Introduction to Oil Tankers

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Outline

- Petroleum Logistics - Players and Challenges
- Tanker Economics
- International Regulations
- Contemporary Trends (Optional)
- Open Session

Significance of Petroleum Movements

- Economic
- Political
- Strategic
- Others
- Transportation & Logistics

Crude Oil Trade

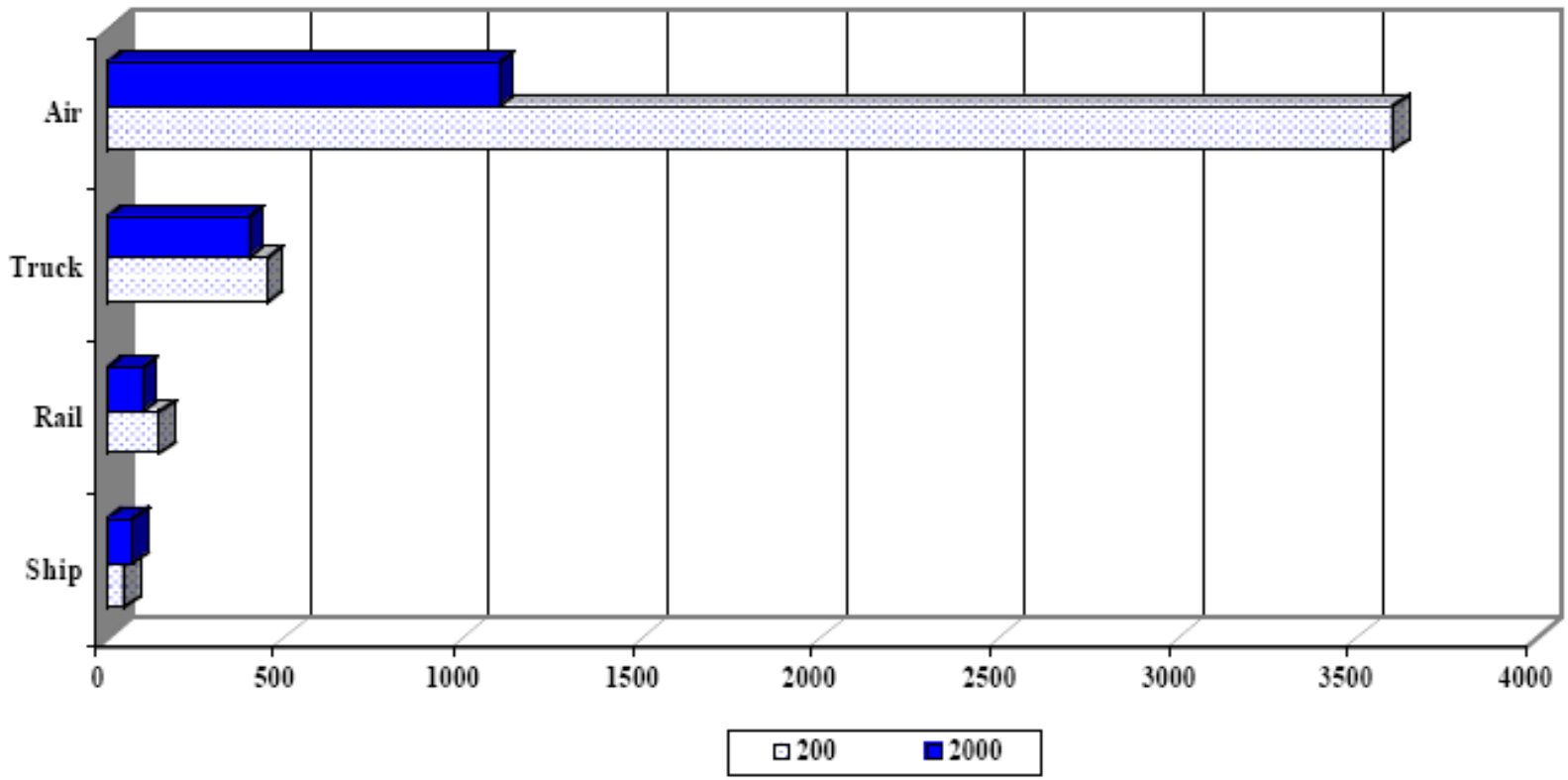
- Oil, the predominant energy source by 1950
- Largest seaborne commodity movement
- Uneven distribution of oil
- Arterial movements
- Economies of scale in seaborne crude movement
- The tonne–mile syndrome

Introduction to Oil Tankers

- **Objective**
  - Close the physical gap
- **Nature of Demand**
  - Derived demand

Relative Operating Cost

($/tonne–mile)



Factors Affecting Choice of Ship Type

- Commodity
- Packaging
- Origin
- Destination

Early Seaborne Oil Movement

- **Wooden Barrels**
  - Sailing Ships
- **Cans**
  - Steamers
- **Tanks**
  - 1869, on board “Lindesnes” by a Norwegian

The Tanker Era

- **S.S. Gluckauf (2,704 dwt), 1886**
  - Prototype of modern tanker
  - Sail–assisted steamer with engines aft
- **8,000 dwt standard size by end of 19th century**
- **End WWII, largest vessel – Nash Bulk, 23,815 dwt**
  - Average size 12,000 dwt
- **1959 – Universe Apollo, 100,000 dwt**
- **1969 – Universe Iran, 326,933 dwt**
- **1976 – Jahre Viking, 564,650 dwt**
  - Biggest human–made mobile floating object

