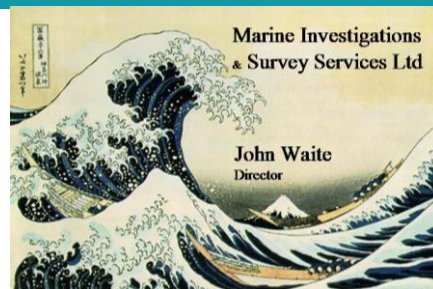




The Evolution and Risks Associated with Pure Car/Car & Truck Carriers

John Waite, Director, Marine Investigations & Survey Services Ltd (MISS)



19.09.2016

Genova
18-21 September 2016

CAR CARRIERS

- Features of Design
- Types of Casualty
- Regulatory Environment
- Impact of New Requirements
- What risk to insurers





FEATURES OF DESIGN

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FEATURES OF DESIGN

- Continous enclosed deck along the length
 - Large, horizontal open spaces
- Stern, side and/or bow doors with ramps
 - For vehicle access
- Ramps or lifts internally between decks
 - For vehicle access



FEATURES OF DESIGN

- „Volume vessels“
 - High sided with minimum draught
- Fine form hull
 - Stability variation with draught
- Navigation bridge high and forward
 - Visibility from the wheelhouse



FEATURES OF DESIGN

- Rapid turnaround in port
 - Cargo planning from ashore
- Securing arrangements for the vehicles
 - May be trucks, cars or trailer cargo



DESIGN FEATURES



High sides vessels with relatively light draught.
NB Offset stern door and ramp



DESIGN FEATURES



„Volume vessels,“ relatively fine hull form

Hoegh Target, 8500 cars

NB Position of the navigation bridge.



DESIGN FEATURES



Internal open continuous deck, with ramps and lifts between for vehicle access.



DESIGN FEATURES



Securing arrangements of the vehicles. Not just cars, but may be „project cargo.“



TYPES OF CASUALTY

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TYPES OF CASUALTY

- Instability
 - High sided with minimum draught
- Mismanaged loading
 - Loss of stability, angle of loll
- Cargo shift
 - Capsize
- Fire
 - Large open spaces and fuel
 - „a car on fire every two months on 35 PCC's, based on 37 years experience.“ (Eurasian Dream)



TYPES OF CASUALTY

- Collision
 - Loss of stability and capsizing
- Grounding/Stranding
 - Removal of cargo and fuels



TYPES OF CASUALTY



Angle of loll during ballast water exchange.

TYPES OF CASUALTY



Stability on departure.

TYPES OF CASUALTY



Cargo Shift?

TYPES OF CASUALTY



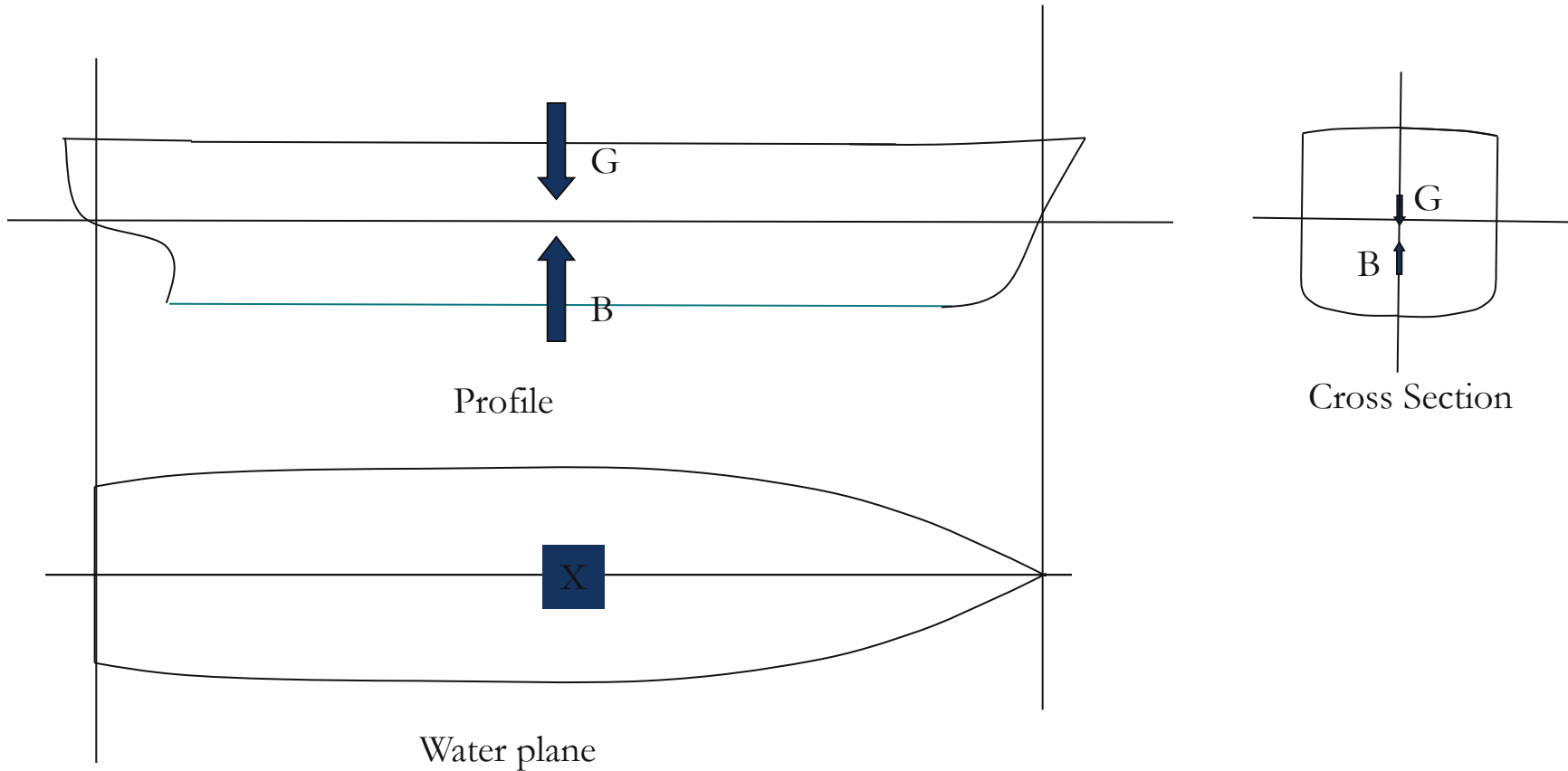
Mangled vehicles- cargo shift increases risk and complicates salvage.

