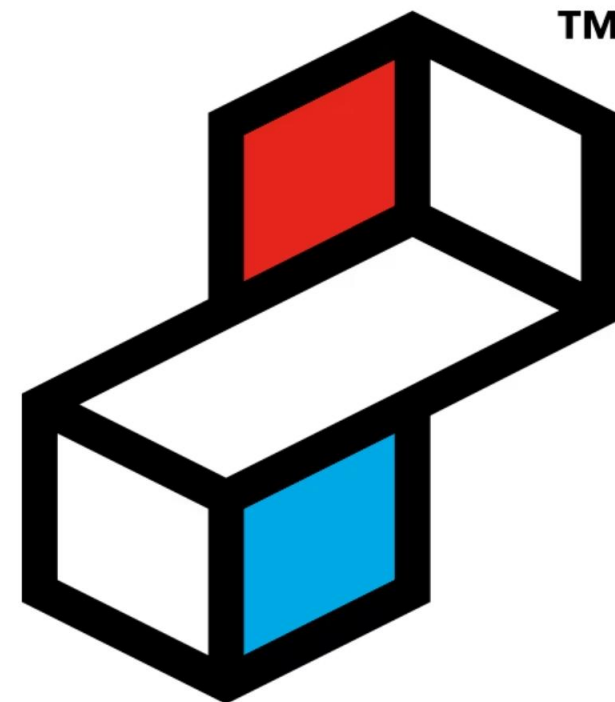




# End-to-End Sea Freight Shipment Process

From RFQ to Proof of Delivery – a comprehensive operational guide covering port, terminal, vessel, customs, equipment, and compliance flows for logistics professionals and freight operations teams.

ULTRA-DETAILED VERSION



**CLUSTER  
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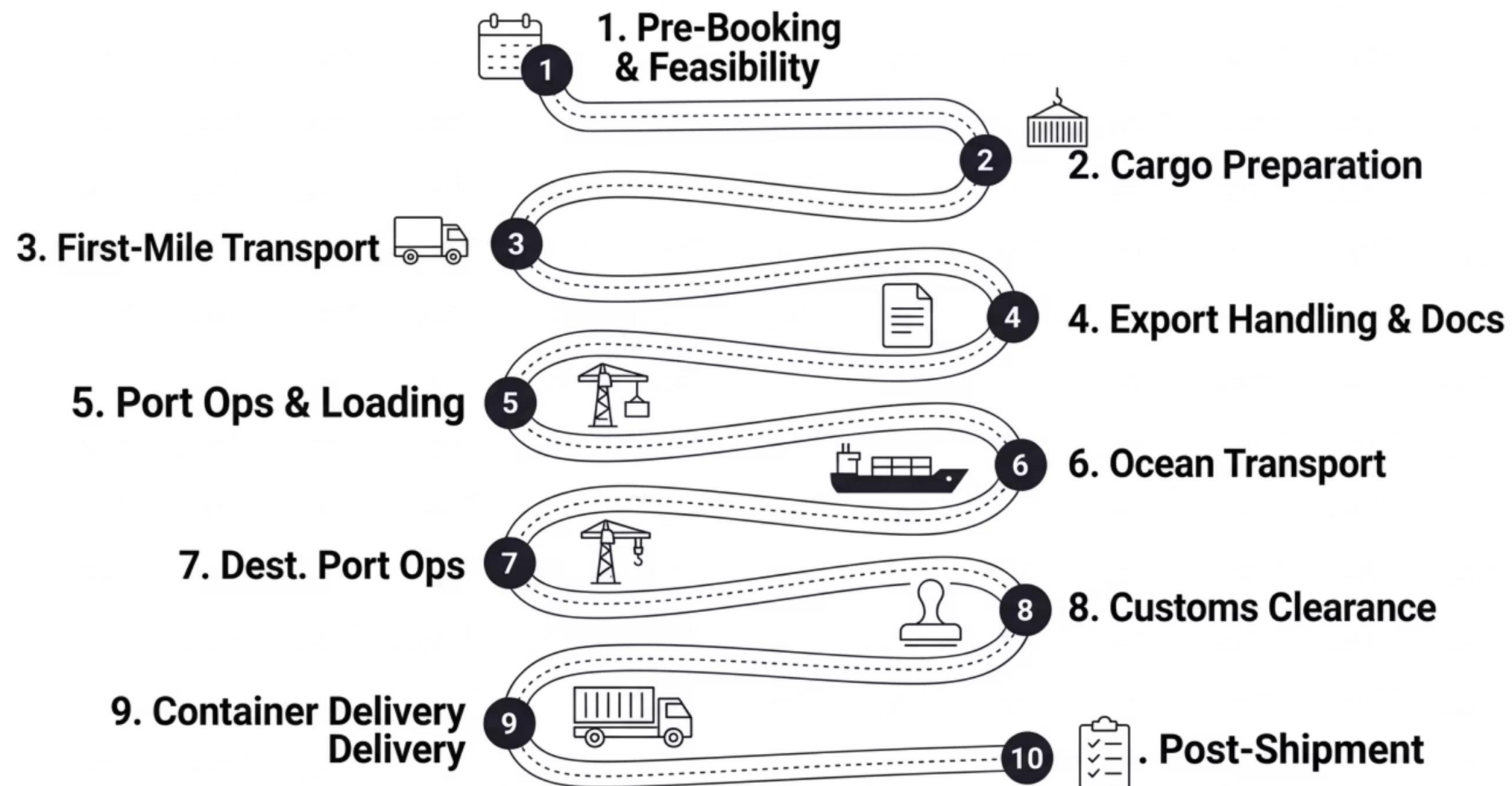
LUXEMBOURG

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**ADDING VALUE IS THE KEY.**

# The Complete Sea Freight Journey

A modern sea freight shipment spans ten distinct operational phases, each with its own stakeholders, documents, systems, and compliance controls. Understanding every step – from the initial RFQ to final data archiving – is essential for minimising risk, avoiding costly delays, and delivering cargo in full, on time, and in compliance.





