

DNV GL MARITIME

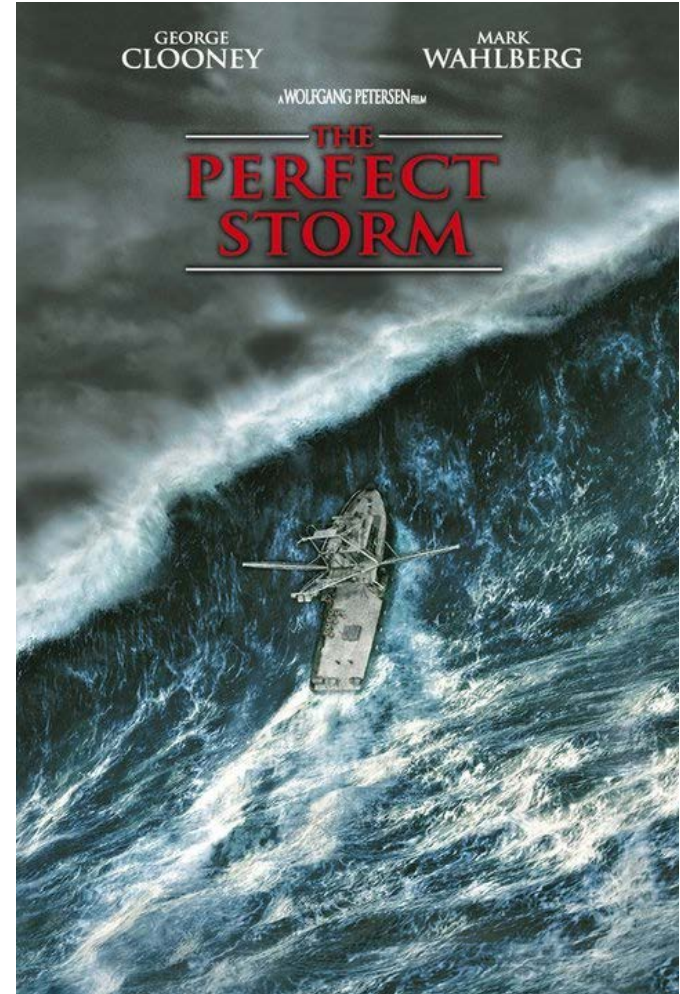
The “min. req. Power issue” and the desire to manoeuvre out

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2. annual SHOPERA-WS, Lisbon, 15. Oct. 2015