TYPES OF CASUALTY

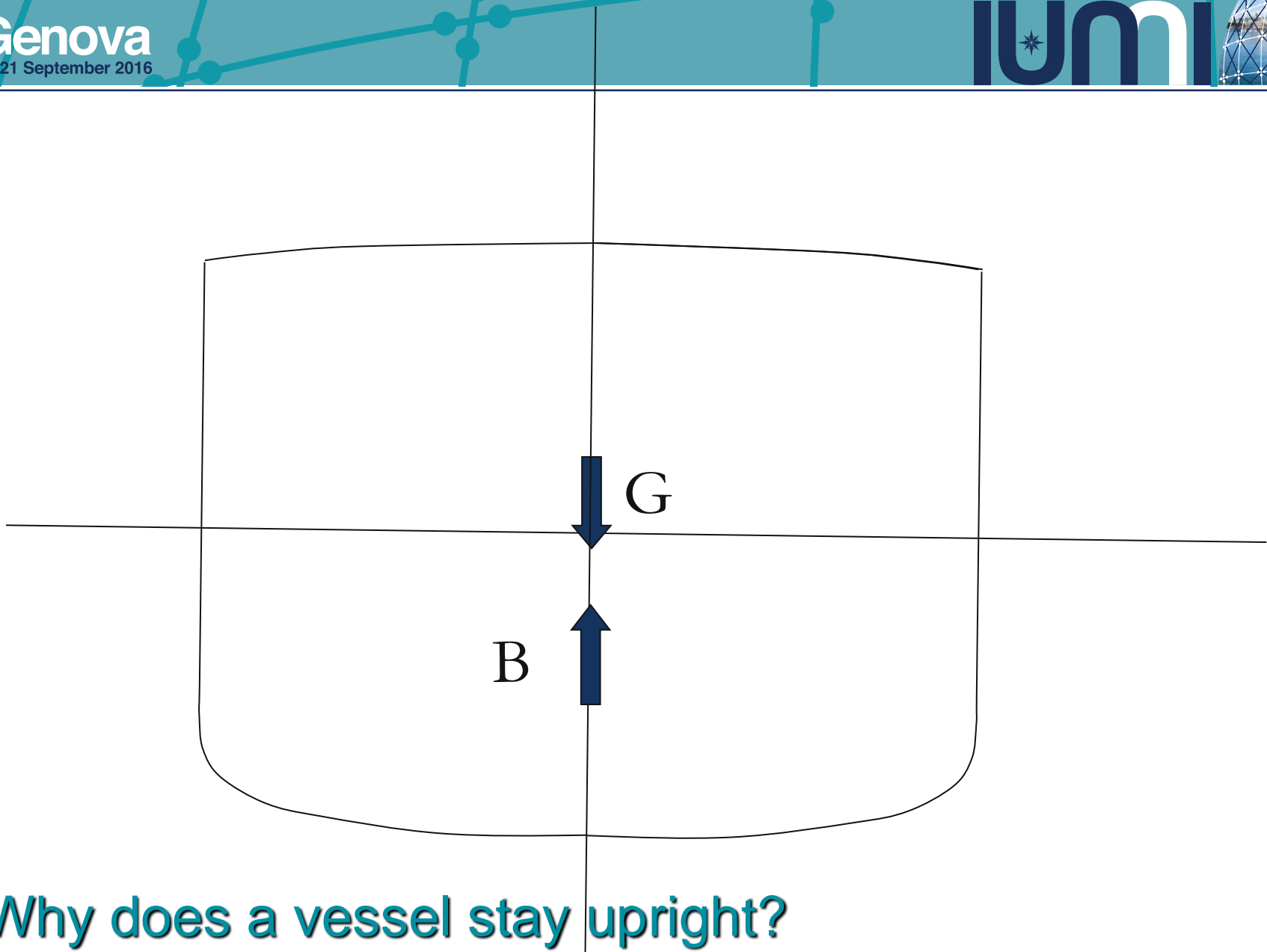


Inadequate stability on departure, open pilot door

