

DE LA RECHERCHE À L'INDUSTRIE



H₂ Composite Pressure Vessel Additional slides / Burst ratio

GTR 13 meeting

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PLAN

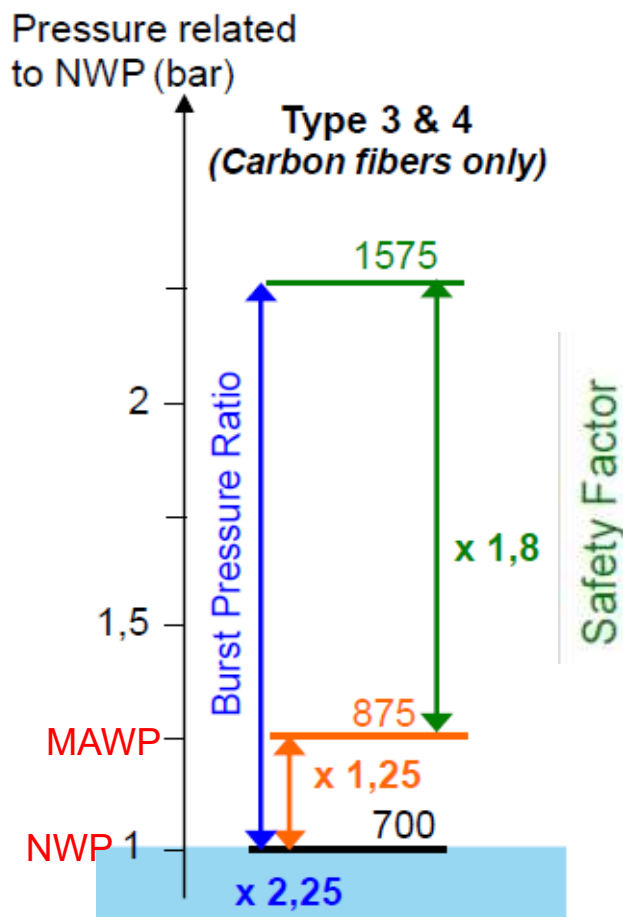
- French Hydrogen Plan
- H₂ Composite Pressure Vessel at CEA
- Burst ratio / HYCOMP project

HYCOMP project: Safety Factor definition

ON-BOARD APPL.

(79/2009/EC and EU 406/2010 - GTR No 13)

Safety Factor: 1.8
(⇔Burst Ratio 2.25)



