Petroleum Marine Logistics, Chartering Practices, and Tanker Supply Chain Operations

MAM011

Course Description

The global petroleum industry is underpinned by one of the most sophisticated and capital-intensive marine logistics systems in the world. Every day, hundreds of millions of barrels of crude oil, clean products, dirty cargoes, and liquefied gases are transported via tankers across international waters—linking upstream production zones, refining hubs, global bunker networks, and strategic energy corridors. These marine movements are governed not only by physical transportation constraints, but also by complex commercial contracts, fluctuating freight markets, risk-based chartering decisions, and multi-party supply coordination.

This training course, "Petroleum Marine Logistics, Chartering Practices, and Tanker Supply Chain Operations," is designed to provide a comprehensive, technically grounded, and commercially relevant understanding of the full petroleum tanker value chain—from vessel selection and charter party negotiation, to lifting coordination, port execution, and dispute management. It addresses the practical realities faced by petroleum charterers, shipping professionals, logistics planners, terminal operators, and marine legal personnel working within NOCs, IOCs, traders, and freight companies.

The course also addresses the growing importance of digital integration, covering tools such as Kpler, Vortexa, Signal Ocean, and E-Docs platforms, which now shape real-time freight visibility and documentation flows. Moreover, global concerns around carbon regulation, fuel transition, and ESG compliance are redefining the way marine contracts are structured, vetted, and enforced—making it essential for supply and chartering professionals to operate at the intersection of operational discipline and regulatory insight.

Course Objectives

By the end of this course, participants will be able to:

- Analyze commercial and logistical characteristics of key cargo types (LPG, clean, dirty, LNG, dry bulk).
- Understand marine chartering frameworks (voyage, time, COA) and negotiate key charter party clauses.
- Coordinate vessel readiness, laycan scheduling, and port interface operations with terminals and agents.
- Identify, mitigate, and troubleshoot risks associated with delays, vetting rejections, and documentation errors.
- Apply freight tools (Worldscale, lumpsum, route economics) for voyage planning and performance analysis.

- Handle operational, legal, and compliance aspects of petroleum cargo movement including LOIs, demurrage, and sanctions.

Who Can Benefit

- Marine and Chartering Coordinators
- Petroleum Supply and Lifting Planners
- Port and Terminal Operations Officers
- Crude/Product Movement and Scheduling Teams
- Contracts, Legal, and Commercial Advisors
- Freight Analysts and Voyage Economists
- Oil & Gas Marine Assurance and Compliance Officers.

Course Duration

10 Working Days (2 Weeks)

Course Outlines

1. **Petroleum Cargoes and Global Marine Trade Fundamentals**
    - Petroleum Product Typology and Transport Properties
        - Physical and chemical handling characteristics of:
        - LPG (Propane/Butane): vapor pressure, tank types (refrigerated vs. pressurized)
        - Clean Products: jet fuel, gasoline, ULSD—flash points, oxidation stability, viscosity
        - Dirty Products: slurry oil, VGO, HSFO—heating, compatibility, contamination risk
        - LNG: molecular composition, BOG dynamics, containment systems (Moss/Type B/ Membrane).
    - Marine Cargo Mapping and Regional Flows
        - Major petroleum trade routes: AG–Japan, West Africa–EU, U.S. Gulf–LATAM
        - Loading zones and berth categories
        - Seasonal arbitrage windows (gasoline summer spec, winter kerosene demand)
        - Freight market correlation to cargo destination economics.
    - Bunkers, Dry Cargoes & Intermodal Competition
        - Marine fuel specs under ISO 8217 and MARPOL Annex VI
        - Compatibility matrix for VLSFO vs. ULSFO, stability checks, sulfur curve monitoring
        - Dry cargoes: sulfur, petcoke, anode coke—common shipment hazards
        - Future fuels: methanol, ammonia, biofuels—technical challenges for marine integration.