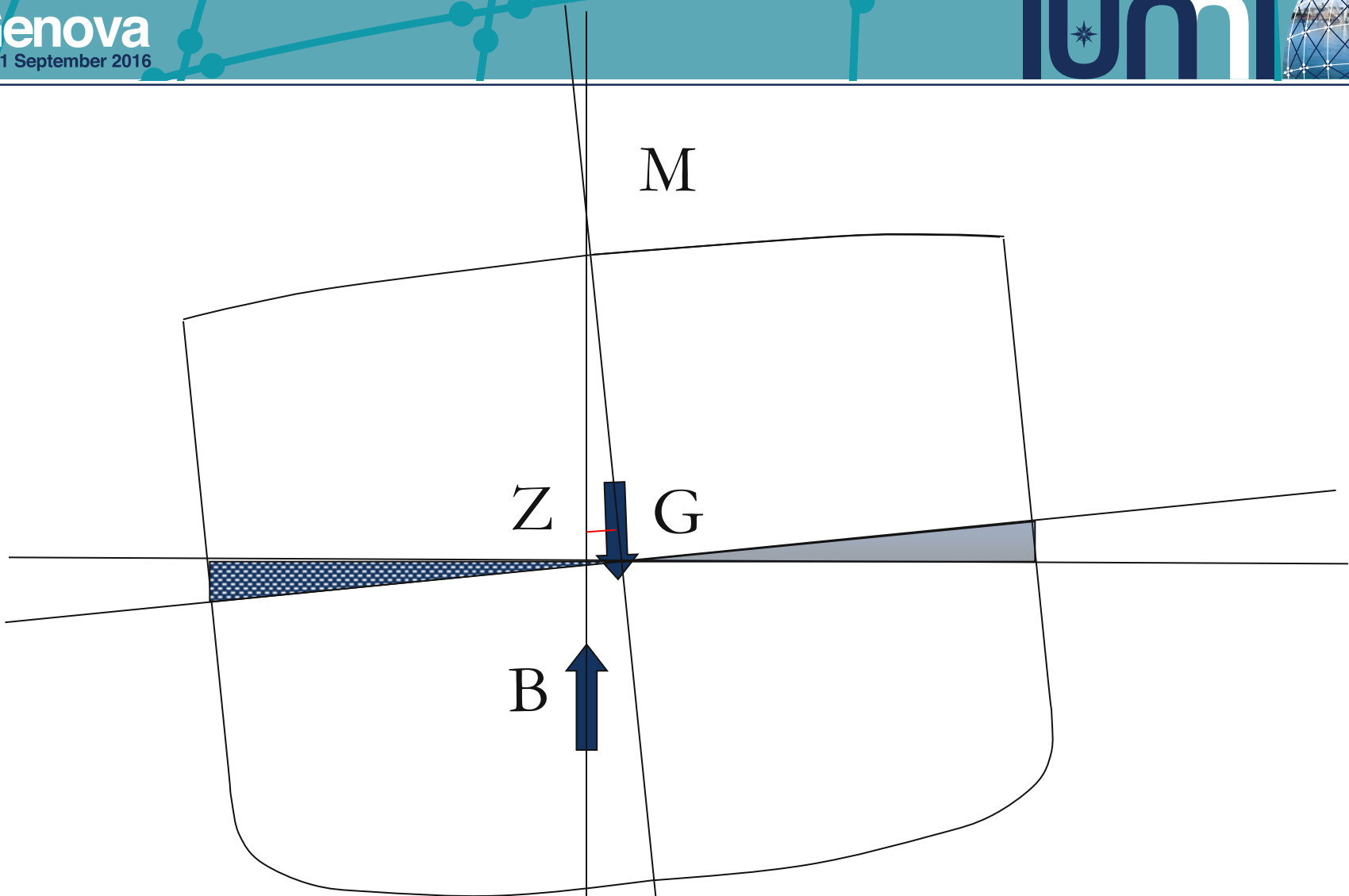




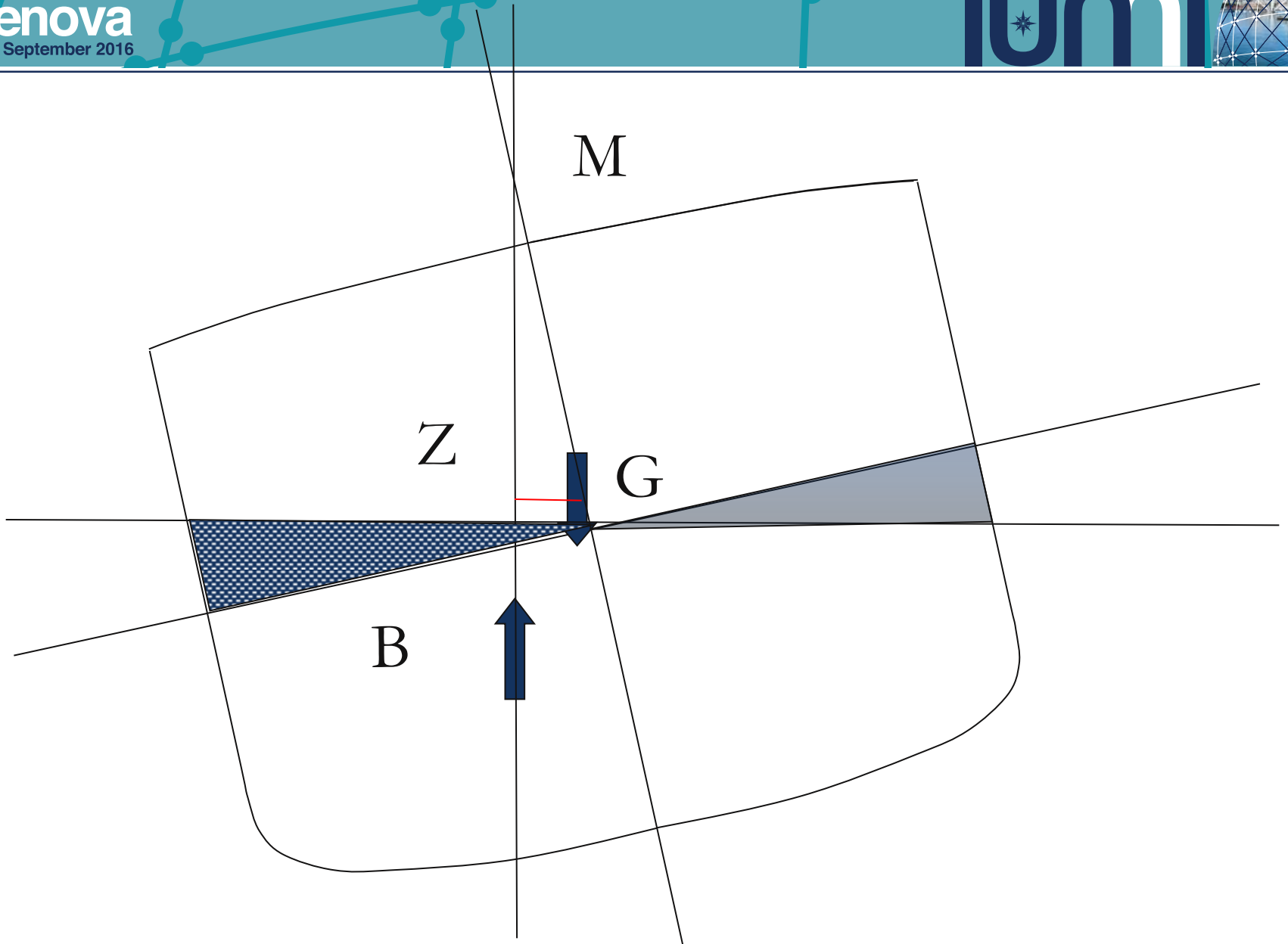
Is stability an issue