PHASE 1 · PRE-BOOKING

# 1.1 RFQ Intake & Data Capture

## Activities

Receive the RFQ via email, EDI, API, portal, or sales representative. Capture all critical cargo parameters including type (FCL/LCL/OOG/Breakbulk/RoRo/Reefer/DG), dimensions (L×W×H), gross and net weight, pallet type, and stackability. Record commodity classification (HS code, IMDG class), Incoterms, UN/LOCODE origin and destination, required ETD/ETA, and any special handling requirements such as humidity control, reefer setpoint, or shock-sensitive designations.

## Controls, Documents & Systems

- Sanctions screening: shipper, consignee, vessel, country
- Dual-use goods and embargo checks
- Port restrictions: DG bans, OOG limits, reefer plug availability
- Vessel draft and terminal congestion status

**Documents:** RFQ, MSDS (DG), product data sheet, technical drawings (OOG)

**Systems:** CRM, TMS, Rate Management System, Compliance Screening Tool

## 1.2 Routing, Carrier & Equipment Feasibility

### Routing Options

- Direct service
- Transshipment via hub port
- Feeder + mother vessel combination

### Schedule & Space Checks

- Carrier sailing schedules
- Space availability per sailing
- CY, VGM, and documentation cut-off times
- Port operational windows: strikes, weather, public holidays

### Equipment Availability

- 20DC, 40DC, 40HC standard dry
- Reefer units – PTI-passed
- Flat Rack and Open Top for OOG
- IMDG acceptance matrix verification
- OOG crane capacity and lashing requirements

PHASE 1 · PRE-BOOKING

## 1.3 Quotation & Booking

### Rate Calculation Components

- Ocean freight base rate
- Surcharges: BAF, CAF, THC, ISPS, EBS, PSS
- Pre-carriage and on-carriage costs
- Customs brokerage fees
- Equipment surcharges (OOG, reefer, DG)

### Booking Confirmation Must Include

- Unique booking number
- Confirmed vessel and voyage reference
- CY, VGM, and documentation cut-off times
- Equipment pick-up reference from depot

Cross-check rate validity, surcharge accuracy, and all confirmation details before issuing acceptance to the shipper.

## 2.1 Packaging & Palletisation

### Packaging Standards

All wooden packaging must comply with **ISPM-15** (heat treatment or fumigation). Dangerous goods packaging must meet **IMDG** performance testing requirements. Reefer cargo must allow adequate airflow around packages, and OOG cargo must be engineered for secure lashing at sea.

### Labels & Markings

Apply handling labels, DG hazard and subsidiary risk labels, "this way up" orientation arrows, and humidity indicators as required. Ensure all markings are legible, durable, and visible from the exterior of the outer packaging.

### Protection Controls

Deploy moisture protection via desiccants and VCI (Volatile Corrosion Inhibitor) film where applicable. Use shock and tilt indicators for fragile or sensitive cargo. Conduct final packaging integrity inspection before hand-off to carrier or trucking company.

## 2.2 Documentation Preparation



### Commercial Documents

- Commercial invoice
- Packing list
- Insurance certificate
- Export licence (if required)



### Origin & Compliance

- Certificate of origin (preferential or non-preferential)
- Phytosanitary / health certificates
- MSDS for dangerous goods



### Document Controls

- Invoice vs. packing list consistency check
- HS code validation against destination tariff
- Licence and certificate validity dates confirmed

