

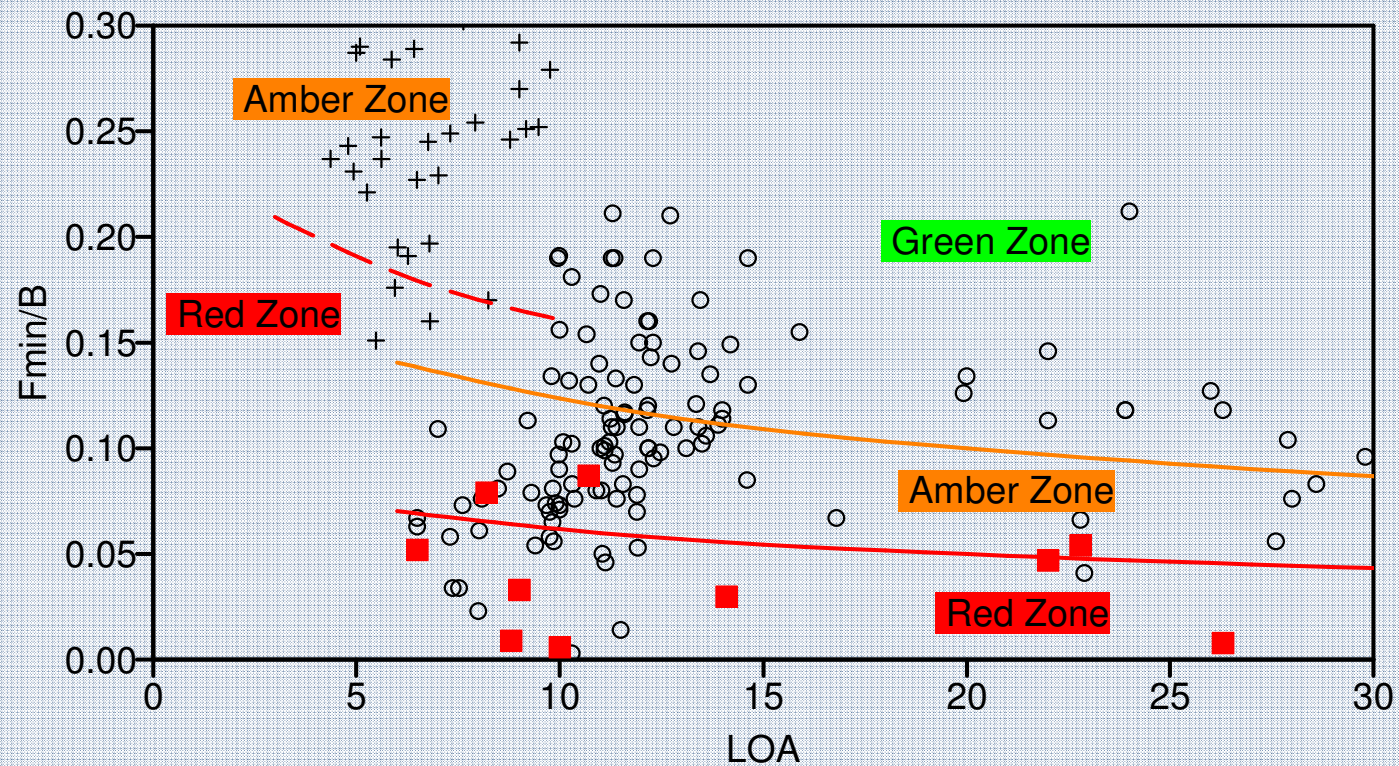
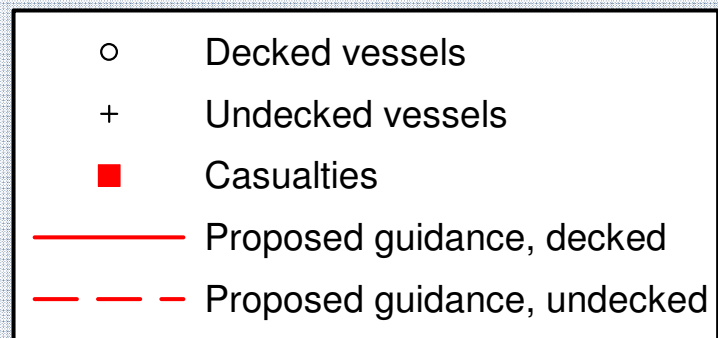
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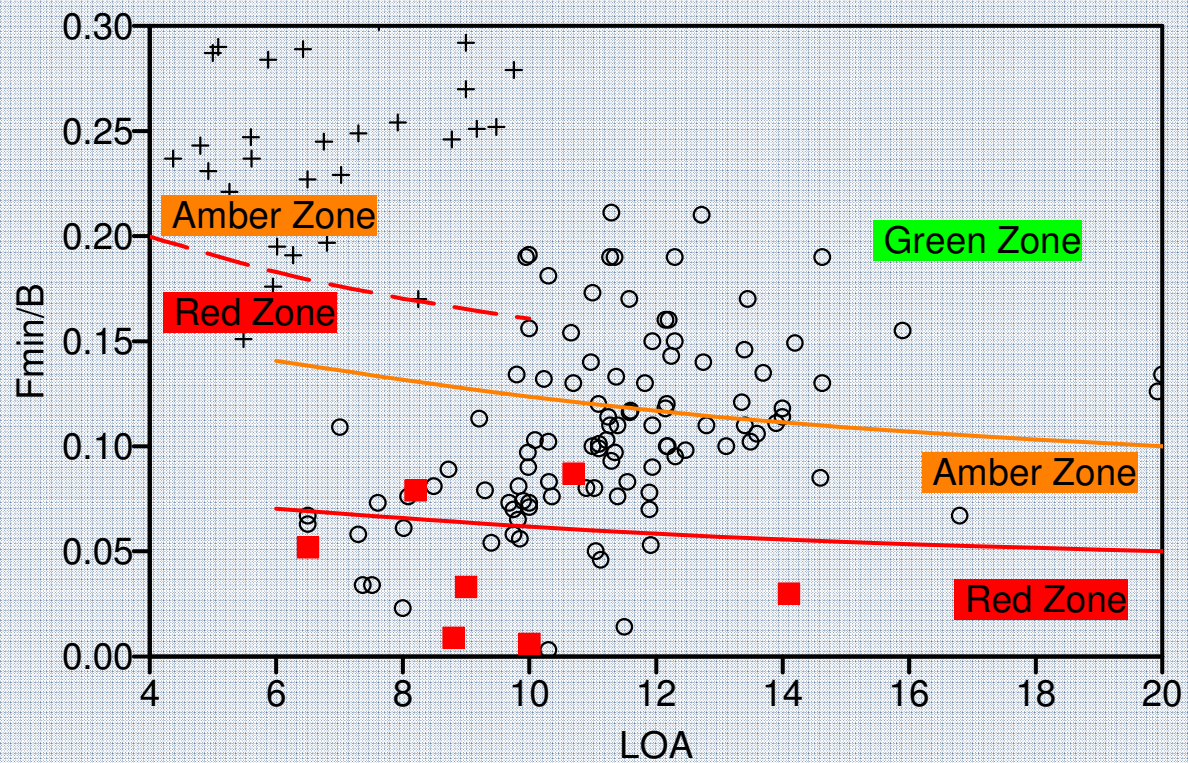
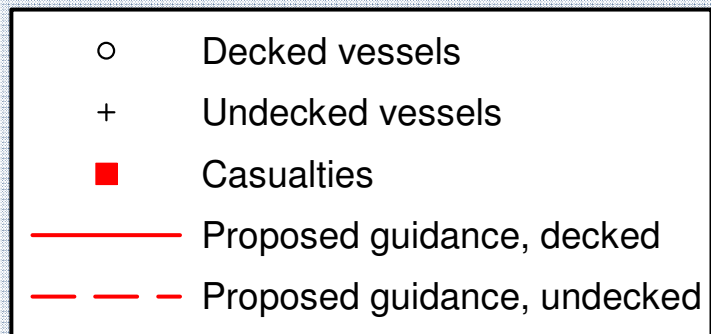
Freeboard Guidance.

