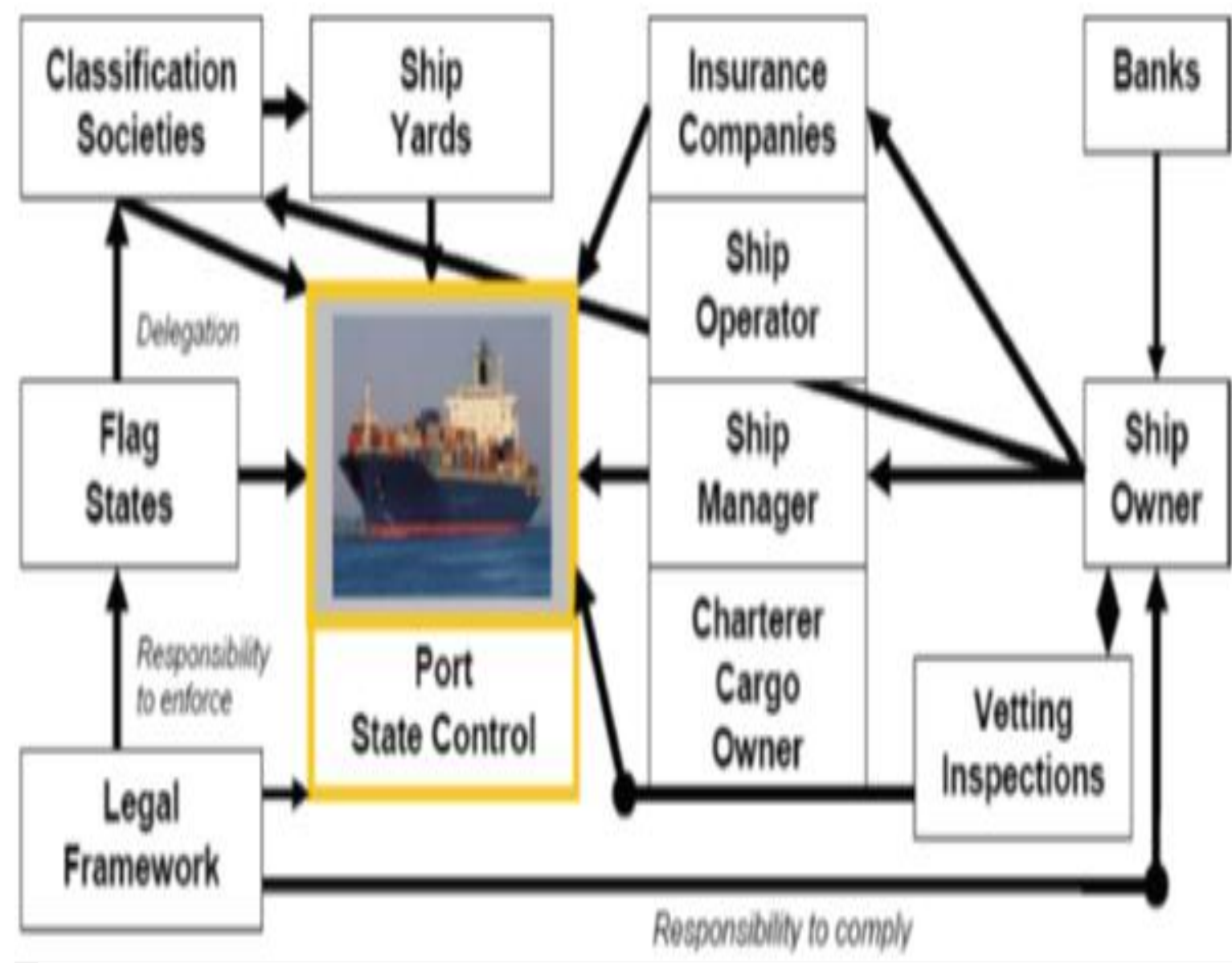


## FROM MANAGEMENT TO OPERATION



International shipping is very complex and involves large numbers of multi-national players

### Operations Complexities

Shipping companies are operating in a complex business, commercial, financial, regulatory, legal and international environment with significant level of daily interactions with large number of parties. Their operations most of the time are constraint by these relationships and interactions.