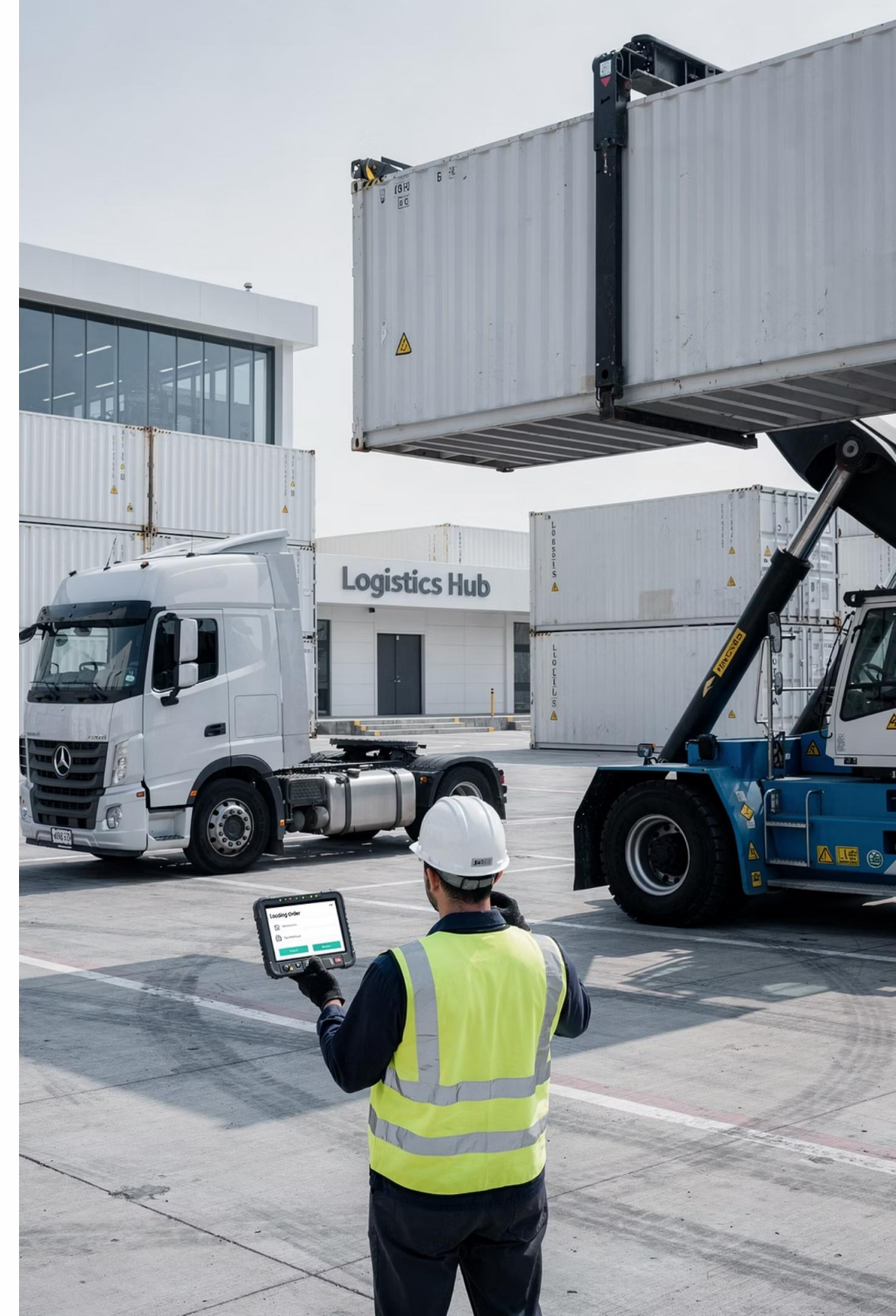
# 3.1 Empty Container Release (FCL)

## Release & Collection Process

The forwarder or carrier issues an empty equipment release order. The trucker collects the **Equipment Interchange Receipt (EIR)** from the depot and performs a thorough pre-trip inspection before accepting the unit. Any pre-existing damage must be noted on the EIR before departure.

## Inspection Checklist

- Structural integrity: walls, roof, floor, forklift pockets
- Door gasket and locking rod condition
- Floor condition – no contamination, nails, or damage
- Odour contamination check
- Reefer: Pre-Trip Inspection (PTI) certificate, setpoint calibration, cleanliness grade



PHASE 3 · FIRST-MILE TRANSPORT

## 3.2 Cargo Pick-Up & Transport to Terminal

01

### Truck Assignment

Select appropriate truck type based on cargo dimensions, weight, and any special requirements such as flatbed, low-loader, or temperature-controlled trailer.

02

### Driver Pre-Departure Checks

Driver performs count check, visual inspection of cargo condition, and seal check if collecting a pre-stuffed container. Confirms weight compliance against axle load limits.

03

### Transport & Monitoring

GPS tracking active throughout transit. Reefer units monitored for temperature excursions in real time. Weight distribution documented for port gate entry. CFS drop-off or direct CY delivery confirmed against cut-off schedule.

# 4.1 Container Stuffing (FCL)

## Stuffing Procedure

Cargo is loaded into the container following an approved load plan. Proper load distribution ensures compliance with the container's Maximum Gross Mass (MGM) and weight-per-axle road limits. Blocking, bracing, dunnage, lashing, and desiccants are applied as required by cargo type and transit duration.

- DG segregation rules strictly observed
- Reefer: air flow channels maintained, setpoint verified
- OOG: lashing points and securing certified

## Controls & Documentation

- Photo documentation at start, mid, and close of stuffing
- Seal number recorded and cross-referenced to packing list
- Weight distribution compliance verified
- Container door closed and sealed in presence of supervisor
- EIR updated with final seal number and condition



## 4.2 LCL Consolidation at CFS

1

### Cargo Receipt

CFS operator receives individual LCL consignments. Each piece is weighed, measured, and tallied against the packing list. Dock receipts are issued.

2

### DG Segregation

Dangerous goods are identified and segregated per IMDG compatibility matrix prior to consolidation. Incompatible DG classes are assigned to separate containers.

3

### Consolidation

Compatible cargo is consolidated into FCL containers following an optimised load plan. A CFS manifest is created listing all consignments by marks, numbers, description, and weight.

