



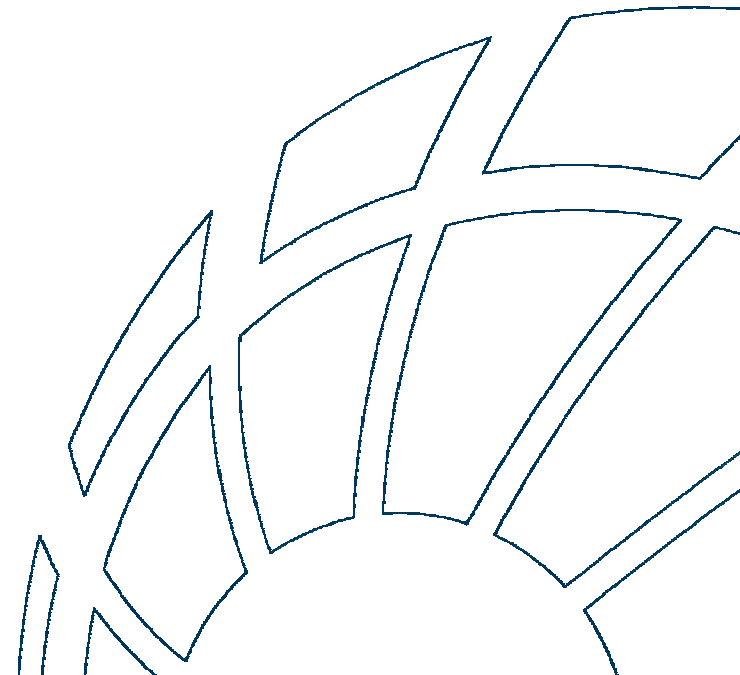
"Where will our knowledge take you?"

Peer van Oosterhout

Technical Director / Senior Marine Surveyor

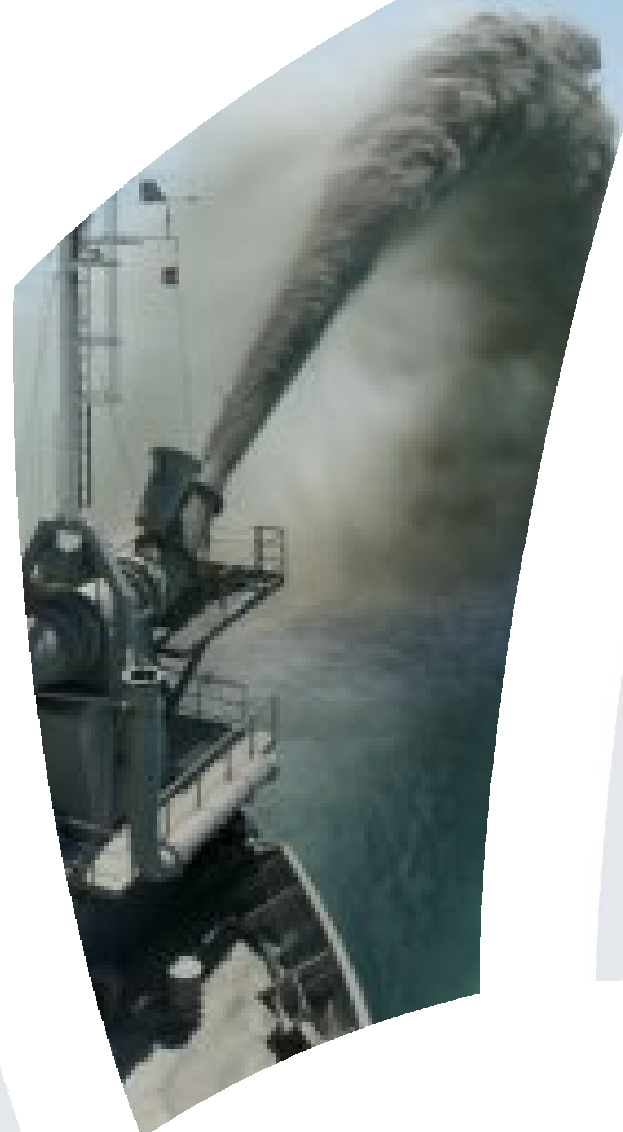
Copenhagen

11 September 2007



Dredging

Technical Issues / Human Element



The human element / negligence

A part of all damages are caused by a human element

what we call human error / negligence

The human element / negligence

The Human Factor in Accidents at Sea can be defined as those accidents involving ships and their crew and cargo,

which accidents are in some way linked to a human error as opposed to a purely technical failure.

The human element / negligence

Total claim amount over 2005:

USD 1.400.000.000,00

Which may rise to:

