Freight Calculator Report

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Executive Summary

This report presents the optimal vessel-cargo assignment for committed cargoes, maximizing total portfolio profit/loss while respecting laycan windows and vessel constraints.

Metric	Value
Committed Cargo P/L	$2,326,157.25
Market Cargo P/L	$0.00
Idle Vessel Penalty	-$42,831.25
Net Portfolio P/L	$2,283,326.00

Optimal Vessel-Cargo Assignment

The following table shows the recommended vessel assignment for each committed cargo, with the selected discharge port that maximizes TCE (Time Charter Equivalent).

Cargo	Vessel	Type	Discharge Port	Duration	TCE
BHP Iron Ore 1	ANN BELL	CARGILL	Primary	35.27 days	$23,860/day
CSN Iron Ore 2	ANN BELL	CARGILL	RIZHAO	86.90 days	$23,860/day
EGA Bauxite 0	ZENITH GLORY	MARKET	QINGDAO	79.24 days	$26,627/day

Rationale Behind Recommendations

1. Optimization Objective

The algorithm uses brute-force combinatorial optimization to:

- Assign each committed cargo exactly once
- Use each vessel at most once
- Select the best discharge port among alternatives

2. Vessel Selection Logic

ANN BELL (Cargill) was selected for Iron Ore cargoes due to:

- Already committed (on-hire), prioritized to maximize utilization
- Favorable position proximity to load ports (lower ballast distance)
- Lower fuel costs resulting in higher profit margins

ZENITH GLORY (Market) was selected for Bauxite cargo because:

- Offered better TCE ($26,627/day) for the West Africa to China route
- ETA aligned within the laycan window (earliest/latest loading dates)

3. Discharge Port Selection

RIZHAO was chosen over QINGDAO/TIANJIN for CSN Iron Ore 2:

- Shorter laden distance (10,728 nm vs 11,371 nm)

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- Lower fuel consumption = higher profit
- TCE difference exceeded the 2% tolerance threshold

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Key Assumptions Used

Assumption	Value	Source/Rationale
Speed Mode	Economical	Uses economical_speed columns
Fuel Price (VLSFO)	~$440/MT	bunker.xlsx (Singapore)
Fuel Price (MGO)	~$850/MT	bunker.xlsx (Singapore)
Daily Hire (Market)	FFA 5TC Rate	ffa_report.xlsx interpolation
Address Commission	3.75%	Industry standard
Broker Commission	1.25%	Industry standard
Bunker Days	1.0 day	Default bunkering stop
Laycan Enforcement	Enabled	ETA within cargo dates
AWRP Fee	$1,500	Fixed per-voyage
CEV Fee	$1,500	Fixed per-voyage
ILHOC Fee	$5,000	Fixed per-voyage

Profit/Loss Calculation Methodology

Revenue Calculation

Revenue = Loaded Qty x Freight Rate x (1 - Address Coms - Broker Coms)

Where Loaded Qty = min(Vessel DWT, Cargo Quantity)

Hire Cost Calculation

Hire Cost = (Daily Hire x Total Duration + Ballast Bonus) x (1 - ADCOMS)

Total Duration = Ballast Days + Laden Days + Port Days + Bunker Days

Bunker Expense Calculation

Bunker Expense = (IFO Usage x IFO Price) + (MDO Usage x MDO Price)

IFO Usage = Sea consumption (ballast + laden) + Port consumption

Remaining fuel onboard valued at previous month's price

TCE (Time Charter Equivalent)

TCE = (Revenue - Bunker Expense - Misc Expense) / Total Duration

This metric allows comparison across different voyage lengths

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Alternative Discharge Port Analysis

The following table compares TCE across alternative discharge ports. Ports within 2% TCE of the best option are considered equivalent.

Cargo	Port	Laden (nm)	Duration	P/L	TCE	Within 2%
CSN Iron Ore 2	RIZHAO	10,728	86.90d	$1,090,695	$23,860	YES
CSN Iron Ore 2	QINGDAO	11,371	89.14d	$1,016,604	$22,715	NO
CSN Iron Ore 2	TIANJIN	11,373	89.14d	$1,016,355	$22,711	NO
EGA Bauxite 0	QINGDAO	11,124	91.41d	$1,400,099	$26,627	YES
EGA Bauxite 0	TIANJIN	11,924	94.18d	$1,307,958	$25,197	NO

Vessel Utilization Summary

Cargill Vessels

Vessel	Status	Assigned Cargo
ANN BELL	USED	BHP Iron Ore 1, CSN Iron Ore 2
GOLDEN ASCENT	UNUSED	-
OCEAN HORIZON	UNUSED	-
PACIFIC GLORY	UNUSED	-

Market Vessels Used

Vessel	Status	Assigned Cargo
ZENITH GLORY	USED	EGA Bauxite 0

Note: Unused Cargill vessels incur a penalty of $42,831.25 (1 day idle cost). No profitable market cargo was found for these vessels within laycan constraints.