

Peter Hayes: Draught Marks and Bent Ships

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Synopsis:

Ships are rarely built as straight as designed and all bend to varying extents under load/buoyancy distribution and environmental forces. Traditionally, the treatment of ship draughts (calculation of trim, reading the hydrostatics, etc.) has considered the ship to be straight between the reference points, the forward and aft draught marks used for measurement. The fact that ships bend when placed under load has almost been treated as an afterthought. An allowance for the change in displacement due to any measured hull deflection has been the only correction to the hydrostatic particulars that has been typically applied.

Ships can be fitted with different sets of draught marks. On a typical frigate, there will be aft draught marks at the cutup (aft end of the skeg) and a second set near the transom. There will also be fitted various projection draught marks. All the draught marks should accurately represent the ship and all should be able to be used to determine the local draught of the baseline and consistently determine the hydrostatic particulars. Finally, there are situations, such as docking and navigating locks, where allowing for hull deflection can be important.

This presentation develops a methodology that can handle a bent ship.

About the presenter:

Peter is the Hydromechanics Cell Lead within the Naval Technical Bureau. He has over 43 years of experience in Naval Architecture within defence, 23 of those spent working in Naval ship stability. He authored the Material Requirement Set in Ship Stability for Navy which details all naval stability requirements for surface vessels. Peter is the Engineering Warrant Holder in Ship Stability for the Navy Engineering Branch.

Peter graduated from the University of NSW in 1977, with a Bachelor of Engineering (Naval Architecture) and completed a Research Masters in Engineering at UNSW Canberra in 2014, with the focus of his thesis on the stability of Naval Landing Craft.