USD 2.000.000.000,00

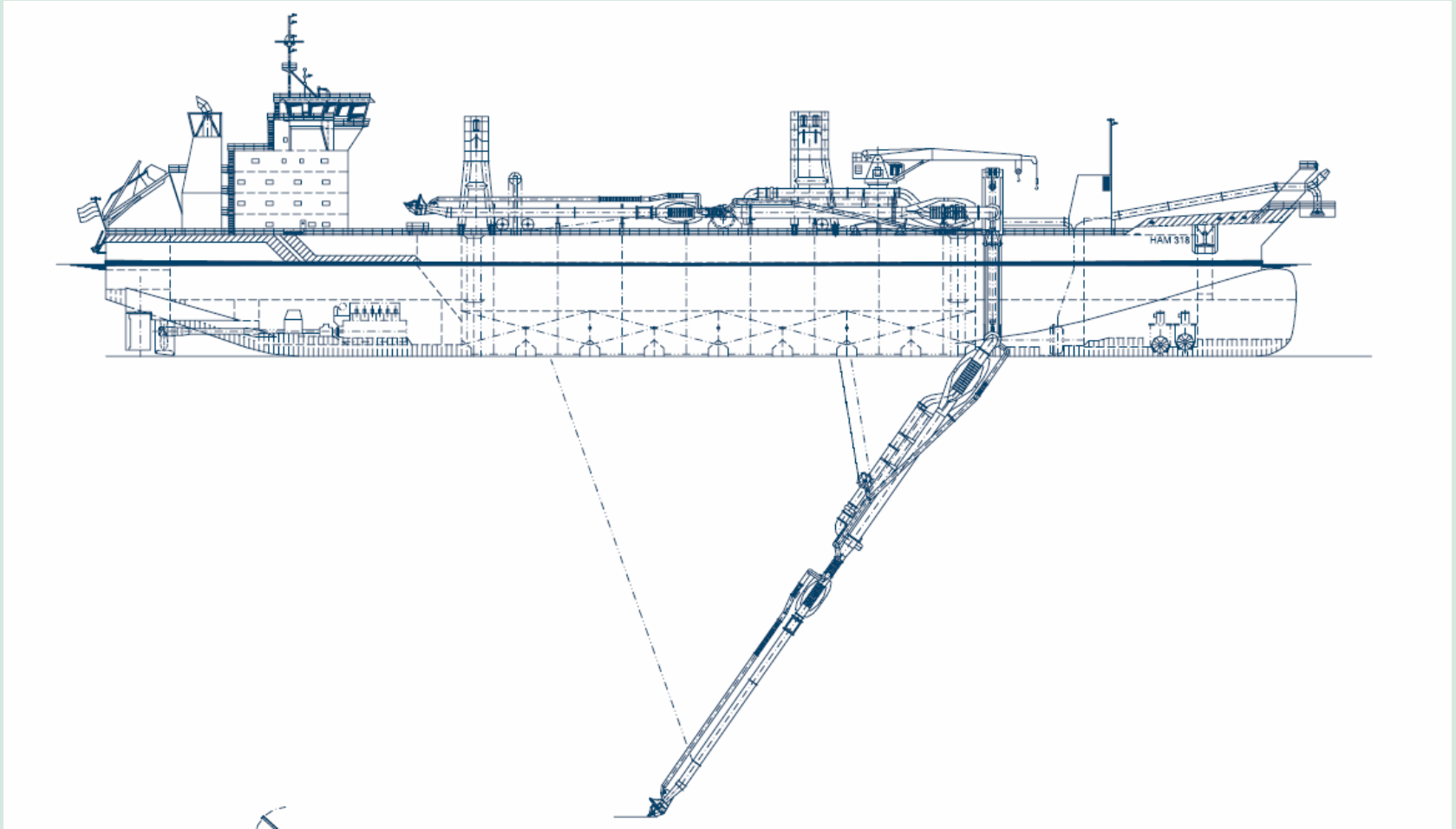
The human element / negligence

A few examples of vessels in dredging and some examples of damages

Trailing suction hopper dredger



Trailing suction hopper dredger