## 4.3 Verified Gross Mass (VGM)

### Why VGM Matters

Under SOLAS regulation VI/2, no container may be loaded onto a vessel without a verified gross mass. Failure to submit an accurate VGM prior to the carrier's cut-off will result in the container being rolled to the next sailing, causing potentially significant delays and additional costs.

### Two Approved Methods

- **Method 1:** Weigh the fully packed and sealed container using a certified scale at the stuffing facility or terminal.
- **Method 2:** Weigh all cargo items and packaging individually, then add the container tare weight (from the CSC plate).

The VGM declaration must be submitted to the carrier with a full audit trail, including the certifying signatory, weighing method, scale calibration reference, and timestamp.

## 4.4 Export Customs Clearance



### Declaration Submission

Submit electronic export declaration to customs authority (e.g., AES in the US, NES/CDS in the UK). Attach supporting documents: invoice, packing list, licences, and certificates.



### Customs Controls

System assigns a risk channel (Green/Orange/Red). HS code validated against national tariff. Dual-use goods checked for export control classification and licence requirement.



### Export Release

Upon customs release, an Export Accompanying Document (EAD) or equivalent is issued. Container may now proceed to terminal gate. Sanctions re-screening performed at release stage.

## 4.5 Bill of Lading Instructions & Issuance

### Shipping Instructions (SI)

The shipper or forwarder submits SIs to the carrier, typically via an online portal or EDI. SIs must exactly mirror the commercial invoice and packing list in terms of shipper, consignee, notify party, cargo description, HS code, container and seal numbers, and Incoterms.

### B/L Types & Controls

- **Original B/L:** Negotiable title document – required for Letter of Credit transactions
- **Express Release / Telex Release:** Surrendered at origin, released at destination electronically
- **Sea Waybill:** Non-negotiable – suitable for intra-company shipments or trusted counterparties

Draft B/L must be reviewed and approved before finalisation. Corrections after vessel departure incur amendment fees and potential customs complications.

## 5.1 Gate-In at Terminal

01

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### Gate Appointment & Arrival

Truck arrives at terminal with a pre-booked gate appointment. Driver presents booking reference, container number, and EIR. Terminal queue management systems control truck flow.

02

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### OCR & Automated Checks

OCR gantry cameras capture container number, ISO type, and condition images. System cross-references against VGM submission, booking, and customs release status.

03

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### Physical Inspection

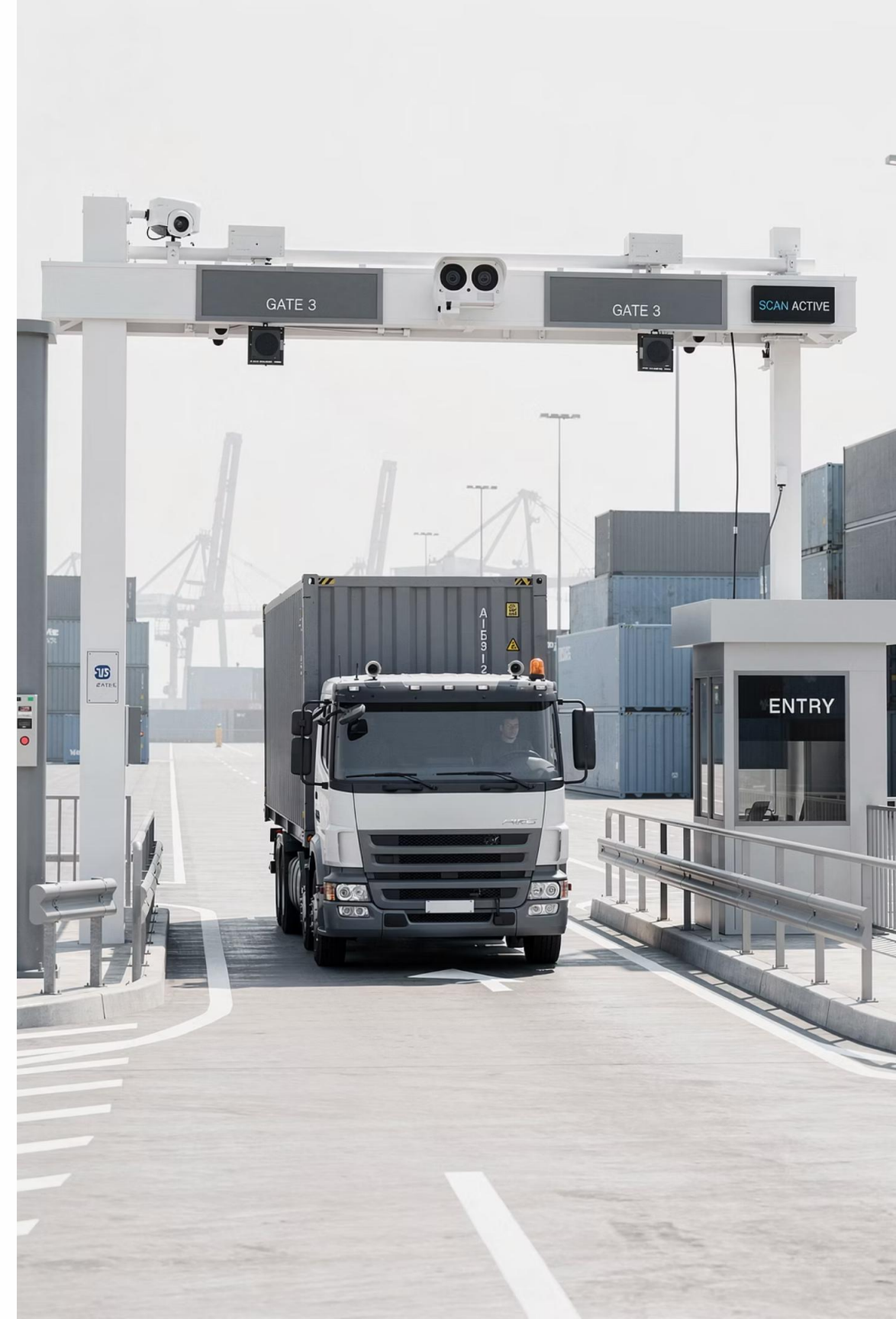
Terminal staff verify seal integrity, check for visible damage, and confirm documentation status. Reefer containers are directed to plug-in zones immediately upon entry.

