



Worldscale: A Primer

Worldwide Tanker Nominal Freight Scale

Tanker Derivatives Forum, New York
The Baltic Exchange

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- ▶ *Worldscale History*
- ▶ *Guiding Principle: Equivalent Daily Hire*
- ▶ *Basis of Calculation*
- ▶ *Standards & Assumptions*
- ▶ *Application*



Origins

- ▶ *1861 - First transatlantic shipment of oil on the 350 dwt Elizabeth Watts – 1,329 barrels of oil from Philadelphia to London*
- ▶ *1878 – First successful oil tanker, 390 dwt Zoraster commissioned by the Nobel Brothers Petroleum Producing Company for transport from Baku to Astrakhan on the Caspian Sea*
- ▶ *1886 – 3,500 dwt Gluckauf built in Newcastle in for the German American Petroleum Co. - prototype of today's oil tanker – shipwrecked off Long Island March 24, 1893.*



Origins

- ▶ *Tanker freight rates were originally quoted in dollars or shillings and pence per long ton for individual voyages*
- ▶ *For multiple load and discharge combinations it was necessary to calculate and agree on many different rates of freight for each voyage option*





Origins

- ▶ *The concept of freight rate schedules is almost 70 years old and originated during World War II (1939-1945)*
- ▶ *The war effort saw the British and US governments requisition commercial vessels for re-supply operations*
- ▶ *Owners of these vessels were paid on the basis of a daily hire rate*





Origins

- ▶ *From time to time vessels became surplus to the war effort and were “relet” to the owners on a voyage basis*
- ▶ *The rate of freight for these voyages was calculated so that, after allowing for port costs, bunker costs and canal expenses, the net daily revenue was equal to the daily hire rates being paid by the governments*
- ▶ *Schedules of rates were laid down by the governments that were calculated on the basis of the “equivalency principle” for hire rates*



Origins

- ▶ *The last schedule of tanker voyage rates was issued by the British Ministry of Transport (MOT) for rates effective January 1, 1946*
- ▶ *The last schedule of tanker voyage rates was issued by the United States Maritime Commission (USMC) for rates effective February 1, 1946.*
- ▶ *The industry had come to realize the benefits of maintaining the schedules for negotiating purposes and ease of communication and a system evolved of agreeing rates on the basis of “plus or minus a percentage from MOT or USMC”*



Origins

- ▶ *Until 1969 a number of different schedules were issued: Scales No.s 1, 2, 3; Intascale in London and American Tanker Rate Schedule (ATRS) in New York*
- ▶ *In 1969 the Worldwide Nominal Tanker Freight Scale (“Worldscale”) was introduced to replace Intascale – ATRS survives as “AR”*
- ▶ *On January 1, 1989 “New Worldscale” was introduced incorporating an updated standard vessel with a daily hire rate increased from US\$ 1,800 per day to US\$ 12,000 per day.*





Equivalent Daily Hire

- ▶ *Regardless of the voyage performed, the owner will “theoretically” earn the same daily amount or daily hire (measured in US\$/Day) after voyage costs are deducted from voyage revenue*
- ▶ *Freight rates listed in the Worldscale publication are derived using the following principle:*

$$\text{DAILY HIRE} = \frac{\text{VOYAGE REVENUE} - \text{VOYAGE COSTS}}{\text{VOYAGE ELAPSED TIME}}$$



Definitions

- ▶ *Voyage Revenue = The freight payment made to the owner in US\$ based on the calculation of the Worldscale published rate (US\$/MT) times cargo quantity (MT)*
- ▶ *Voyage Costs = The expenses incurred by the tanker owner in meeting the obligation to load, transport, and discharge charterers cargo including: port costs, fuel costs, canal charges*
- ▶ *Voyage Time = The elapsed time in days for the vessel to carry out the laden transit and the ballast transit back to the load port*