Trailing suction hopper dredger



Trailing suction hopper dredger



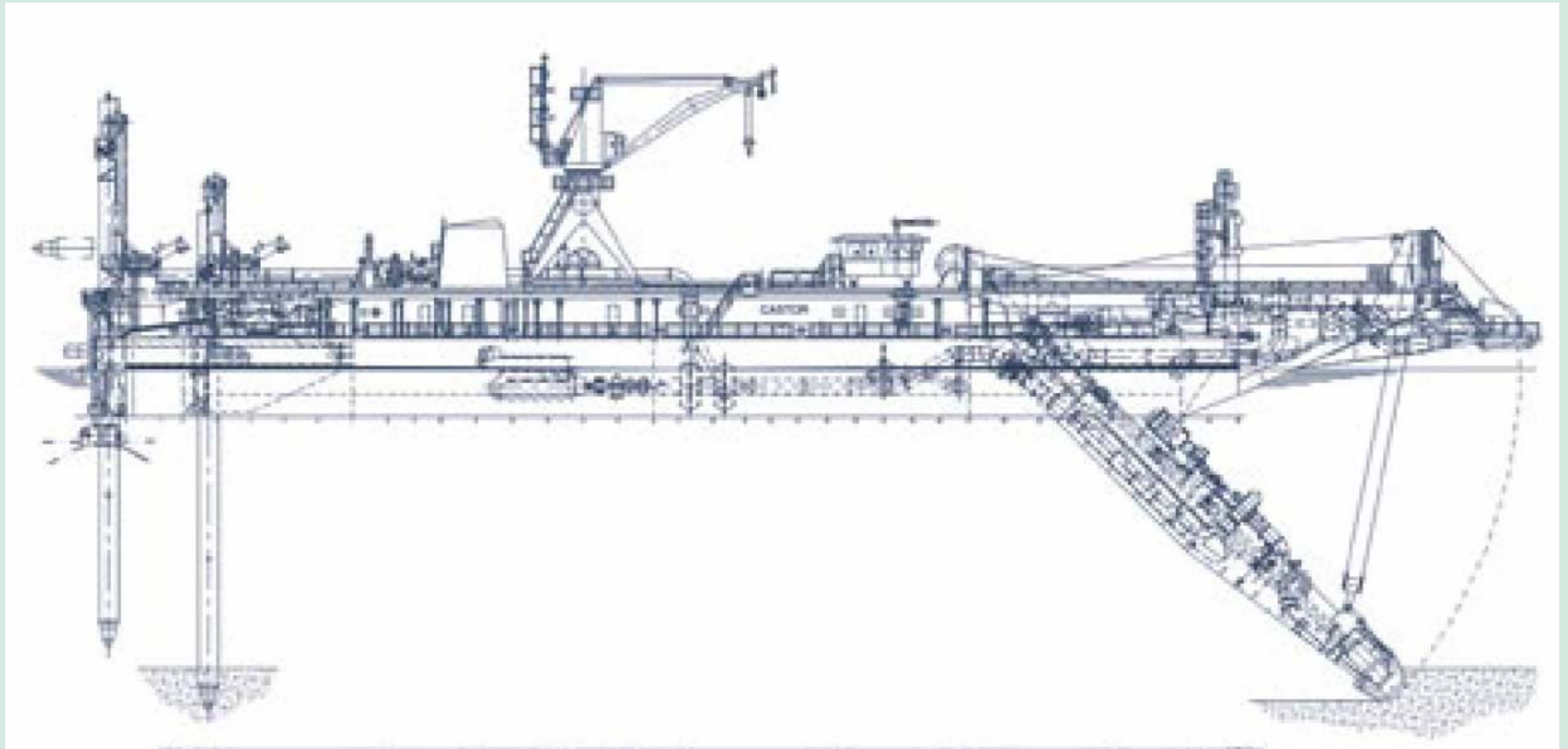
Trailing suction hopper dredger



Cutter suction dredger



Cutter suction dredger



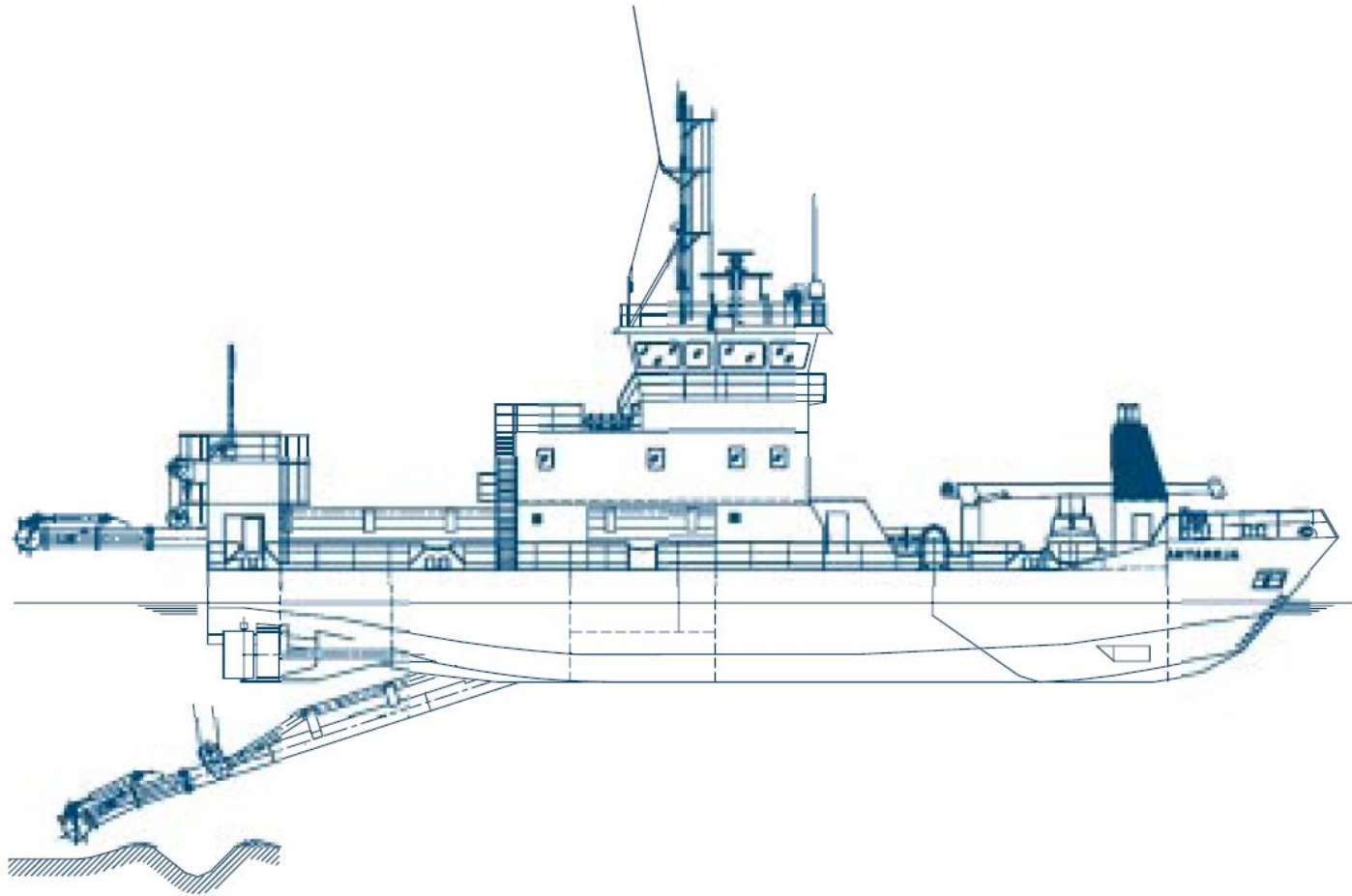
