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DESIGN ENGINEERING KNOWLEDGE CENTER

DEKC-MARITIME.COM

Rapid Concept Design for Cargo Ships

Harry Linskens

harry@dekc.nl

CAESES Users Meeting

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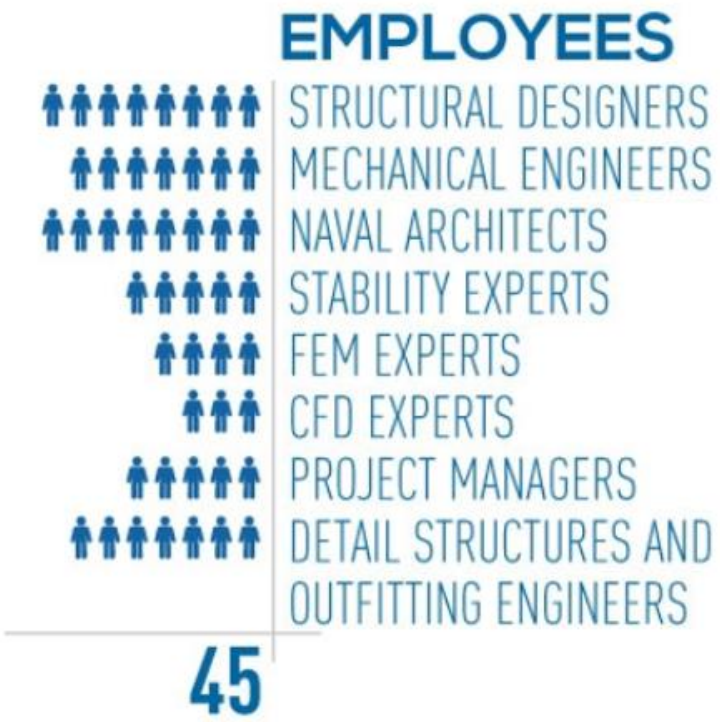
WHO ARE WE?