$$SF = \frac{\text{MinimalBurstPressure}}{\text{DesignPressure}}$$

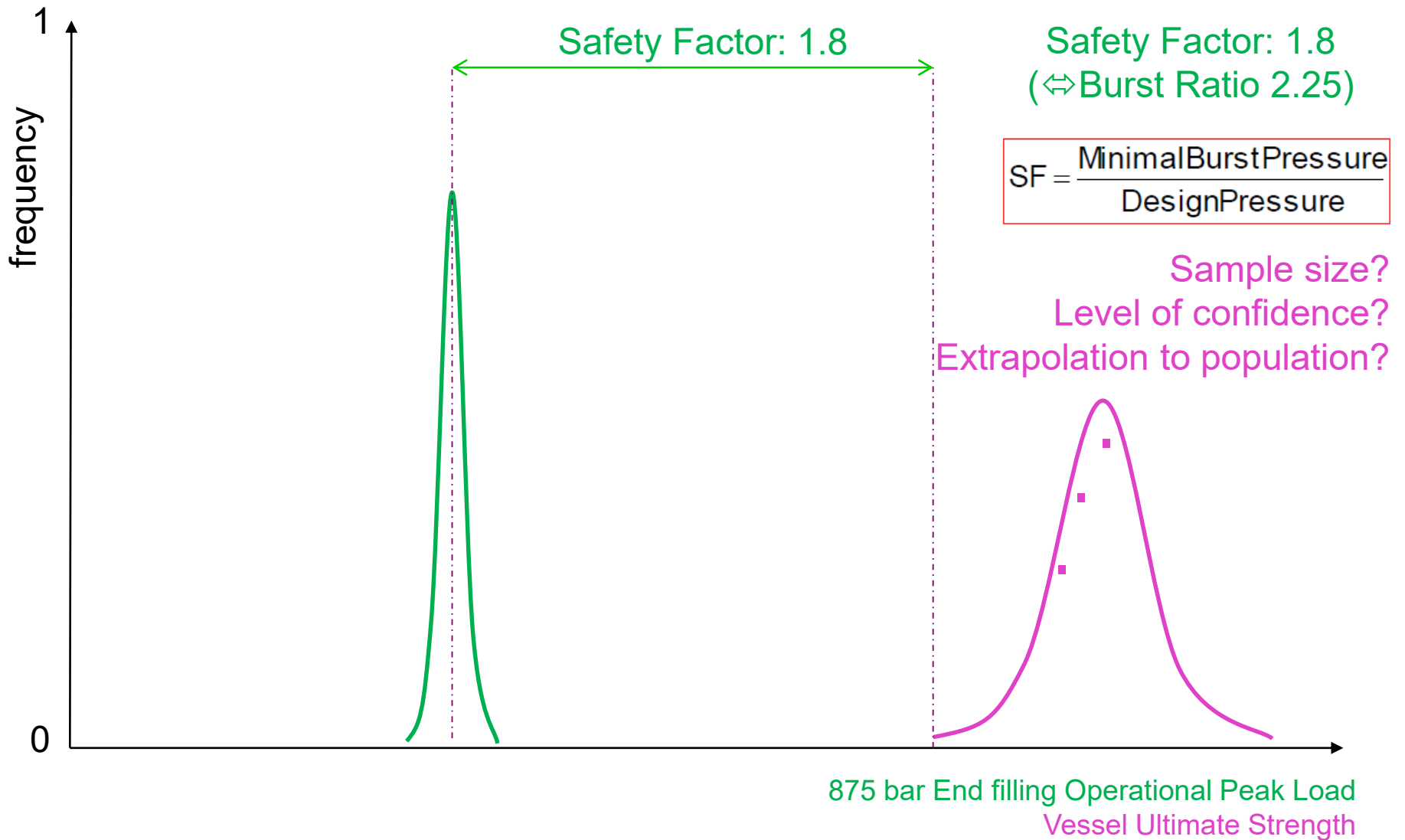
NWP=Nominal Working Pressure