2. Chartering Principles, Freight Mechanics & Contract Structures

- Tanker Categories and Deployment Dynamics
  - Size-to-trade mapping:
  - VLCC/Suezmax: crude
  - Aframax/LR2: clean vs. dirty cross-utilization
  - MR/Handy: feeder trade and port constraints
  - Vessel specs: DWT vs. summer deadweight, TPC/TPI, cargo tank coating.
- Charter Party Forms & Legal Structures
  - Voyage, time, COA, and bareboat frameworks
  - Detailed walk-through: ASBATANKVOY, BPVOY, SHELLVOY clauses
  - Fixture recap best practices, oral contracts, and enforceability tests
  - Shifting, pumping warranty, early NOR, cargo retention liability.
- Freight and Cost Mechanics
  - Worldscale (WS) calculations from flat rates to WS percentages
  - Lumpsum freight vs. WS comparisons
  - Port costs, deviation clauses, canal surcharges
  - Rate assessment and arbitrage strategies: LTBP, forward freight premiums.

3. Advanced Chartering Tactics, Markets & Risk Management

- Strategic Chartering Models
  - Triangulation and backhaul optimization
  - Charterer's market vs. owner's market dynamics
  - Time charter vs. spot freight economics
  - COA modeling and performance triggers.
- Market Platforms, Price Intelligence & Tools.
  - Baltic Exchange Tanker Indices, Signal Ocean, Vortexa, TankerWire, Kpler
  - AIS data integration for fleet tracking and delay estimation
  - Tanker market correlation with crude flat price and crack spreads.
- Risk Control and Forward Markets
  - Operational risks: port limitations, draft restrictions, cargo contamination
  - Freight derivatives (FFAs): how traders and owners hedge freight exposure
  - Performance claim strategy: underperformance, speed & consumption claims
  - Laytime/demurrage exposure and clause-based mitigation.

4. Tanker Logistics, Port Interface & Supply Chain Coordination

- Tanker Operations in Practice
  - Cargo measurement: ullaging, temperature correction, ASTM tables
  - Load/discharge optimization: manifold compatibility, tank prep, slop management
  - STS operations: mooring plans, fendering systems, OCIMF STS guides
  - Ullage surveys, OBQ/ROB management, inert gas system role.
- Monthly Lifting Execution & Port Synchronization
  - Laycan alignment, arrival windows, delay buffers
  - Reconfirmation cycles, ETA management, pilotage constraints
  - Coordination with terminals, refinery schedulers, and agents
  - Vetting rejections and contingency asset activation.
- Documentation, Statement of Facts & Dispute Prevention
  - NOR issuance protocols and tendering conditions
  - SOF best practices and linkage to laytime/demurrage clocks
  - Bill of Lading, cargo manifest, certificate packs
  - Handling disputes: timeline evidence, clean vs. claused documents.

5. Maritime Legal Risk, Compliance & Capstone Simulation

- Legal Infrastructure and Dispute Management
  - CP legal enforceability and maritime arbitration venues: LMAA, SCMA, ICC
  - Demurrage clock intricacies, off-hire, deviation, partial loss
  - Letters of Indemnity (LOIs): use cases, risks, enforceability
  - Insurance roles: P&I, H&M, war risk, pollution coverage.
- Compliance, ESG & Sanctions Management
  - Sanctions screening: OFAC, EU, UK, IMO "red flag" triggers
  - Know Your Vessel (KYV) and Know Your Counterparty (KYC)
  - ESG charter party clauses: EEXI, CII, ETS, bunker emissions reporting
  - Port state control interaction and detention risk.
- Capstone Simulation Workshop
  - Live scenario: negotiate charter, schedule lifting, manage delay
  - Vetting rejection, weather delay, cargo compatibility challenge
  - Freight calculation under real-time WS rate
  - Legal clause implications in charter execution.