MARITIME DESIGN & ENGINEERING COMPANY



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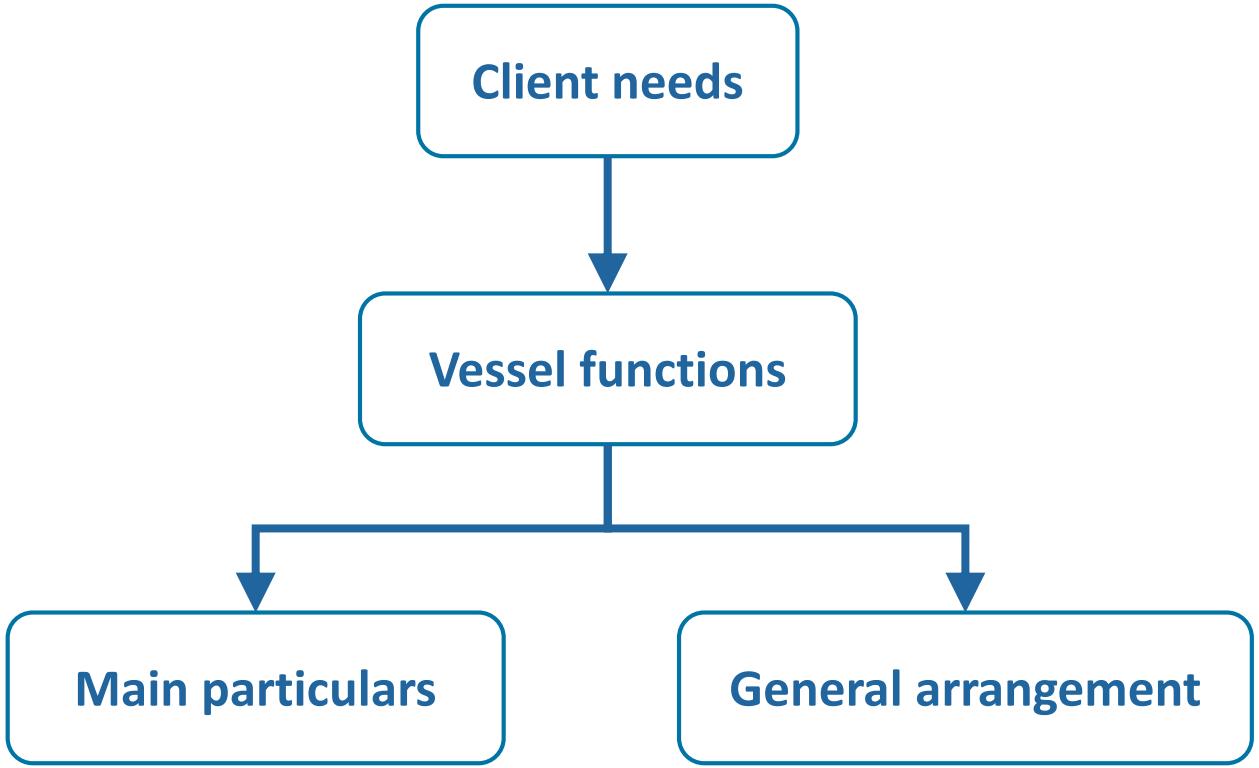
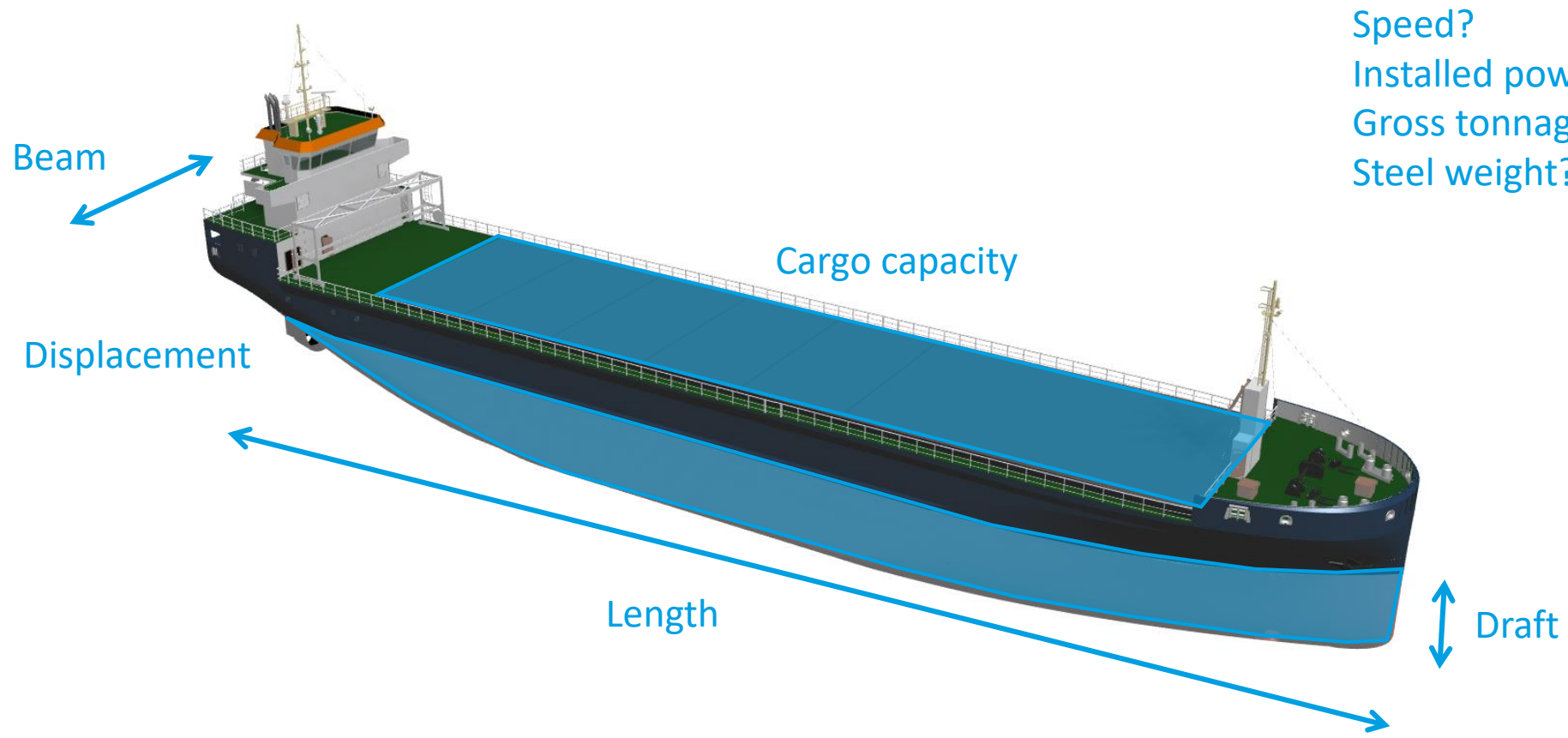
Concept Design: An Introduction

What really is concept design?



