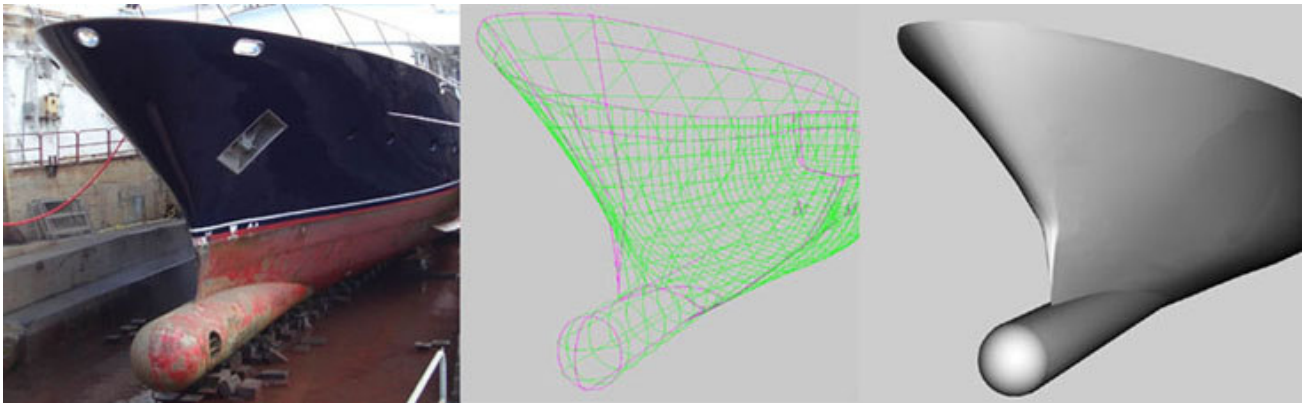
Hull Measurement and Lines Generation

WOLFSON UNIT
FOR MARINE TECHNOLOGY & INDUSTRIAL AERODYNAMICS

INTRODUCTION

The Wolfson Unit is now offering a hull surface measurement service for existing vessels. The output from the exercise is a hull lines plan and a 3D hull surface definition. These outputs can then be used for hydrostatics calculations and general design work.



METHOD

A method, using laser scanning technology, developed by the Wolfson unit has proven to work extremely well. The change from previous practice is to devolve the process into separate phases of measurement; lines generation and verification. The measurement is undertaken by a Wolfson Unit naval architect and the lines are then generated by the same naval architect using 'ShipShape', the Wolfson Unit lines generation program, and the verification is done by a second naval architect using a surface rendering program. Once the lines plan is complete the data may be imported directly into 'HST', The Wolfson Unit hydrostatics and stability program.

MEASUREMENT

A laser theodolite is used to measure the angle and distance of the hull surface by reflection. When the hull does not reflect well enough or specific points on the hull are required then reflective tape targets may be employed. Once the measurement is complete a CAD file of all the points in 3d space coordinates relative to the base station is produced. This file and associated sketches are used as the basis for the lines generation.

LINES GENERATION

'ShipShape' is used to create the lines. A grid of sections and longitudinals is set up. Measured sections and/or longitudinals are read in by 'ShipShape' and mapped onto the grid interpolating where necessary using parametric cubic splines. The result of the fairing process provides a set of orthogonal sections, waterlines and buttocks which are used as the basis for the verification.

VERIFICATION

Using the output of ShipShape a surface rendering of the hull is generated. All the measurement points are then superimposed upon this rendering, including those not used in the lines generation process. The offset of each measurement point normal to the hull is determined. Any errors are used as the basis for refairing the lines until all inaccuracies are minimised.

Wolfson Unit MTIA, University of Southampton, Southampton SO17 1BJ, UK
Tel: +44 (0)23 80585044 Fax: +44 (0)23 80671532
Email: wumtia@soton.ac.uk Website: www.wolfsonunit.com

UNIVERSITY OF Southampton