The structure and management of a shipping company is significantly affected by the nature of the trade involved and by its size. For example, the structure of a tramp operator will generally be different from that of a much larger liner company or industrial ship operator.

### Shipping Segments

Shipping segments may be defined in a variety of ways. Shipping segment by geography of operation:

- Deep-sea shipping
- Short-sea shipping
- Coastal shipping
- Inland waterways.

Depending on the segment, the ship types/sizes and fleet sizes; the business model for fleet/ship deployment, etc. will vary with effect on other operational aspects such as energy efficiency.

Shipping segments by operation type

- Liner operations
- Tramp operations
- Industrial operations



### Contract of Carriage Legal Framework

#### Common law

Imposes four basic obligations on the carrier:

- The carrier must deliver the goods in the same condition as when they are shipped.
- The carrier has an absolute duty to provide a seaworthy ship.
- The carrier undertakes to proceed on a voyage without unjustifiable "deviation".
- The carrier must complete the voyage with "reasonable dispatch".



#### Hague-Visby Rules

The Hague-Visby Rules are for the international carriage of goods by sea. These rules preserve the four common law obligations as above; but in less strict form and protects the shippers by ensuring some level of the carriers' liability via specifying the carrier's main duties.



#### Types of contracts

For carriage of cargo/goods, the main types of contracts in shipping are:

- Bill of Lading
- Charter party
- Contract of Affreightment

### Types of Contracts

#### Bill of Lading

A legal document that governs the relationship between the shipper and the carrier. It is a standard form document that acts as a contract, a receipt for the cargo and also could be transferred and traded by endorsement.

#### Charter party

"Charter party" is a contract by which the ship owner lets the ship to another person. Charter parties' content is highly standardized and are grouped into three main types:

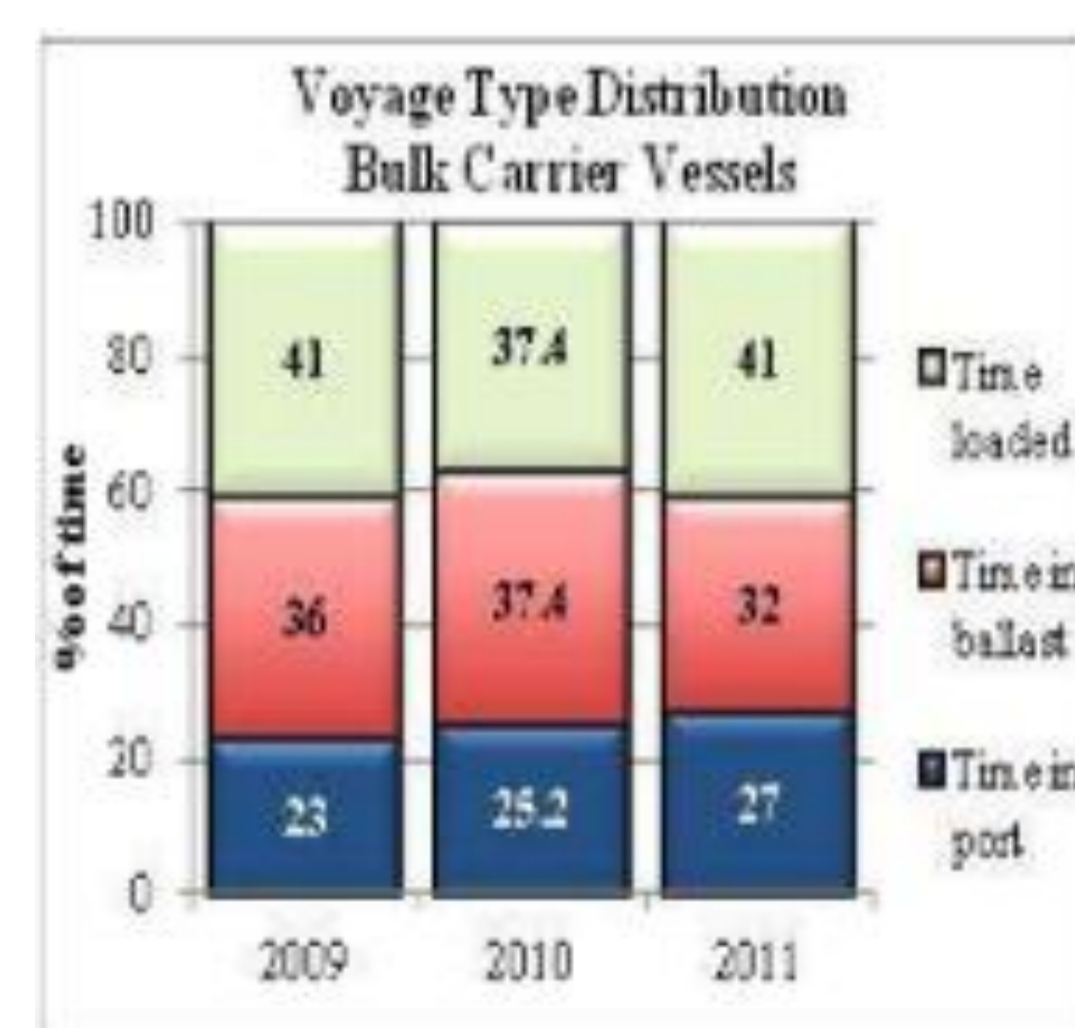
- **Voyage charter:** It is a contract of carriage for one or more voyages.
- **Time charter:** The ship is manned and operated by the owner but its capacity is let to the charterer for a specified time period.
- **Demise or bare boat charter:** The charterer takes full control of a ship as if it is his/her own ship; dealing with all ship aspects such as manning and maintenance.