What needs to be decided?



Speed?
Installed power?
Gross tonnage?
Steel weight?

How is a concept design made?

1. Meet with client and determine needs:
   - Specific vessel dimensions, maximize cargo
   - Specific cargo, minimize ship size
   - No idea yet?
2. Determine required functionality
3. Make initial estimate of design
4. Check feasibility of design
5. Repeat 3-4 if necessary *(usually, yes)*

How does this work in practice?

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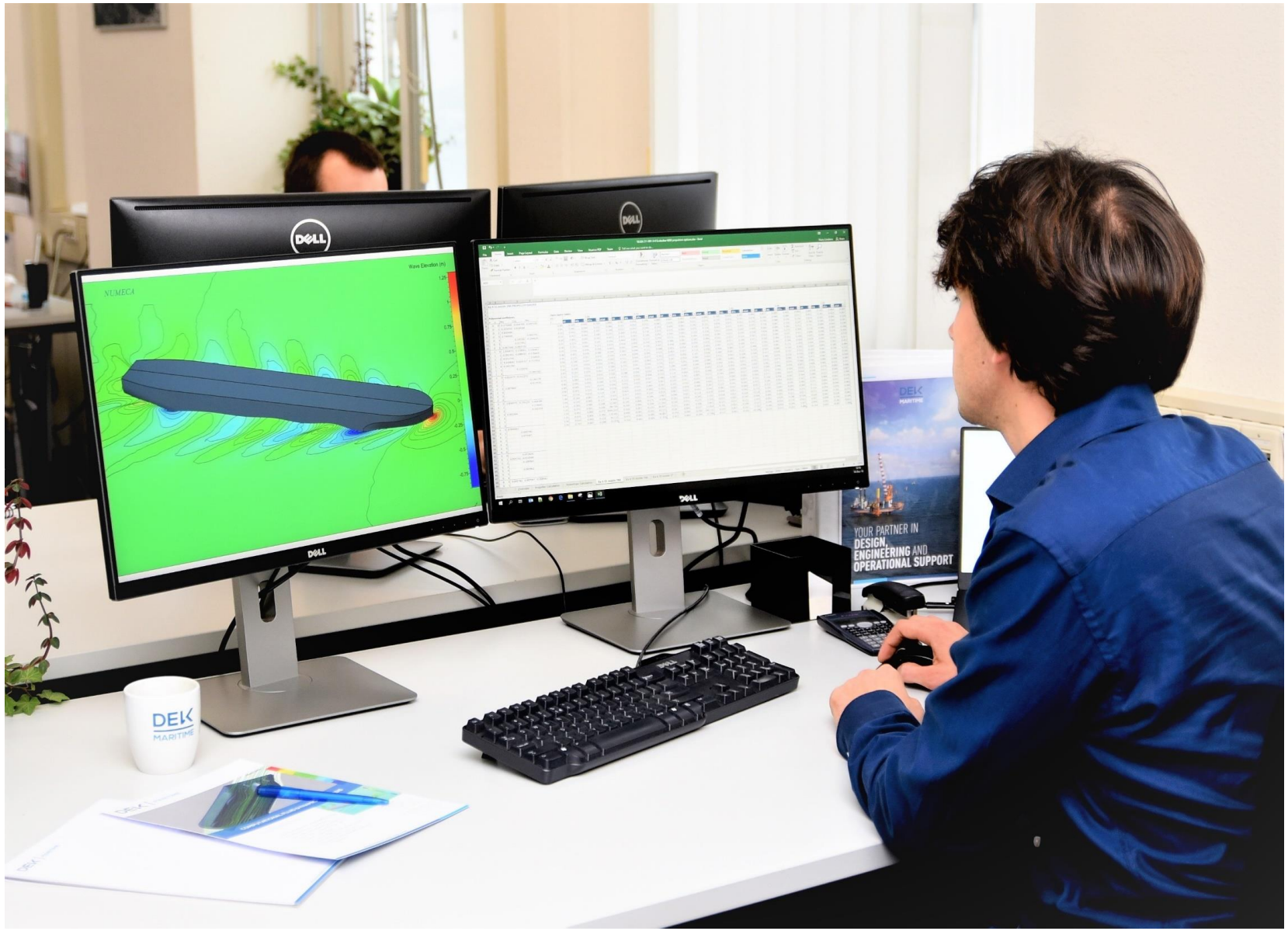