What does it mean?

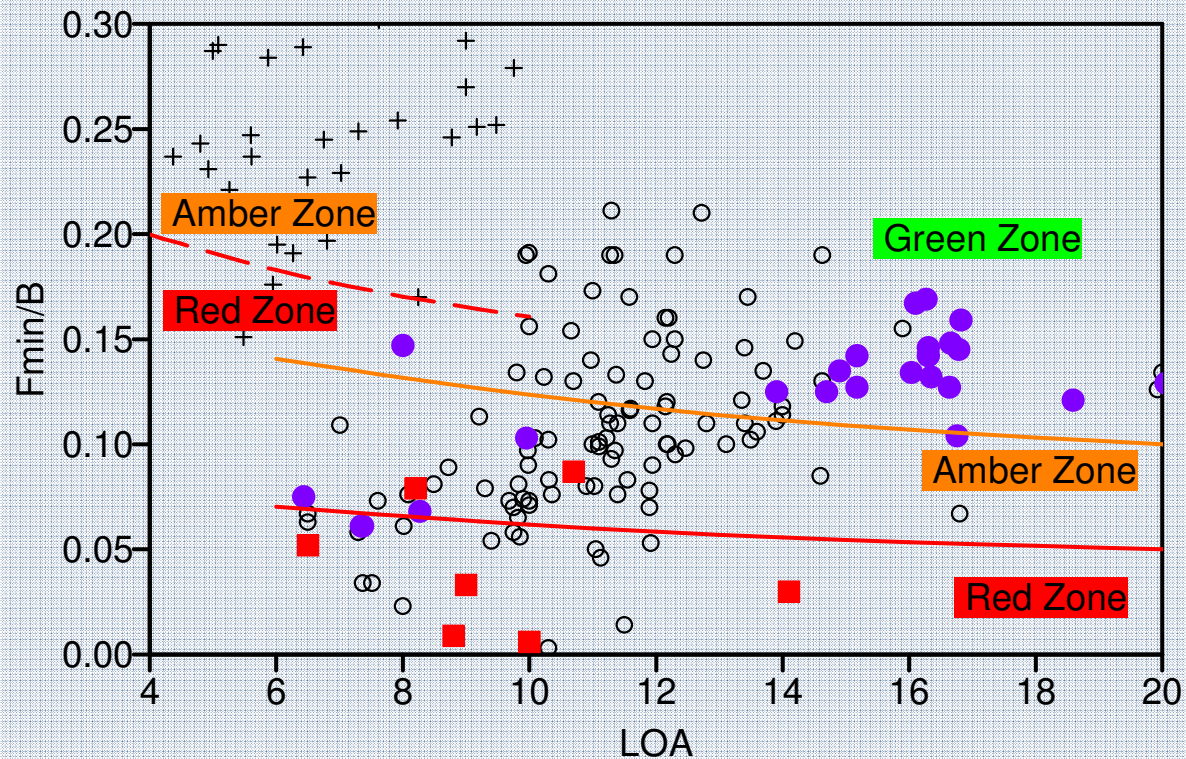
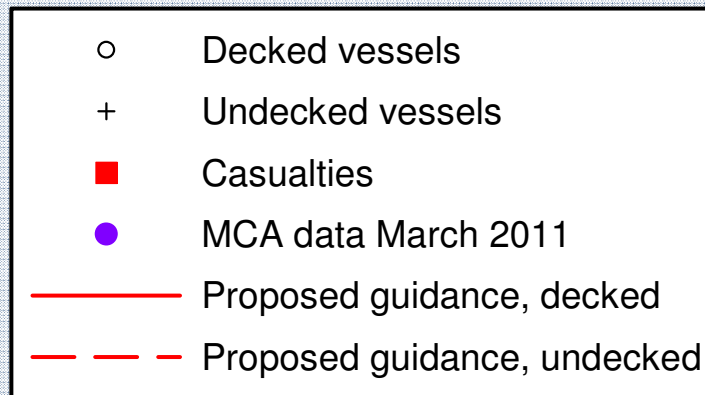
Wolfson Unit database
collated for MCA
in 2005 and used to
develop the guidance
on freeboards