Cutter suction dredger



Water injection dredging



Water injection dredging



Split hopper barge



Example of damage: collision



Example of damage: grounding / collision



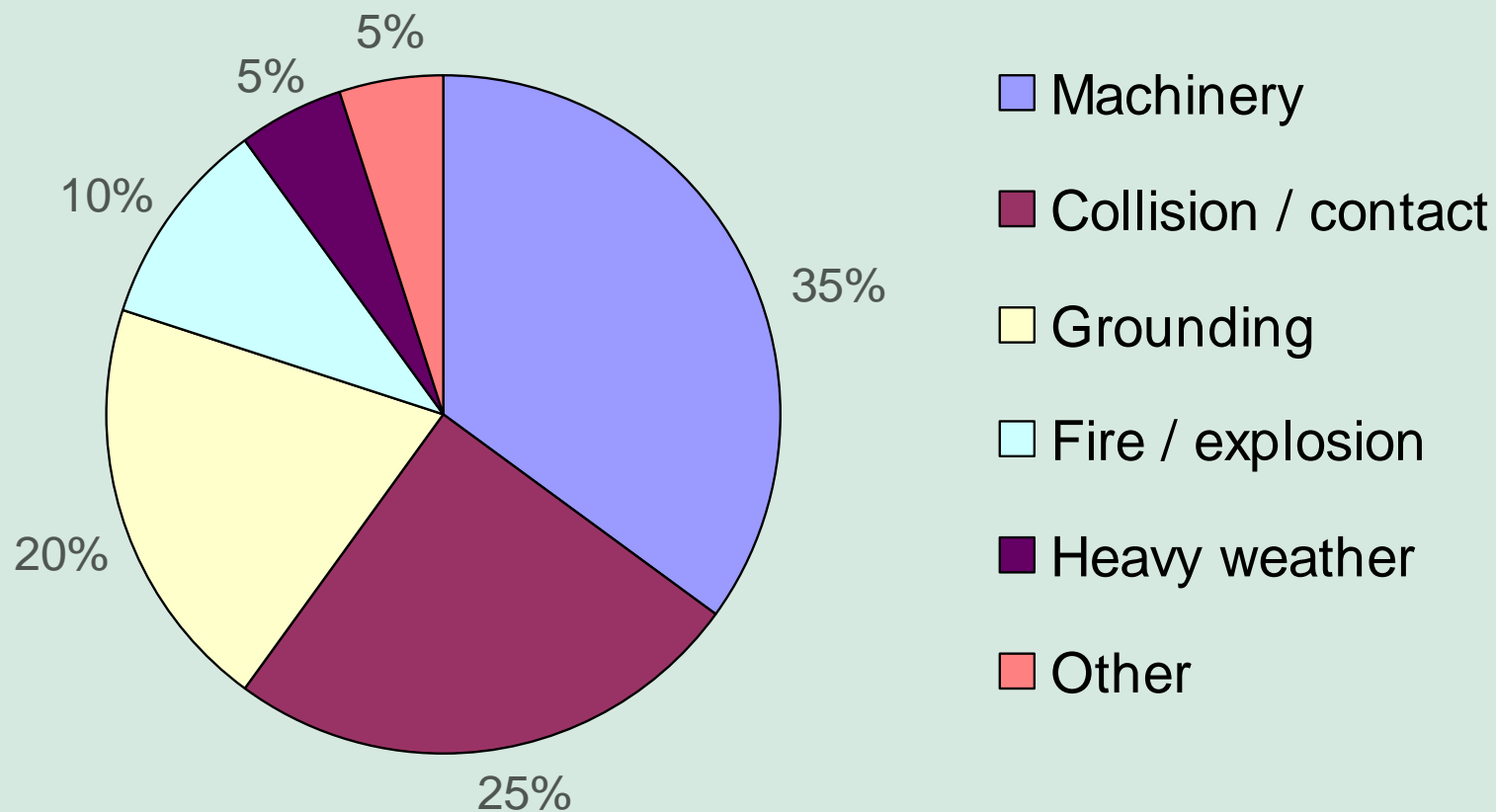