for PCC's? What are the basics?

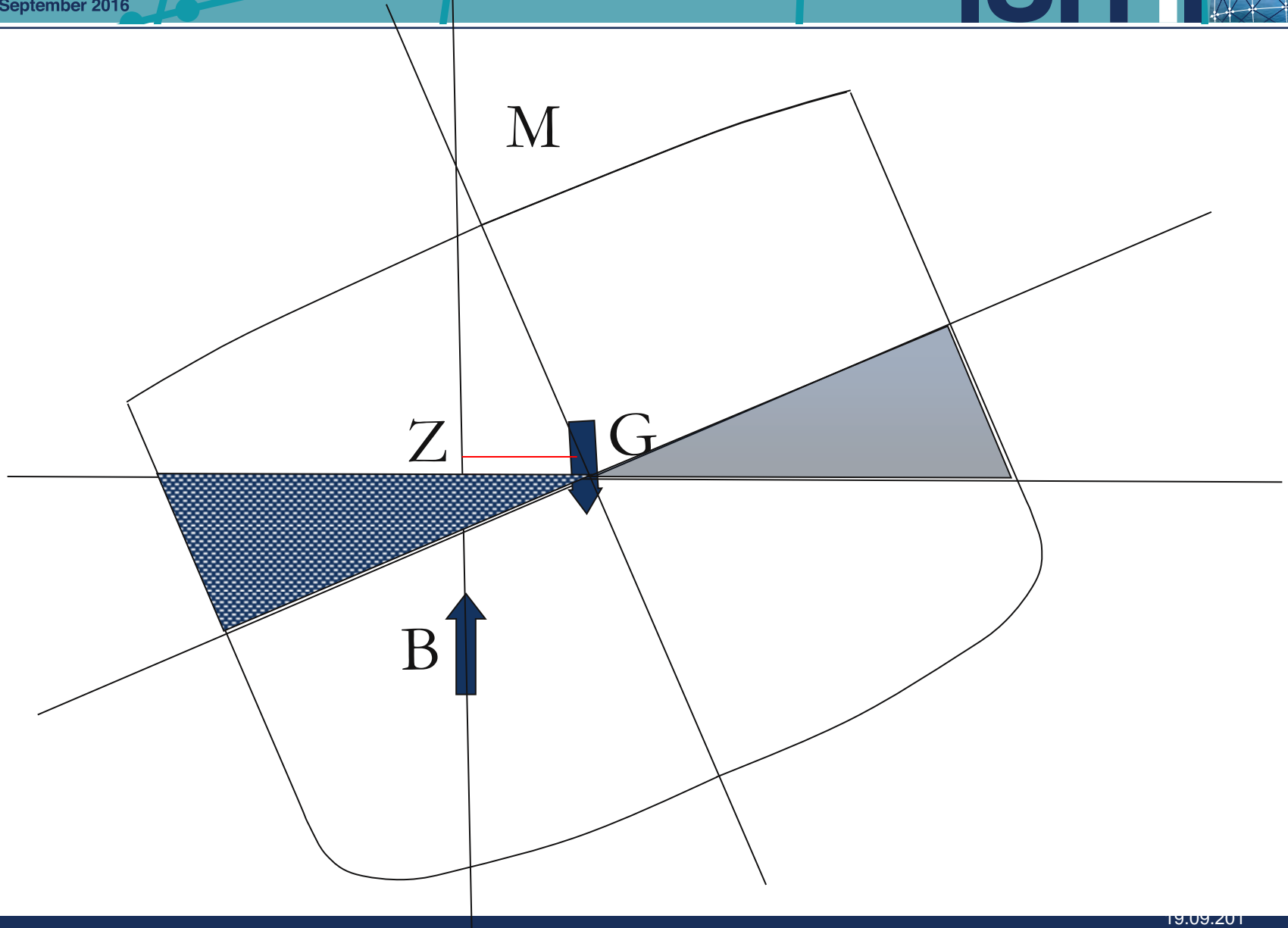


Why does a vessel stay upright?