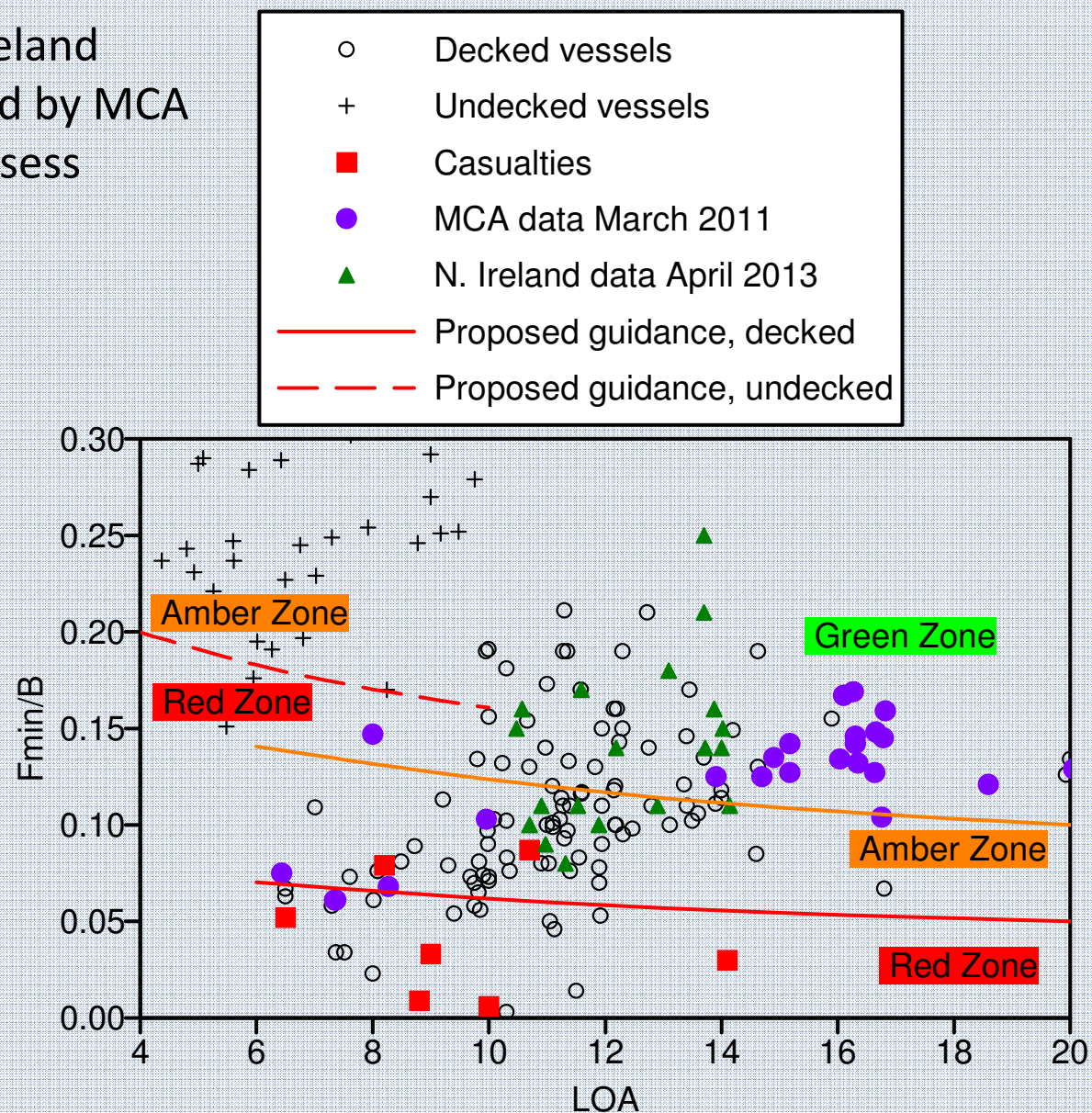
The small vessel fleet



Additional data collected by MCA in 2011 as an impact assessment of the proposed guidance



Further N. Ireland
data gathered by MCA
In 2013 to assess
MGN 427



Aleyna - capsized in November 2008 when trawl came fast in strong tide
Length 14m, Beam 4.9m

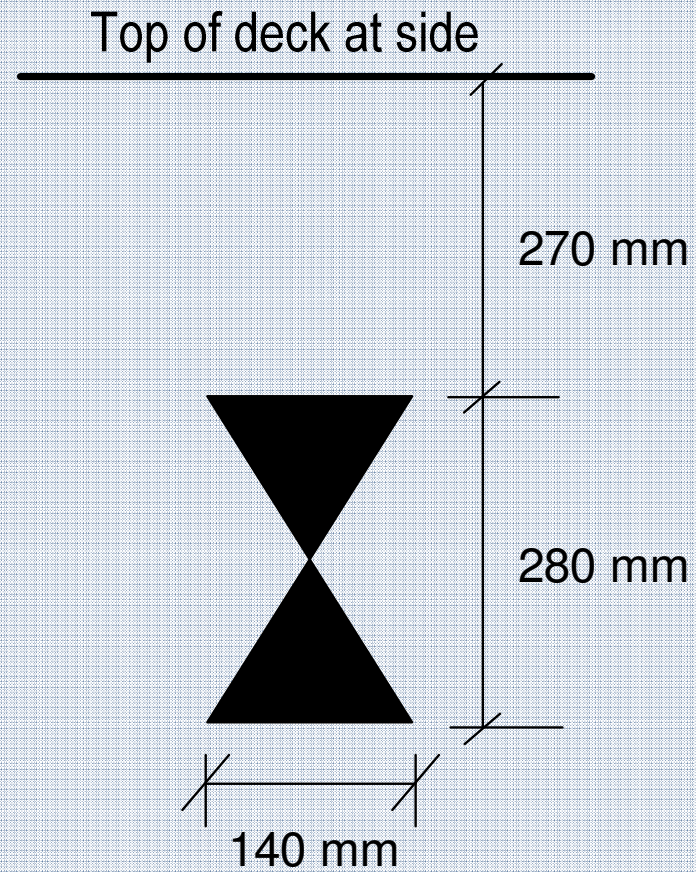
A large, rusted fishing boat, the Aleyna (NN138), is shown capsized and resting on a stone pier. The boat is heavily damaged, with significant rust and debris visible. A person is standing on the upper deck area. The boat is positioned against a stone wall, and a smaller white boat is visible in the foreground.

Proposed safety guidance suggests danger of capsizes if freeboard less than 27cm

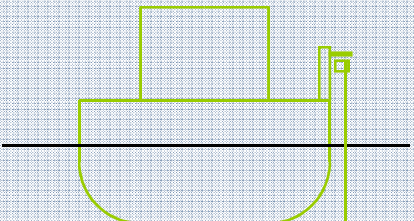
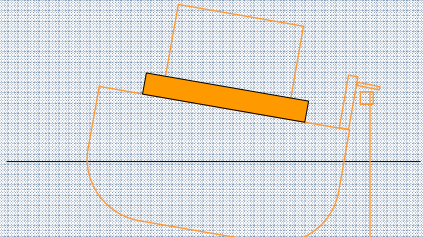
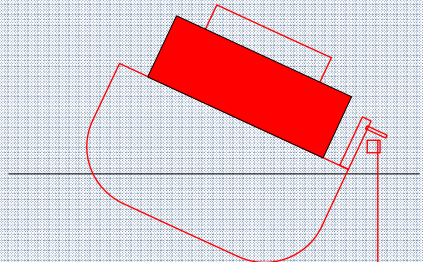
Proposed freeboard mark

