

DESIGN OF A LOW-WASH INLAND PATROL BOAT

Master Thesis Presentation by Radomir JAŠIĆ

Supervised by Prof. André HAGE

Developed in DN&T, Belgium

The Need For Development

- Increased river transport
- Increased need for safety and control
- Modernization of fleet
- Compliance to recent trends in the field

Wake is a Comprehensive Pollutant

- Safety impact
 - Safety of people
 - Safety of vessels
 - Structural damage
- Environmental impact
 - Sediment transport
 - Weathering of rocky shores
 - Disturbance of flora nad fauna
 - Increase of emitted gasses

Multihull Design as State of the Art

- Extremely slender hulls
- Wave cancelation between hulls
- Breaking waves in the field



-Picture taken from <http://www.freerepublic.com>

Form Follows Function

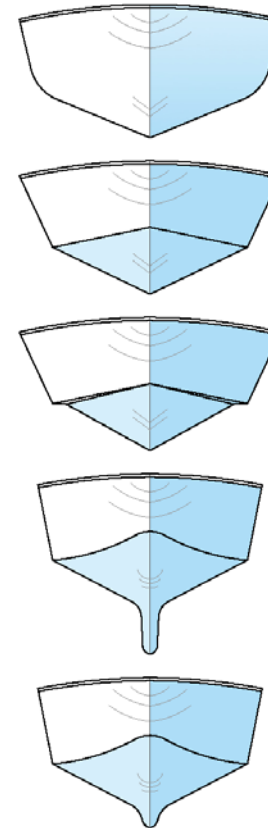
As a Design Concept

- Hull form as function of requested performance
- Structure able to support use in wide range of conditions
- Open and closed spaces compliant to needs of performing daily tasks
- Propulsion providing maximum reliability in all conditions
- Daily on-board provisions

Learning Lessons of the Past

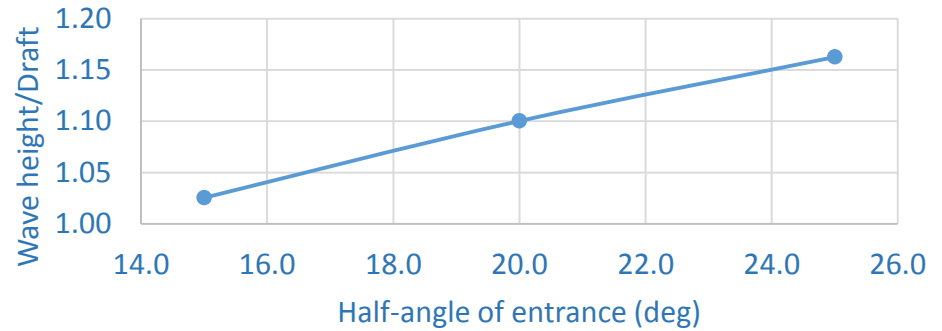
Exploration of existing designs and their respective characteristics

- Round chine hull
- Single hard chine V hull
- Double hard chine V hull
- Axe bow wave piercing hull
- Modified axe bow hull