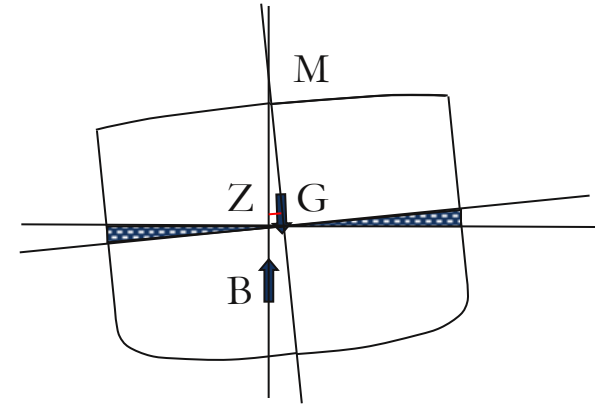
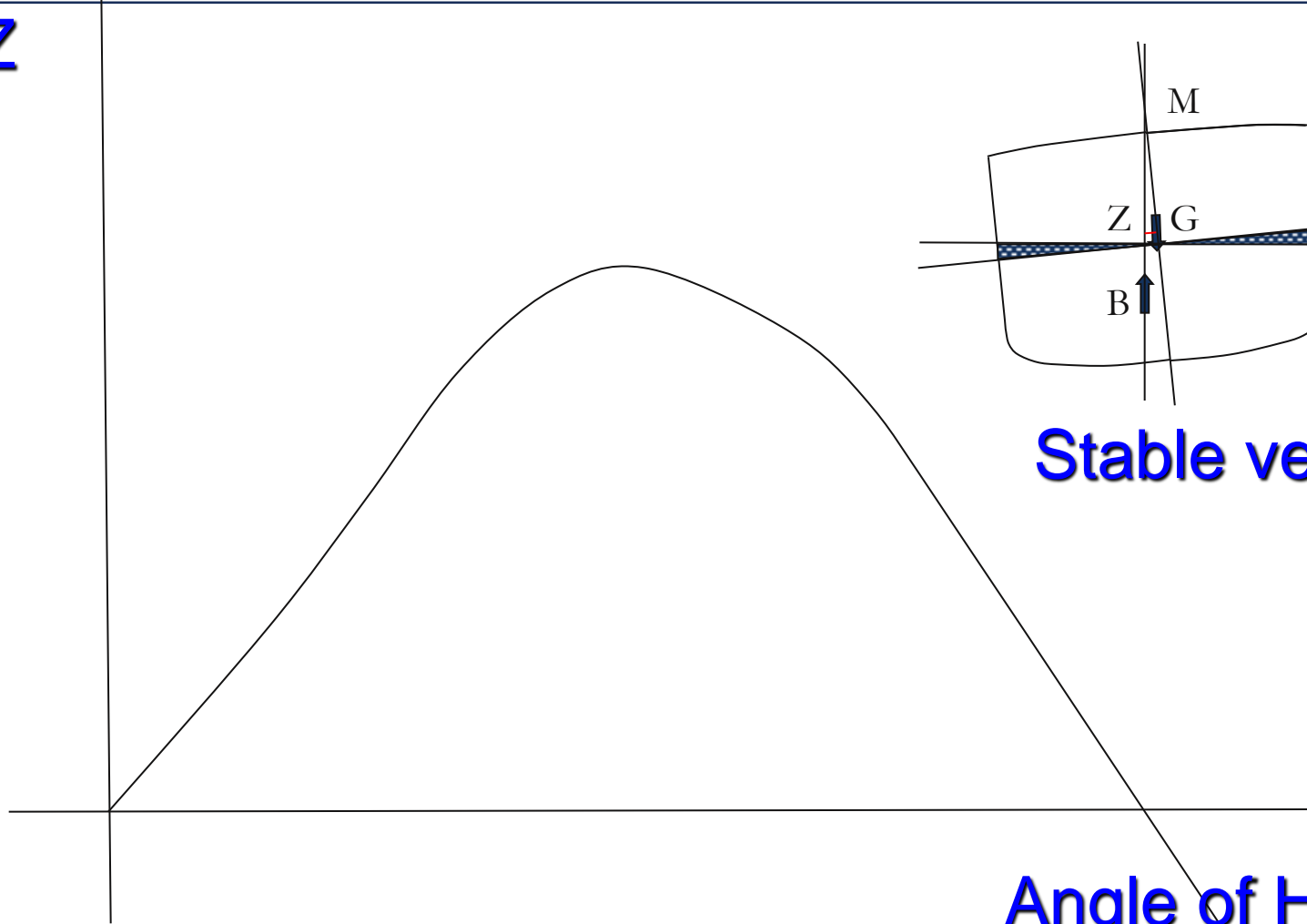
Why does a vessel stay upright (intact ship)