Classification of Crude Oil Carriers

- **Aframax 60–79,999 dwt**
- **Million Barrel 120–159,999 dwt**
- **VLCC 160–349,999 dwt**
- **ULCC 350,000+ dwt**
  - A typical VLCC is 350m long, 60m wide and 30m deep

Classification – Product Carriers

- Smaller vessels, shorter distances
- Carry different parcels simultaneously
- 50% clean products
- 50% dirty products

Classification – Combination Carriers

- Diversification strategy
- Minimize ballast voyages
- Gain rate advantage
- Ore/Oil carriers
- Ore/Bulk/Oil carriers

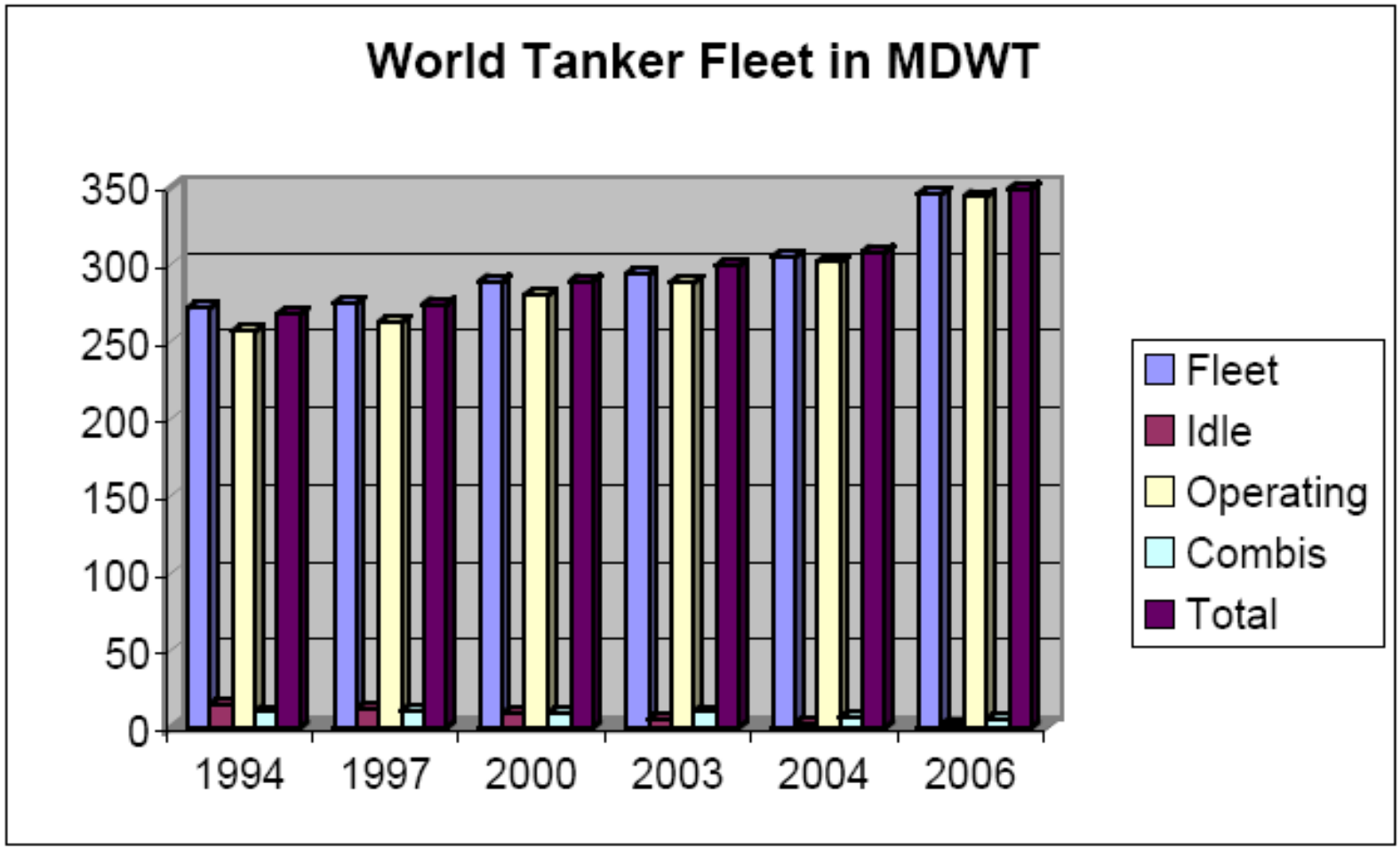
Classification – Chemical Tankers

- Very sophisticated and expensive
- Many small tanks with separate pumping system

Classification – Gas Carriers

- **LPG Carriers**
  - Carried @ –50° C
  - Tramps
- **LNG Carriers**
  - Carried @ –153° C
  - Long Term Charter
- **Expensive and sophisticated**