04

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### Yard Assignment

TOS (Terminal Operating System) assigns a yard slot based on vessel stowage plan, DG segregation requirements, and reefer power availability. EIR updated with gate-in timestamp.



## 5.2 Yard Stacking & Storage

### Standard Dry Cargo

Containers are stacked by vessel, port of discharge, and weight class. The TOS optimises stack height and crane reach to minimise re-handles and maximise throughput.

### Dangerous Goods

DG containers are positioned in designated segregation zones per the IMDG Code. Minimum separation distances from other DG classes, accommodation areas, and terminal boundaries are enforced.

### Reefer Containers

Plugged into reefer racks with continuous power supply. Temperature monitored every 15–30 minutes by the terminal's reefer management system. Alarms triggered for deviations beyond agreed setpoint tolerance.

### OOG Cargo

Out-of-gauge cargo stored in dedicated OOG areas. Restricted crane and yard equipment movements planned to avoid damage. Height, width, and weight restrictions enforced by terminal operating rules.

## 5.3 Vessel Stowage Planning

### Stowage Plan Development

The carrier's stowage coordinator creates a full bay-plan covering all containers for the voyage. The plan balances structural loading, stability (GM), trim, and list requirements. Port rotation dictates that cargo for the last port of call is loaded deepest in the stack.

### Key Planning Controls

- IMDG segregation table compliance – DG classes kept apart from each other and from foodstuffs
- Reefer positions limited by onboard power circuit capacity
- OOG positions pre-approved by vessel's chief officer with lashing bridge confirmation
- Hazmat declarations reviewed against IMDG manifest
- Final stowage plan transmitted to terminal in BAPLIE (EDI) format



## 5.4 Vessel Loading

01

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### Pre-Loading Sequence

Terminal confirms all containers in the load list are gate-in, VGM submitted, customs released, and DG documentation accepted. Sequence is ordered by stowage plan to minimise crane moves.

02

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### Crane Operations

Ship-to-shore (STS) cranes lift containers from the yard (via AGV or straddle carrier) and place them in the designated cell coordinates on the vessel. Each lift is recorded in the TOS against the vessel's bay plan.

03

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### Post-Load Checks

Lashing gangs secure top-stow containers with twistlocks and lashing rods per the vessel's Cargo Securing Manual (CSM). Reefer containers are plugged in and setpoints confirmed. Load list reconciliation performed before hatch covers are closed.