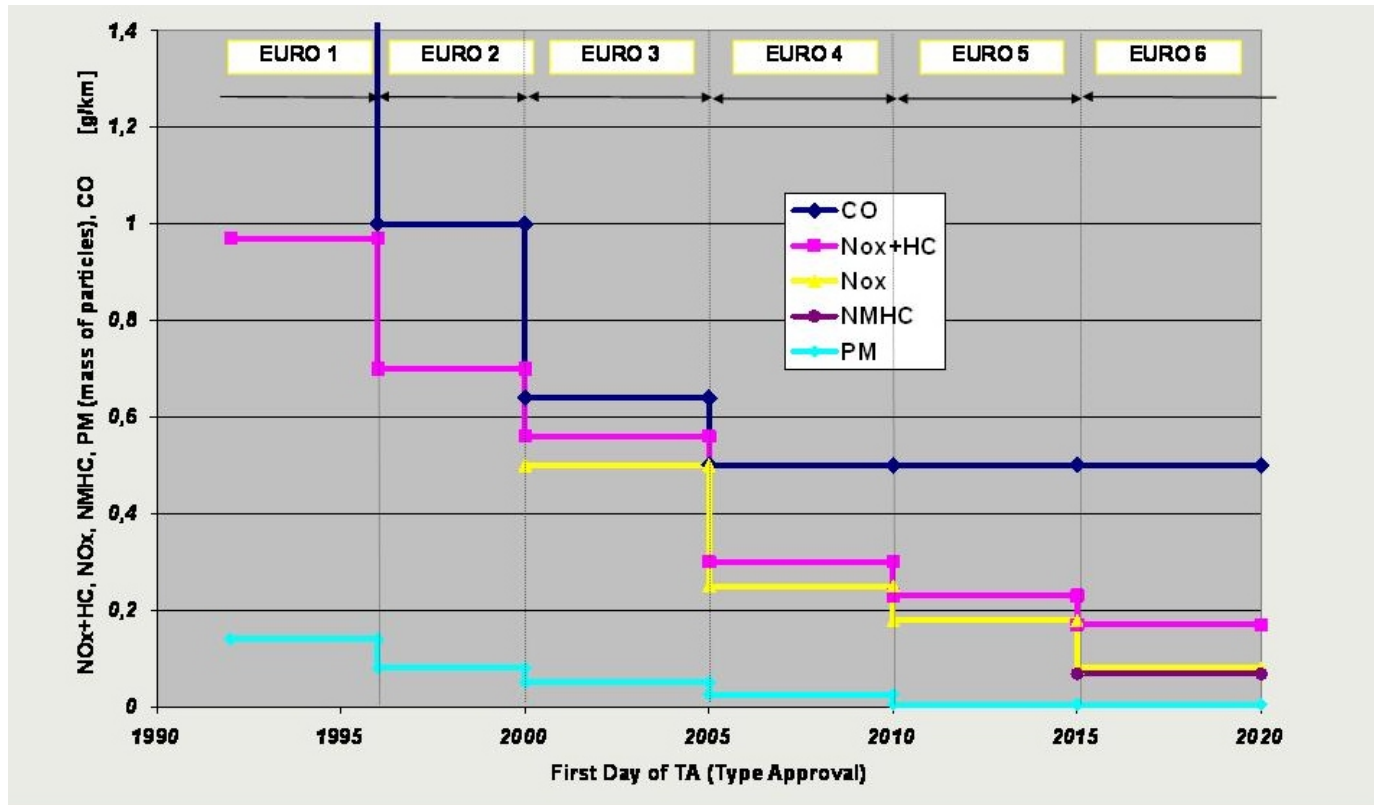
Agenda

- Background
 - how emission limits work for regulators
- Some drawbacks of actual “min. req. power guidelines”