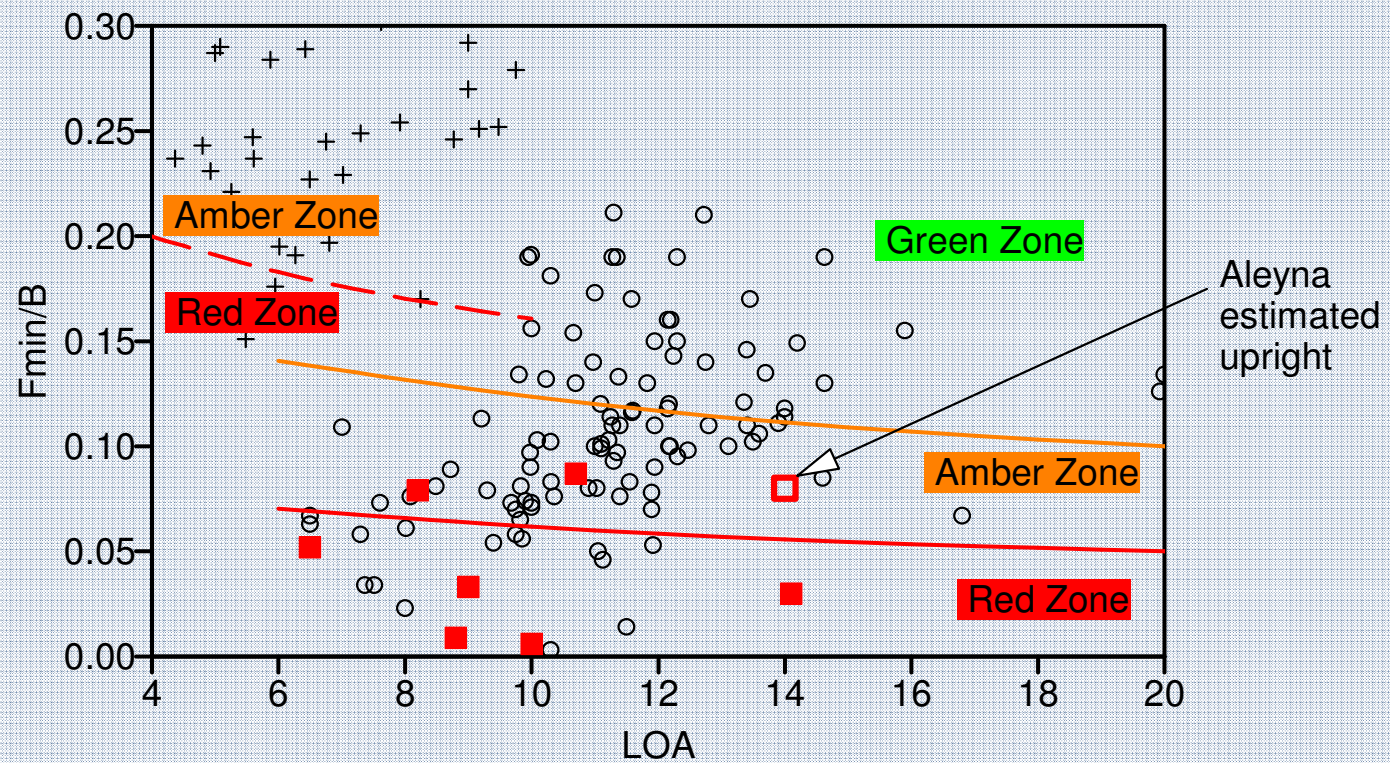
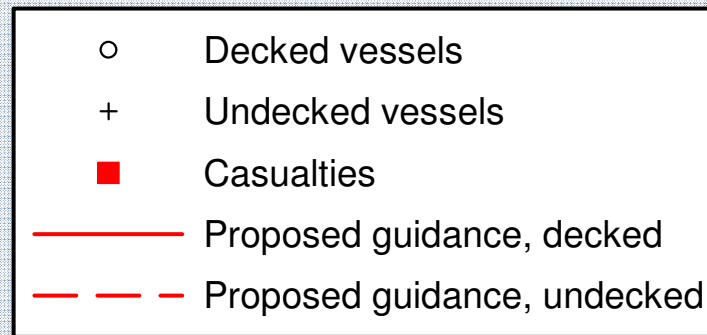


Freeboard Guidance Mark - size and location



STABILITY NOTICE

Name Aleyna No. NN138 Owner Mr Lucky Length 14 metres Beam 4.9 metres	Loading & Lifting Guidance	Safety Zone	Minimum Freeboard	Maximum Recommended Seastate
	Good margin of residual freeboard	Good margin of safety	At least 55 cm	
	Loading or lifting reduces minimum freeboard to less than 55 cm	Low level of safety	27 to 55 cm	1.6 metres
	Excessive loading or lifting reduces minimum freeboard to less than 27 cm	Danger of capsize	Less than 27 cm	0.8 metres



Aleyna

Very low freeboard - Amber safety zone in normal operation when upright

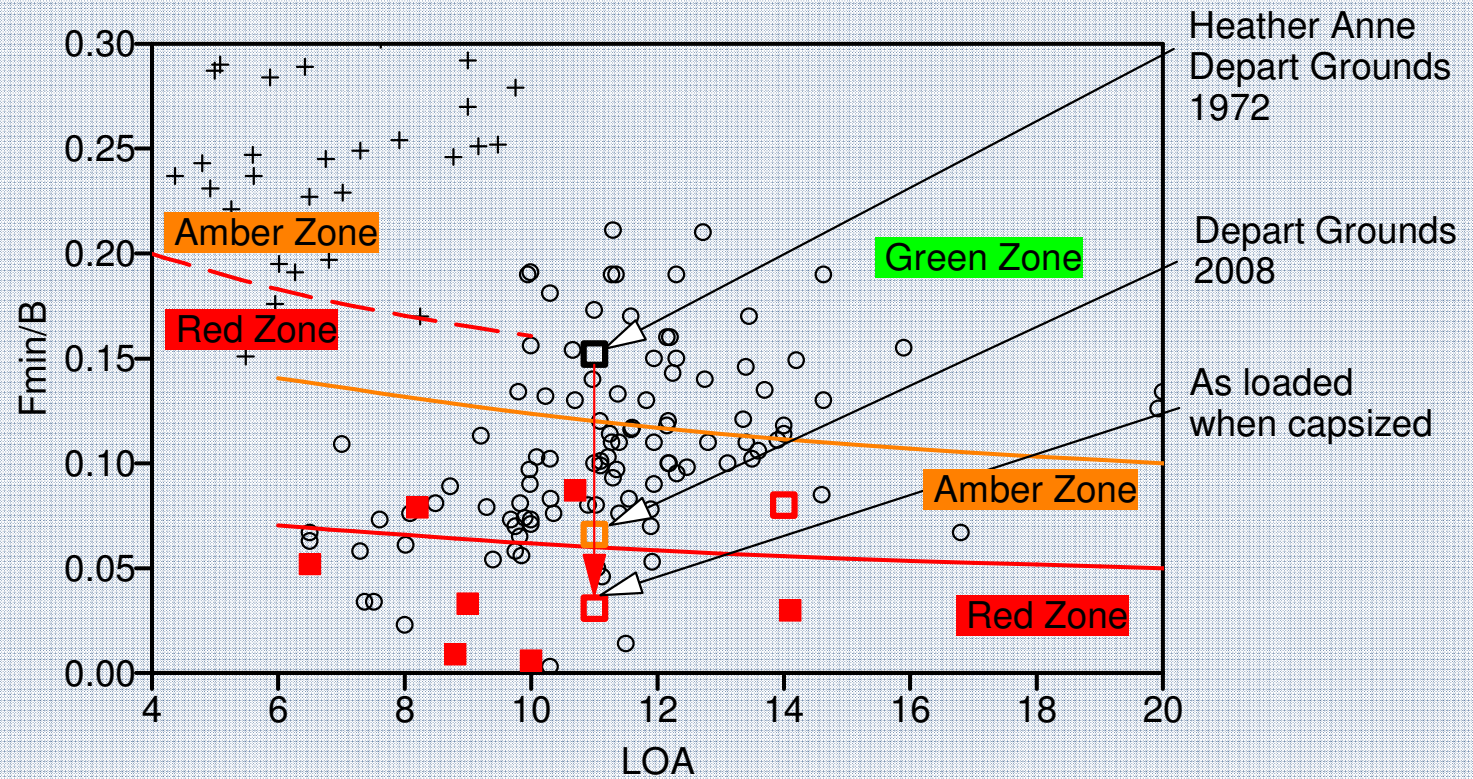
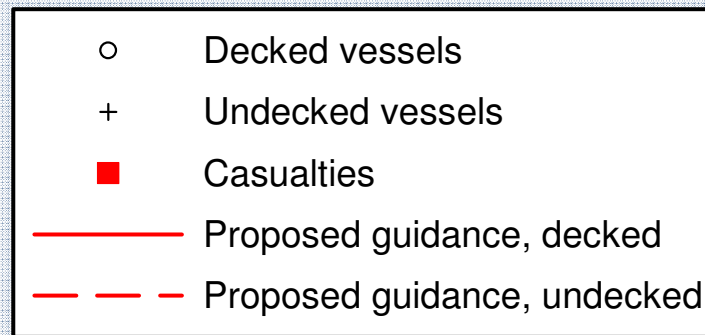
No margin for lifting - Any significant lift reduced freeboard to Red danger zone