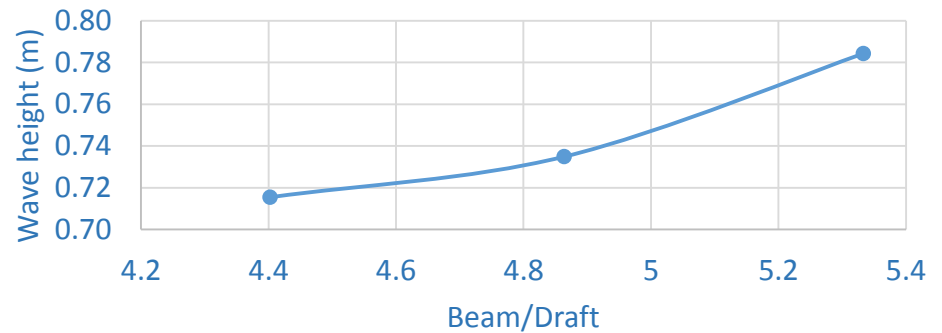


Wake is Defined by a Set of Hull Variables

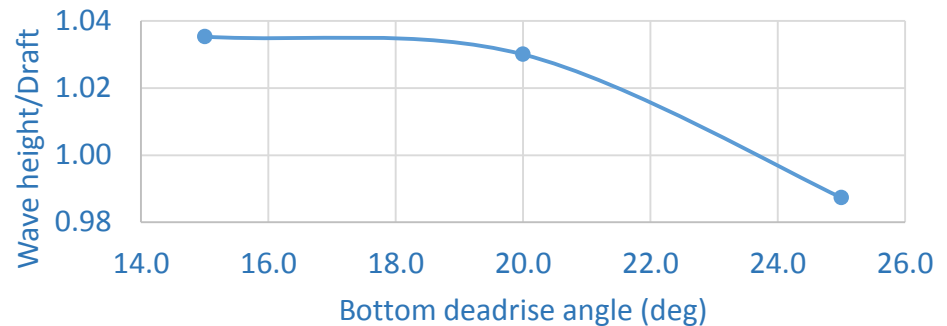
- Angle of entrance



- Beam/Draft ratio