- wish list for IMO on “manoeuvrability criteria in adverse weather conditions”
- Conclusion



Reducing emission output constantly...

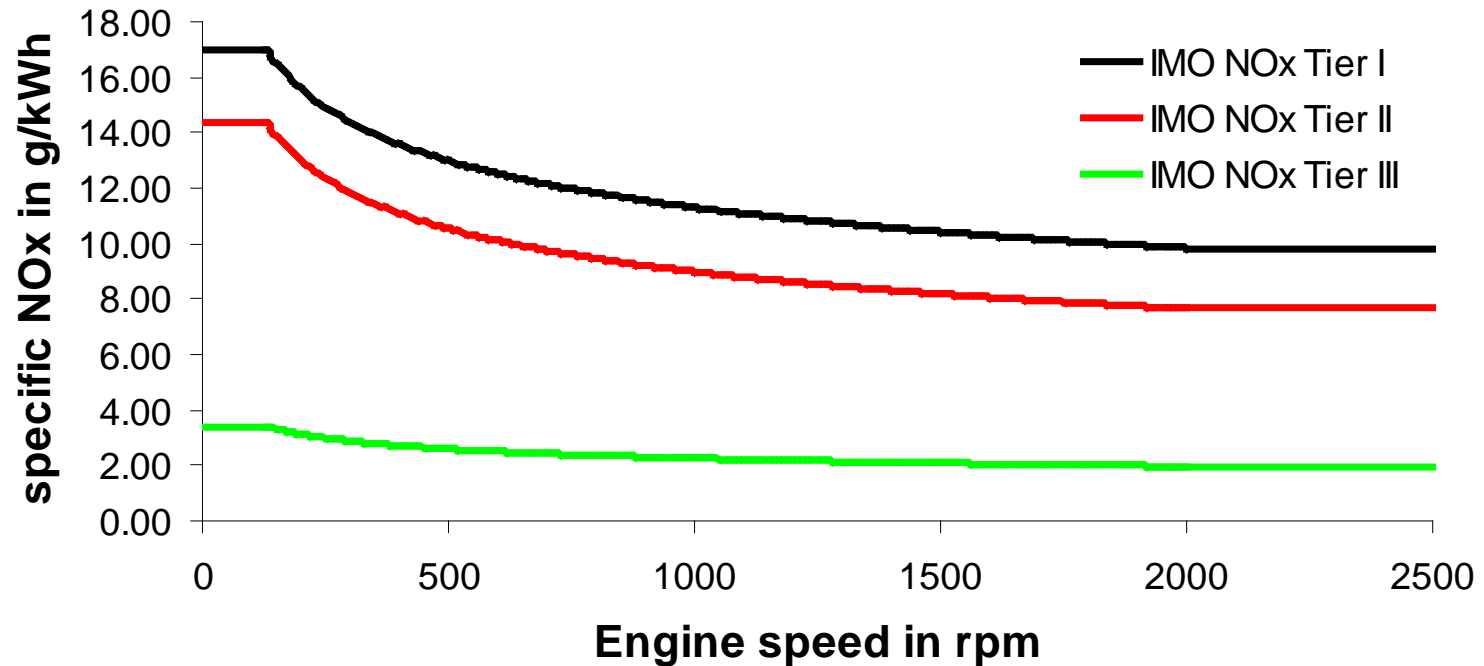
Restriction: cost effectiveness...