GZ

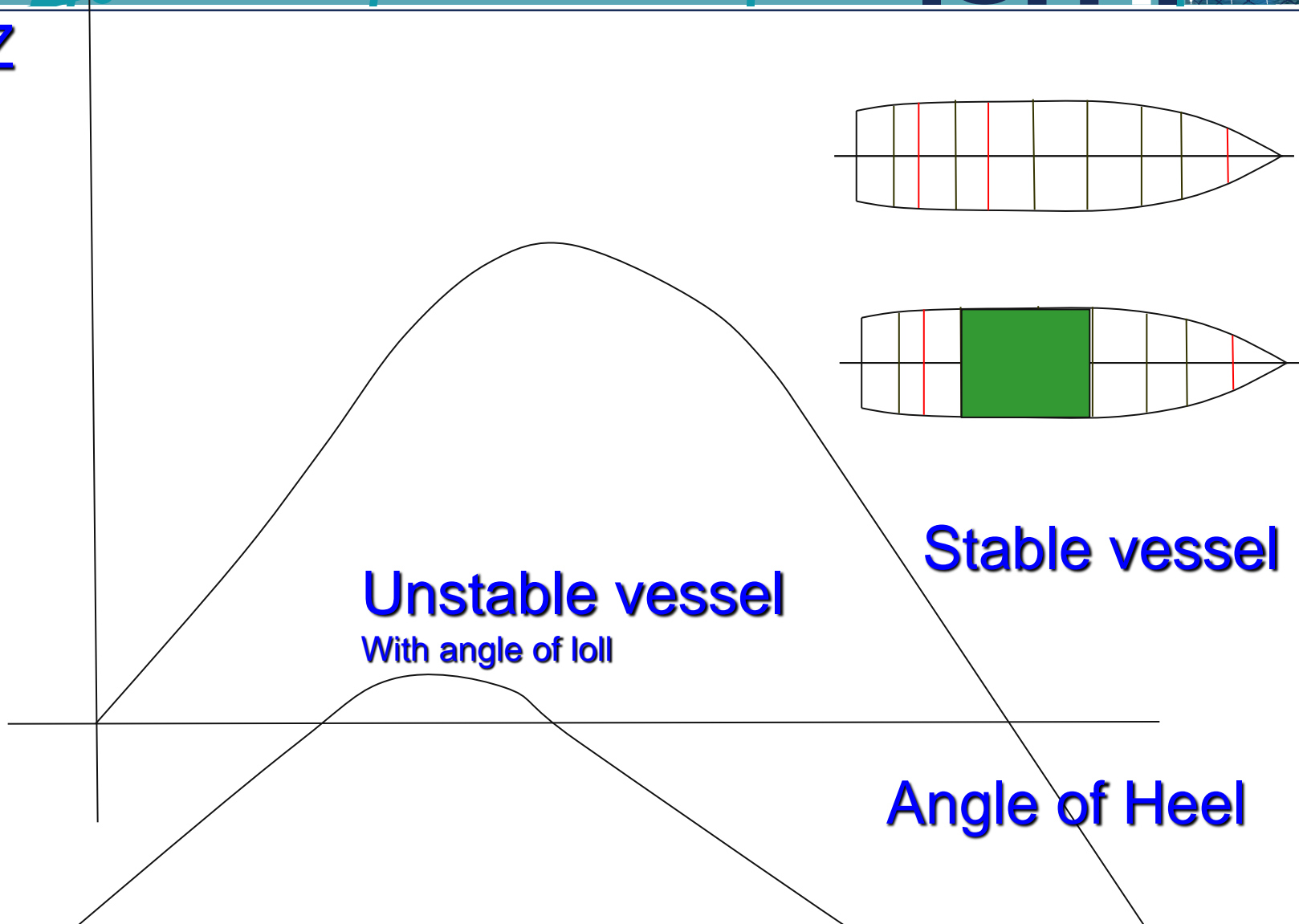


Stable vessel

Angle of Heel



GZ



Unstable vessel
With angle of loll

Stable vessel

Angle of Heel

COMMON FACTORS IN LOSS OF STABILITY

- Lack of control of fluids on board
 - Gauges not working, no regular sounding, estimated transfers of ballast
- Change in load sequence
 - Lost control of stability
- Inability to quickly assess stability
 - Lack of awareness when vessel has „angle of loll.“
 - Attention to car securing arrangements



COMMON FACTORS IN LOSS OF STABILITY

- Cargo plans prepared ashore or by cargo superintendent, but responsibility of the ship's officers
- Rapid turn around
 - Time for securing, damage to cargo
- Partial loading and discharge
 - Lack of accurate weight information about the number and characteristics of the vehicles.
 - Stability control



COMMON FACTORS IN LOSS OF STABILITY

- The effect of trim, particularly by the bow, in reducing the stability.