MAWP=Maximum Allowable Working Pressure,

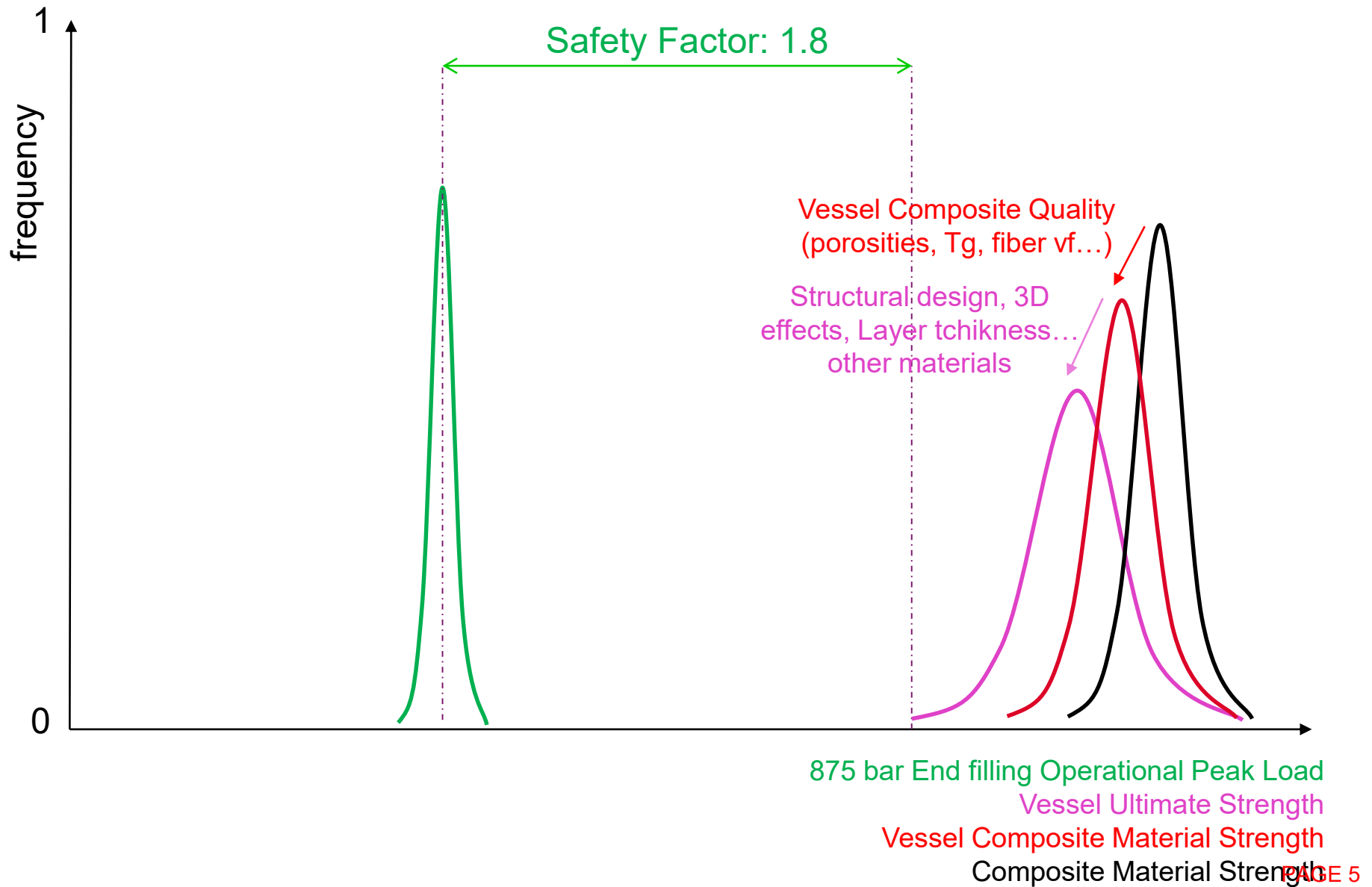
Design Pressure=MAWP

nominal pressure	filling pressure	burst ratio	burst pressure	Hycomp safety Factor