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Reducing emission output constantly...

Restriction: cost effectiveness...



Energy Efficiency Index – The basic idea



$$\text{EE Index} = \frac{\text{Air pollution (emitted CO}_2\text{)}}{\text{Transport work}}$$



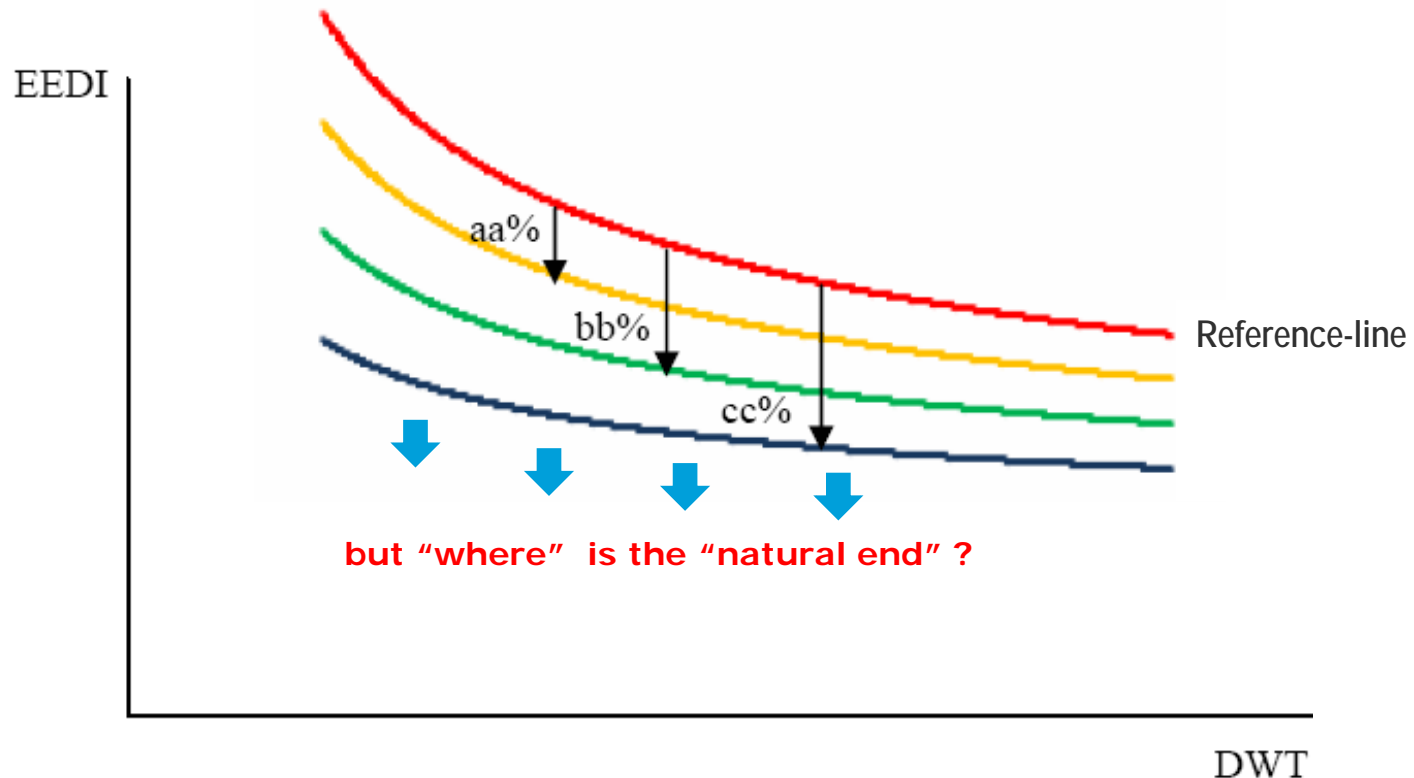
$$\text{EEDI} = \frac{\text{Engine Power} \cdot b_e \cdot c_F}{\text{Cargo}_{\text{Design Capacity}} \cdot v_{\text{ref}}}$$