Example of damage: sinking



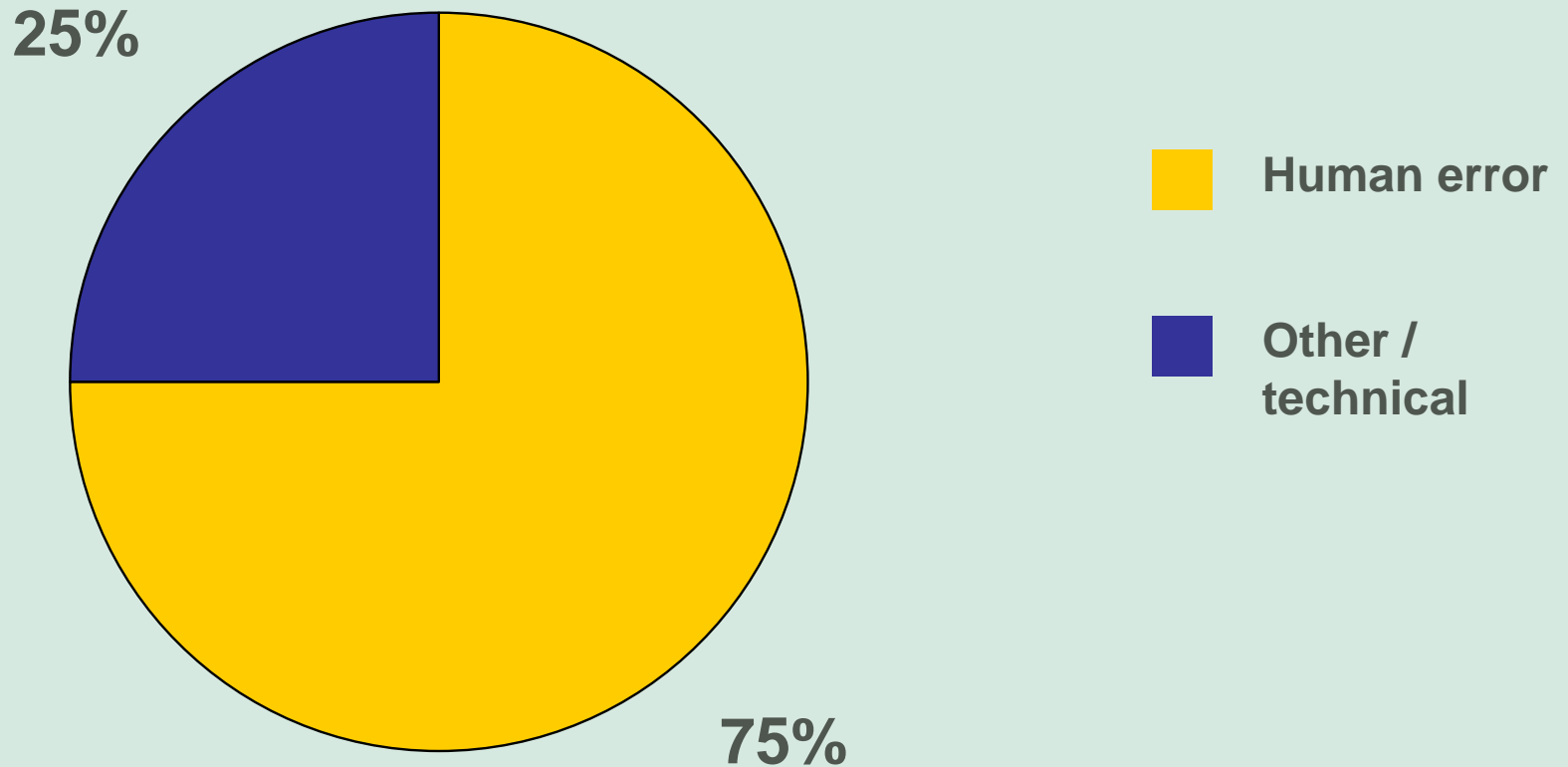
Example of damage: fire / explosion



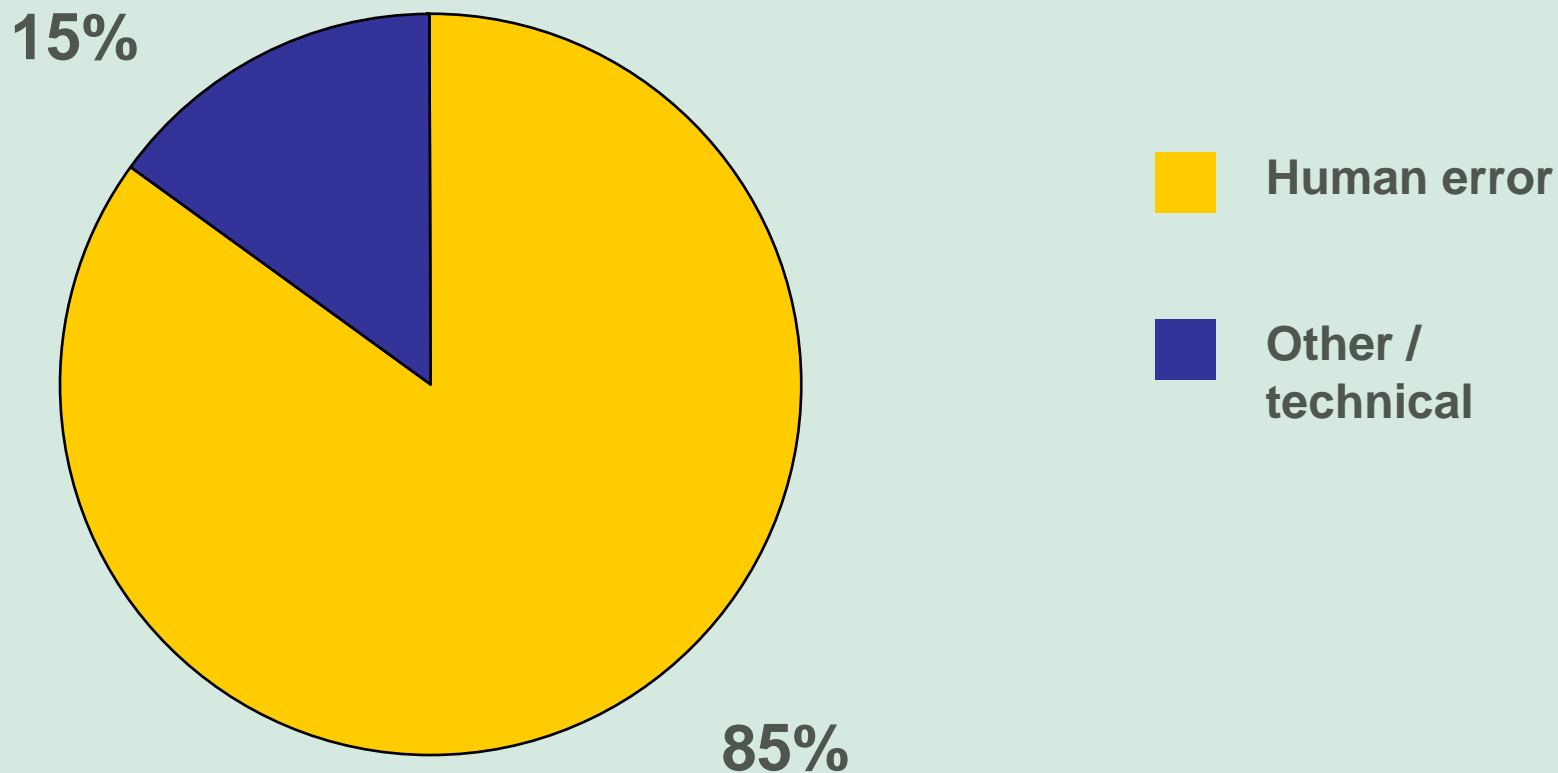
Cause of damage



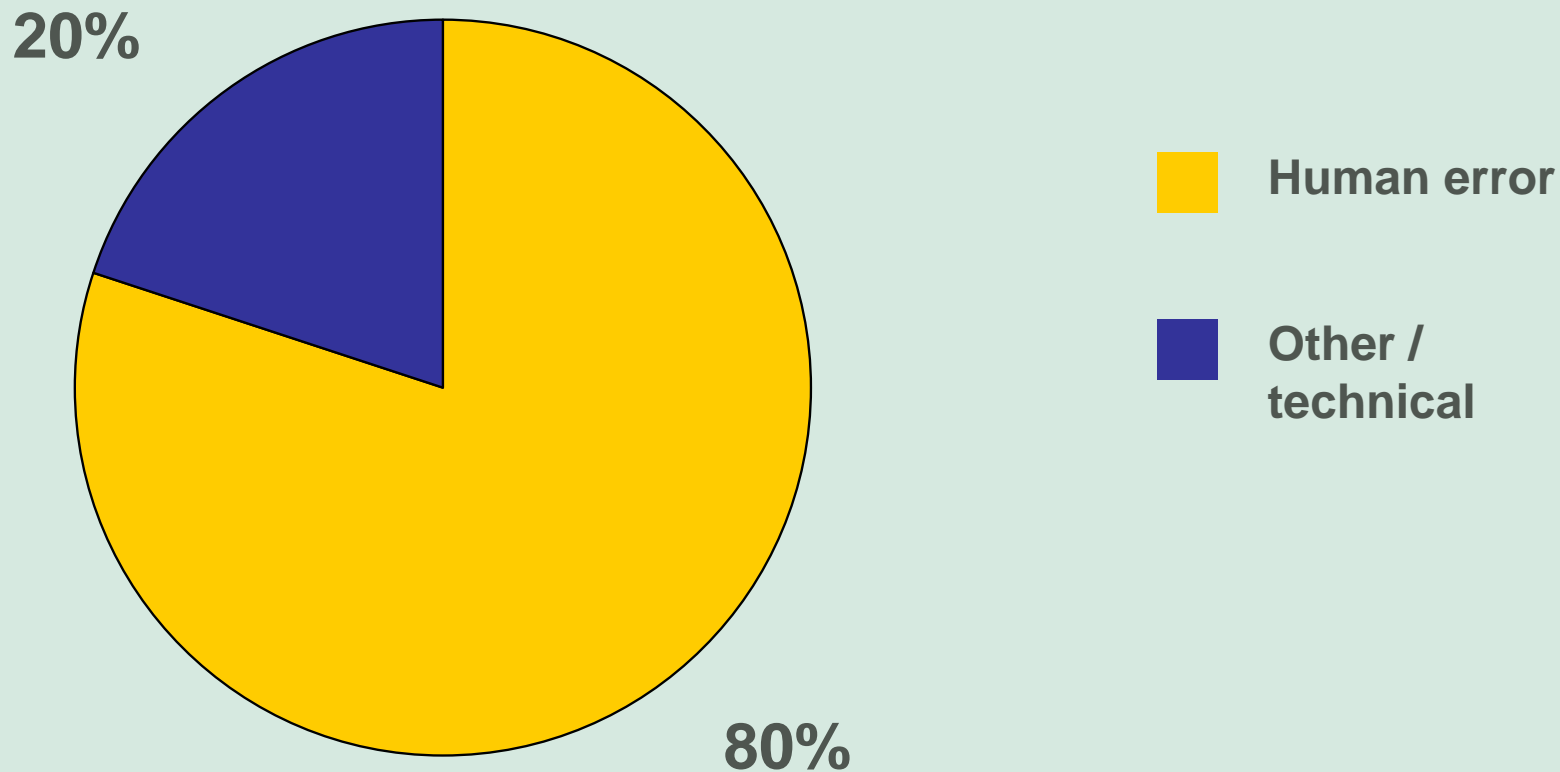