700	875	2,25	1575	1,8
700	875	2	1400	1,6

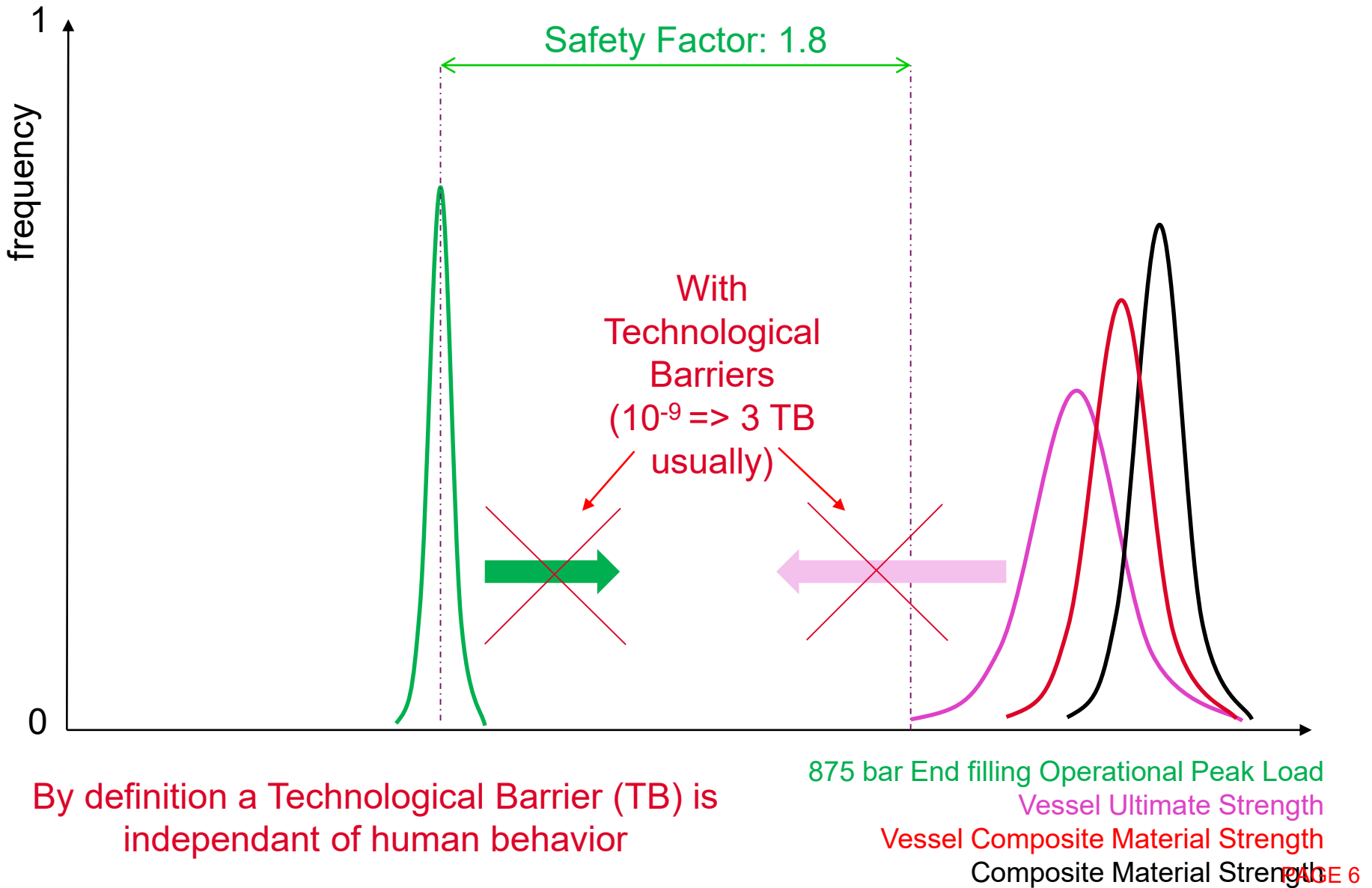
Vessel Frequency distributions: Load and Strength



