

# Loading, discharging and trim





# Making up a stowage plan.



**Before the loading of the cargo commences a stowage plan must be made up to ensure the safety of the vessel, the cargo and the crew.**





## Making up a stowage plan.

*Considerations regarding safety  
of ship, cargo and crew*





## **Making up a stowage plan.**

*Considerations regarding safety  
of ship, cargo and crew*

- . the stowage factor of the cargo**
- . the trim of the vessel**
- . sweating and intermixing  
(*segregation of cargoes*)**
- . order of *destinations*.**





# The stowage- factor





## The stowage- factor

The stowage factor indicates the *volume* of the cargo hold *occupied* by one ton of cargo.





# Bale space

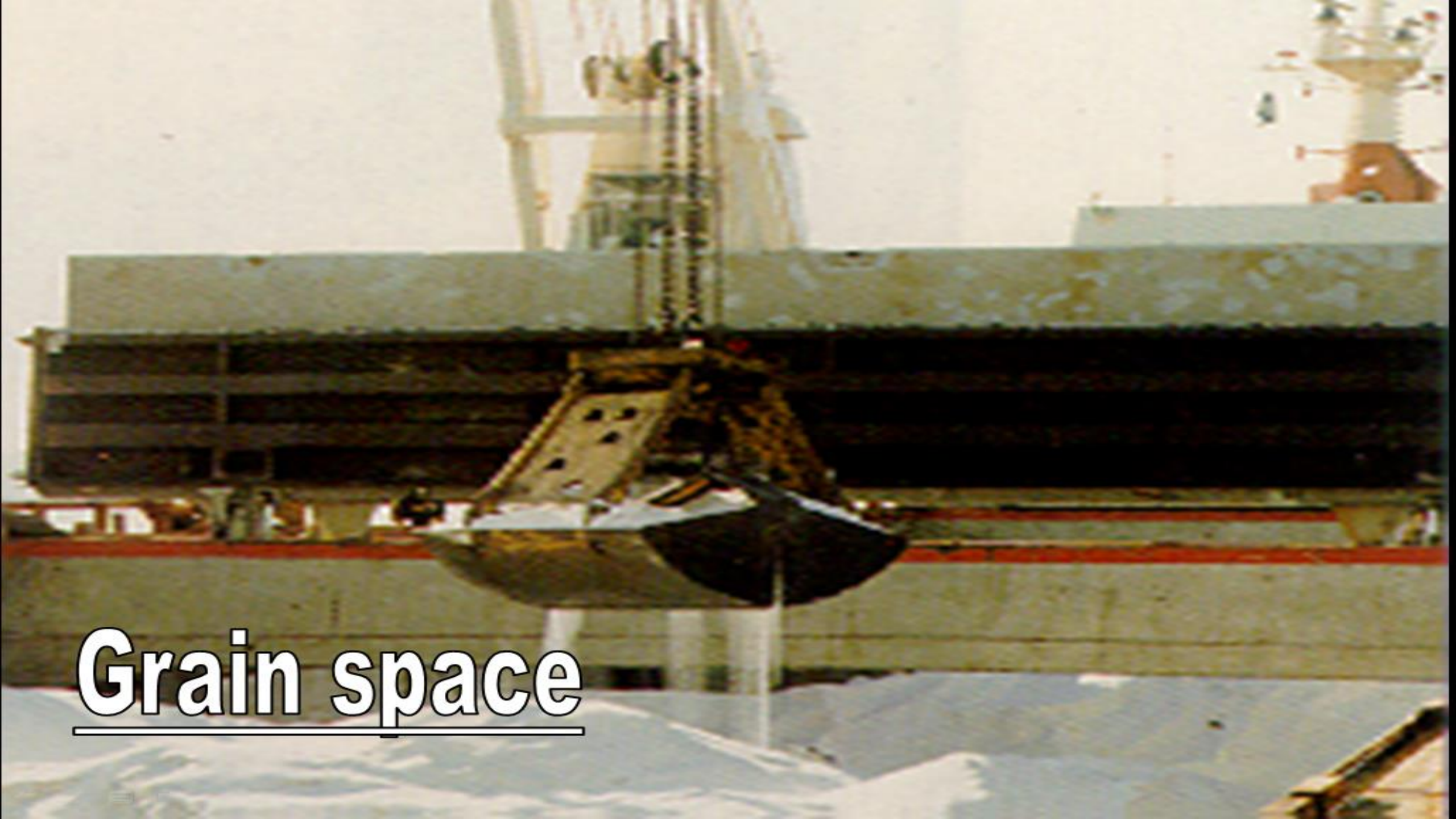




# Bale space

*By bale space is meant the volume of the cargo holds that can be used for general cargo.*