Cause of damage, general H&M



Cause of damage, dredging



Cause of damage, average H&M



Damage: grounding



Damage: grounding / contact



Damage: contact / allision



Damage: sliding away



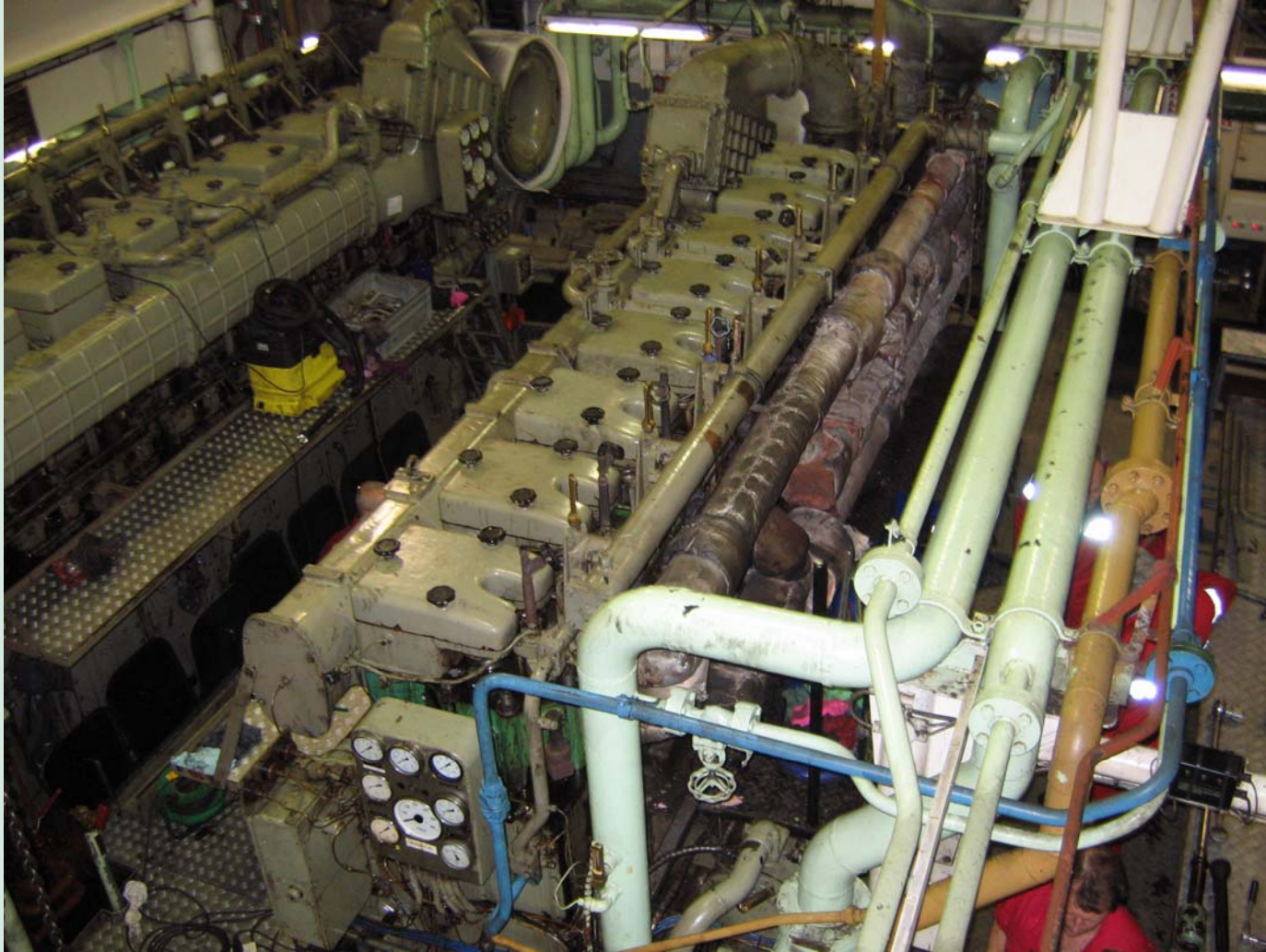