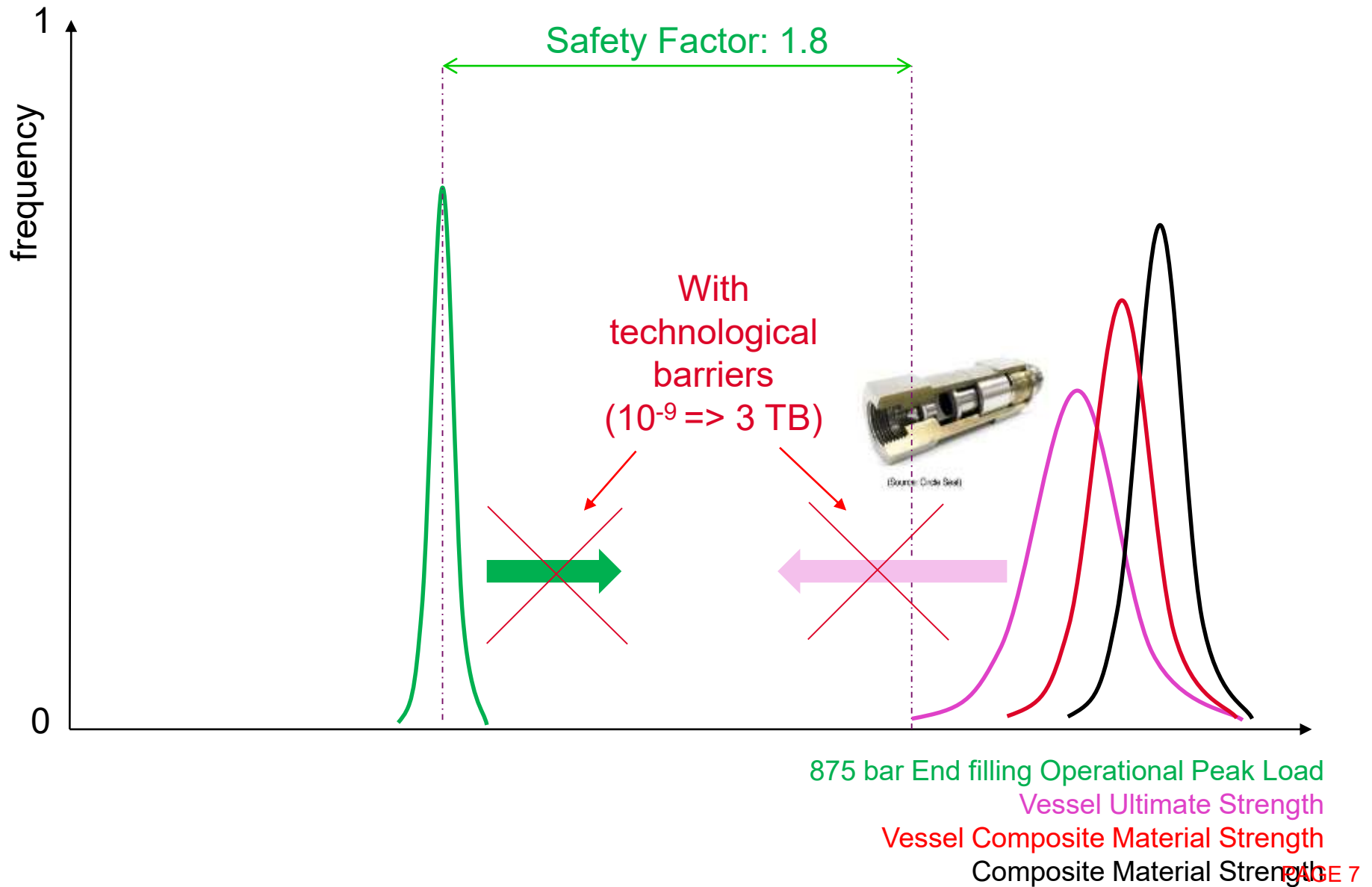
Frequency distribution evolution: material to vessel



