

CECW-PD

1 February 1999

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Economic Guidance Memorandum 99-05, Deep Draft Vessel Operating Costs

1. The enclosed Deep Draft Vessel Operating Cost information is provided for immediate use and should be used until new information is provided.
2. All costs have been reanalyzed, but vessel characteristics remain the same as FY98. The  $\pm 5$  percent caps from the FY98 costs have been removed, and the fuel costs are based on a 5-year moving average instead of the 3-year average previously used. Some significant changes have occurred with the removal of the  $\pm 5$  percent cap, mainly with foreign containerships and bulkers. Without the artificially placed caps the maximum hourly cost changes would be +3 percent and -5 percent. Fuel costs have dropped while operating costs have generally risen. Annualized replacement costs are mixed. A decrease in hourly costs does not necessarily correspond to a decrease in transportation cost savings as the FY98 cap changed the relationship between vessel sizes of the vessel types.
3. Questions concerning this memorandum can be addressed to Ron Conner, CECW-PD, 202-761-0132.

FOR THE COMMANDER:

Encl

/s/  
JAMES F. JOHNSON  
Chief, Planning Division  
Directorate of Civil Works

25 January 1999

FY 1999 PLANNING GUIDANCE  
DEEP DRAFT VESSEL COSTS

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## Deep Draft Vessel Costs

### Introduction

The deep draft vessel costs shown herein are provided for use by Corps of Engineers planners in studies to determine the potential benefits of harbor improvement projects. It is the latest in a series of revised or updated vessel costs published every one to two years since the 1960's. This set of costs updates the FY98 Costs, published October 1998. Corps Studies contemplate investment in new harbor works, therefore, all vessels are priced as new and are amortized at the discount rate (6 7/8%) used to evaluate Corps harbor projects.

The accompanying Vessel Operating Cost worksheets show costs, dimensions, typical speeds and immersion rates for a large number of vessel types and sizes. Corps studies usually require determination of transportation costs for vessels of specific intermediate sizes. For that purpose the formulas for relating deadweight to draft and other dimensions are shown in Appendix A. Linear interpolation of costs is appropriate to determine the operating cost for a vessel different than the sizes given. The vessel dimensions in the cost tables are all in feet. All weights (deadweight, fuel consumption, tpi) are in metric tonnes.

### 1999 Explanatory Notes

Vessel Capital Costs. Replacement costs for all types of vessels have been based on a ten year average to dampen any sudden upward or downward shift in prices. The only exception to this rule is double-hull tankers since they have a relatively short historical base. Tankers continue to be grouped into double hull and non-double hull categories, since double-hull is the only configuration allowable by OPA 90, and single hull vessels calling U.S. port will have to be phased out by 2010. Since few U.S. flag vessels have been built in recent years, replacement costs for these vessels have been based on a cost differential applied to the replacement cost for foreign flag vessels. The FY99 ten year averages reflect decreasing construction costs for most vessel types.

Fixed Operating Costs. These costs have been reanalyzed for 1998 price levels. Ship operators and ship management companies were surveyed for the tanker and bulker costs, while containership lines were surveyed for those costs. The Foreign Vessel Operating Costs are based on an Open Registry, which is a flag of convenience with ITF (International Transport Workers= Federation) approved crews. U.S. Vessel Operating Costs reflect the higher crew costs incurred over a flag of convenience. Vessel Replacement costs continue to constitute the largest percentage of Operating costs (about 50%) followed by Crew costs (about 25%). Freight rates continue to fall due to competition (more efficient, increasing capacity) causing the various industries to face constant pressure to cut operating costs, particularly in the foreign bulk market for FY99 costs.

Vessel Characteristics. The vessel characteristics are the same as in FY98. They will be reexamined for the next update using statistical analysis with data Ship Registers. Regression equations for the vessel characteristics, which include length, beam, draft, immersion rate, horsepower, and speed can be found in Appendix A. Standard errors of the estimates and R-squared measurements have been provided to facilitate risk and uncertainty analysis. Although the regression equations were estimated based on metric measures and presented with conversion factors in the appendix, the vessel dimensions in the cost tables are all in feet. All weights (deadweight, fuel consumption, tpi) are in metric tonnes.

Continuing from the FY98 costs, tanker characteristics and equations are the regardless of single or double hull characteristics. Also, the regression estimates continue to be inaccurate for the postpanamax containerships characteristics because of relatively few data points so actual vessel characteristics were used in place of the regression estimates. This should improve somewhat in the next cost update as more vessels are built.

Fuel Costs. Fuel consumption rates remained the same as in FY 1998. Fuel prices were updated to reflect a 5 year moving average, instead of the 3 year average previously used. The prices used to produce the fuel costs are from Fairplay magazine and are based on the overall average of weekly prices at nine bunkering locations worldwide including New York, Houston and Los Angeles in the U.S., for the 60 month period ending September 1998. Prices were adjusted to 1998 price levels using the U.S. Gross National Product Implicit Price Deflator. Most prices appeared to be linked to the value of the dollar, hence this GNP index was deemed a suitable proxy for multiple country-specific inflation rates. The bunkering locations, monthly prices and price adjustments are also presented in Appendix B.

Although fuel prices have been averaged over five years, the extremely low fuel prices in 1998 have dampened the average. Prices have been falling from their peak in 1996 all through 1997 and 1998, and although they are expected to slow recover, levels above the 1996 peak are not expected. Fuel costs for specific vessel itineraries and bunkering locations can be determined by use of Appendix B and/or other published prices. The Clarkson Ship Register has consumption figures for most containerships, tankers, bulkers and reefers, and Fairplay publishes bunker prices for thirty bunkering ports in addition to the nine used in this analysis. IWR has subscriptions to both data sets so inquiry with them if you need to adjust the costs for a specific vessel (consumption) or vessel itinerary (bunkering port).