Damage: sliding away



Damage: sliding away



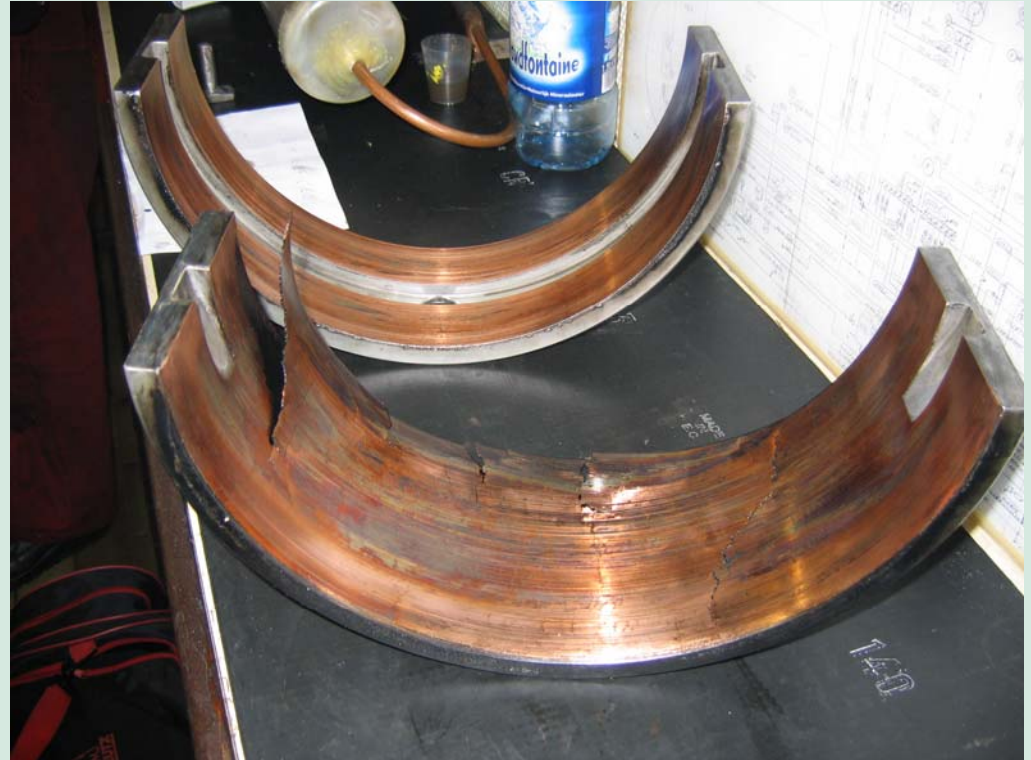
Damage: engine



Damage: engine



Damage: engine



Damage: engine

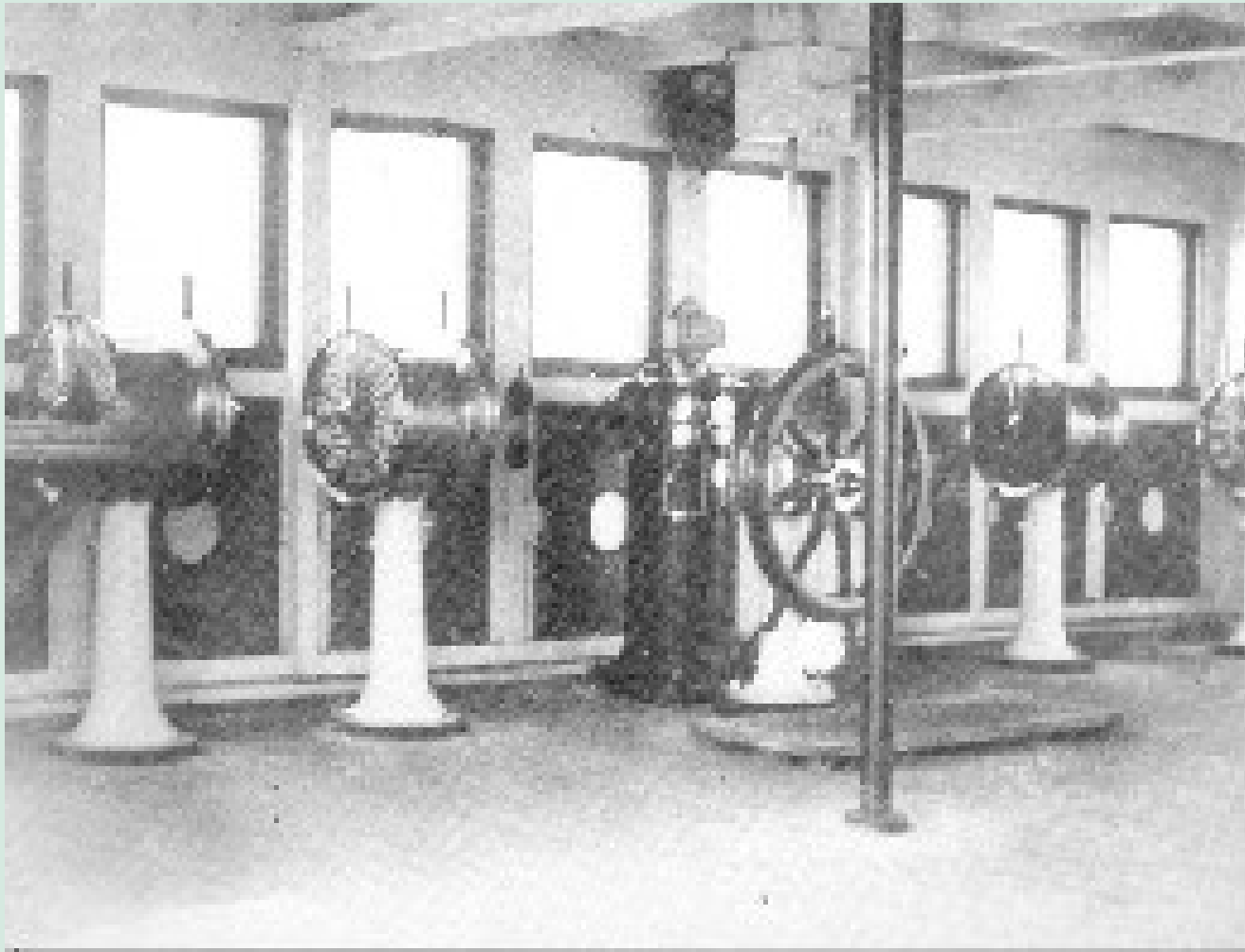


Why human errors?