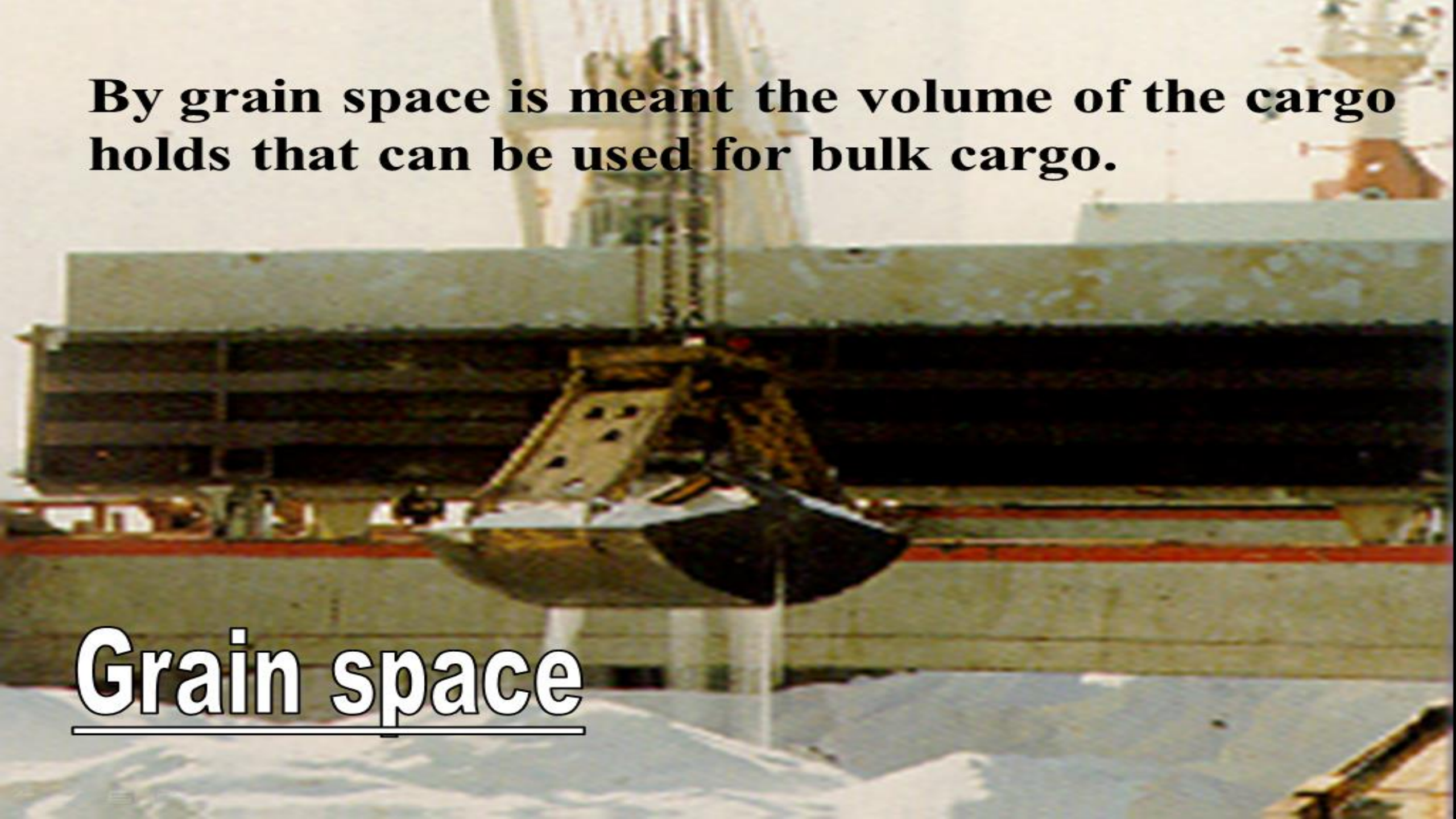


Grain space



**By grain space is meant the volume of the cargo holds that can be used for bulk cargo.**

**Grain space**





# Oil space





# Oil space

*Ullage* (to allow for the expansion of the oil).



