



Long lifetime design - Does Quality make sound business sense?

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What is Quality?

In everyday life we use the term quality for a

- *superior,*
- *deficiency-free,*
- *long-living,*
- *user-friendly*

product and we know that quality has its price.



Definition according ISO 9000

“Quality is the degree to which a set of inherent characteristics fulfils requirements.”



Definition according Phil Crosby

“Conformance to requirements.”

A separate difficulty with this is that the requirements may not fully represent what the customer wants.



To produce quality means...

...to define a set of requirements that fully represents what the customer wants.

...to design and produce in compliance with these requirements.



Different ways to buy a new vessel

A ship owner can

- 1. ...buy a vessel off the shelf.*
- 2. ...develop an own concept and define clear requirements. Award the contract to a shipyard on the basis of a detailed specification.*
- 3. ...approach the shipyard with the transportation problem. Develop the requirements together with the yard.*



The most promising way

All three ways can lead to quality, however the third way is the most promising one since

...the owner gets the most efficient ship

...the (European) yard can keep a competitive edge.



Yard and Owner complement each other

The owner knows the business environment better than the shipyard. The owner has the experience in operating ships.

However, the shipyard has the experience in applying a variety of technical solutions and the yard has appropriate simulation tools to find out what might be the best solution.



Example 1:

Design optimisation considering operational aspects

The ship owner has the experience with

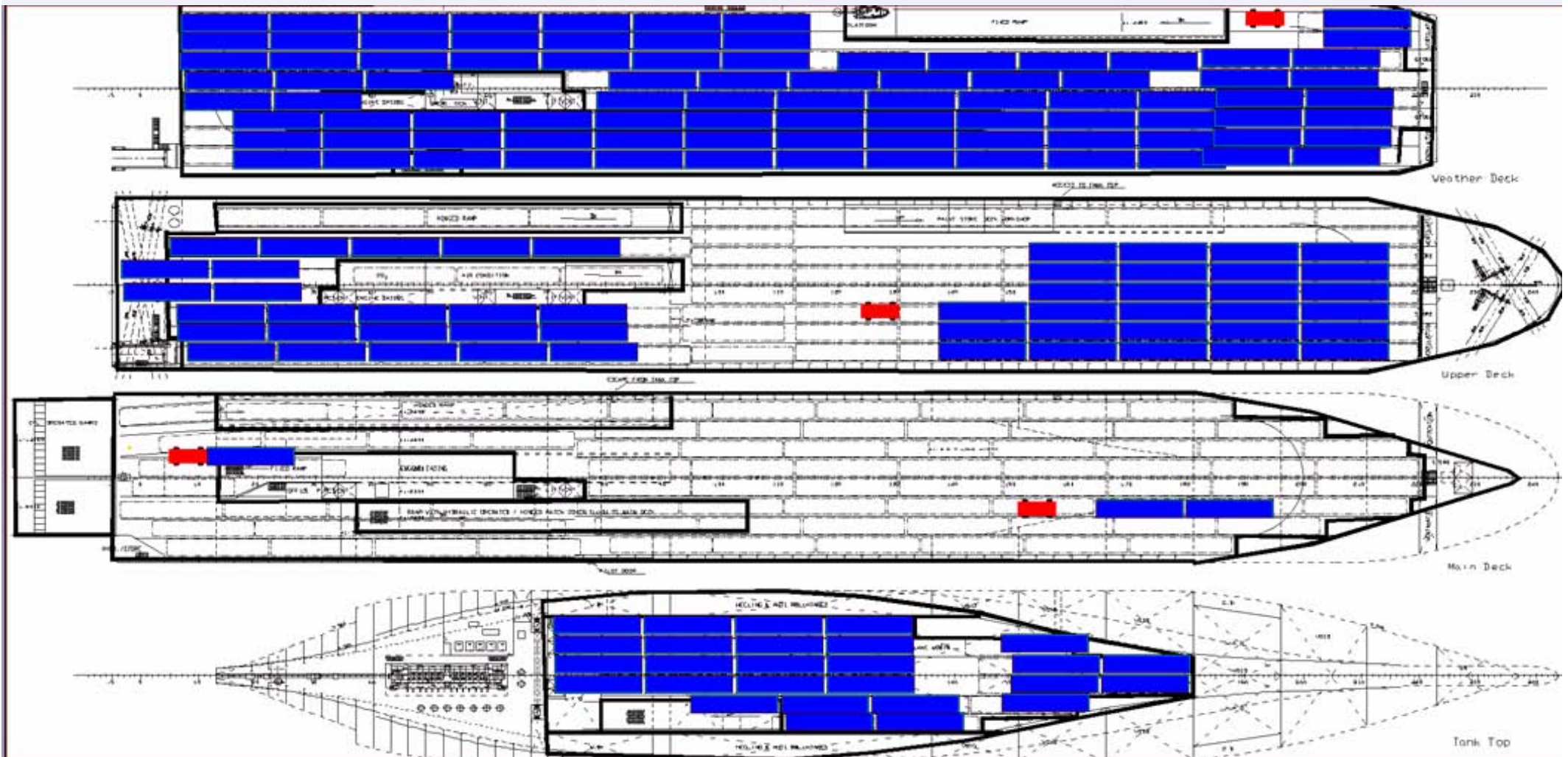
- *the particular business,*
- *general procedures,*
- *port facilities,*
- *terminal capabilities,*
- *skills of the crew...*



The shipyard can...