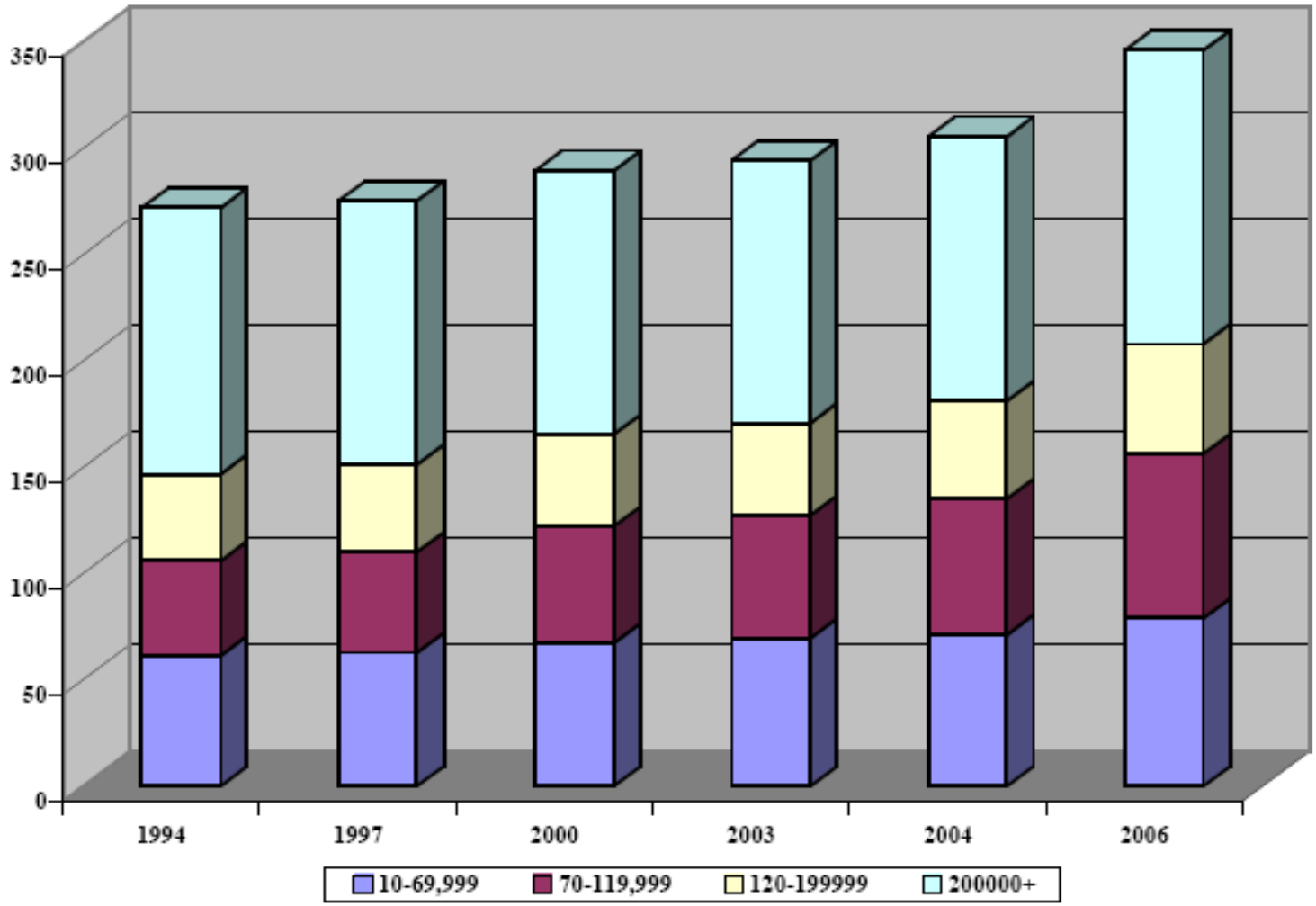
World Tanker Fleet



Source: R.S. Platou 2006

Tanker Fleet by Size

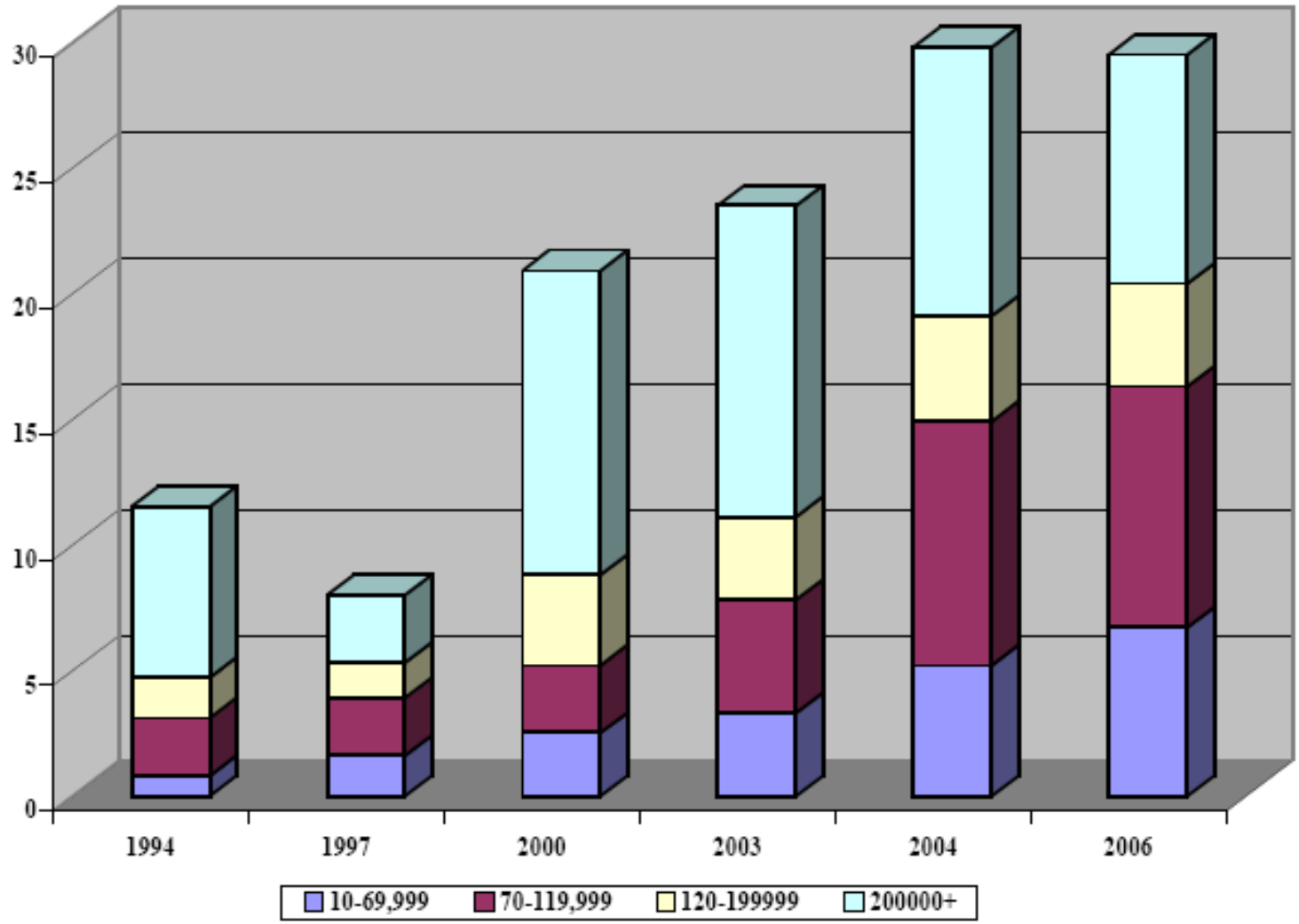
(in million dwt)