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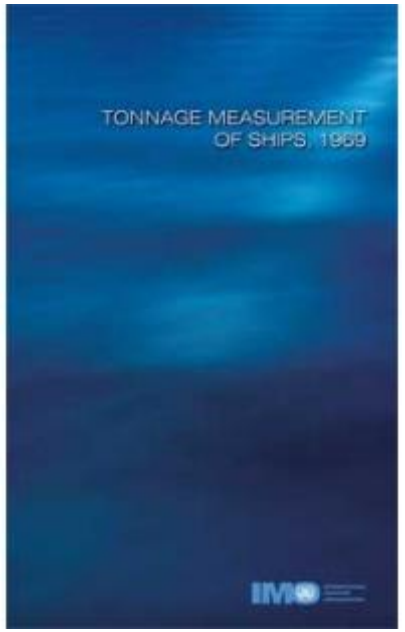
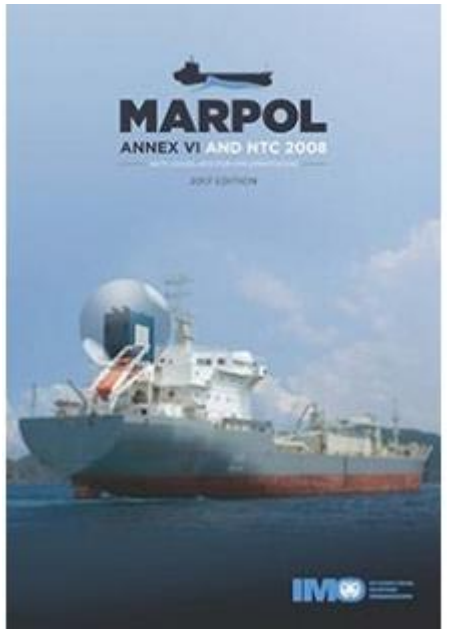
Why am I sitting alone behind my desk?

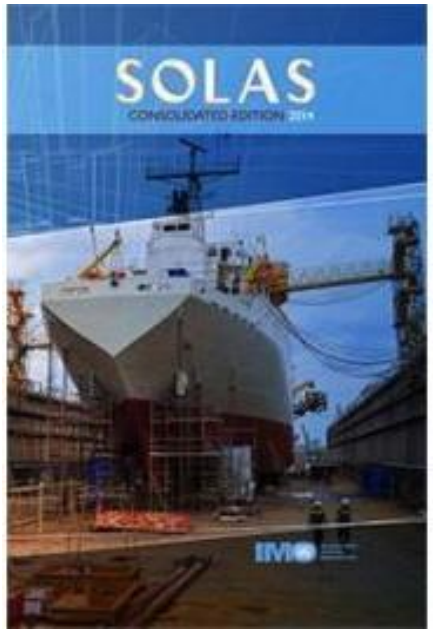
- Concept design is the shortest design phase
  - No time to set-up team
  - Limited to those who have had client contact already

- The decisions made have far-reaching implications
  - Main dimensions influence everything!
  - Essential to make a well-considered choice

So, what am I actually spending my time on?







Where does CAESES come into all of this?

- Freeboard → depends on hull geometry
- Stability → depends on hull geometry
- Tonnage → depends on hull geometry
- Speed-power → depends on hull geometry
- Ice-class power → depends on hull geometry