Freeboard Guidance refers to the ***residual operational*** freeboard



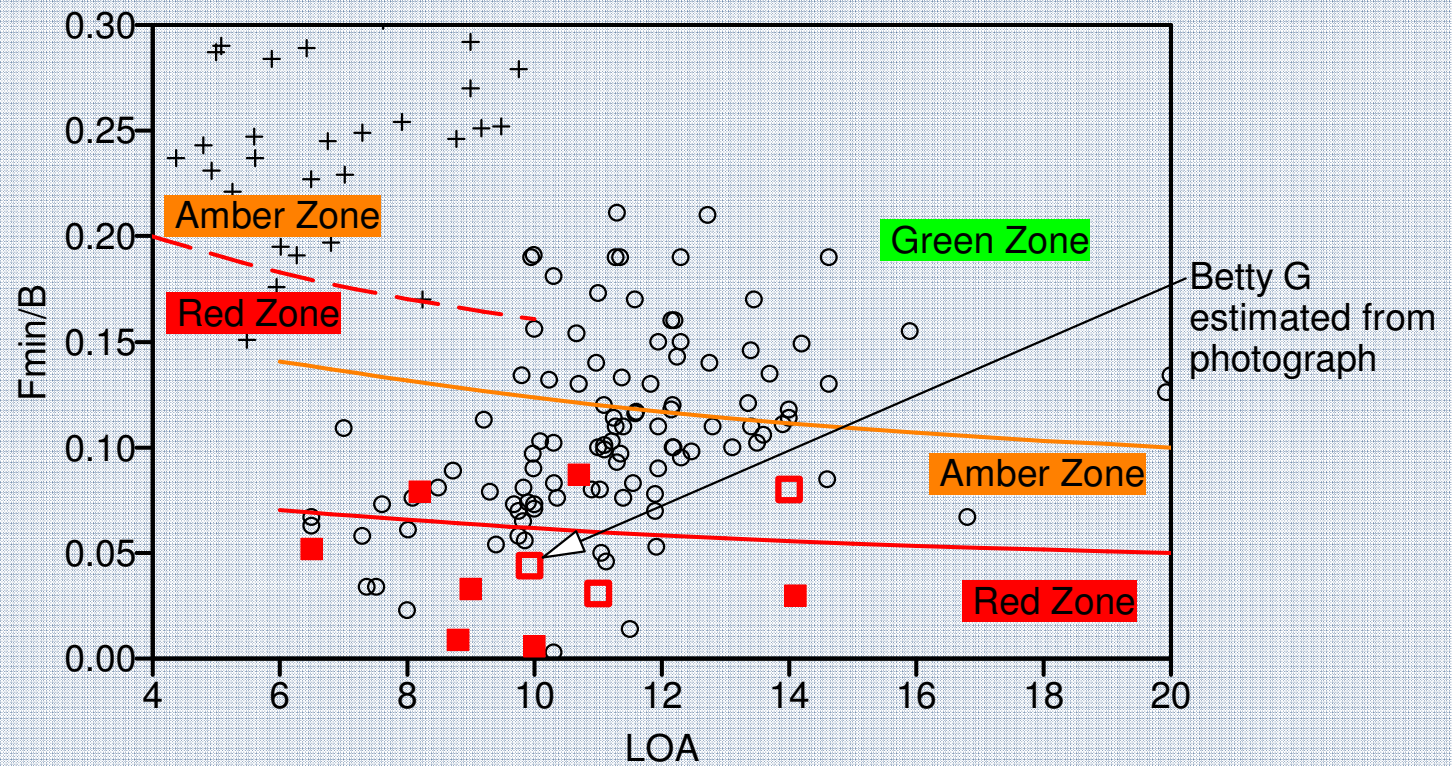
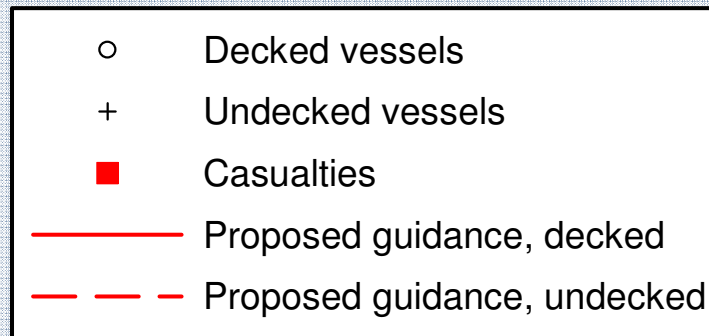
Heather Anne -
Capsized in December
2011 while overloaded