**By Oil Space is understood 98% of the total volume of the tank.**



# Types of cargoes





# General cargo.





# GENERAL CARGO



# GENERAL CARGO

**General cargo is cargo coming in boxes, crates, bags and pieces.**

**The *stowage plan* will indicate where the various *cargo-items* have been stowed.**





# Union Purchase





# Union Purchase

Derrick

Derrick

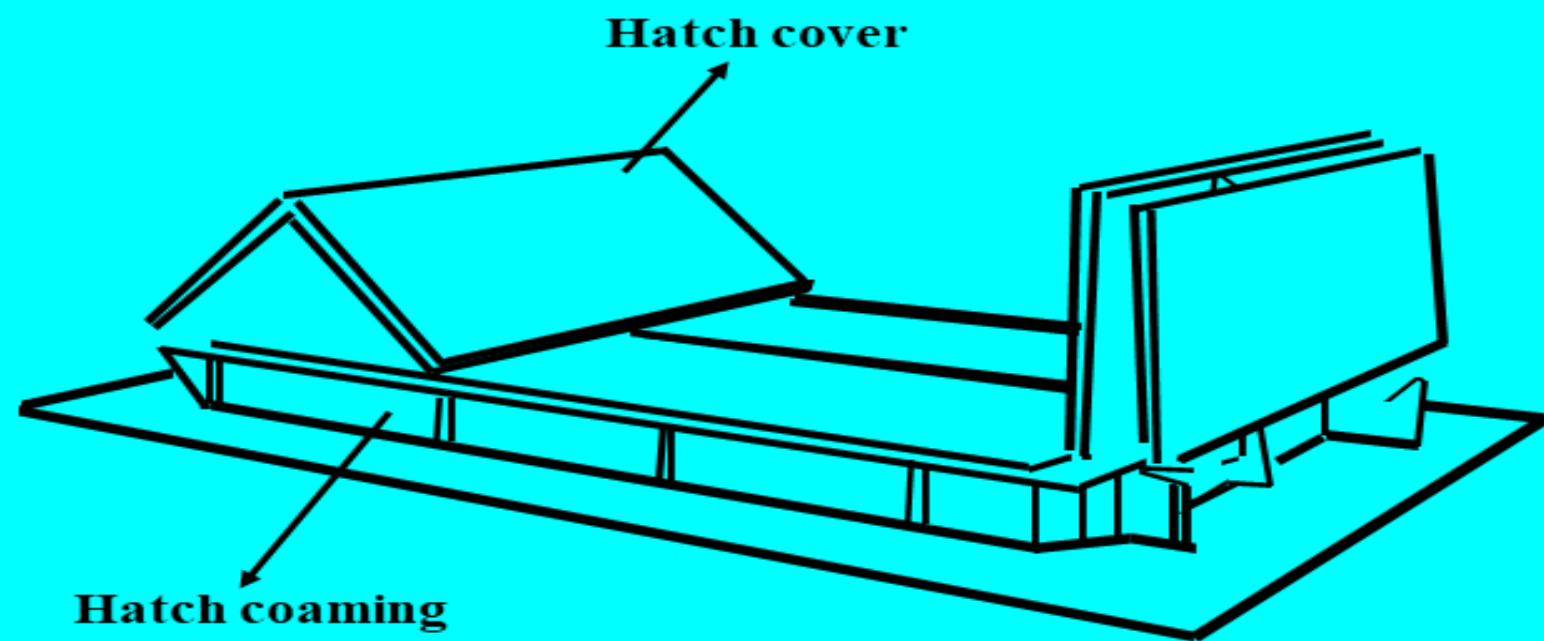
runner

Union purchase (*married gear*)  
is a method of  
general-cargo-handling  
with two *derricks*  
and one *runner* in between.