- ...feed a simulation program with all the data provided by the customer,*
- ...investigate different design configurations,*
- ...predict the time for unloading and loading of the vessel.*

Usefulness of ramp configuration





Example 2:

Seakeeping – Reduction of Roll motions

The owner has...

...his own experience with roll damping systems,

...requirements for cargo lashing,

...requirements for crew habitability.



The shipyard has...

...experience with all passive and active roll damping systems.

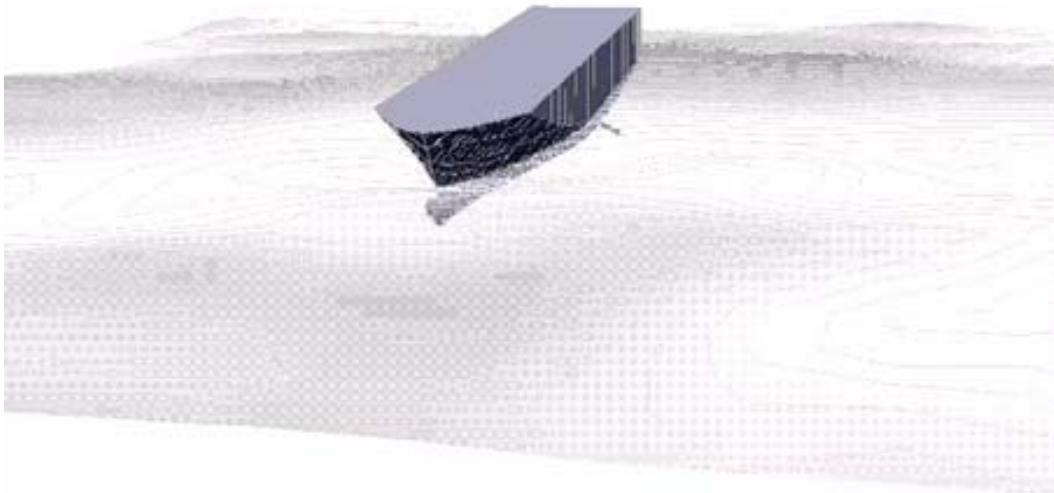
... the tools to simulate the effects of different systems in order to find the best solution for the intended area of operation.

(Less lashing, cargo damages etc. versus costs and loss of cargo.)

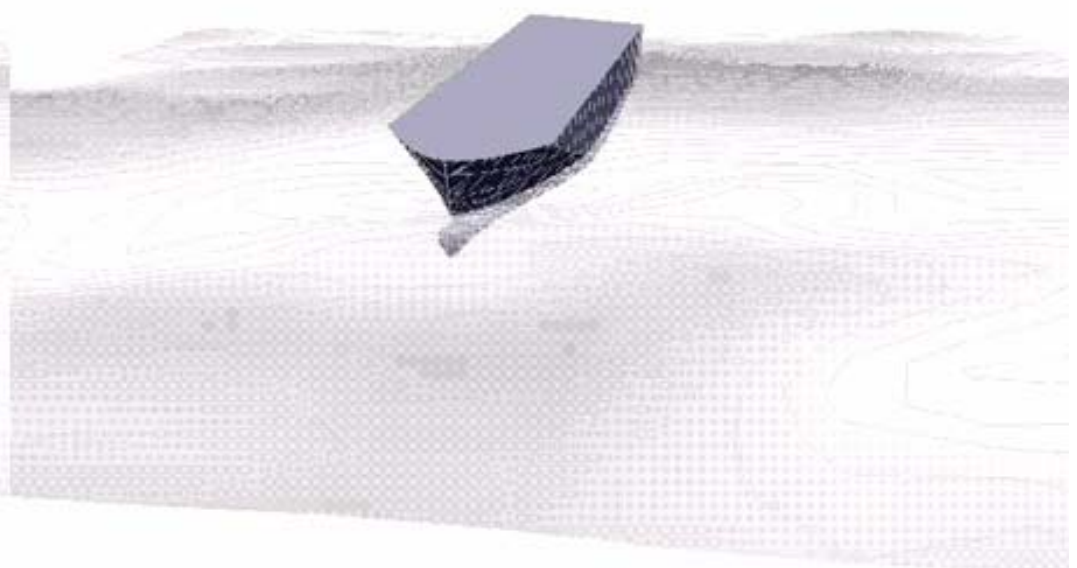


Usefulness of fin stabilizers

T=11.0s, H 1/3= 6.0m
no wind, Speed: 10.0knots
320.1s



T=11.0s, H 1/3= 6.0m
no wind, Speed: 10.0knots
320.1s





Example 3:

System design with regard to maintenance and operation

The owner has...

...the concept for the system design,

...requirements for accessibility and removableness,

...requirements for maintenance and his own maintenance program.