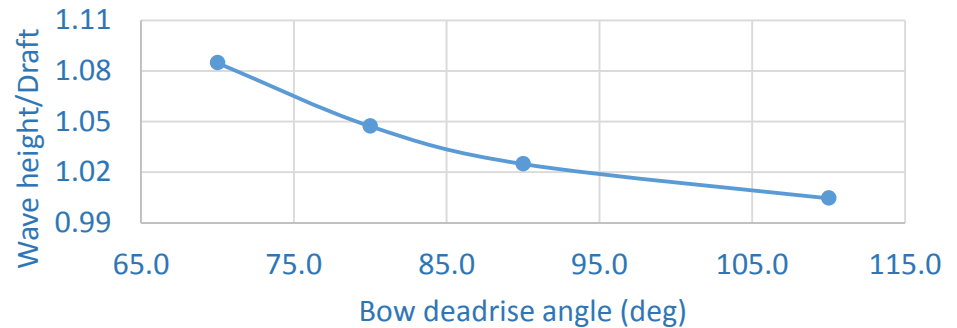


- Bottom deadrise angle

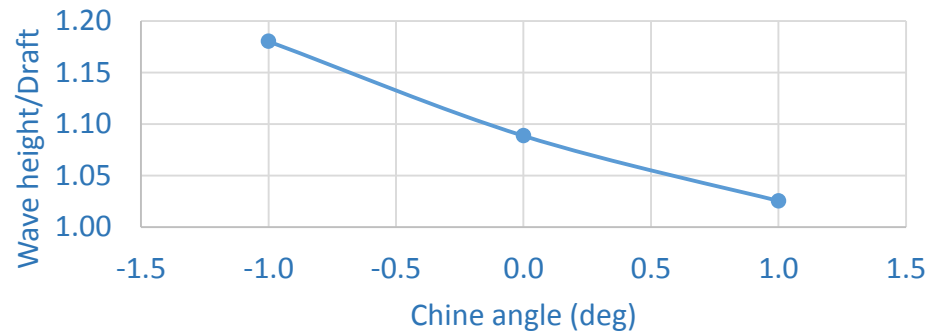


Wake is Defined by a Set of Hull Variables

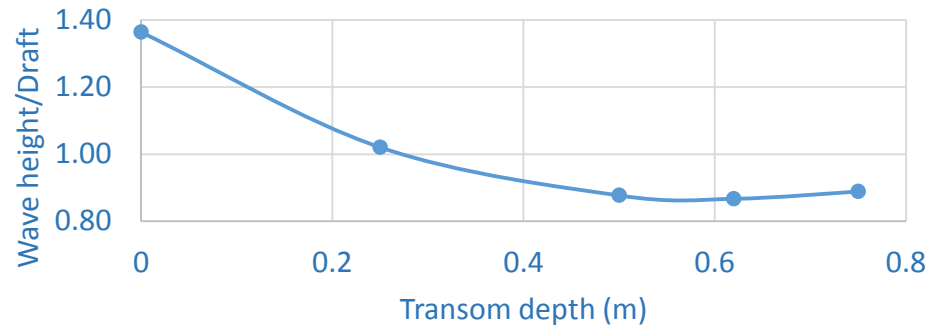
- Bow deadrise angle