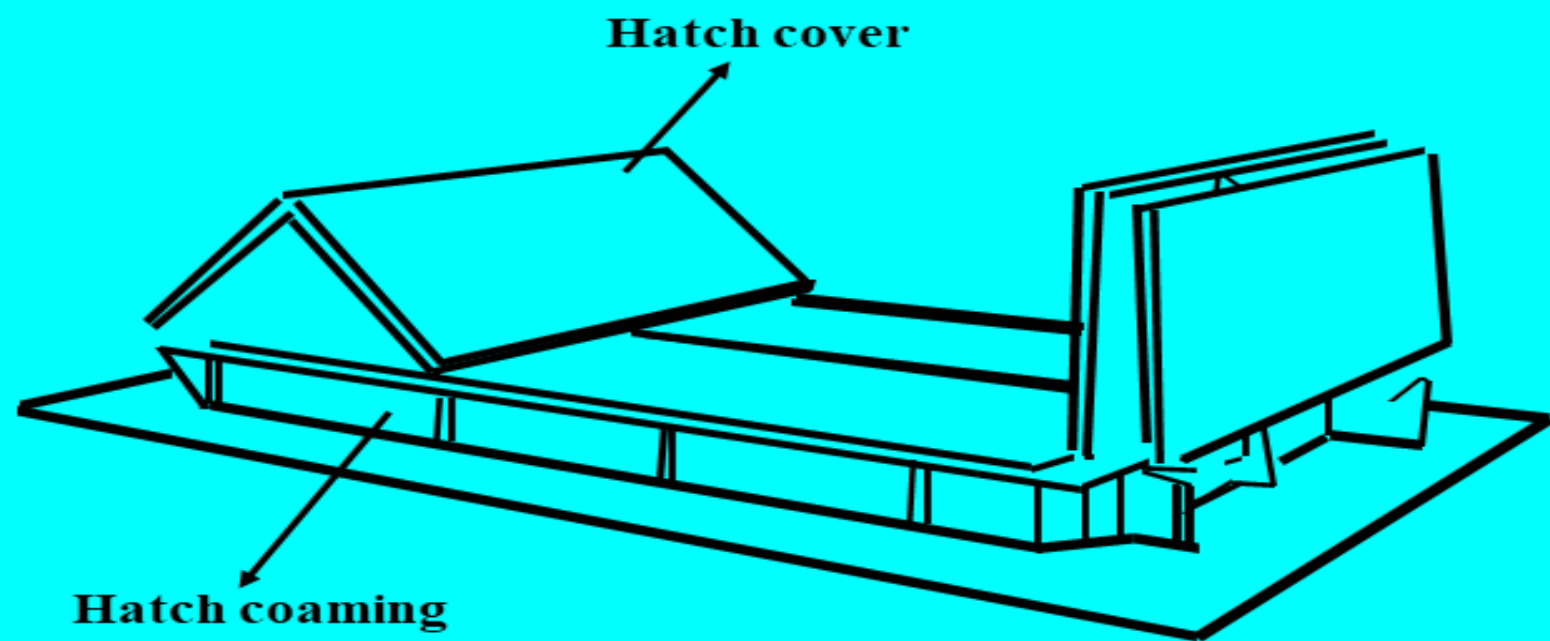


# THE HATCH





# THE HATCH



**A hatch  
gives *access*  
to a hold.**



# Bulk cargo





# BULK CARGO

*Bulk carrier carrying sugar.*



*Crude oil carriers.*





# BULK CARGO

*Bulk carrier carrying sugar.*



*Crude oil carriers.*



**Bulk cargo is *unpacked cargo of one commodity.***  
**There is *dry bulk cargo* (grain, ore)  
and *wet bulk cargo* (oil).**







**Wet bulk cargo  
is loaded and discharged  
by pumps.**



**Dry bulk cargo  
is loaded and discharged  
by cranes with grabs  
or by pumps.**







**Containerized cargo**







When things have gone wrong.....





# CONTAINERS





# CONTAINERS

Containers are loaded by *straddle carriers* (or *gantry cranes* or *portal cranes*) and stacked in *Bays, Rows and Tiers*.