b_e ← specific fuel oil consumption
 c_F ← conversion factor fuel to CO₂
 v_{ref} ← reference speed

$$P \sim v^3$$

The EEDI as mandatory instrument

EEDI is used as efficiency criteria for new build ships and will be lowered every five years (phase) by about 10% per each phase:



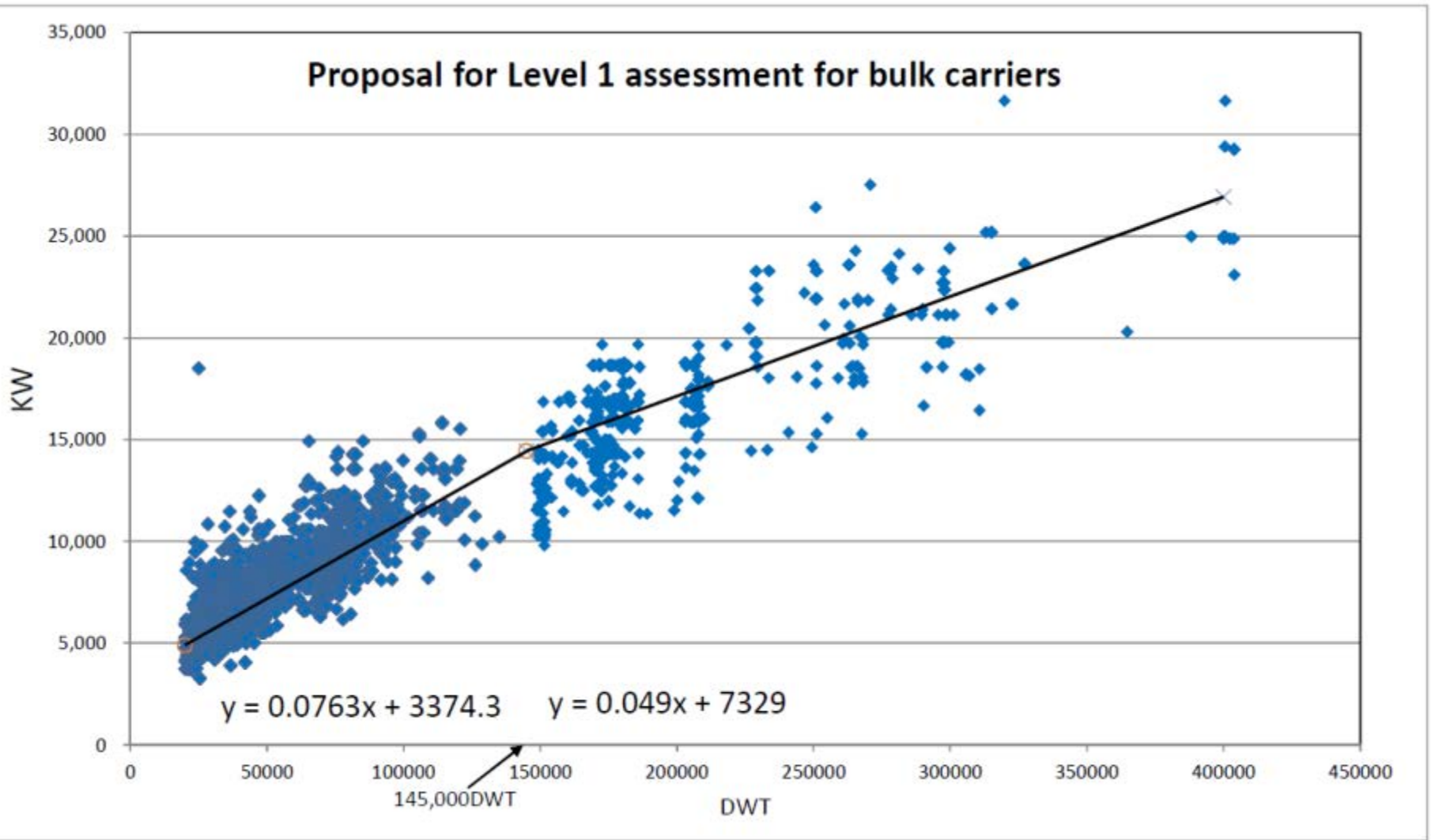
Caution: ships engine "power" is part of the EEDI formula !!!