- Chine longitudinal angle

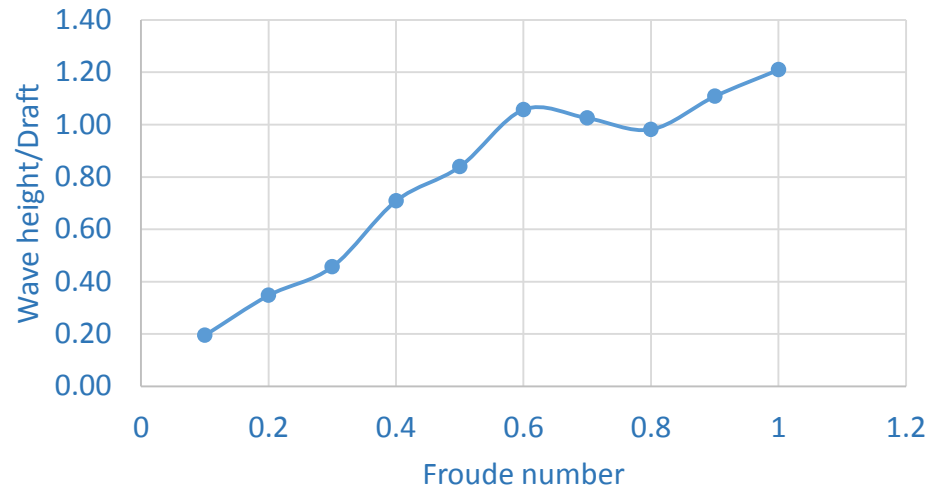


- Depth of transom

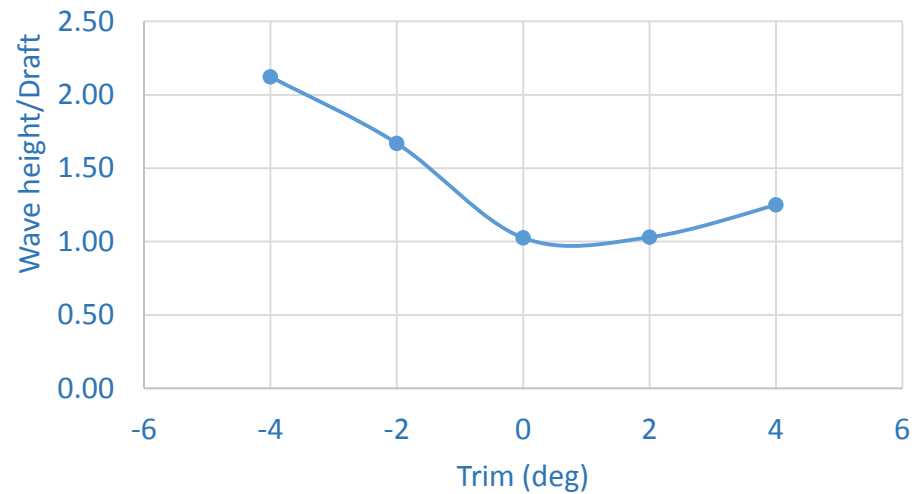


Wake is Defined by a Set of Hull Variables