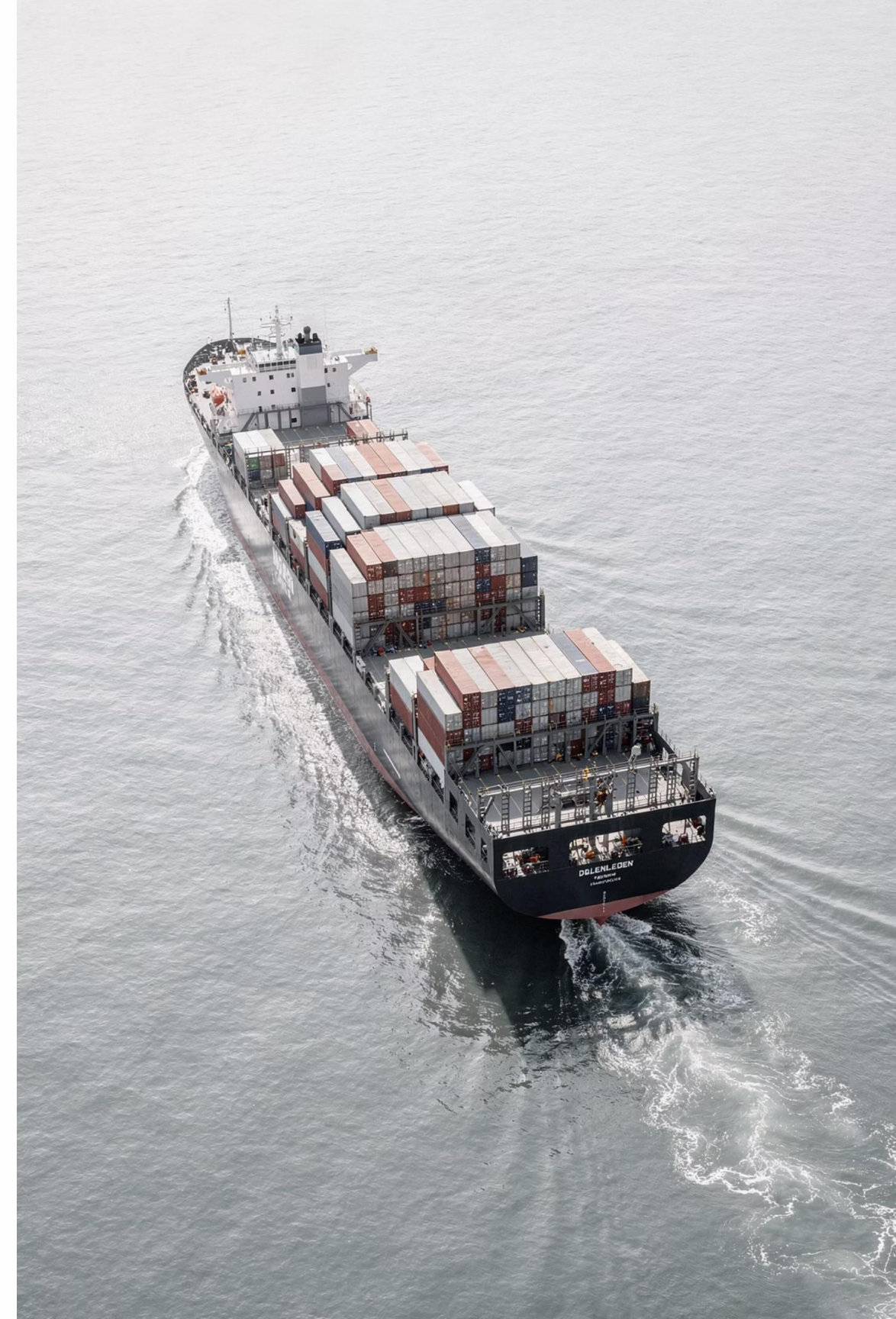
# 6.1 Voyage Execution

## Departure & Notifications

Upon departure, the carrier transmits an **Actual Time of Departure (ATD)** notice to all parties. The forwarder and shipper receive updated ETA based on planned route, vessel speed, and known port congestion at the next call. Any deviations — vessel speed reduction (slow steaming), route changes, or schedule updates — are communicated via milestone status messages.

## Carrier Communications

- Departure notice with confirmed ATD
- ETA updates at regular intervals (typically every 24–48 hours)
- Transshipment confirmation notice at hub port
- Arrival notice to consignee and notify party



## 6.2 In-Transit Monitoring



### Vessel Position

Real-time AIS-based vessel tracking. ETA re-calculated against port berth windows and congestion forecasts. Forwarder monitors for deviations impacting downstream bookings.



### Reefer Monitoring

Onboard reefer data loggers record temperature, humidity, and CO<sub>2</sub> at preset intervals. Alarms transmitted via satellite to carrier and shipper if setpoint is breached. Corrective actions logged in voyage record.



### Weather & Routing

Master receives dynamic weather routing advice. Vessel speed and course adjusted to avoid heavy weather, reducing structural stress and cargo risk. Updated ETAs communicated to all stakeholders.



### DG Emergency Procedures

DG Emergency Response Procedures (ERP) are held on the bridge. In the event of a DG incident, the vessel's emergency team follows IMDG EmS and MFAG procedures. Coast Guard and Port Authority notifications as required.

## 6.3 Transshipment Operations

1

### Discharge at Hub

Container is discharged at the transshipment hub (e.g., Singapore, Colombo, Rotterdam, Tanger Med). TOS records arrival and triggers yard assignment for connecting vessel.

2

### Yard Storage at Hub

Container stored in the hub terminal's import-export yard. Reefer units re-plugged immediately. DG segregation maintained per IMDG rules. Free time monitored against agreed dwell allowance.

3

### Loading onto Feeder/Connecting Vessel

Container loaded onto the connecting mother or feeder vessel per revised stowage plan. All transshipment activity – including reefer continuity and OOG handling – recorded in the carrier's system and reflected in B/L event milestones.

# 7.1 Vessel Arrival & Discharge

## Pre-Arrival Activities

The terminal receives the vessel's discharge list (BAPLIE/EDI) 24–48 hours prior to arrival. Berth is allocated, crane gangs are scheduled, and yard slots are pre-assigned. The consignee or notify party receives an **Arrival Notice (AN)** from the carrier or forwarder, triggering the import clearance process.

## Discharge Operations

- Vessel berths; STS cranes commence operations per sequence plan
- Each container scanned and inspected upon discharge
- Reefer containers directed to plug-in racks within minutes of discharge
- DG containers routed to segregated holding zones
- Damage reports raised for any units showing visible damage on discharge



## 7.2 Import Yard Storage

### Yard Placement & Inventory

Containers are assigned import yard slots by the TOS. Inventory accuracy is critical – discrepancies between TOS records and physical yard count can result in missed collections and demurrage disputes.

### Free Time & Storage Charges

The carrier's free time clock starts from the date the container is made available (typically the day after vessel arrival). Once free time expires, **demurrage** accrues at the terminal and **detention** begins once the box leaves the gate but is not returned within the agreed free period.