#### Contract of affreightment

This is a contract whereby a ship-owner agrees to move a specified quantity of cargo over a specified period of time from one port to another. Mainly applies to bulk cargo and are often set for relatively long periods.

### Just in Time (JIT) Operation

Ships for a number of reasons spend extended periods of time in ports or at anchorage. If these periods could be reduced in favour of additional days at sea, the ship could adjust to lower speeds and thus save fuel. This is regarded as a major energy saving measure. In shipping, JIT could apply to both ship's passage and port operations.



#### Constraints to JIT operation

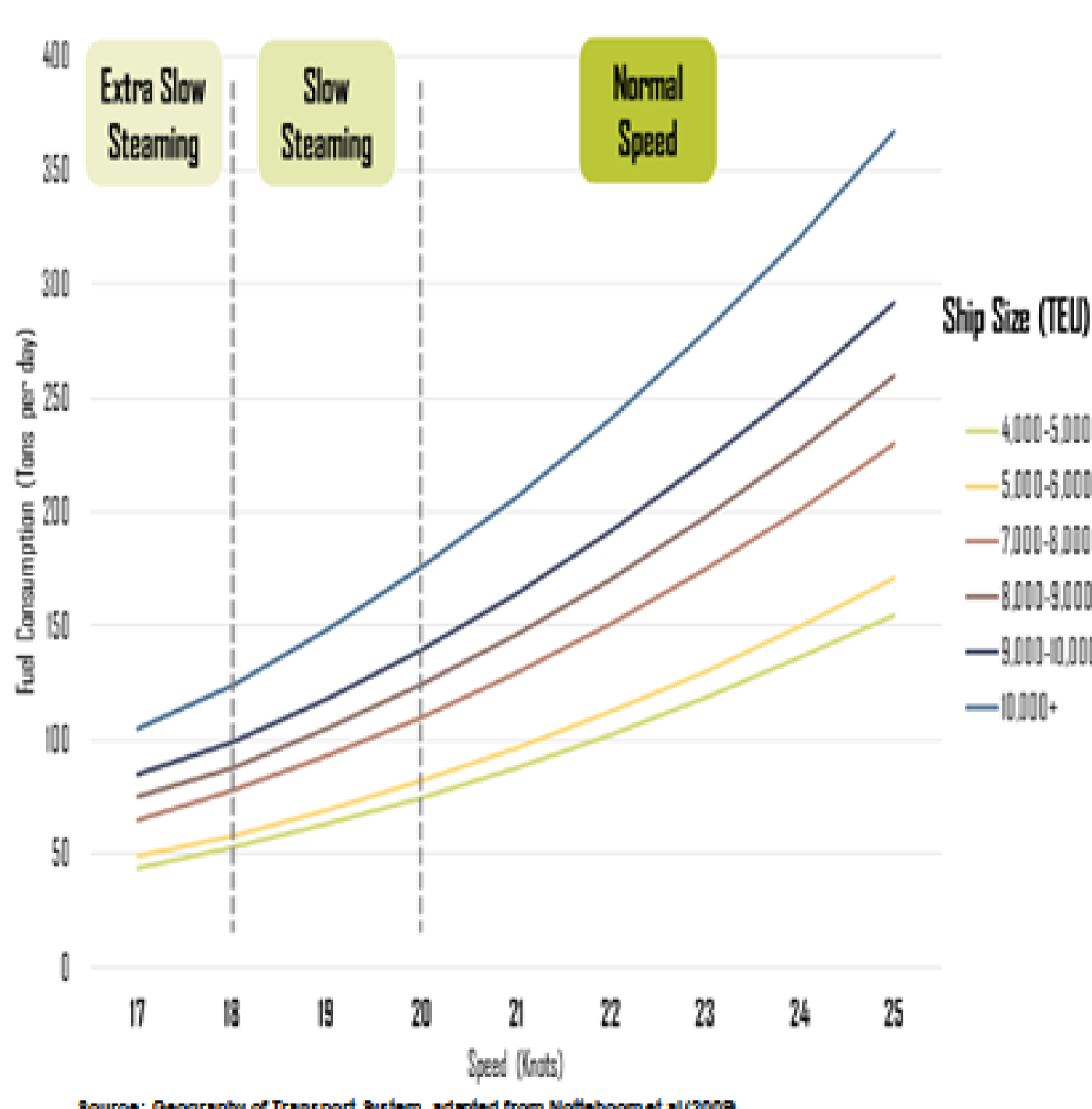
The constraints are usually not due to the ship itself but the way the industry works. There are many organisations involved in ship operation, as well as nature, that impose constraints on JIT operation:

- **Charter party constraints:** These include clauses on various aspects of ship operation that practically restricts efforts for slow steaming or JIT operation.
- **Weather constraints:** The weather is normally another factor; however, better weather routing is possible.
- **Route constraint:** The route of the vessel may involve channel crossing, passing through pirate areas, etc.
- **Port constraints:** Port congestions, port poor planning of its operation, etc. lead to long port times for the ship.
- **Other constraints:** These are specific constraints that may apply by various parties involved in ship operation.

To support JIT operation, all the above constraints need to be resolved.

### Slow Steaming

Slow steaming (reducing ship speed) is the most effective way for reducing a ship's fuel consumption. For every 1% speed reduction, close to 2% reduction in fuel consumption per tonne mile is feasible.



To exercise slow steaming requires a number of investigations. Slow steaming may impose the need for additional ships, may impact crew, would require changes to voyage plans, would impact clients/shippers, and will have technical impacts on the ship itself including main engines and propellers as well as the hull. Decision making is part of the fleet deployment aspects and require a full economic and technical assessment. Where fuel prices are high or charter rates are low or ship over-capacity exists, slow steaming is cost effective and normally exercised by leading companies.

### E-Navigation and Voyage Management

E-navigation refers to collection, integration, exchange, presentation and analysis of maritime information onboard and ashore by electronic means to enhance berth to berth navigation and related services. E-Navigation are promoted for ship safety and environmental protection. E-Navigation is an enabling technology that would facilitate more efficient ship scheduling and routing; thus could potentially lead to Just in Time operations, use of better autopilot system and controls, use of advanced ship performance analysis and weather routing; all in all leading to not only safer but more energy efficient ship operations.

### Shipping Contracts and Energy Efficiency

To save energy, it is well known that reducing ship speed or investing in new technologies are very effective. Under most charter party terms, the charterer pays for the fuel and the owners have no incentive to save fuel. Also, as the charterers do not own the ship, they have no incentive to invest in the ship to make it more energy efficient. This is referred to as "split incentives".