Source: R.S. Platou 2006

Tanker Deliveries by Size

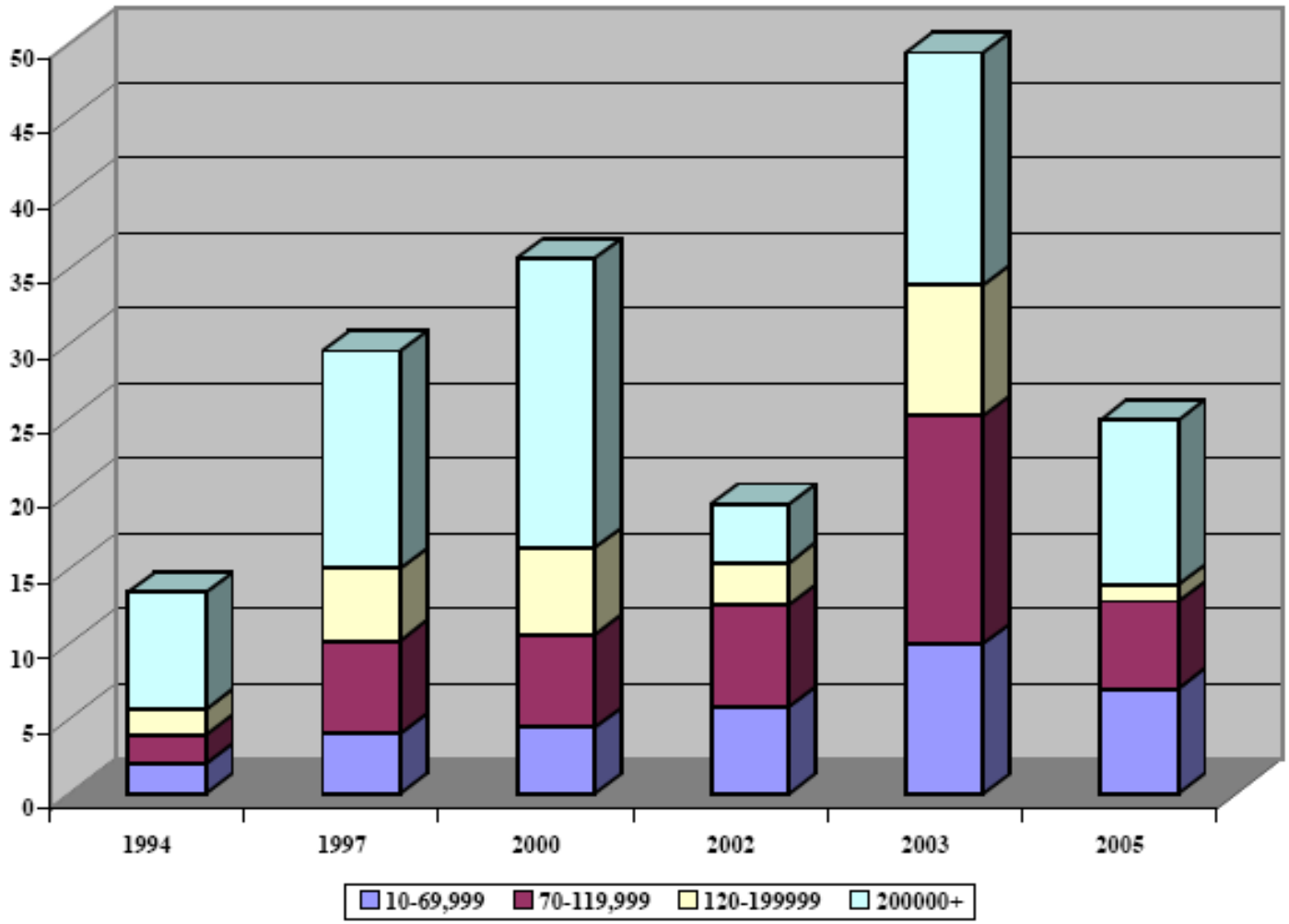
(in million dwt)