The shipyard has...

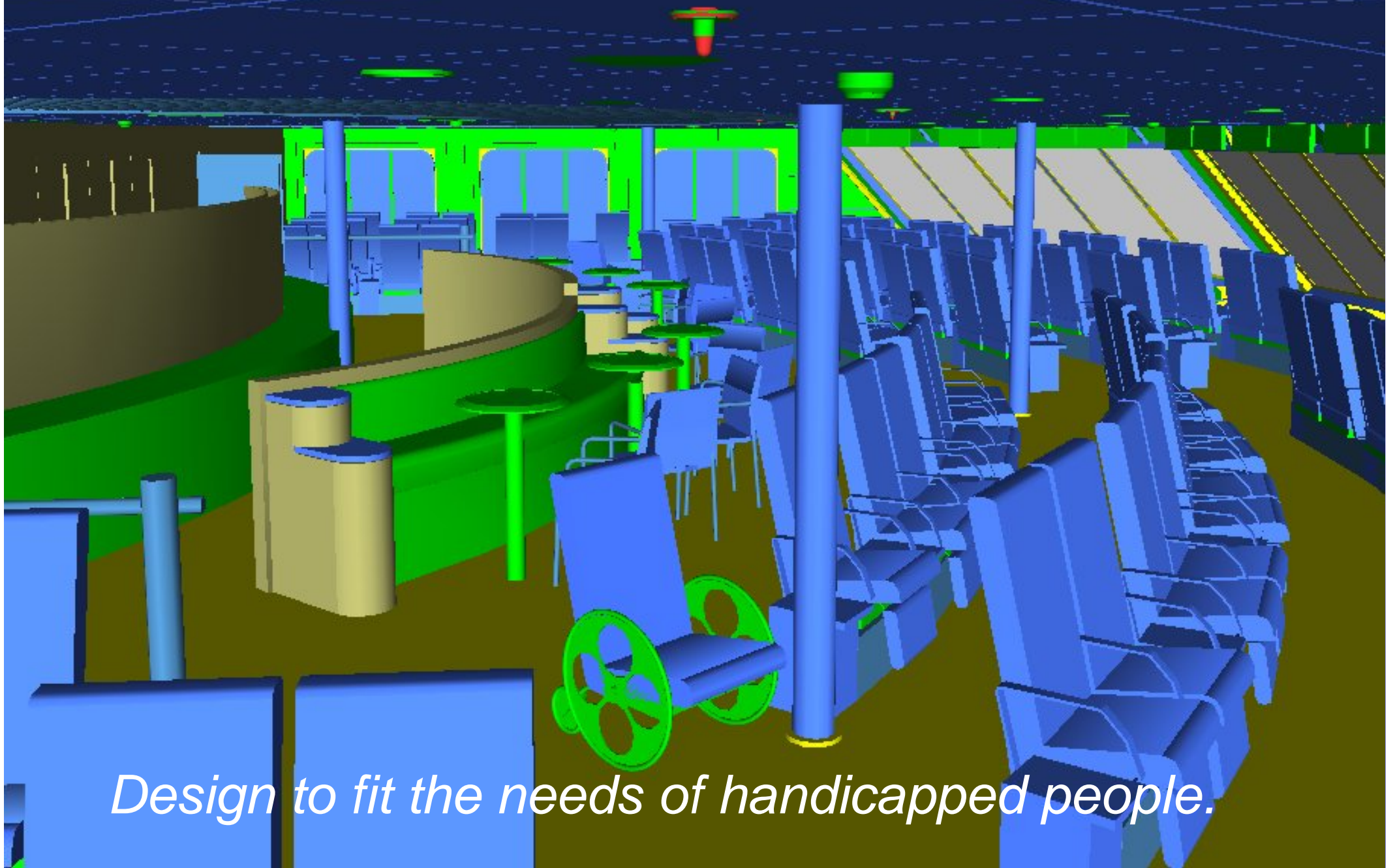
...a complete 3D model of the vessel for

- optimisation with regard to maintenance,*
- crew training in virtual reality,*

...manuals and documentation in electronic format as an input for the maintenance software,

...recycling and disposal information in the 3D model for all materials and components

Example...



Design to fit the needs of handicapped people.



Summary and Conclusion

“An efficient ship is profitable and environmentally compatible”

An efficient ship is profitable and it complies with the safety, health and environment (SHE) policy of the owner, flag state and IMO.

(Leading to mandatory or non-mandatory SHE requirements)



To realise this, the shipyard should

...understand the owner's business,

...be well familiar with legal requirements,

...analyse possible hazards,

*...study the safety, health and environment
policy of the owner,*



To realise this, the shipyard should

- ...define quality measures jointly with the owner,*
- ...establish a detailed evaluation schema for all technical decisions,*
- ...develop and compare technical solutions with aid of modern software tools,*
- ...find solutions on a sound rational basis rather than on a subjective opinion.*



This leads to
Quality
and increases the ship's
Efficiency.

Thus,
Quality makes sound business sense!



SHIP EFFICIENCY

by STG