### Continuous Monitoring

Reefer containers monitored 24/7 for temperature and alarm status. DG segregation maintained and checked by terminal safety officers. Any anomalies reported immediately to the carrier and consignee.

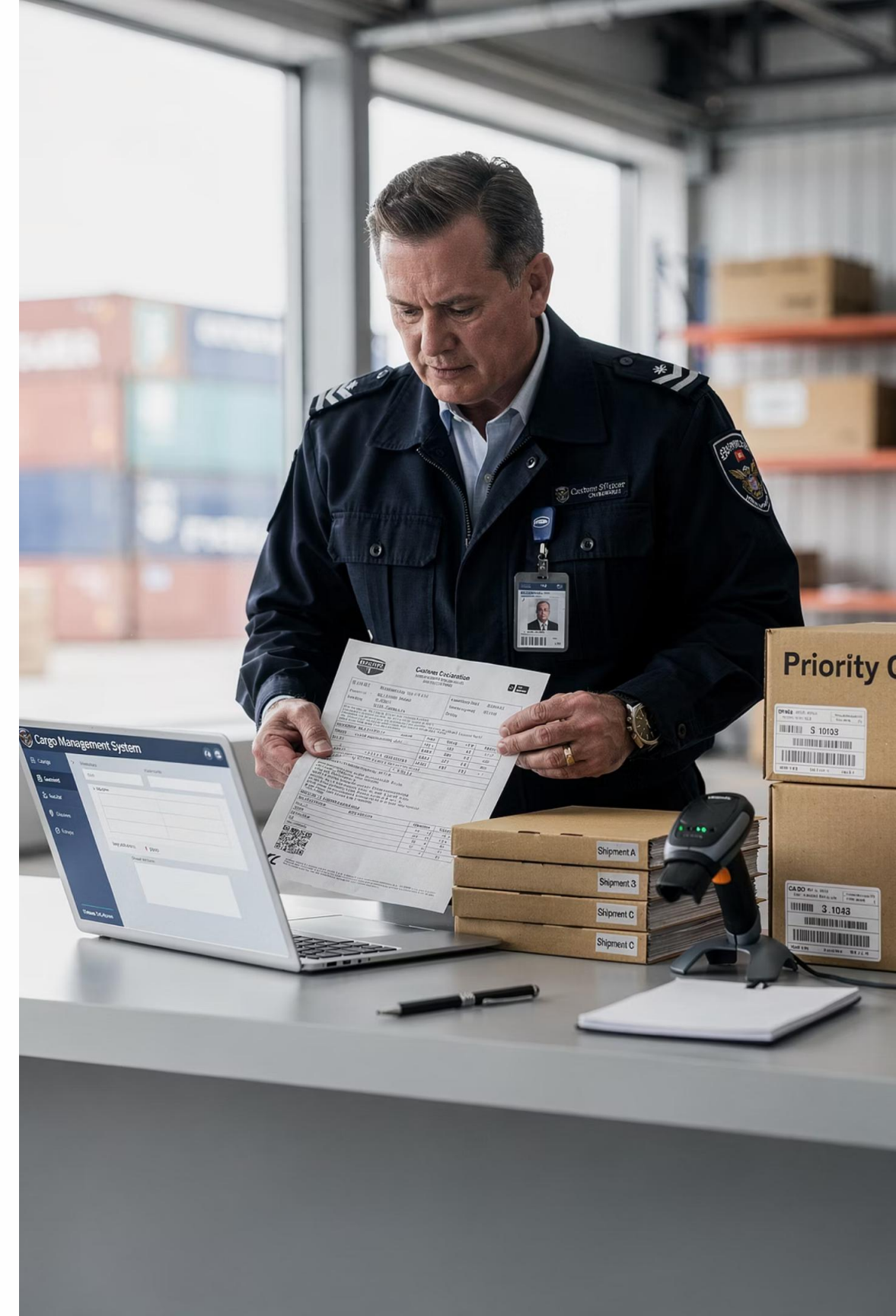
# 8.1 Documentation Submission

## Required Documents

- Import declaration (entry) filed with customs authority
- Commercial invoice and packing list
- Original or express-released Bill of Lading
- Certificate of origin (for preferential duty rates)
- Product-specific certificates: phytosanitary, health, conformity, CITES
- Import permits and licences where mandated
- MSDS for DG commodities

## Filing Process

The licensed customs broker submits the import entry electronically to the national customs system (e.g., ACE in the US, CDS in the UK, ATLAS in Germany). Classification, valuation method, and origin declaration are confirmed. Pre-arrival filing is strongly recommended to avoid terminal dwell charges.



## 8.2 Customs Examination



### Physical Examination

Customs officers open the container and inspect cargo against declaration. Count, weight, markings, and commodity type are verified. Any discrepancy can result in penalties and seizure.



### X-Ray Scanning

Non-intrusive imaging (NII) equipment produces X-ray images for comparison against the declared contents. Used for risk-based targeting of high-risk shipments without the time cost of full physical examination.



### Sampling & Testing

Laboratory samples may be drawn for food safety, chemical analysis, or conformity testing. Results can take days to weeks — customs hold remains in place until clearance is issued.



### DG & Reefer Verification

Dangerous goods verified against IMDG documentation and physical labelling. Reefer temperature logs reviewed for compliance with commodity-specific import temperature requirements.