Source: R.S. Platou 2006

Tanker New Orders by Size

(in million dwt)



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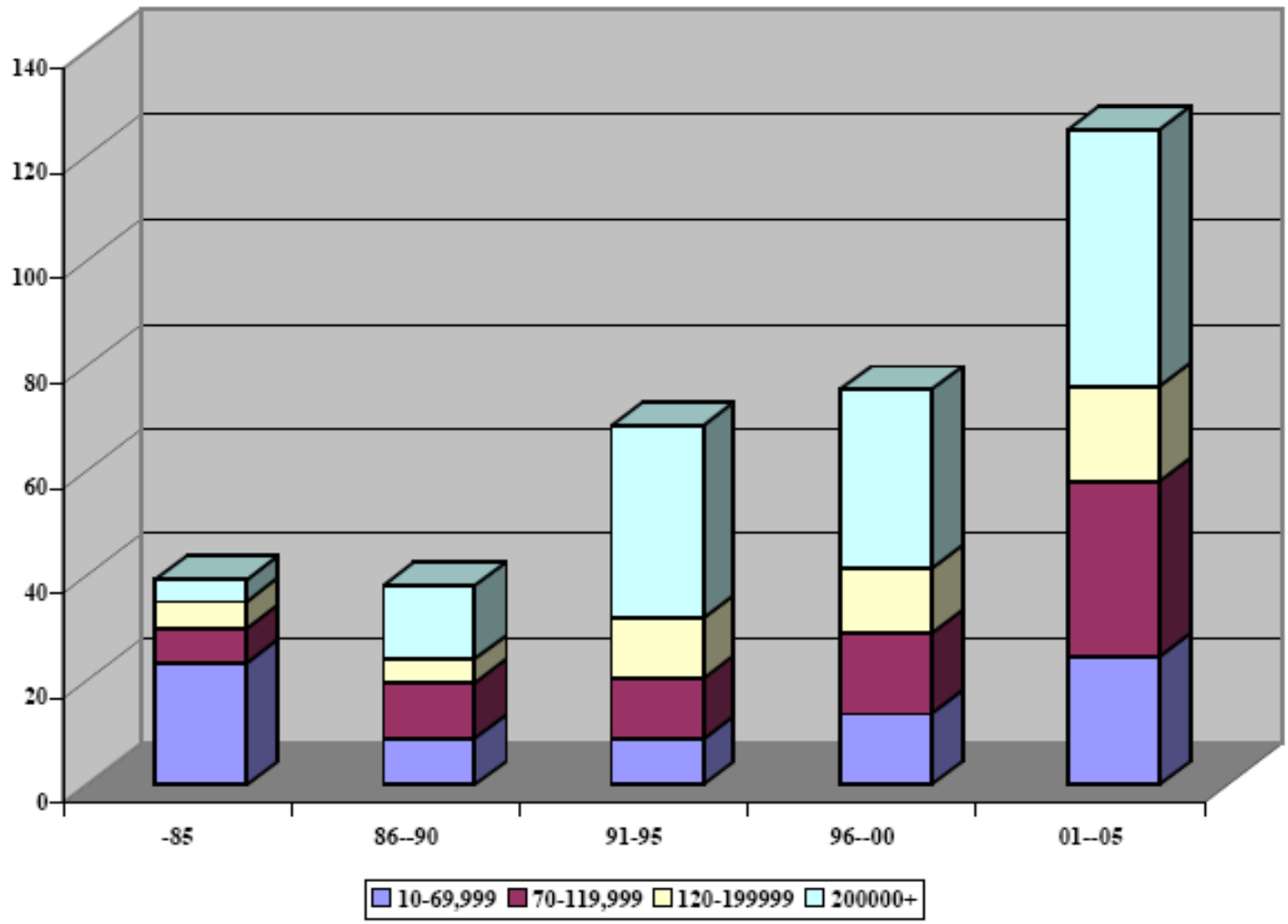
Tankers: Age Profile



