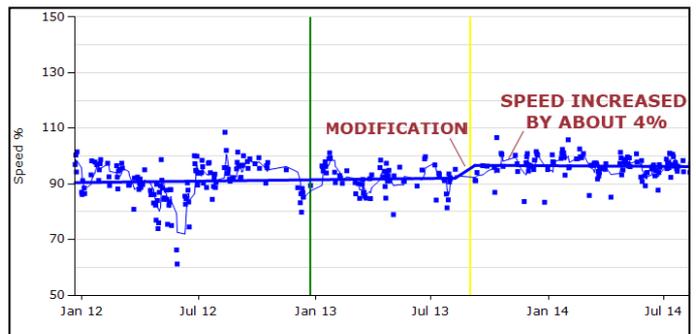
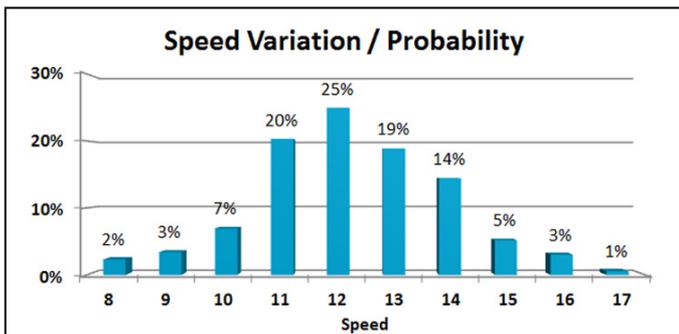
TRIM OPTIMIZATION BY DESIGNING A NEW BULBOUS BOW

The bulbous bow on Clipper Galaxy, a 9,100 dwt G-Class multipurpose vessel, was designed to be most effective at a draught of 7.5 m and a speed of 16 knots. As a consequence of the design draught and speed, the vessel's performance at other conditions was less than optimal. Consequently, Clipper decided to implement trim optimization on Clipper Galaxy - to improve performance at other than design conditions and to reduce the overall energy consumption of the vessel.

The in-house performance management system COACH was used to analyze the actual sailing conditions in more detail. It soon became clear that the actual sailing conditions differ significantly from design conditions. The analysis revealed that Clipper Galaxy was operated at design speed in less than 6% of the time, and at design draft in less than 10% of the time. I.e. the mpp vessel was primarily operated in part-load condition and at economical speed. This is seen from the graphs below.

Clipper Galaxy would clearly benefit from a bulb modification and it was decided to initiate an investigation of the expected savings. A redesign process applying CFD techniques and several model tests showed a saving potential of about 8-9% including fitting of a rudder bulb. The bulb modification on Clipper Galaxy was carried out at first opportunity, during dry-dock in August 2013. The existing bulb was cut off and a new bulb with a different size and shape was fitted.

The new bulb was tested on sea-trial which revealed a saving of around 10%. The improved performance of the vessel was subsequently verified by means of COACH proving an improvement on the speed of about 4%, which equals a fuel saving of 10-12% at the same speed. However, the actual saving depends also on loading and speed conditions. Consumption before and after, as well as the current loading and speed patterns, brings the overall saving to around 8.5% including the rudder bulb effect.



M/V CLIPPER GALAXY

BUILT: 2011
 DWAT: 9,100
 DRAFT: 8.4
 LOA: 119.8
 BEAM: 20.4
 TYPE: Multipurpose/tween/container/heavy lift
 GRAIN/BALE CUBIC: 11,131 / 370725 cubic feet
 HOLDS/HATCHES: 1HOLD/1HATCH
 CRANES: 2 X 200 MT - COMBI
 FLAG: Bahamas

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