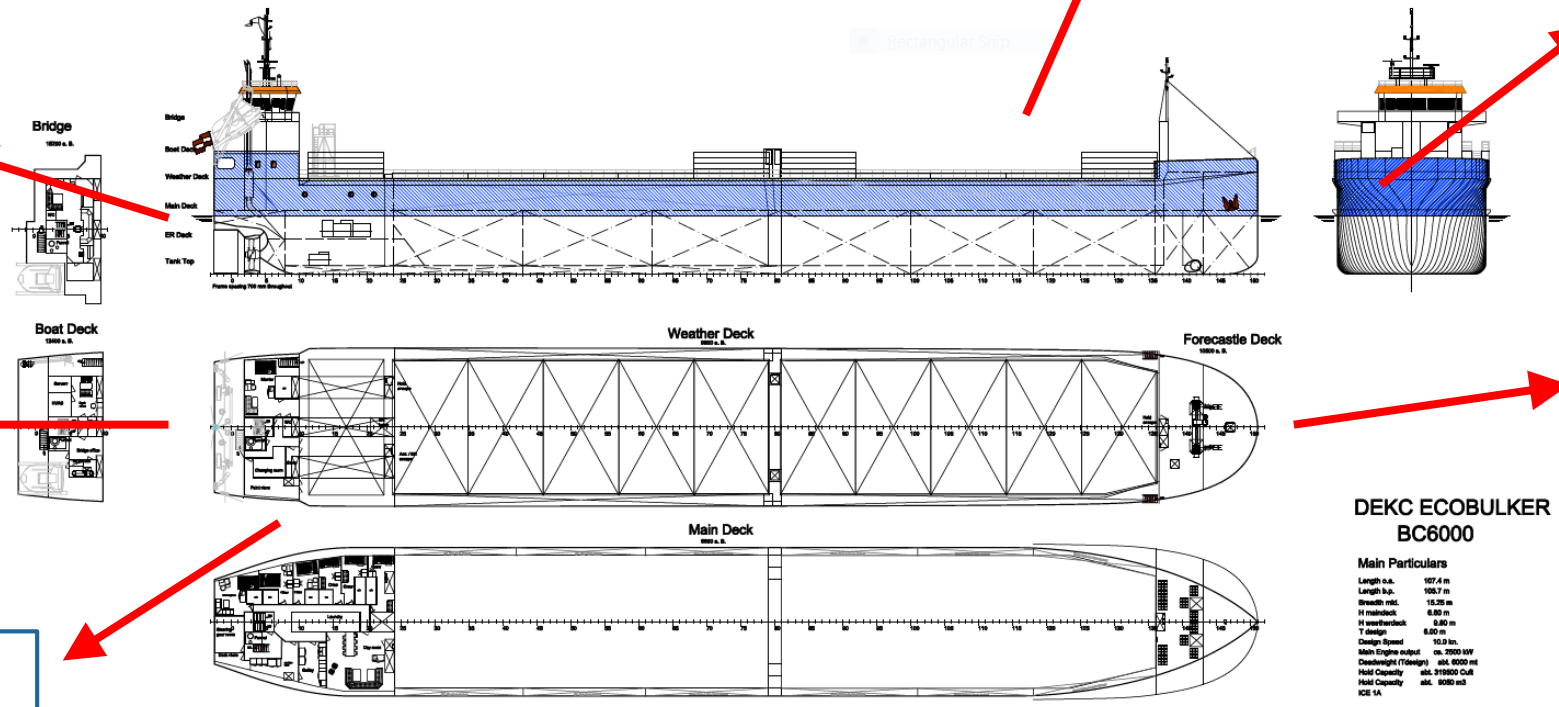
Concept Design Workflow

Concept Design Then…

HULL:
Reference design
(maybe scaled? 3D?)

STAB:
Hand calcs
(/NAPA?)

ICE:
Excel
(/NAPA?)