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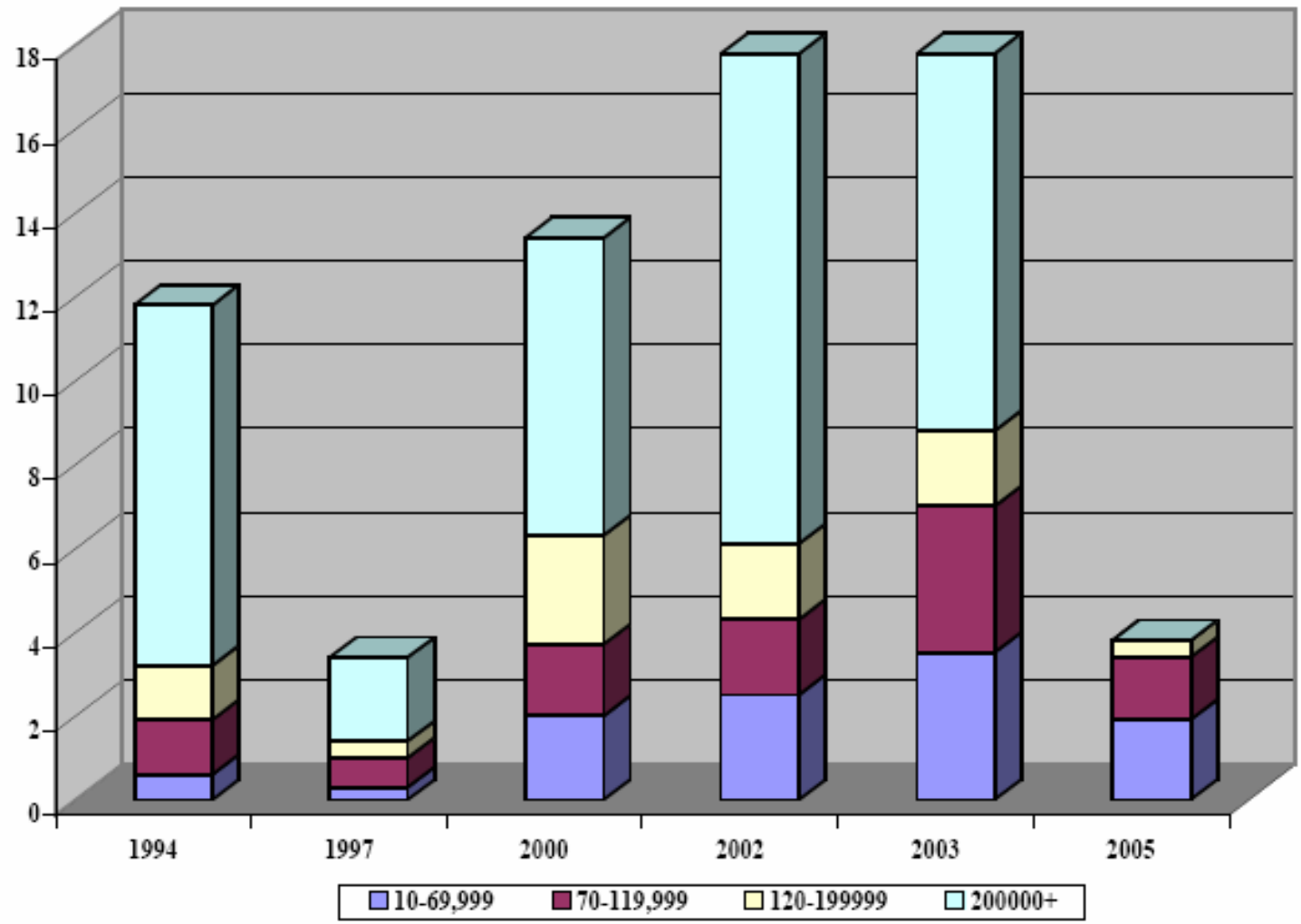
Tankers Scrapped by Size

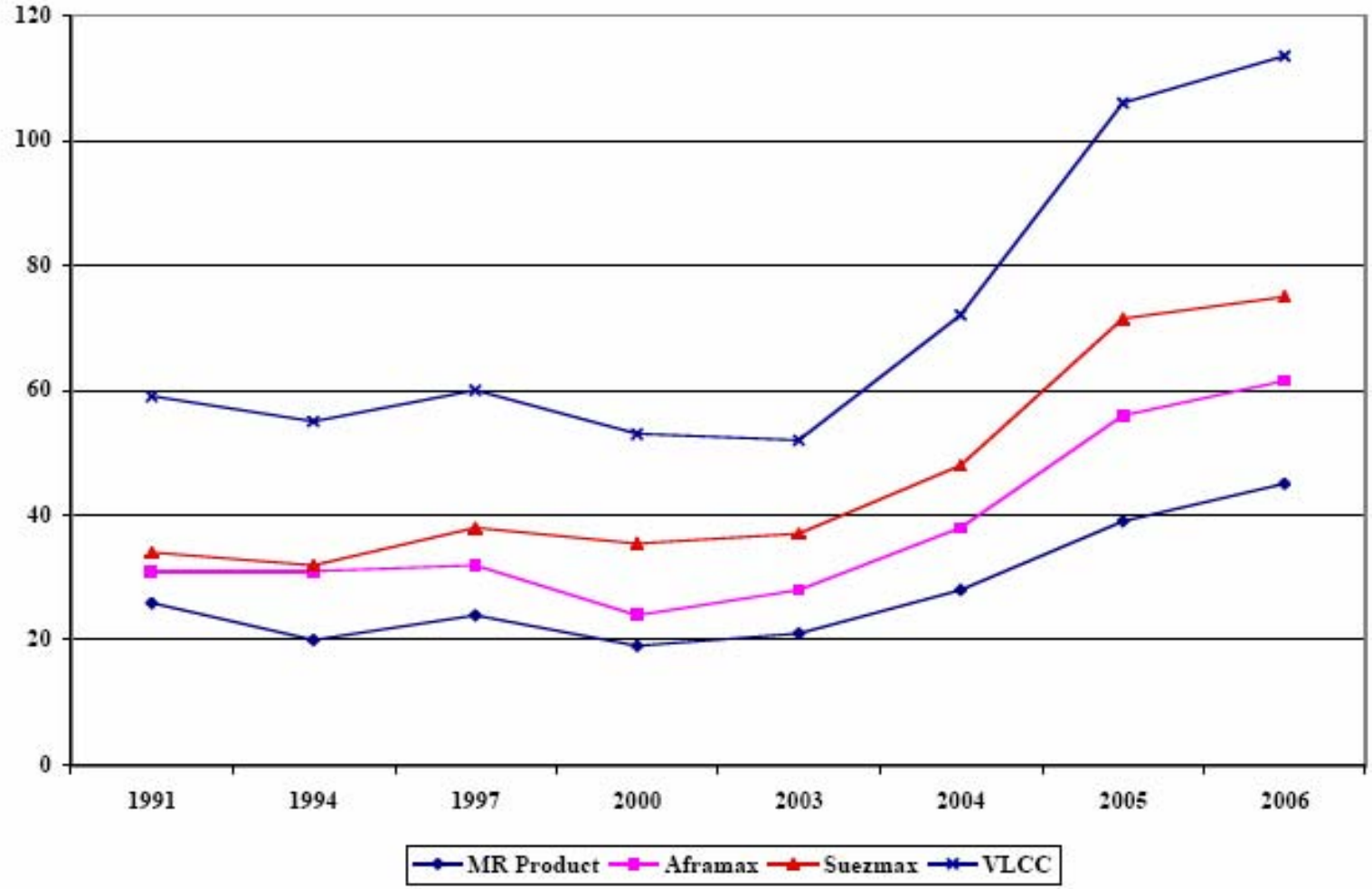
(in million dwt)