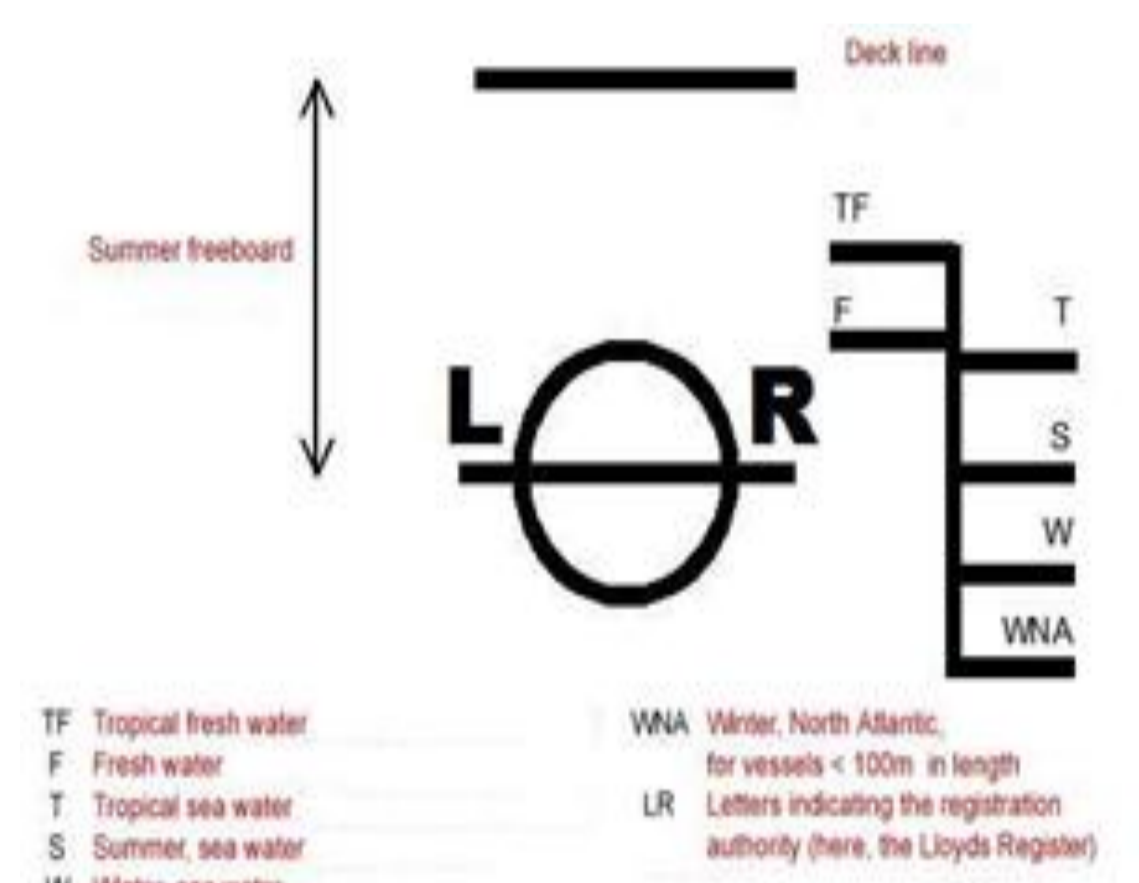
Generally speaking, the current contractual arrangement leads to a number of drawbacks in the form of:

- Split incentive as indicated above
- Provides incentives for fast steaming
- Act as a barrier to upgrading ship technologies
- Act as a barrier to improving ship operation

The above aspects result from shipping contracts that are highly commercially sensitive and limits inter-party working on ship energy efficiency. Efforts are underway to remove these barrier via development of new clauses for inclusion in various shipping contracts of carriage. For example, there has been attempts by BIMCO to develop relevant clauses for slow steaming.

### Ship Capacity Utilization

Maximum cargo capacity of a ship depends on its load-lines which are placed on each side of the ship and shows the ship's maximum true mean draught that must not be exceeded.



If this full capacity is used for carrying cargo, then it is easy to demonstrate that the ship's fuel consumption per unit of cargo carried will be minimized. This expresses the notion that ships with higher capacity utilization factor are more energy efficient.

Increasing the ship's operational capacity load factor will depend on a number of parameters, the most important ones are:

- **Nature of ship deployment or lack of cargo:** A fleet could be organized in a way to have ships operating at their full capacity. Lack of cargo can lead to part load operation.
- **Improved cargo load planning:** The loading of the ship may not take place properly leading to reduced use of its maximum capacity.
- **Optimal use of ballast water, fuel and spares,** etc. These need to be optimized and not maximized to provided additional capacity for cargo.
- Reduced length of ballast voyages and generally unproductive ship operation.