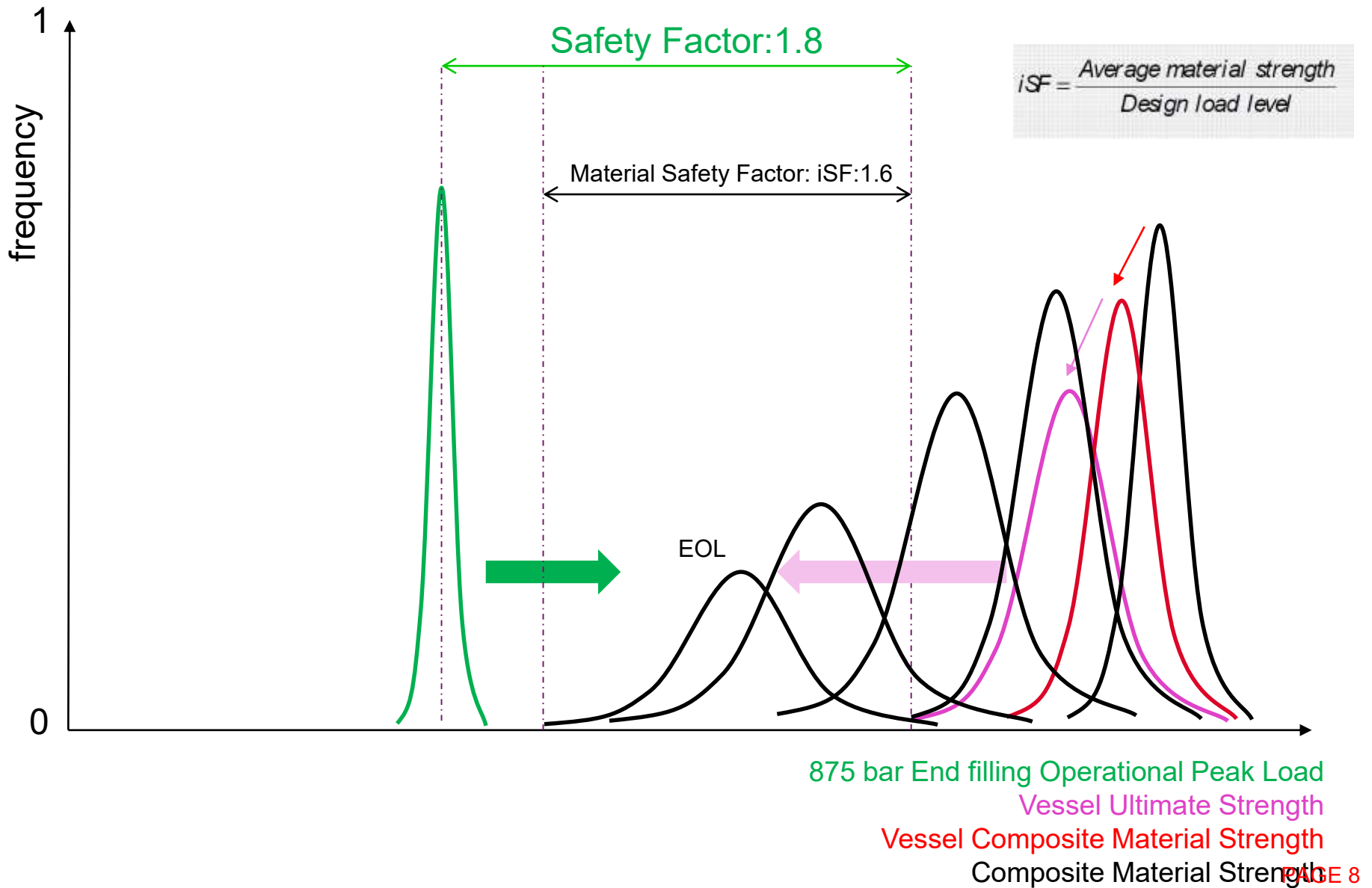
Vessel Frequency distributions: Load and Strength