Source: R.S. Platou 2006

Second Hand Prices of Five Year Old Tankers

(in million dwt)



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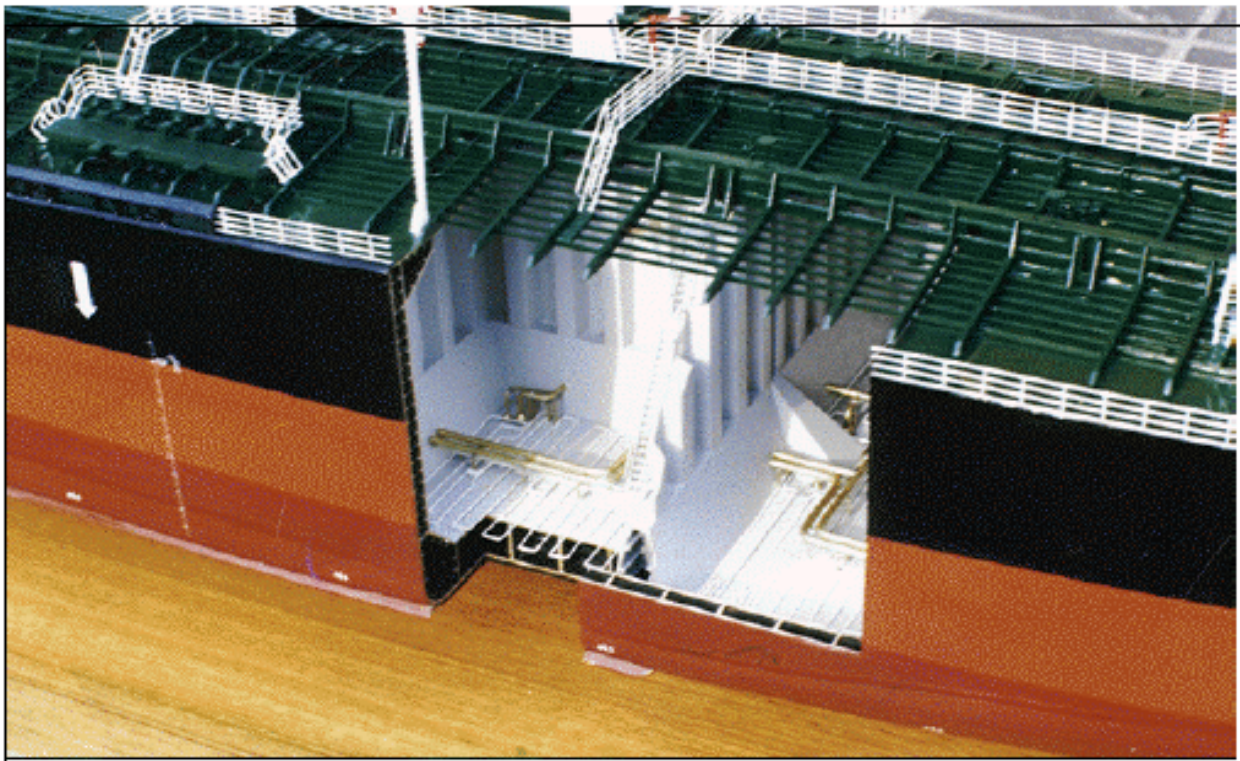
Double Hull Construction

Double Hull Construction



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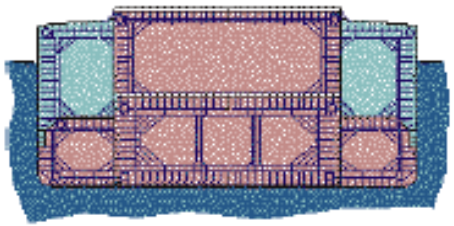