Minimum propulsion power (background)

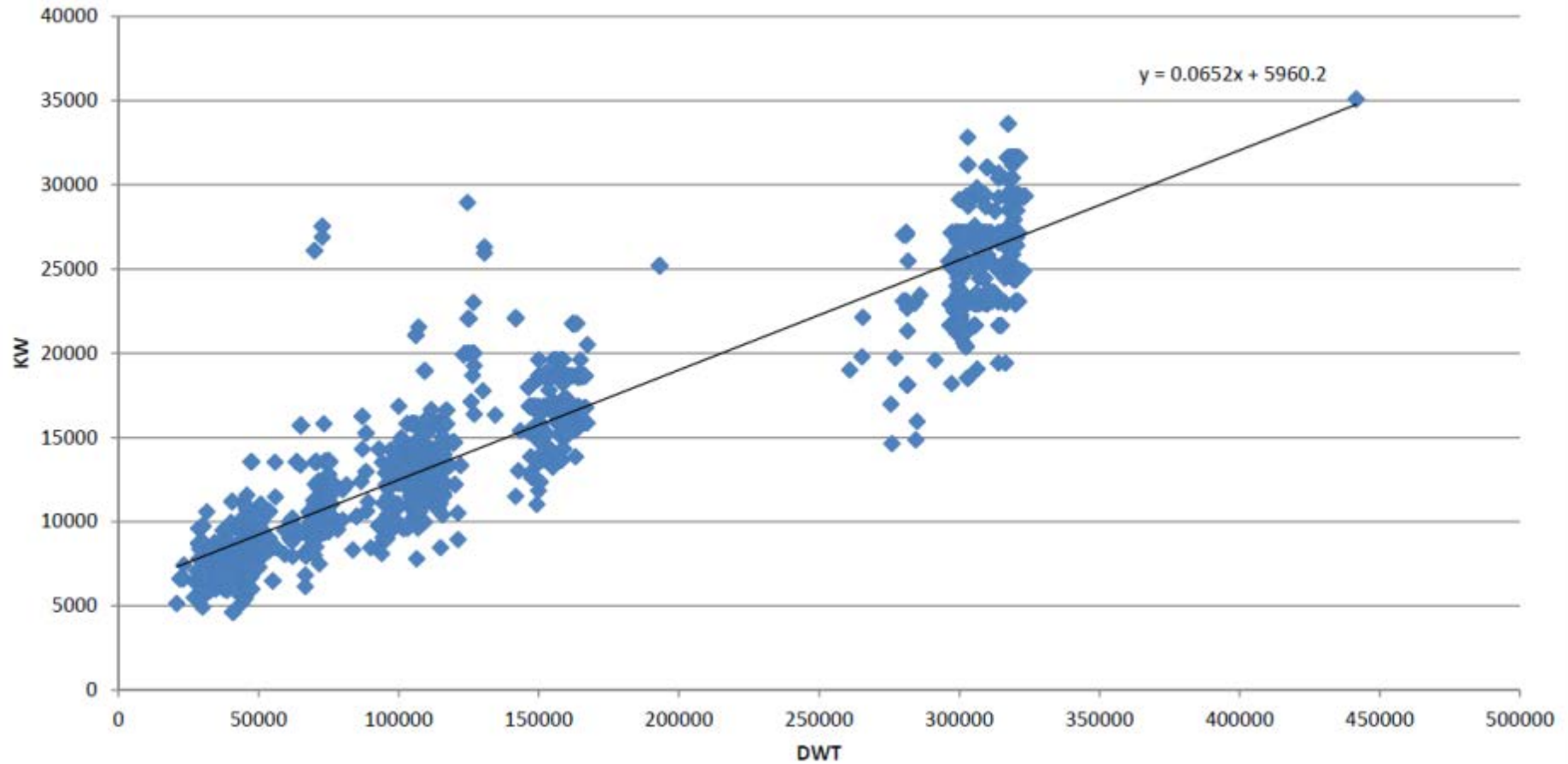
- **Ship designers may choose to reduce the ship's installed power to achieve the required EEDI**
- A provision was added to regulation 21 in chapter 4 of MARPOL Annex VI, stating:
 - *“For each ship to which this regulation applies, the installed propulsion power shall not be less than the propulsion power needed to maintain the manoeuvrability of the ship under adverse conditions as defined in the guidelines to be developed by the Organization.”*
- During MEPC 65 in May 2013 the improved interim guidelines were adopted and agreed valid until the end of 2014 (Phase 0)
- MEPC 67 decided that the Improved interim guidelines would also be valid for Phase 1, but also left an opening for re-visiting this
- MEPC 68 revised interim guidelines for Phase 1
- Ongoing R&D (e.g. SHOPERA) expected to provide solution for phase 2