Formulation of Worldscale Rate

WS100 or Flat Rate

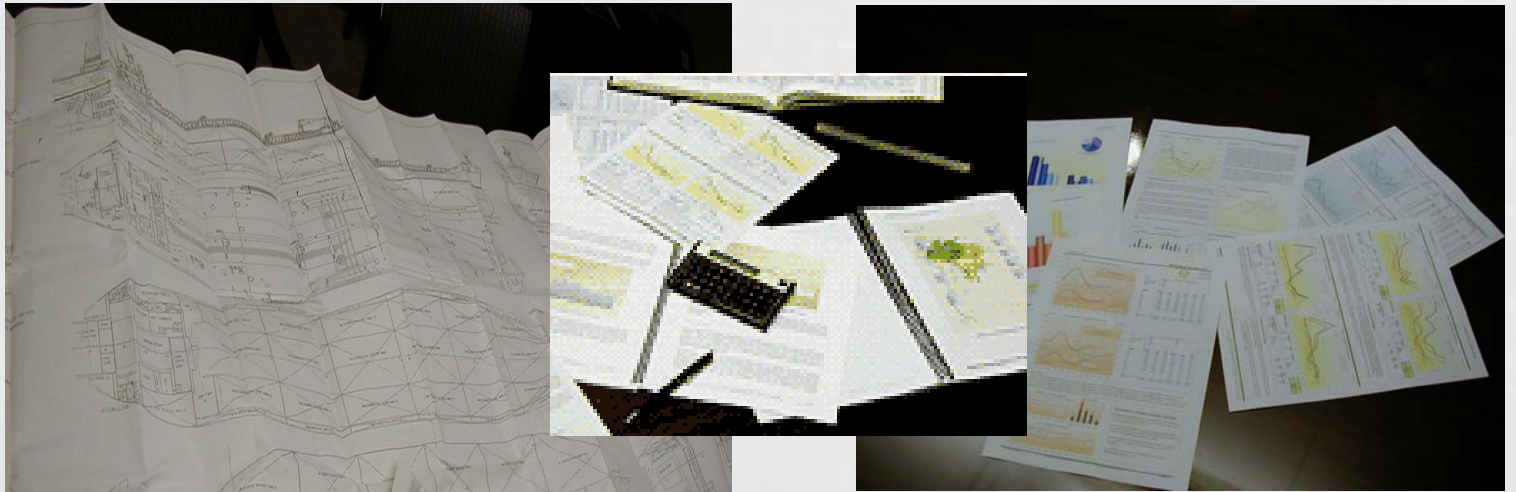
$$\text{DAILY HIRE} = \frac{\left[\text{WS 100 (US\$/MT)} * \text{Cargo Qty. (MT)} \right] - \left[\text{Port + Fuel + Canal Costs} \right]}{\text{Round Trip Miles / Speed / 24}}$$

$$\text{WS 100 (US\$/MT)} = \frac{\left[\text{DAILY HIRE} * \text{Round Trip Days} \right] + \left[\text{Port + Fuel + Canal Costs} \right]}{\text{Cargo Qty. (MT)}}$$



Standard Vessel

- ▶ *Total capacity* 75,000 MT
- ▶ *Average service speed* 14.5 knots
- ▶ *In-transit bunker consumption* 55 MT/Day
- ▶ *Other bunker consumption* 100 MT/Voyage
- ▶ *Bunker grade* 380 cst
- ▶ *Fixed hire element* US\$ 12,000/Day
- ▶ *Port time* 4 days 1:1





Other Assumptions

- ▶ *Bunker costs – Currently calculated as the average worldwide bunker price for 380 cst fuel oil during the October 1, 2006 through September 30, 2007*
- ▶ *Port costs – As assessed by Worldscale associations based on information available to them up to the end of September 2007*
- ▶ *Canal transit time – 24 hours for Panama Canal transit; 30 hours for Suez Canal transit*



WS100 Rate / Flat Rate

$$\text{WS 100 (US\$/MT)} = \frac{\left[\text{US\$12 K / Day} * \left(\frac{2 * \text{Miles}}{14.4 \text{ knots} / 24 \text{ hours}} \right) + 4 \text{ port days} + \text{canal time} \right] + \left[\text{Port costs} + \text{Fuel costs at sea} + \text{Fuel costs in port} + \text{Canal Costs} \right]}{75,000 \text{ MT}}$$

- ▶ *The annual Worldscale publication lists over 60,000 WS100 rates on the basis of US\$/MT*
- ▶ *The rates are arranged for port combinations alphabetically by discharge port first*



Market Rates

- ▶ *Spot rates will vary in the market as driven by the forces of tonnage supply and demand*
- ▶ *Spot rates are typically quoted as a percentage premium or discount of the published rate or WS100 rate*
- ▶ *Therefore a Suezmax rate of WS 125 is 125% of the WS100 rate*
- ▶ *Similarly a VLCC rate of WS 90 is 90% of the WS100 rate*





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