

Voyage calculations for tankers

The VLCC Alsace is chartered to carry a cargo of 244,000 mt from Ras Tanura to Rotterdam, via Cape, ballasting from Rotterdam via Suez Canal.

Cargo details

- Cargo: 244,000 mt 1 grade crude oil no heat

Vessel details

- VLCC Alsace, SDWT 279,000; SCNRT 65,000
- Speed: 12.5 knots laden; 13 knots in ballast
- Consumption–FO: 62 mt per day laden and 50 mt per day in ballast;
- Consumption–DO: in port idle 24 mt/d; working 38 mt/d DO;
- No DO consumed at sea.

Routes and ports

- Ras Tanura, Load port
- Rotterdam, Discharge port, via Cape, return Ballast via Suez
- Distances: Ras Tanura–Rotterdam: 11,307 nm
- Rotterdam-Ras Tanura: 6,524 nm
- Port time: TTL 4 days, 2 days for discharging
- Suez Canal transit: 1 day, consumption 20 mt FO

Costs

- Costs Address and brokerage commission: TTL 2.5% (all included)
- The bunker price is \$260/t for FO, \$400/t for DO at Ras Tanura
- The port costs are \$70,000 at load and \$180,000 at discharge.
- Running costs: \$10,000/day.
- War risk additional premium (WRAP): the insured value (I.V.) is \$70 million, and the applicable. WRAP for Ras Tanura is 0.03%.
- Crew war bonus insurance allowance: \$4,000.
- Suez Canal transit costs \$245,000

Fixture

The flat rate (WS100) Ras Tanura to Rotterdam CS is \$18.35/mt; fixture agreed at WS85. US\$0.23 per mt to be added as fixed rate differential on cargo loaded or discharged in Rotterdam. Canal differential of \$3.75 per SCNRT

Calculate net freight and time charter equivalent rate.

Step 1. Calculate freight

Cargo is 244,000 mt. Rate is \$18.35 (WS 100).

Fixture agreed WS 85. Freight rate is \$15.59. $\$15.59 \times 244,000 = \$3,803,960$

Fixed differential $\$0.23 \times 244,000 \text{ mt} = \$56,120$

Canal differential $\$3.75 \times 65,000 = \$243,750$

Total freight income is \$ 4,103,830

Commission is 2.5% ($2.5\% \times \$4,103,830 = \$102,595.75$)

Net freight: Total freight – commission = \$4,001,234.25

Step 2. Calculate the voyage duration

a) Laden leg = $11,307 \text{ nm} / 300 \text{ nm/day}$ (12.5 knots x 24 hours) = 37.69 days

b) Ballast leg = $6,524 \text{ nm} / 312 \text{ nm/day}$ (13.0 knots x 24 hours) = 20.91 days

Total sailing days = 58.6

Loading will take: 2 days

Discharging will take: 2 days

Plus Suez transit = 1 day

Total estimated voyage duration = 63.6 days

Extra days 10% (weather margin) = 6.36 days

Total= 69.96 days

Step 3. Calculate bunker costs

a) FO (fuel oil) consumption at sea:

Laden leg: $62 \text{ mt FO per day} \times 37.69 \text{ days} = 2,336.78 \text{ mt}$

Ballast leg: $50 \text{ mt FO per day} \times 20.91 \text{ days} = 1,045.50 \text{ mt}$

Suez Canal transit (FO) = 20 mt

Total bunker quantity: 3,402.28 mt

Total FO cost: $3,402.28 \text{ mt} \times \$260 = \$884,592.80$

b) DO (diesel oil) consumption in port (no diesel oil consumption at sea.)

DO in port Idle: $24 \text{ mt per day} \times 2 = 48 \text{ mt}$

Working: 38 mt per day x 2 = 76 mt

Total DO cost: 76 mt x \$400 + 48 mt x \$400 = \$49,600

c) Total bunker costs: \$934,192.80

Step 4) Calculate other voyage costs

a) Port costs \$70,000+\$180,000=\$250,000.

b) Suez Canal transit = \$245,000

c) Insurance premiums (additional insurance premiums for the voyage)

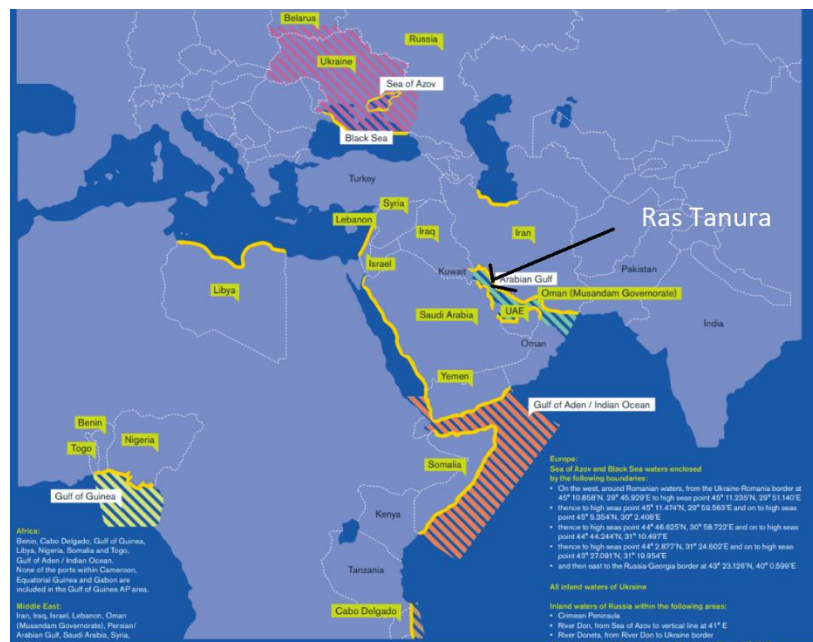
1 War risk additional premium (WRAP) is 0.03% of \$70.0 million (insured value) = \$21,000.

2 Crew war bonus insurance allowance: \$4,000.

Total insurance: \$25,000

Other costs: \$495,000

Total: \$520,000



Gross voyage surplus= Net freight – voyage costs – bunker costs = \$2,547,041.45

Gross daily = Gross voyage surplus/days (69.96 days) = \$36,407.11

Net daily = Gross daily – daily running cost = \$36,407.11-\$10,000=\$26,407.11

TCE: Gross daily/(1-comission)=\$37,340.62

!!!! Note that if no commissions are payable, then TCE = Gross daily.