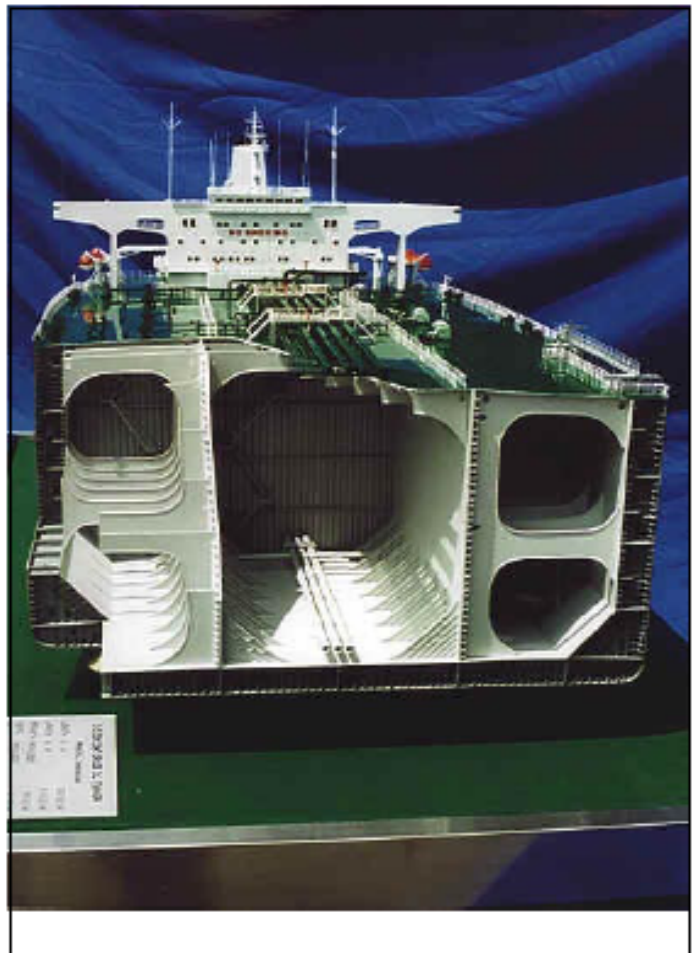

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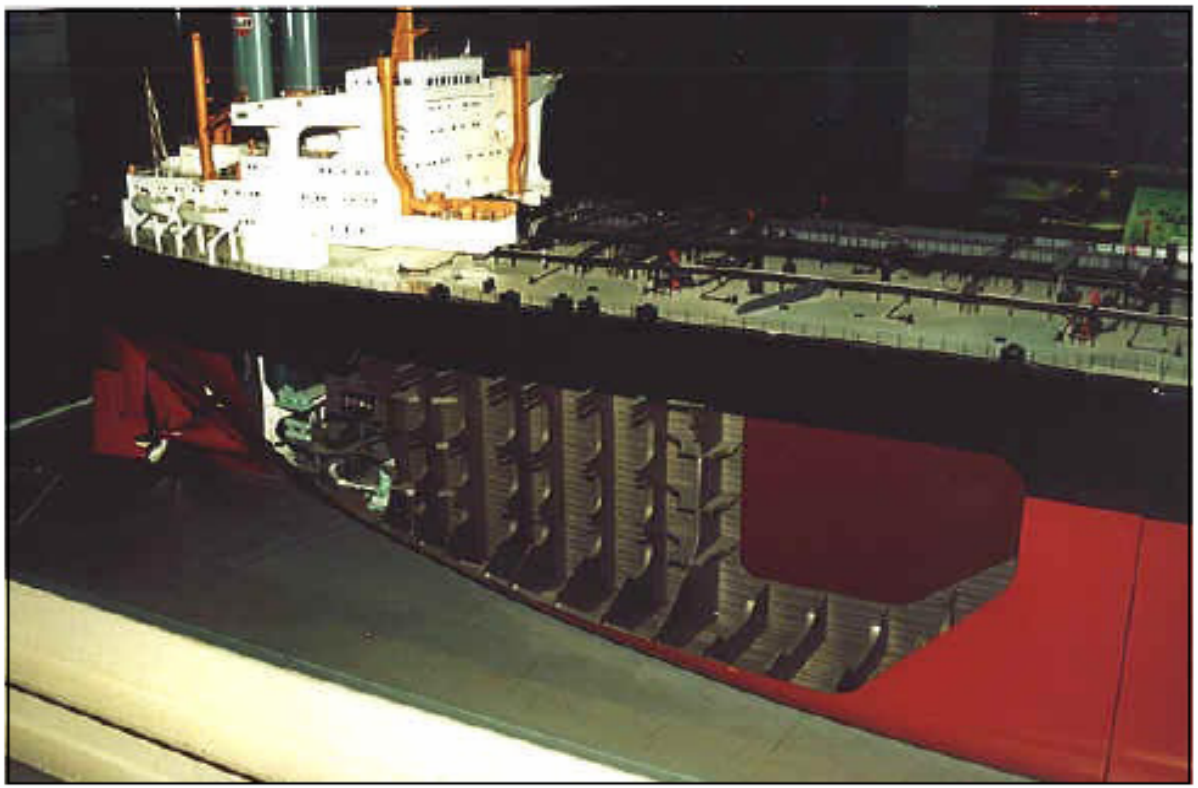

Overview of Tanker Operations

- **Nomination**
- **Loading**
- **Loaded Passage**
- **Discharging**
- **Ballast Passage**
  - Tank cleaning
  - Preparation for loading

Crucial Factors in Cargo Handling

- **Age of the Ship**
- **Size and condition of cargo pipelines**
- **Condition of the cargo tank's bulkheads**
- **Experience of ship's personnel**
  - Officer-in-charge of cargo operations

Cargo Handling Precautions

- Keep petroleum gas out of the accommodation
- Keep all doors, ports, windows closed
- Trim the ventilators
- Close cargo tank lids and sighting & ullage ports
- Frequent checks during loading and unloading