

Vessel Load Factor Analysis

Start Date:

August 2004

Lead Researcher(s):

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**Projected
End Date:**

Problem Addressed:

The development of viable fleet forecasts and economic benefit analysis of vessel operations requires understanding of vessel loading and lading management relationships relative to type of vessel employed, the nature of cargo and associated requirements for handling and transfer, and the regime for vessel operations management given logistical requirements and limitations for cargo services. Historically and presently many USACE waterway system analyses do not include efforts to reconcile critical load factors for projected or potential variances in vessel immersion and capacity relative to cargo volume and weight or the disposition of non-cargo components of vessel loading such as bunkering, requirements for ballast, and carriage for unitized cargos. Non-cargo components often represent significant requirements for vessel loading by weight and therefore directly impact immersed hull draft and corresponding needs for waterway improvements in regard to increased channel depth, width, or reach. The limited load factor information as contained in the existing IWR deep-draft manual is no longer considered sufficient in detail or representative given the nature of vessel operations as they prevail today due to changes in transportation technology, level of transportation information reporting, and maritime industry practice(s). Continuation of current analytical practice without better understanding and address of vessel load factor relationships can result in significant uncertainty and error in the formulation of vessel fleet forecasts and associated determination of requirements for waterway improvements such as increased depth or width.

Objective:

The objective of investigations for vessel load factors is to develop a reference of valid relationships and parameters for estimating the disposition of cargo and non-cargo components of vessel loading to in turn better estimate requirements for vessel immersion and draught. This will include review and update of information concerning typical industry practices for management of vessel capacity and utilization according to significant vessel type and both cargo and non-cargo loading with particular consideration of non-cargo allowances for ballast, bunkering, and any other load factor significant to reasonably estimating hull immersion. Supporting efforts will entail research and development of general relationships for a variable immersion factor applicable to varying hull geometry corresponding to the working range of hull immersion for cargo loading.

Benefits:

Improved analysis of waterway improvements and estimation of associated economic benefits via a more consistent and verifiable approach for the estimation of vessel loading and immersed draught under variable or alternative specifications for waterway system design.

Status:

Studies underway and ongoing; approximately forty (40) percent complete with completion scheduled for mid to late December 2005. Funded under Transportation Systems and NETS programs.

Contract Data:

IWR

Progress:

Products (Bookshelf/Toolbox):

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Related Links:

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Source: Navigation Economic Technologies Program ©2005