REGULATORY ENVIRONMENT

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REGULATORY ENVIRONMENT

- PCC's are subject to IMO requirements when engaged in international trade
 - National trade is to local regulations
- There are no additional requirements for the stability or damage stability of PCC's as there are for ro/ro ferries
- There are additional requirements for fire prevention, detection and control



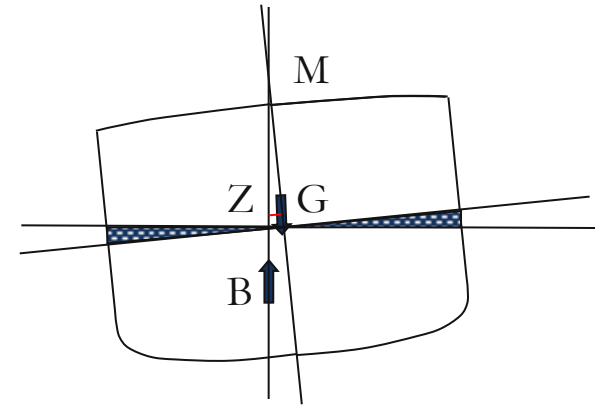
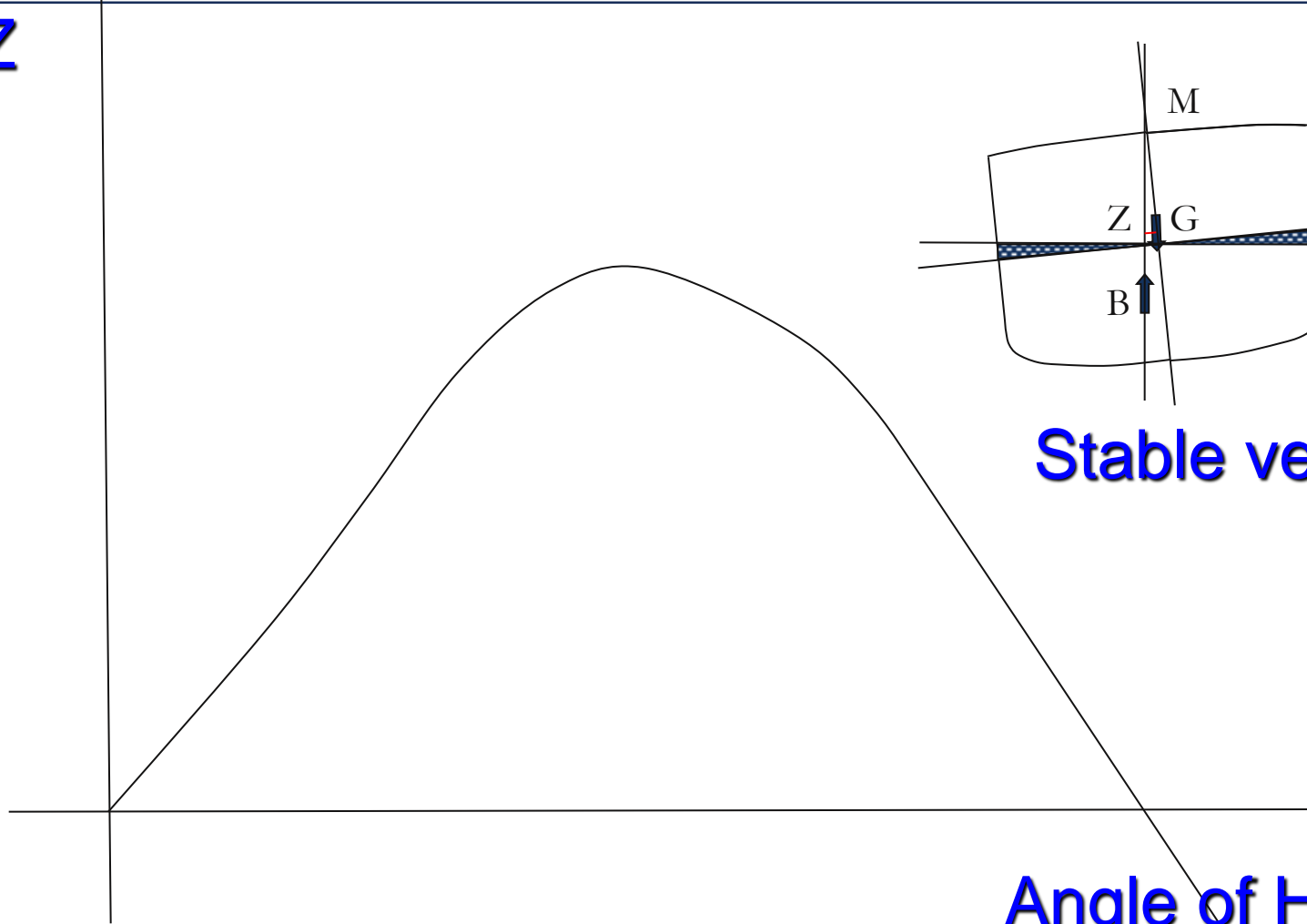
REGULATORY ENVIRONMENT

- Do regulations provide a common standard amongst ship types?
 - Big differences in compliance with stability requirements by ship type