In the early days of shipping:

- Old magnetic compass
- Sextant
- Sun
- Unreliable charts

Bridge equipment on the Titanic



Why human errors?

Nowadays a high number of technical highly sophisticated equipment is available on board:

- (digital) VHF
- Radar; ARPA radar, dredging radar (Ground Penetrated Radar)
- (D)GPS
- Electronic Chart Plotters (ECDIS)
- AIS (Automatic Identification System)
- Navtex
- Weather routing
- Hipap (hydro acoustic positioning system)

Bridge equipment on modern vessels



Why human errors?

An **extensive amount** of data,

sometimes leading to an **overflow** of information.

Why human errors?

An extensive amount of data,

so overwhelming that it creates a fake security for the officer of the watch.

Why human errors?

Situation Awareness

Why human errors?

Situation Awareness

The officer on watch should not only focus on the digital and electronic information which is available, but should also rely upon her / his own findings:

What she or he:

- sees
- hears
- feels
- smells
- tastes

Why human errors?

The presented data is not criticised enough;
it is taken for granted
that the information is correct.

The information that is presented,
is indeed, most of the times, correct.

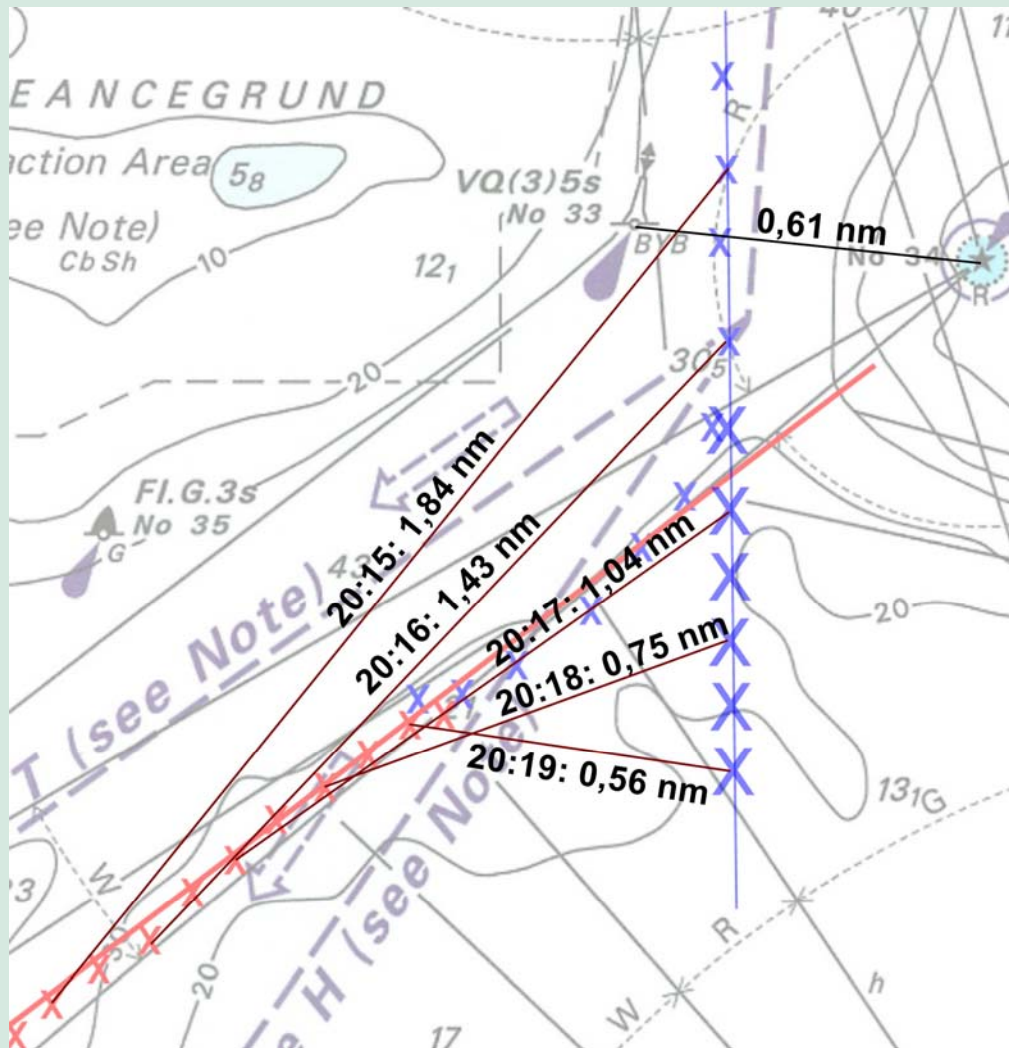
Why human errors?

But in the end it is the officer of the watch,
or the person at the controls

who has to keep an overview of all the
presented information,

and interpret same to come to a final
decision.

Collision: due to human error



Why human errors?

Near misses

The human element / negligence

Total claim amount over 2005:

USD 1.400.000.000,00

Assume this to rise to:

USD 2.000.000.000,00

The human element / negligence

Assume this rises to:

USD 2.000.000.000,00

Considering 75 - 80% to be a result of human error, this implies a figure of

USD 1.500.000.000,00

-

USD 1.600.000.000,00

Why human errors?

Therefore, these people need to be properly educated and qualified / experienced.

Thank you for your attention