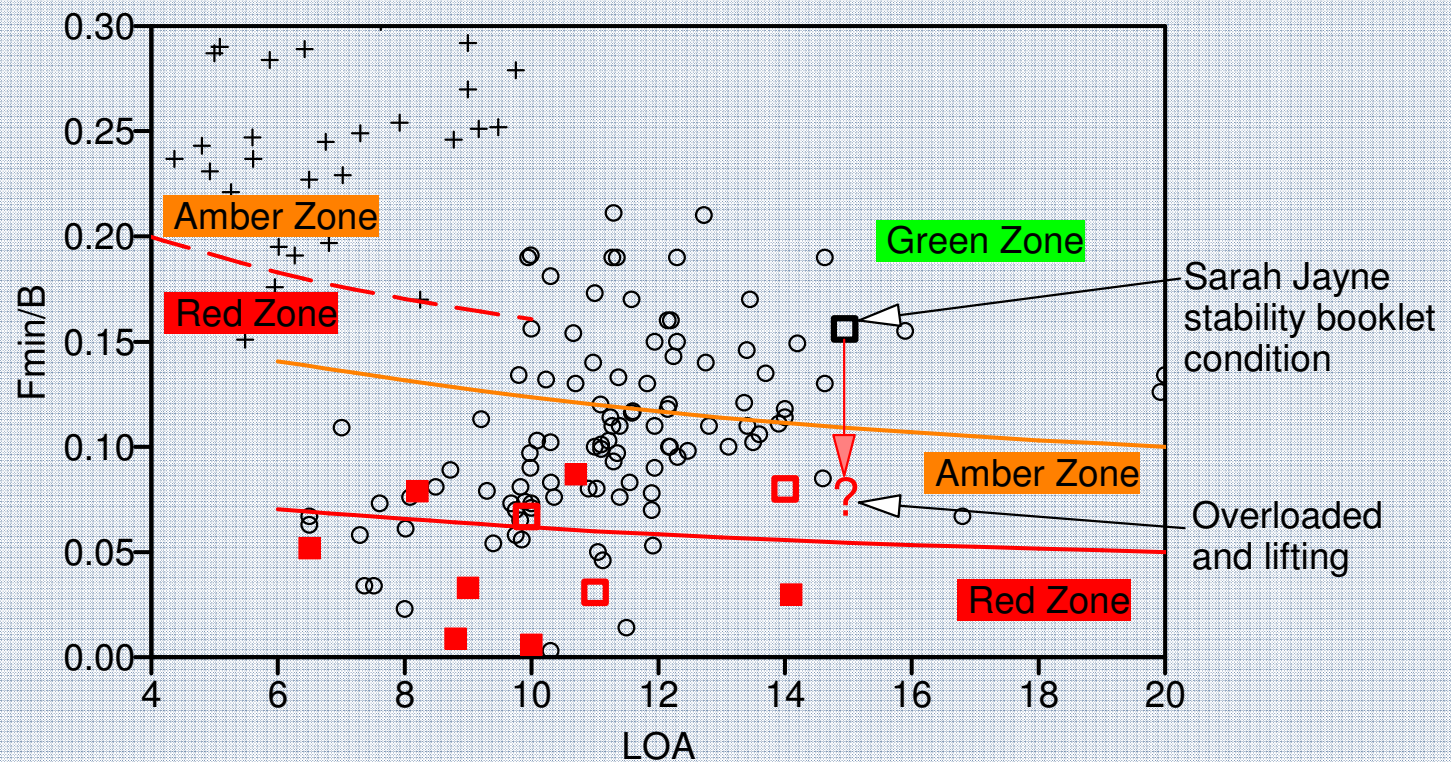
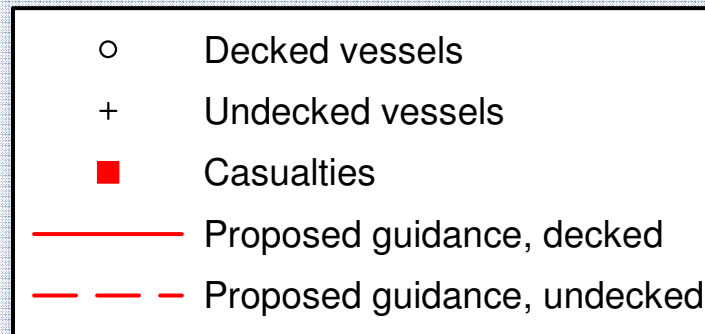


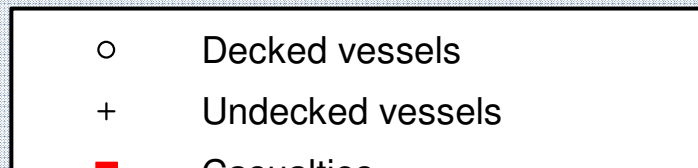
Betty G – Capsized in July 2012 when beam trawls were heavily loaded and one suddenly released





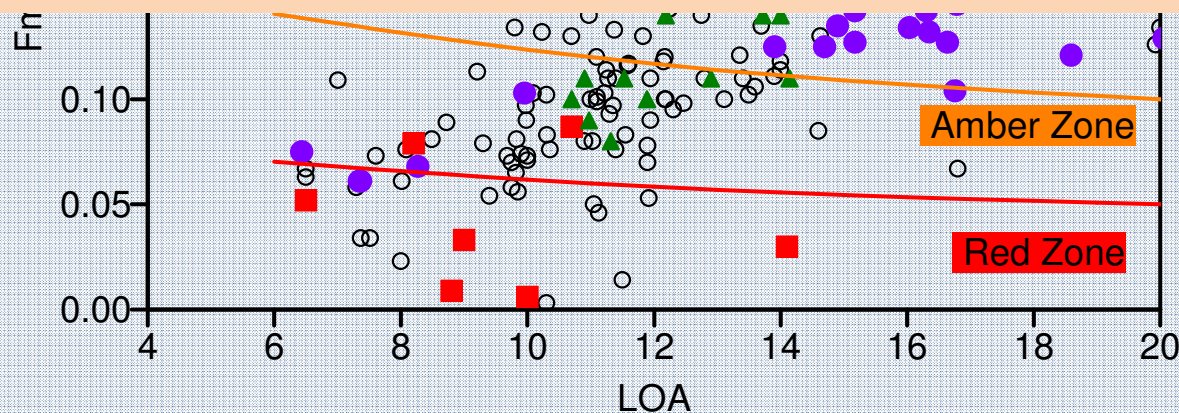
Sarah Jayne – Capsized in September 2012 when overloaded and lifting





These data mean very little without a knowledge of how the boats are operated and how much their freeboard is affected.

Freeboard guidance is most useful to the skipper and crew; **not** the administration.



Freeboard guidance gives meaningful information to the fishermen.

It should ***not*** give naval architects, insurers or regulators something to hide behind.

Why freeboard?