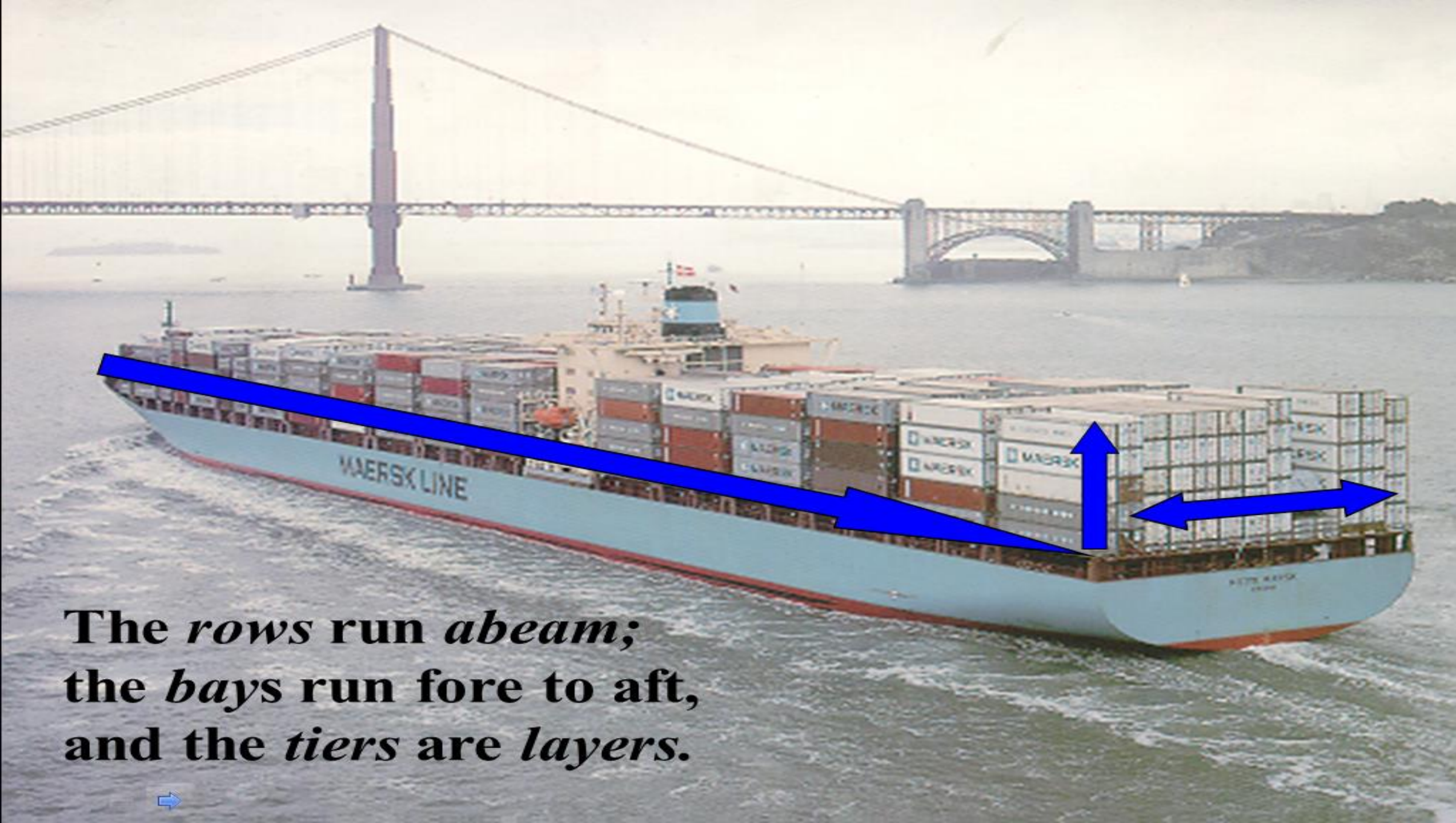




**The *rows* run *abeam*;  
the *bays* run fore to aft,  
and the *tiers* are *layers*.**







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the *bays* run fore to aft,  
and the *tiers* are *layers*.