MEPC 68 – Agreed minimum power line

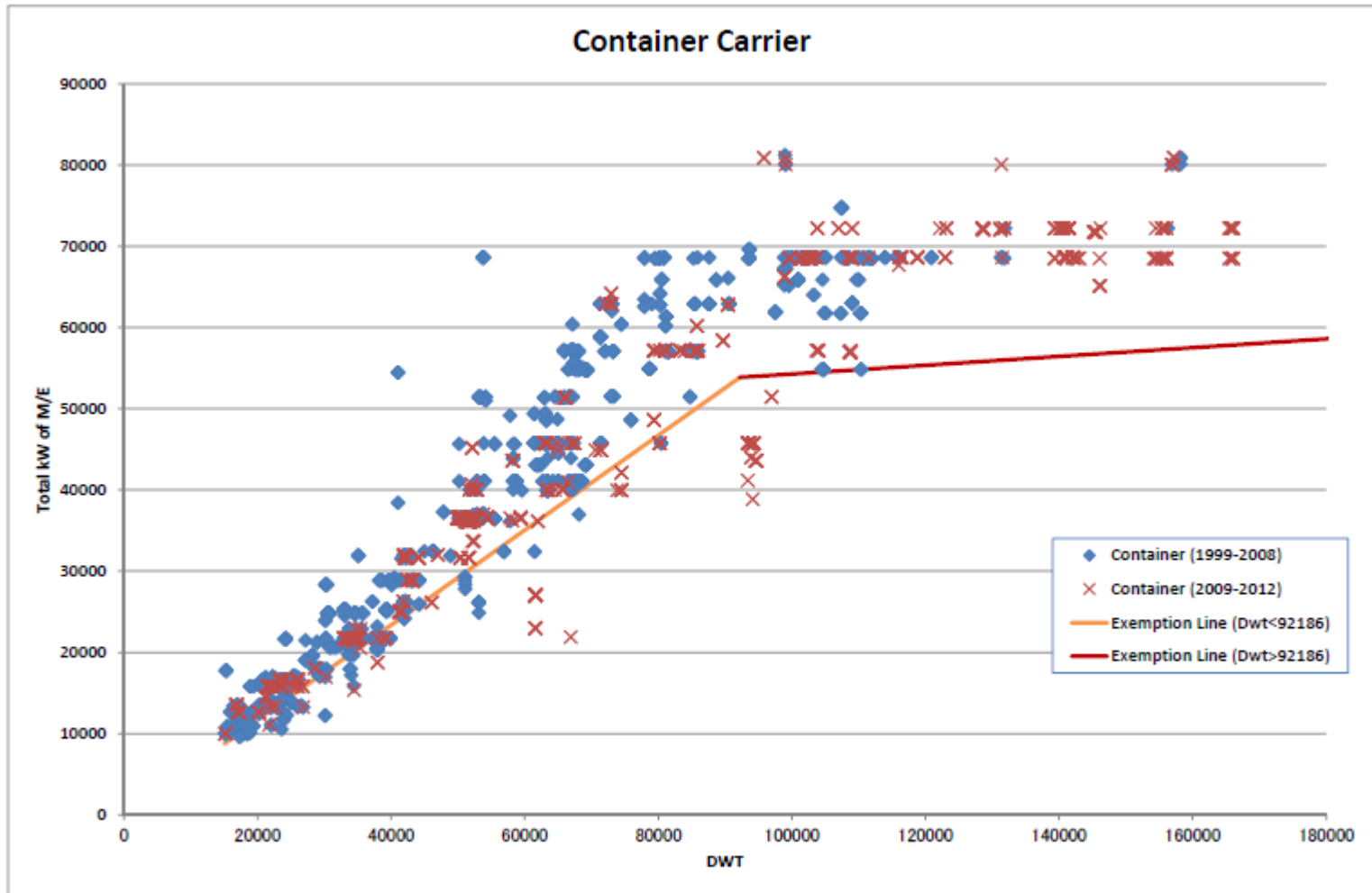


MEPC 68 – Agreed minimum power line

Proposal for level 1 assessment for tankers



Simplified assessment for container ships

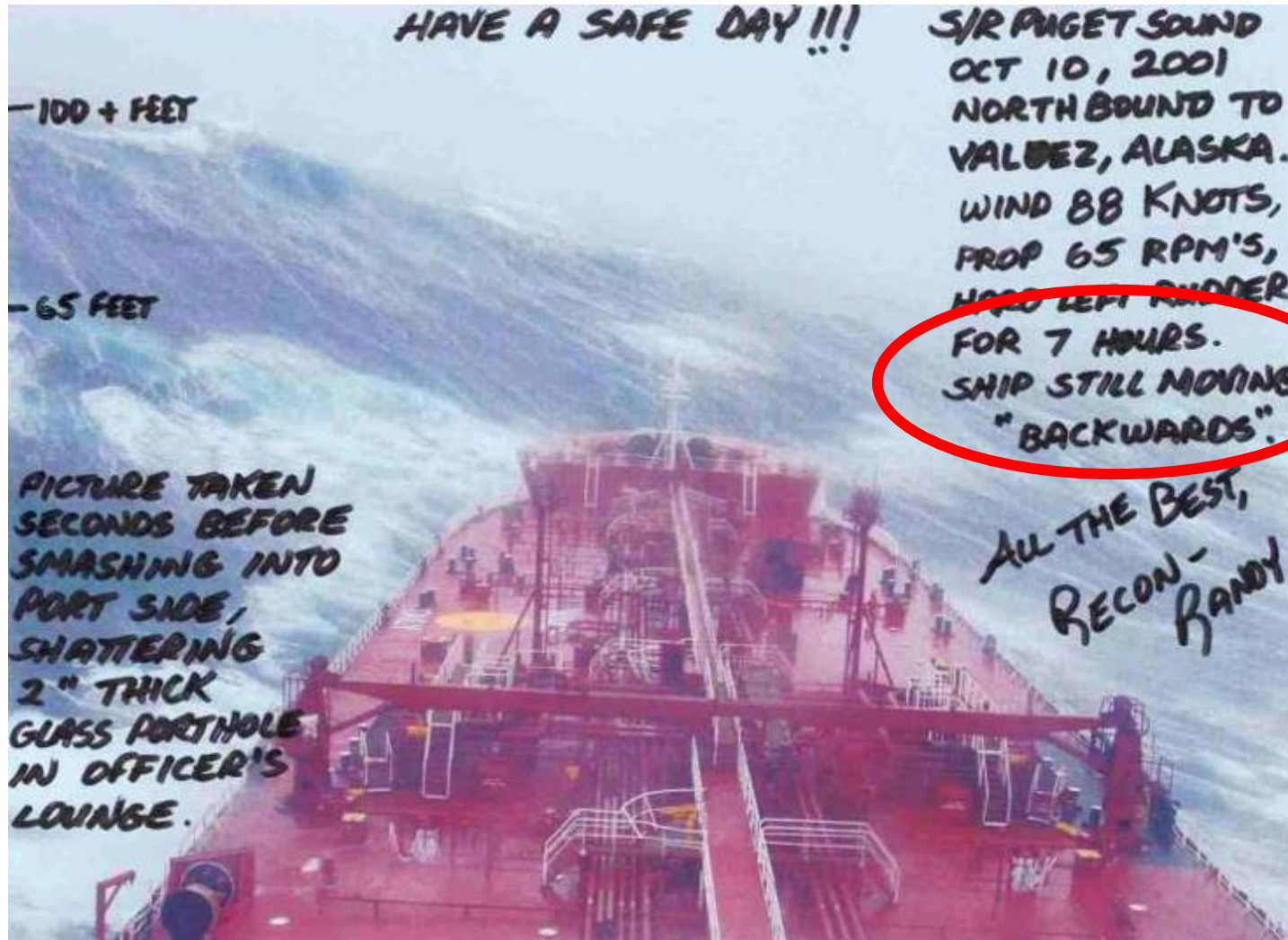


What does mean “conservativeness”

- in a regulatory context, sometimes several levels to check “safety criteria” are used.
- It is normal practice, as more complex the evaluation methodology applied is, the more accurate the results will get.
- With that, the simple evaluation methods needs to be more “**conservative**”, meaning implicitly that they provide some higher “**safety margins**”...



There are conditions overwhelming any ship



Challenges on the topic “manoeuvrability in adverse conditions”

- on Weather conditions:
 - one can find any extreme weather condition which finally stops ships operation in their intended direction
 - associated risks in severe open seas should be identified, is there an issue on grounding, contact or collision in open high seas?
 - some issues should be seen in relation to “proper seamanship” and can’t be solved technically (i.e. start escaping in upcoming storm, tug assistance in harbours)
 - the weather conditions are setting the “severity” for the requirements on manoeuvrability
 - does single events of extreme seas play a significant role?
 - a “balanced and wise” definition of weather conditions is needed to overcome all associated challenges



Verification of “manoeuvrability in adverse conditions”

- IMO needs a “simple” approach to check / verify / approve ships manoeuvring ability in adverse weather conditions that are applicable at ships design stage (before ship is build!)
 - criteria should be validated for a statistical relevant amount of the existing fleet (and ship types)
 - consider a “grading” / step approach for the criteria to be used
 - i.e. is assessment simple and conservative and is a back-up solution possible via a more comprehensive assessment?
 - criteria should allow application also of new technologies
 - any testing during sea trial or in real conditions seems impossible
 - ... ???



Conclusion

- Interrelations between environmental conditions (waves, wind) and associated ship motions, propulsion and rudder interactions are highly complex, albeit IMO guidelines should be as practical / simple as possible.
- Balancing safety with environmental protection is the challenge and hopefully SHOPERA proposes a solution.
- A statistical analysis of existing ships may serve as benchmark but should not play a role for simple regulation purpose
- Terminology used in the past should be revisited whether a re-use is appropriate or not, perhaps a “re-naming” helps avoiding misleading assumptions (i.e. the L1 to L3 assessment, that couldn't be perused to be used)
- criteria should be applicable during design stage of the ship



Thank you for your kind attention.

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