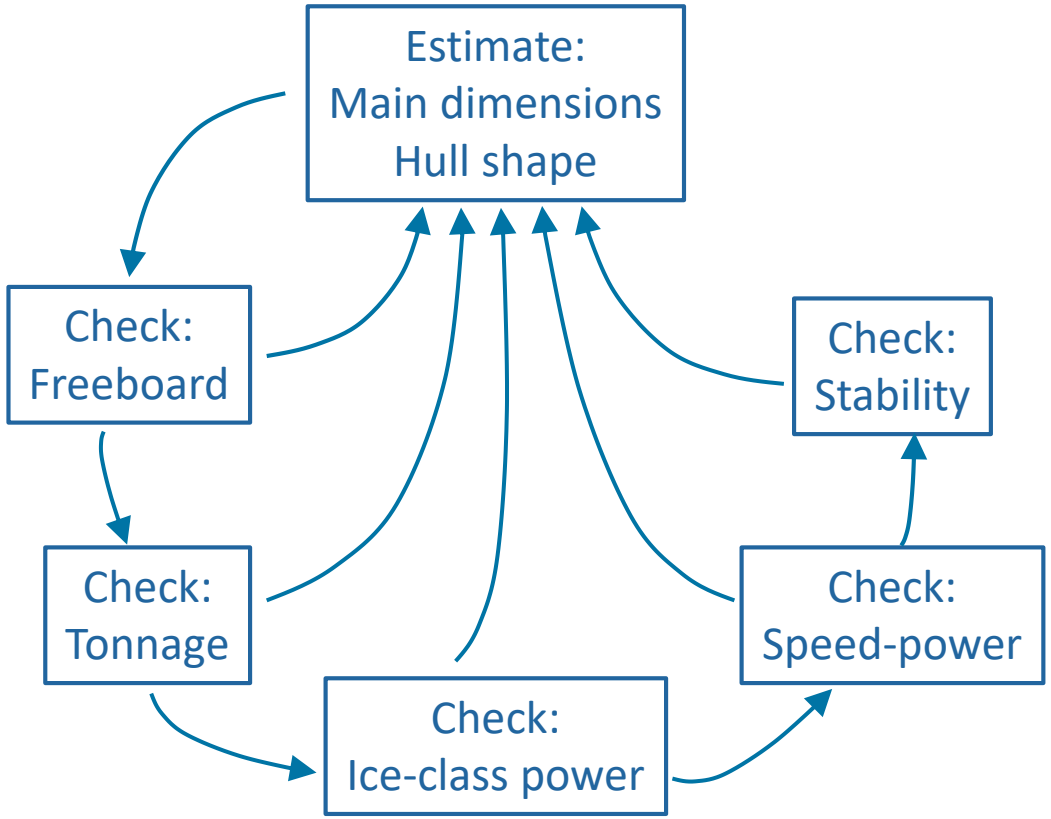


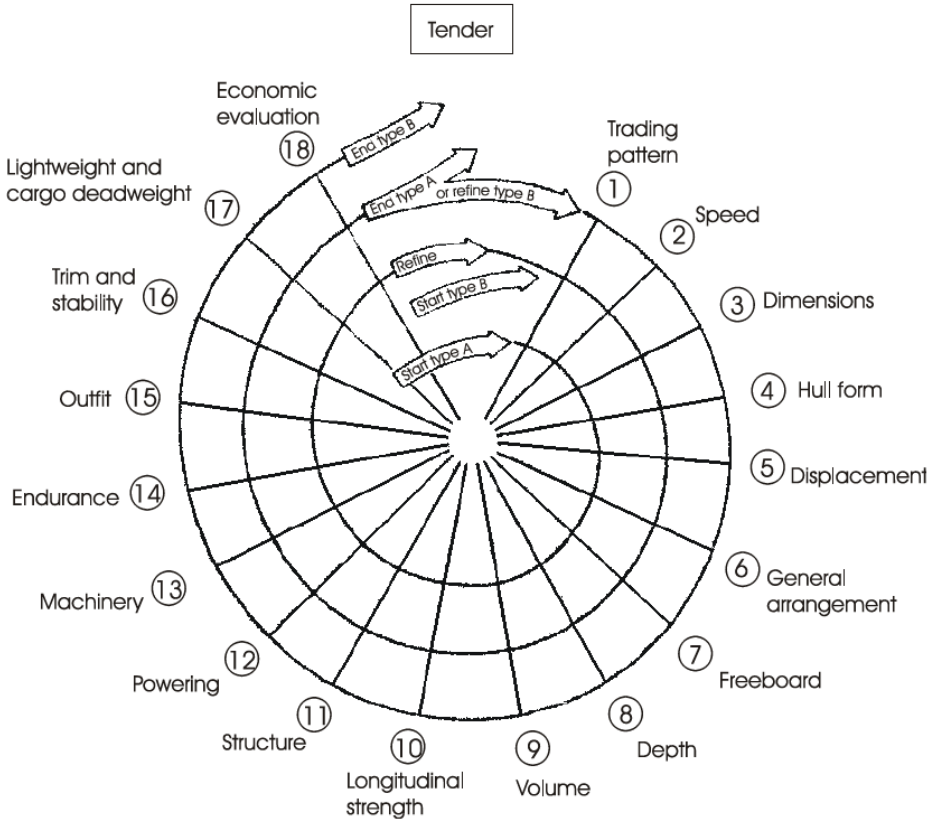
FRB:
Excel

TONNAGE:
Hand calcs

SPEED:
Excel
(/DESP?)