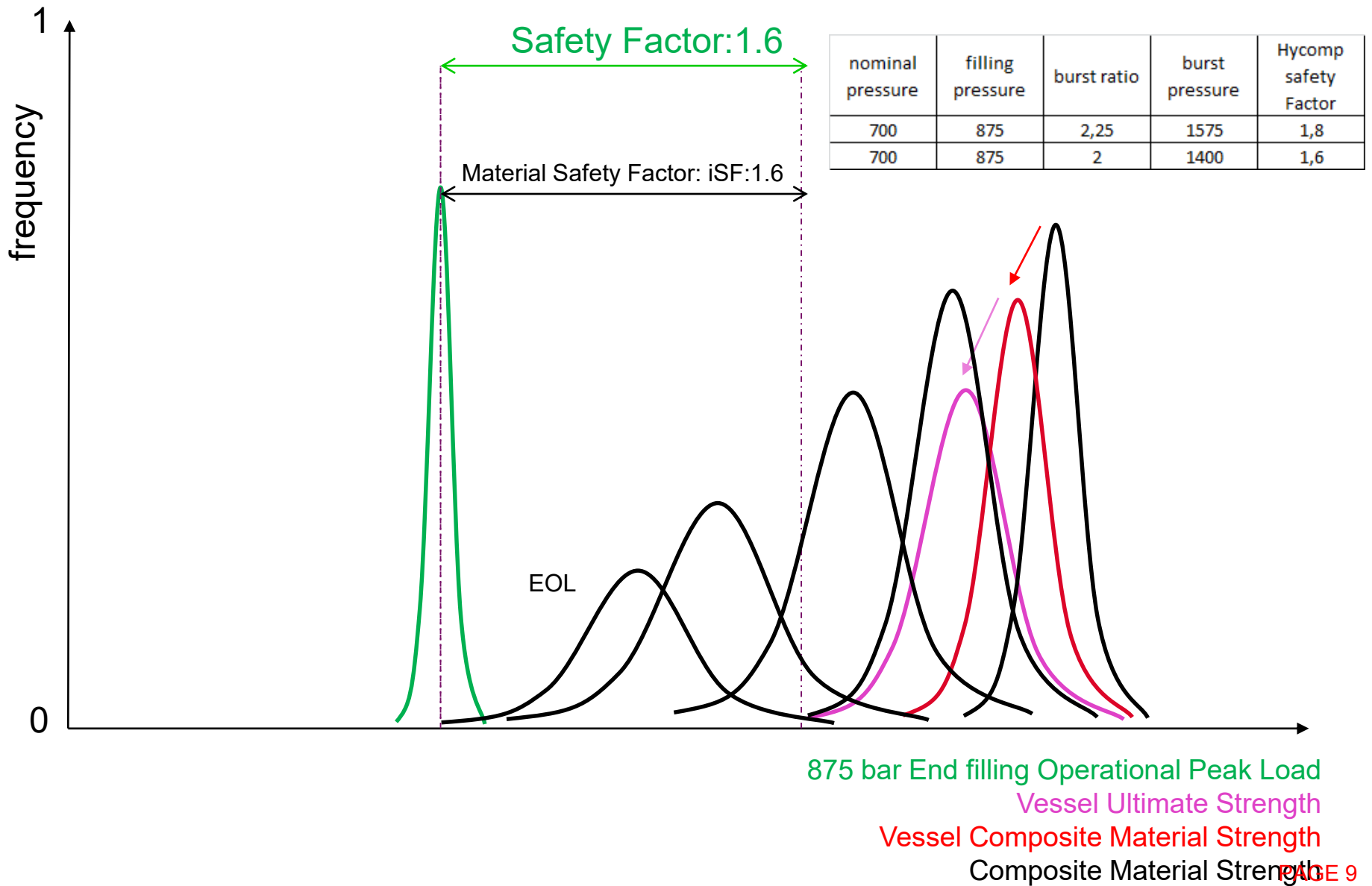
Example of barrier / Fire: TPRD



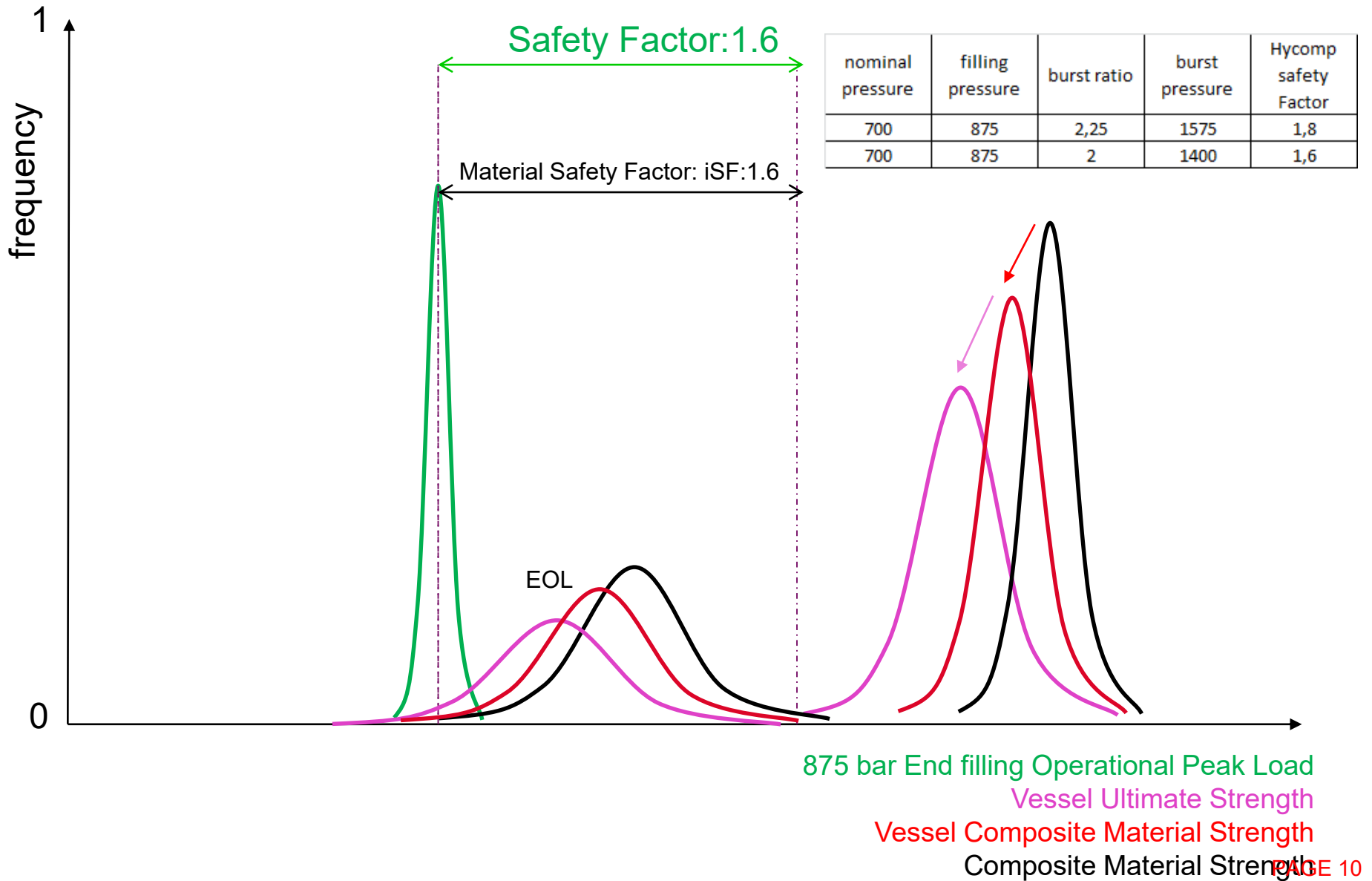
Composite Material Strength at EOF



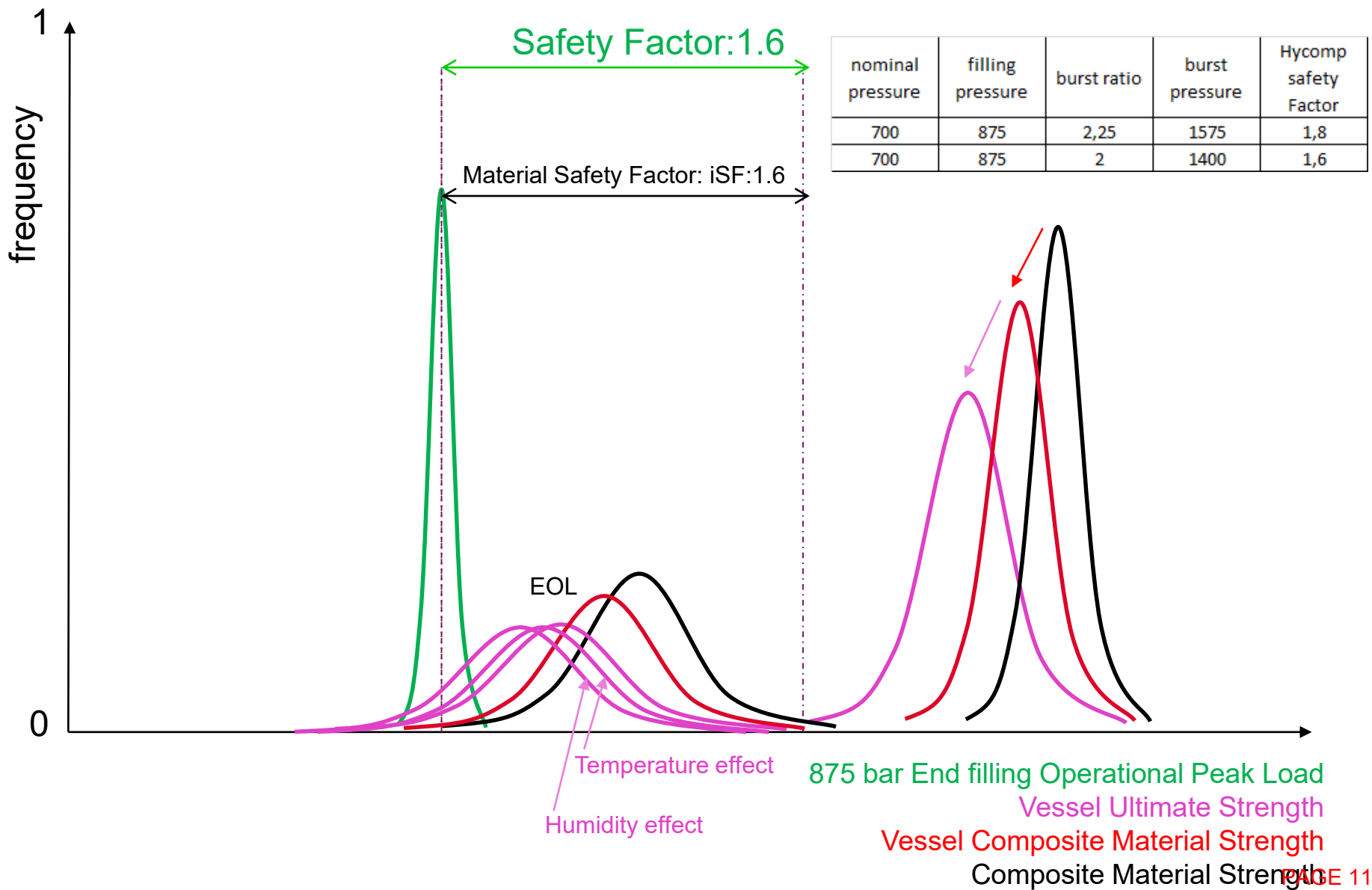
Reducing Safety Factor from 1,8 to 1.6 (⇔ Burst ratio from 2.25 to 2)



If you take into account the vessel



If you take into account effect of Temperature, Humidity



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Thank you
for your attention

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