The most useful measure of vulnerability to capsize is range

Residual range

The second most important parameter is righting moment

Residual righting moment

Both are provided by freeboard

Residual freeboard

Why not GM?

High GM may provide a high righting moment

BUT

Often associated with wide beam:

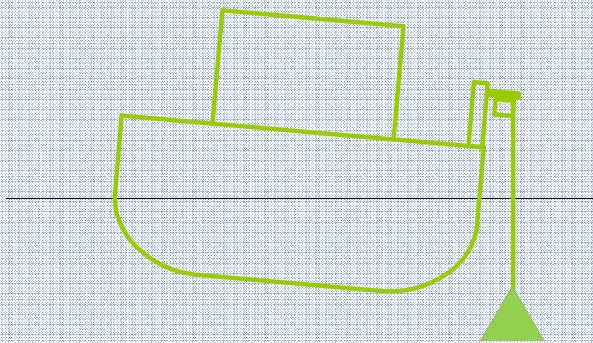
low range,
low angle of maximum GZ,
low angle of deck edge immersion,
low resistance to capsize in waves

Many casualties had high values of GM

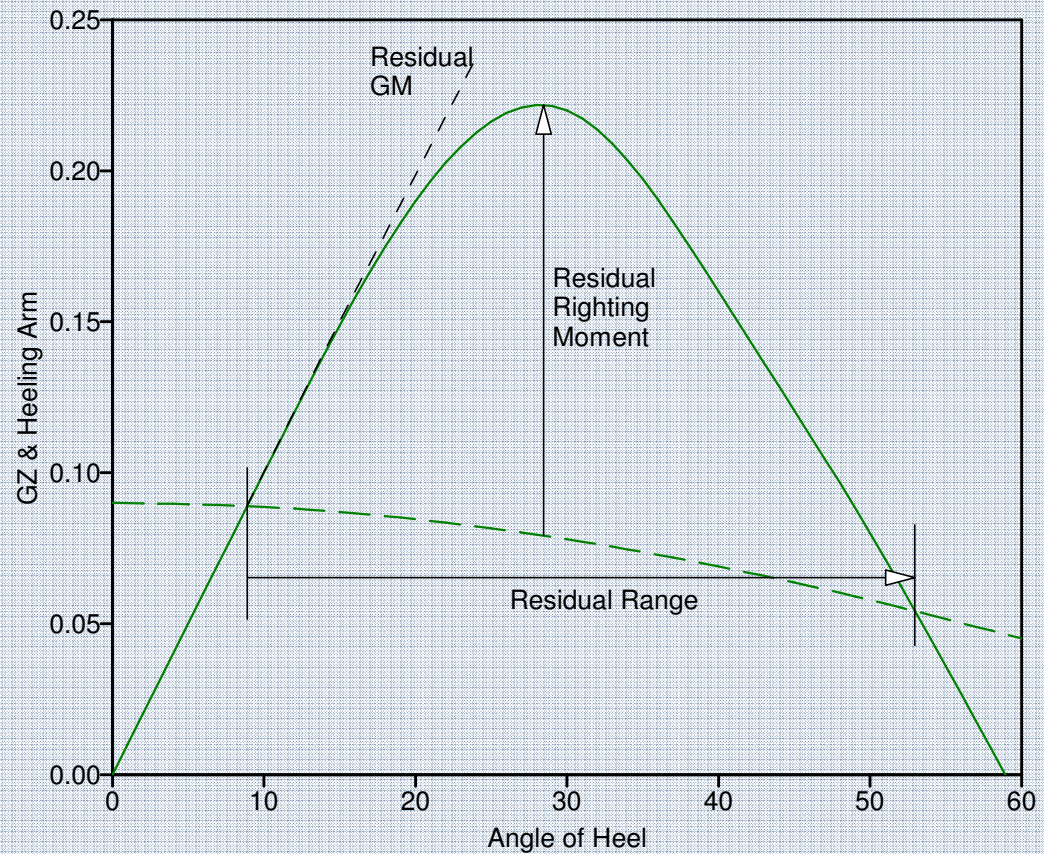
Normal operation, lifting gear

GM:	good
Freeboard:	good
Range:	> 50 degrees
RMmax:	0.14

— GZ - typical
- - - Lever - empty gear



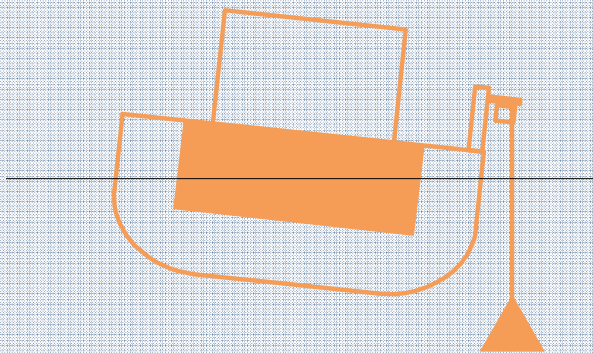
Freeboard mark exposed



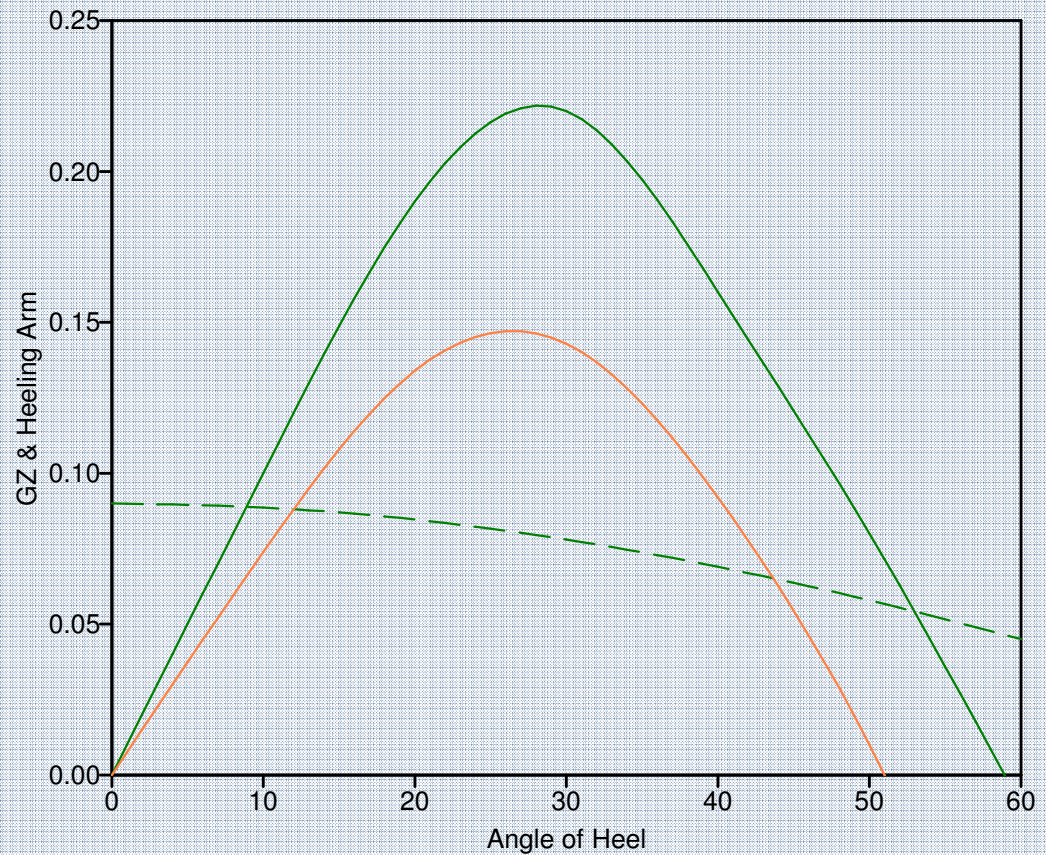
Vessel overloaded, lifting gear

GM:	good
Freeboard:	reduced
Range:	31 degrees
RMmax:	0.06

— GZ - typical
- - - Lever - empty gear
— GZ - overloaded

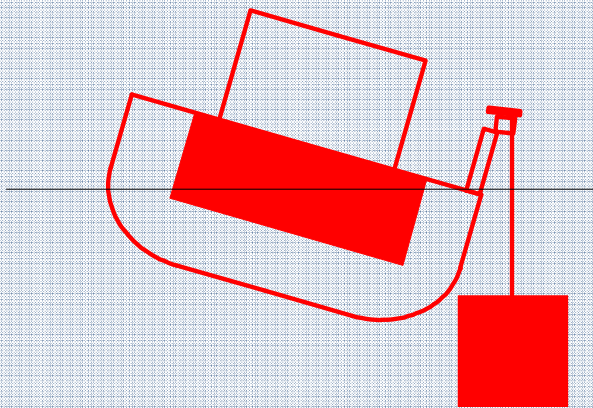