Concept Design Then…





…And Concept Design Now

HULL:
Parametric CAESES geometry

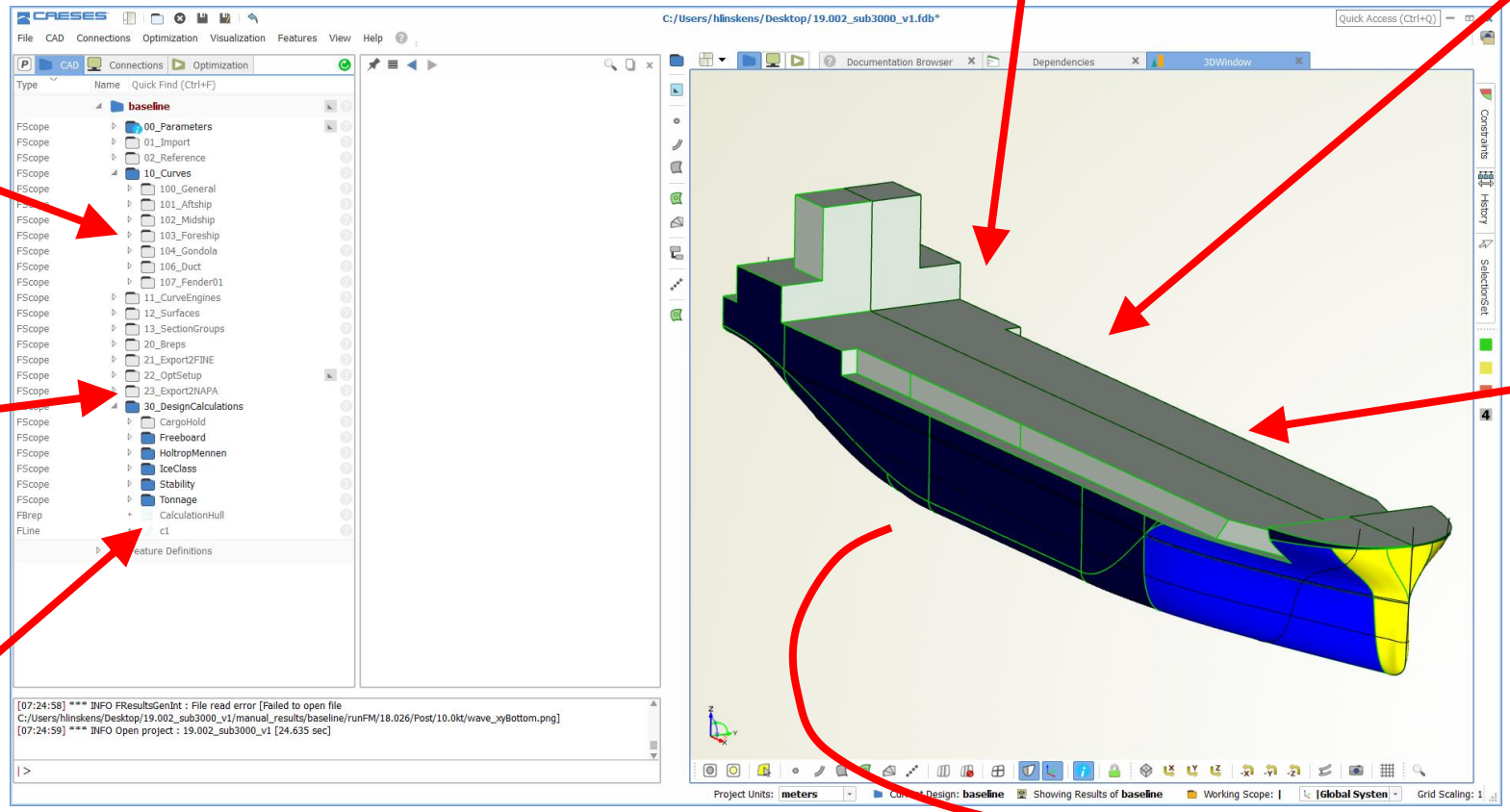
STAB:
Calculated using hull geometry

ICE:
CAESES feature using hull geometry

FRB:
CAESES feature using hull geometry

SPEED:
CAESES feature using hull geometry

TONNAGE:
Calculated from closed Brep



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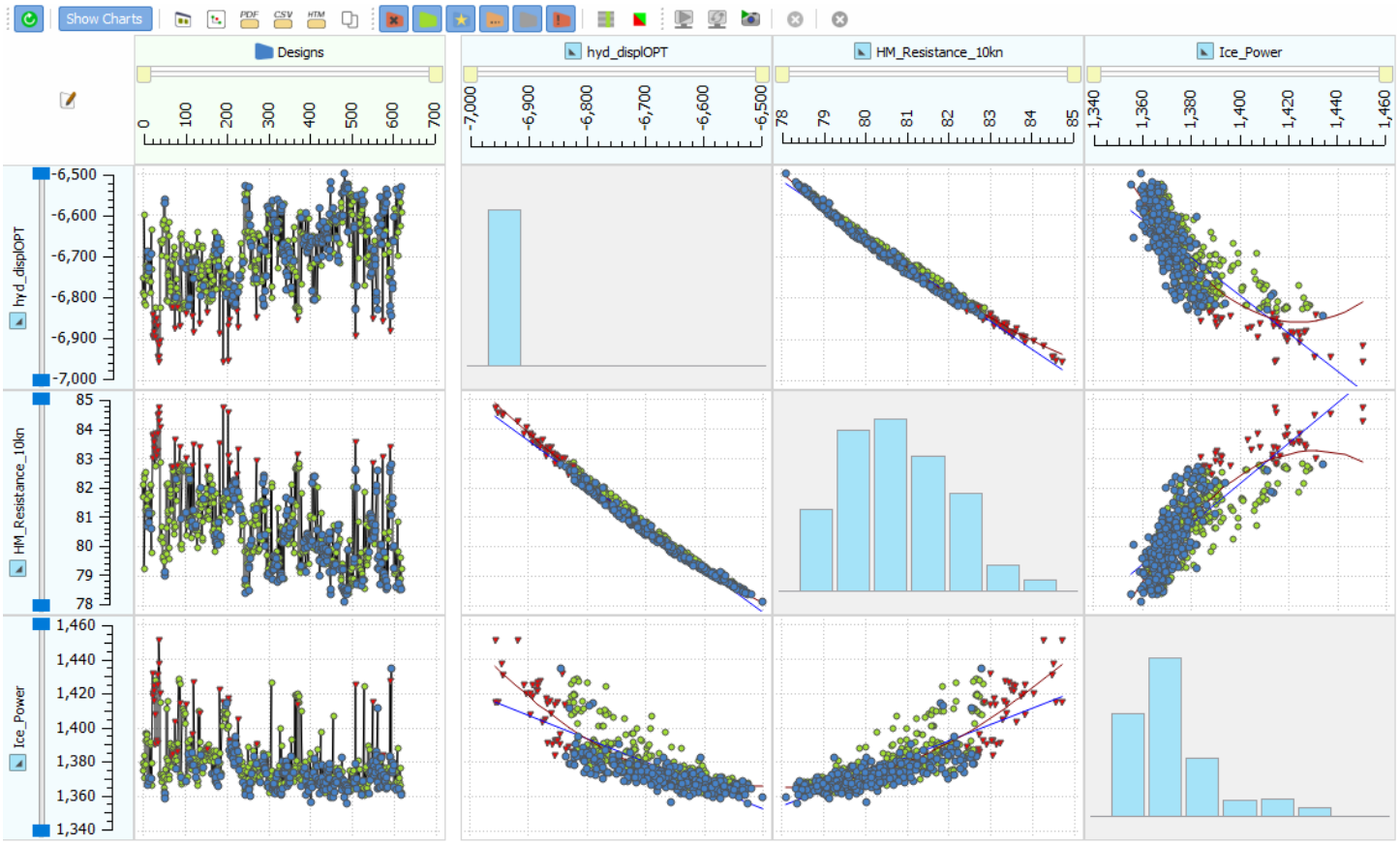
…And Concept Design Now

Displacement

Resistance

Ice-class power



Constraint on gross tonnage

Compared:

Traditional

- Sequential checks
- Manual iterations
- Limited number of variants
- Repetitive hand work

Integrated

- Simultaneous checks
- Automated iterations
- Large number of variants
- Press run, get coffee!

Conclusion

- CAESES is very suitable for concept design
- Less time required to perform design feasibility checks
- More room for optimization at the very start of a design
- Better ships, quicker!

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Thank you for your attention!