6. Petroleum Marine Cargoes & Trade Fundamentals

- Global petroleum supply chain overview & major marine logistics nodes
- Classification & technical handling of cargo types:
  - LPG: Propane vs. Butane, containment types (pressurized/refrigerated)
  - LNG: Boil-off gas (BOG), heel management, membrane vs. Moss systems
  - Clean Products: Jet A-1, Naphtha, ULSD—flash point, oxidation, ASTM/ISO specs
  - Dirty Products: HSFO, VGO, slurry—heating curves, compatibility, sedimentation
  - Bunkers: ISO 8217 grades (VLSFO, ULSFO), sulfur limits, blending strategies
- Petroleum cargo hazards & stability controls
- Dry bulk crossover cargoes (e.g., petcoke, sulfur) – handling implications
- Major trade routes: AG–Japan, USG–LATAM, West Africa–EU
- Seasonal demand shifts and arbitrage windows
- Sustainability implications and new fuels: biofuels, methanol, ammonia.

7. Chartering Frameworks, Freight Economics & Contract Mechanics

- Tanker segmentation: VLCC, Suezmax, Aframax, LR1/LR2, MR, Handymax
- Deployment dynamics: dirty-to-clean switches, ballast optimization
- Charter party types & mechanics:
  - Voyage, Time, COA, Bareboat—legal and operational drivers
  - Key clauses: Laytime, Demurrage, NOR, Shifting, Early Loading
- Worldscale (WS) system in depth:
  - Flat rates, WS % conversion, Suez/Panama Canal surcharge handling
  - WS vs. lumpsum freight: cost modeling
- Fixture workflows: Enquiry to Offer to Recap to CP exchange
- Freight negotiation & arbitrage strategies: LTBP, backhaul premiums
- Cost elements: port dues, deviation clauses, cargo retention risk
- CP enforceability and dispute triggers: pumping warranties, NOR validity.

8. Market Intelligence, Chartering Tactics & Risk Management

- Tactical chartering methods: triangulation, optimal routing, time charter analysis
- Charterer vs. owner market dynamics—spot vs. TC outlooks
- Forward freight markets:
  - FFAs – hedging freight risk, FFA clearing process
  - Correlation with DPP/CPP indices and flat price movement

- Digital analytics tools:
  - Signal Ocean, Kpler, TankerWire, Vortexa—live vessel and market tracking
  - AIS integration for delay estimation and port congestion monitoring
- Risk exposure:
  - Draft limitations, vetting failures, port denials, weather deviation
  - Performance claims: underperformance, speed/consumption variances
- Laytime & demurrage exposure models: clause interpretation and audit defense.

9. Tanker Operations, Port Interface & Supply Coordination

- Port operations and pre-arrival readiness:
  - NOR tendering protocols, terminal vetting, pilotage scheduling
- Onboard operations:
  - Ullaging, OBQ/ROB handling, slop disposal, ASTM table calculations
  - Load/discharge manifold checks, line cleaning, sampling protocols
- STS Transfers: OCIMF guides, mooring plans, risk mapping
- Monthly lifting program execution:
  - Nomination to Confirmation to ETA to Execution to Reconciliation
  - Delay buffer management, reconfirmation cycles, STS congestion planning
- Stakeholder collaboration:
  - Terminal schedulers, shipowners, inspectors, chartering, refinery ops
- Documentation control:
  - B/L issuance, SOF best practices, LOI, customs pack, eDocs transition
  - Linking SOF timelines to demurrage windows.

10. Maritime Legal Frameworks, Compliance, & Integrated Simulation

- Legal risk management:
  - Maritime arbitration bodies: LMAA, SCMA, ICC—when and how to engage
  - CP dispute triggers: off-hire, deviation, cargo claims, pump warranties
- Letters of Indemnity (LOIs):
  - Legal enforceability, P&I Club implications, counterparty protection
- Insurance architecture: P&I, H&M, pollution, war risk—vessel and cargo coverage
- Trade compliance and ESG factors:
  - Sanctions screening (OFAC/EU/IMO), KYV/KYC, red-flag behavior
  - ESG clauses: EEXI, CII, EU ETS, emissions reporting
- Port State Control (PSC) risks and detention avoidance

- Capstone Simulation Workshop:
  - Vessel nomination, delay management, freight pricing under live WS index
  - NOR tendering, vetting rejection response, SOF clock management
  - Legal dispute scenario with clause-based decision-making.