Freeboard mark at waterline

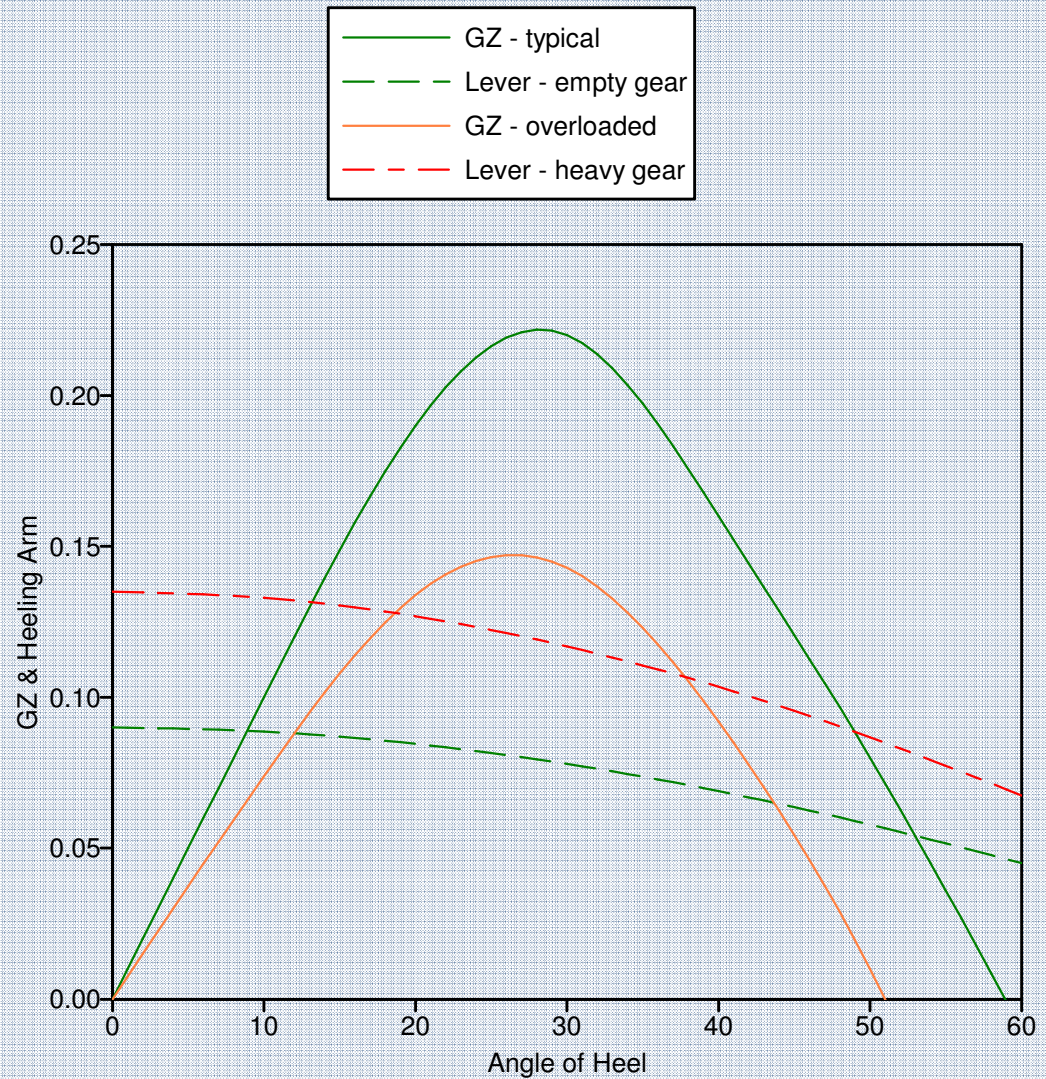


Vessel overloaded & heavy lift

GM:	adequate
Freeboard:	none
Range:	19 degrees
RMmax:	0.027






Freeboard mark submerged

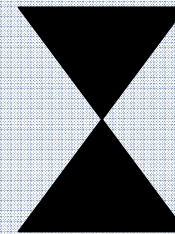


If you can maintain some freeboard
You are probably safe

But you need to know **how** safe relative to the seastate

You need **Freeboard Guidance**

STABILITY NOTICE				
Name: Aleyra No. MN138 Owner: Mr Lucky Length: 14 metres Beam: 4.9 metres	Loading & Lifting Guidance	Safety Zone	Minimum Freeboard	Maximum Recommended Seastate
	Good margin of residual freeboard	Good margin of safety	At least 55 cm	
	Loading or lifting reduces minimum freeboard to less than 55 cm	Low level of safety	27 to 55 cm	1.0 metres
	Excessive loading or lifting reduces minimum freeboard to less than 27 cm	Danger of capsize	Less than 27 cm	0.5 metres



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