## 8.3 Duties, Taxes & Customs Release

### Duty & Tax Calculation

Import duties are calculated on the customs value (typically CIF value) using the applicable tariff rate for the declared HS code. VAT or GST is applied to the duty-inclusive value. Anti-dumping duties, countervailing duties, or safeguard tariffs may apply depending on commodity and country of origin.

### Payment & Release

Duties and taxes are paid via customs duty deferment account, immediate payment, or customs bond. Upon payment confirmation and completion of all compliance checks, the customs authority issues a **customs release note** (e.g., E2 in the UK, CF-7501 in the US). The release note is presented to the terminal as authority to collect the container.

## 9.1 Release from Terminal

01

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### Charge Settlement

All outstanding terminal charges must be settled before a delivery order is issued. This includes Terminal Handling Charges (THC), storage fees (demurrage) for any days beyond the carrier's free time, and any terminal security or infrastructure fees.

02

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### Delivery Order Issuance

The carrier issues a Delivery Order (DO) or Pin Code upon receipt of the surrendered Original B/L or telex release confirmation. The DO authorises the terminal to release the container to the nominated trucker.

03

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### Truck Appointment Booking

A Truck Appointment System (TAS) slot is booked at the terminal. Appointment confirmation, valid customs release, and DO reference must all be presented at the gate. Failure to have all three will result in truck turn-away and rescheduling delays.

## 9.2 Container Pick-Up at Terminal

### Gate Entry & Documentation

Truck driver presents booking reference, Delivery Order pin, and driver ID at the terminal gate. Gate OCR system validates container number, ISO type, and customs release status in real time.

### Container Loading

Yard crane or reach stacker places container onto the truck chassis. Driver verifies the container number matches the EIR and DO. Any discrepancy is reported immediately to the terminal operator before departure.

### Pre-Departure Inspection

Driver confirms seal integrity – seal number must match the customs release documentation. Overall container condition is noted on the EIR. Any damage detected at this stage is recorded and submitted as an exception report for cargo claims purposes.

## 9.3 Last-Mile Delivery to Consignee

### Delivery Execution

The container is transported to the consignee's premises or nominated warehouse. Driver and consignee perform a joint inspection upon arrival. Seal integrity is verified before breaking. Cargo is unstuffed and counted against the packing list. Any shortages, damages, or discrepancies are noted on the Proof of Delivery (POD) document and signed by both parties.

### Post-Delivery Controls

- **Seal integrity:** Seal number confirmed against B/L and customs documentation before opening
- **Damage inspection:** All packages inspected; exception noted on CMR/delivery note
- **Reefer temperature log:** Continuous data logger downloaded and handed to consignee as part of cold chain documentation
- **Empty return:** Container returned to nominated depot within agreed free detention period to avoid detention charges

# 10.1 Final Billing & Invoice Reconciliation

## Ocean Freight

Final freight invoice issued post-sailing. Verify agreed rate, surcharges (BAF, CAF, PSS), and weight/volume basis against booking confirmation and B/L.

## Terminal Charges

Origin and destination THC, container scanning fees, and any port security surcharges. Cross-reference against tariff sheets and free-time agreements.

## Trucking & Haulage

First-mile and last-mile trucking invoices. Verify against agreed rates, actual mileage, and any extra waiting-time or out-of-hours surcharges.

## Demurrage & Detention

Carrier's demurrage invoice for days at terminal beyond free time, plus detention for container days at consignee beyond agreed free days. Dispute any incorrectly calculated start/end dates promptly.

## Customs & Brokerage

Customs broker invoice for professional fees, plus duty and tax disbursements. Confirm duty paid amount against customs entry and deferment account statement.

## 10.2 KPI Reporting & Performance Review



### On-Time Delivery (OTD)

Actual delivery date versus planned ETA at consignee premises. Segment-level analysis (origin, ocean, destination) identifies where delays originate for carrier and supplier performance reviews.



### Dwell Time

Average days container remains at origin terminal post-gate-in and at destination terminal post-discharge. High dwell is the primary driver of avoidable demurrage costs.



### Demurrage & Detention

Total D&D spend as a percentage of freight spend. Track by trade lane, carrier, and commodity. Benchmark against industry norms and drive root-cause reduction programmes.



### Damage Rate & Reefer Excursions

Cargo damage incidents per 1,000 containers and number of reefer temperature excursions per voyage. Both metrics feed directly into insurance premium assessments and carrier SLA reviews.

## 10.3 Claims Handling & 10.4 Data Archiving

### Claims Handling

Cargo claims must be filed within the timeframes stipulated by the Hague-Visby Rules (typically 3 days for visible damage, 1 year for latent damage). Supporting evidence includes the original B/L, survey reports, photographs, temperature logs, packing lists, and proof of value. Claims categories: **cargo damage**, **cargo loss** (short-landed), **delay**, and **consequential loss**. Insurance underwriter coordinates settlement with the carrier's P&I Club.

### Document Archiving Requirements

All shipment documents must be retained in secure, retrievable electronic or physical format for regulatory compliance. Typical retention periods:

- **Customs documents:** 5–7 years (US: 5 years; EU: 10 years for some commodities)
- **Commercial documents:** 5–7 years depending on jurisdiction and contract law
- **DG records:** 5 years minimum
- **Reefer temperature logs:** Retained for claims and food safety audit purposes