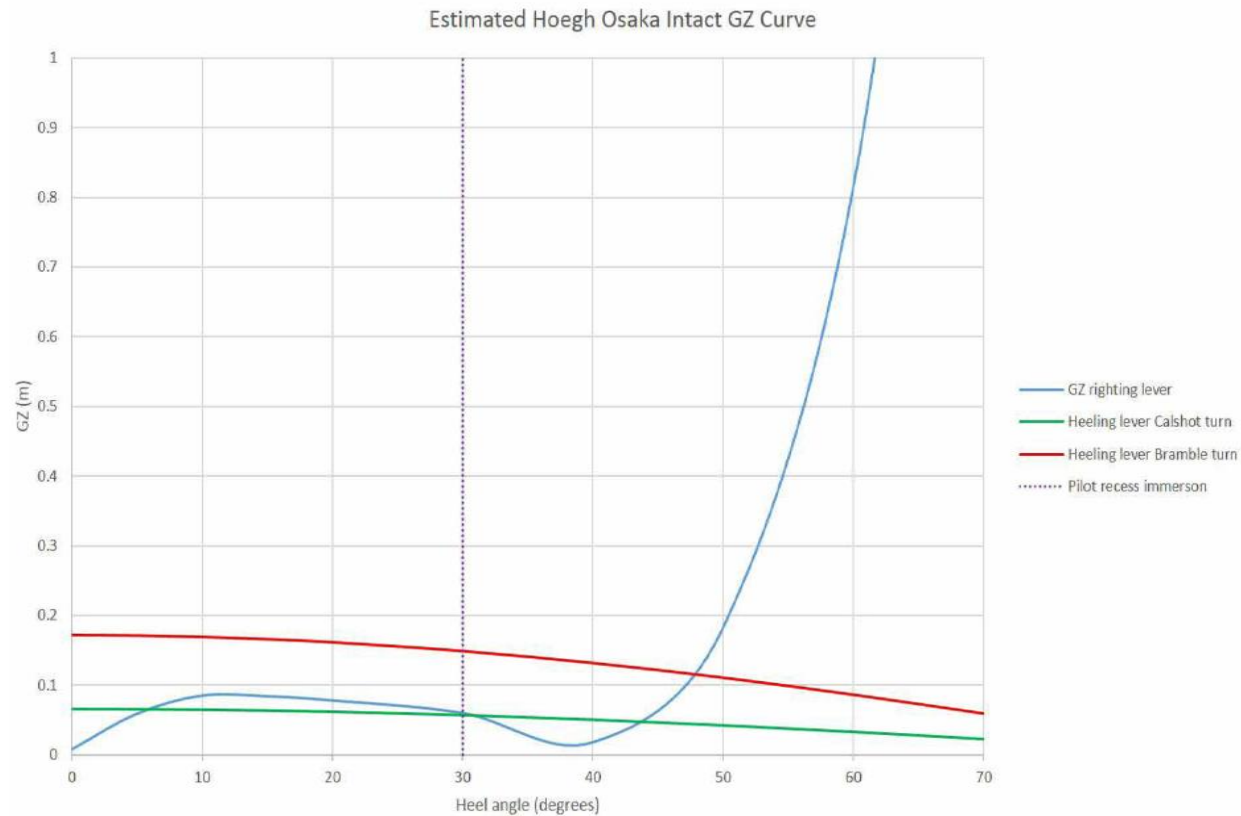
GZ



Stable vessel

Angle of Heel

TYPES OF CASUALTY



Angle of loll after ballasting Hoegh Osaka.

(Crown copyright 2016. MAIB Report No 6/16)



REGULATORY ENVIRONMENT

- Regulations aim to provide a minimum standard; sometimes seen to be in themselves insufficient (Eurasian Dream).



REGULATORY ENVIRONMENT

- Compliance with regulations is often seen as all that is necessary.
- The underlying principle of ISM and „Goal Based Standards“ is to get away from reliance on prescriptive rules.





IMPACT OF NEW REGULATION

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IMPACT OF NEW REGULATION

- Ballast Water Exchange
 - Cougar Ace

Environment requirements

Air pollution and emissions

change of fuel in coastal waters

Stability monitors for ships carrying dangerous chemicals in bulk



IMPACT OF NEW REGULATION

- What about stability indicators for PCC's?
 - Immediate indication of the adequacy of the stability on raising the stern/side ramp.
 - Stability monitors on roll period.





RISKS TO UNDERWRITERS

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RISKS TO UNDERWRITERS

- We rely on crew competence for:
 - Adequate stability
 - Fire control
 - Proper stowage
 - Navigation

- The reality is that we increasingly require the crew to perform with pressure on manpower, time and support.



RISKS TO UNDERWRITERS

- With a total of 8,500 cars, the largest PCC carries cargo to the value of about \$160 million. The vessel itself represents a further \$150 million.





CONCLUSIONS

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CONCLUSIONS

- We rely on crew competence to operate PCC's which may have poor stability characteristics
- There is rapid and varied turn around of the vessels, with cargo planning not performed by the ship's officers
- According to formal investigations, the practice of the trade can be to perform stability assessments after departure. Frequently, poor or inadequate control of the attributes which govern stability has resulted in a casualty.



CONCLUSIONS

- The nature of the cargoes carried is varied. Cargo shifts due to inadequate or improper securing may or may not be causative to incidents, but will actively contribute to a worsening situation and potentially complicate salvage.



CONCLUSIONS

- There are very simple „ready reckoners“ to help assess stability. These shouldn't replace formal assessment, but in some cases they would provide immediate indications that stability was potentially inadequate.



CONCLUSIONS

- Insurers sometimes underestimate the role they can play in vessel operation, witness the role played through the Joint Hull Committee wrt:
 - Inert gas in (oil) cargo spaces
 - Substandard ships
 - Shipyard risk assessments

- Insurers shouldn't be afraid to use available warranty clauses to help identify and mitigate the different risks associated with ship types.

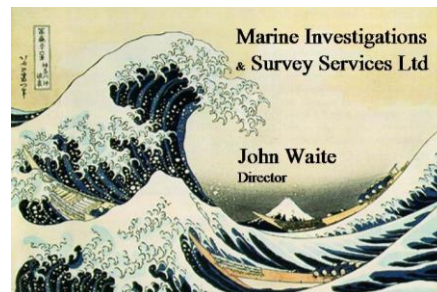


Thank you for your attention. It is always a great pleasure and privilege to be invited to address IUMI.

I would be pleased to answer any queries you may have or to discuss the presentation further later.

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