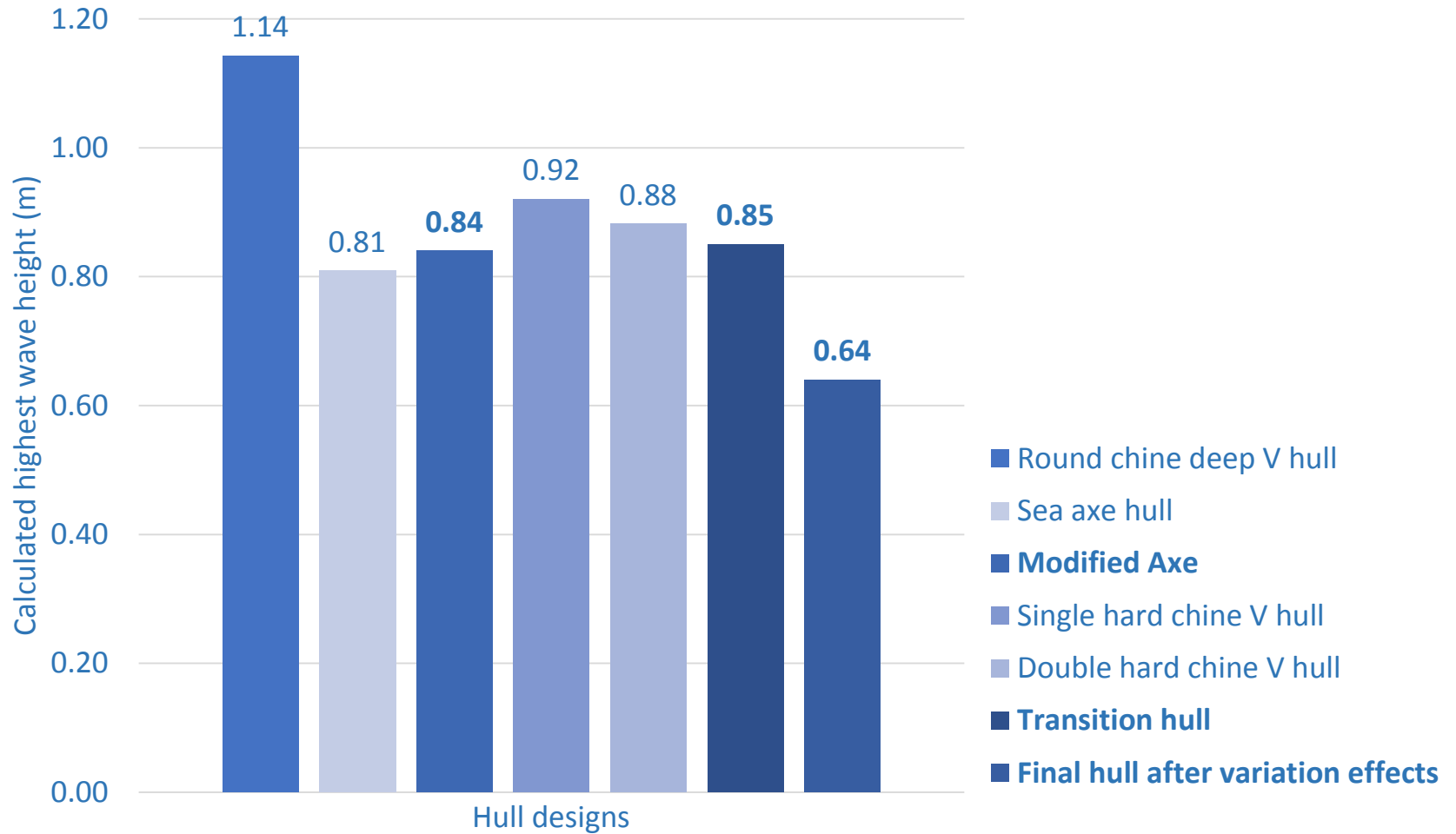
- Velocity



- Trim angle

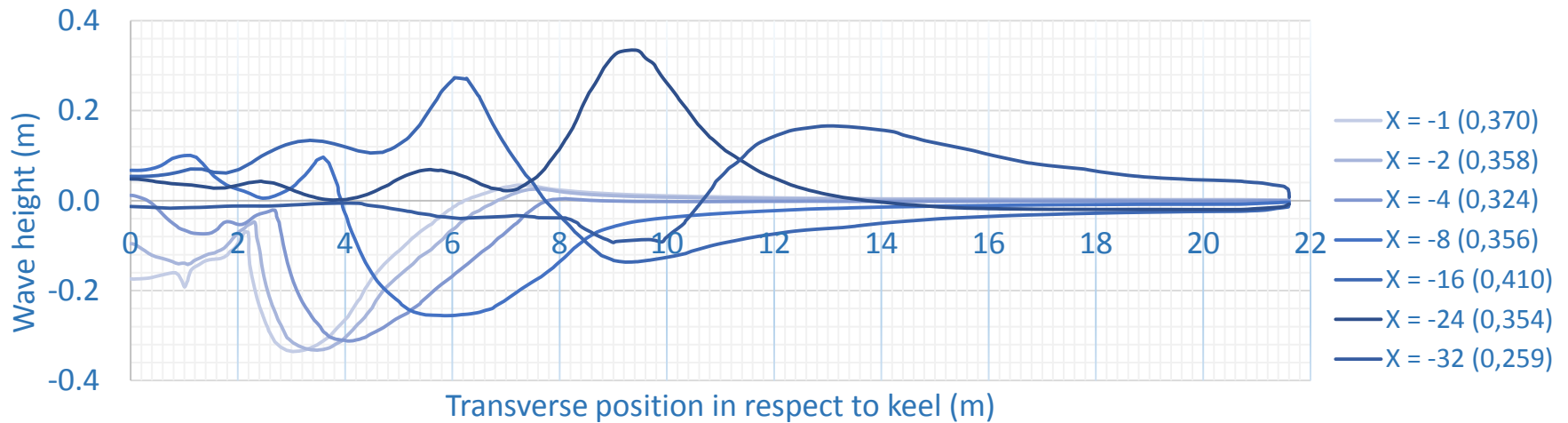
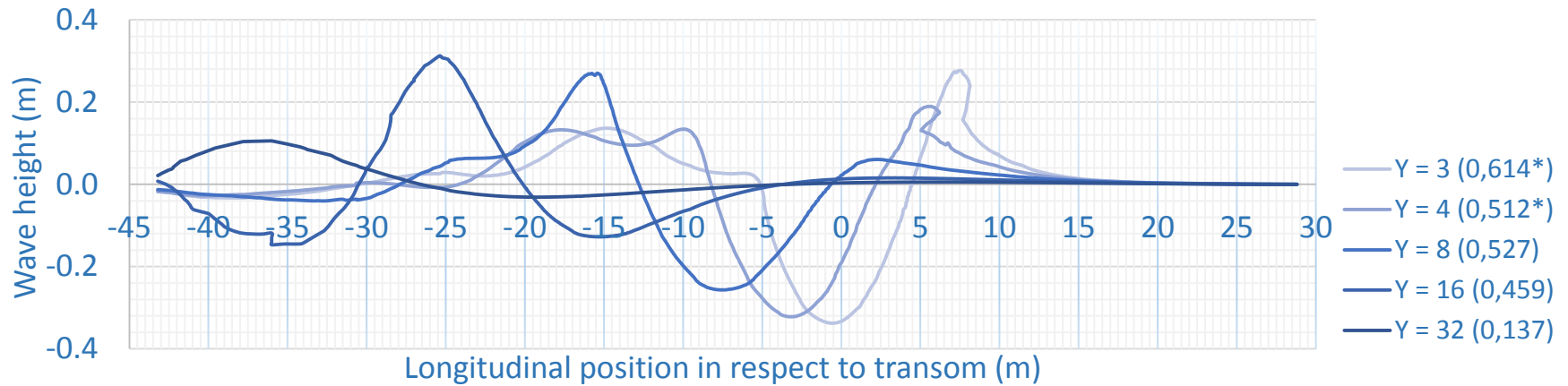


35% Lower Wake Through Superposition

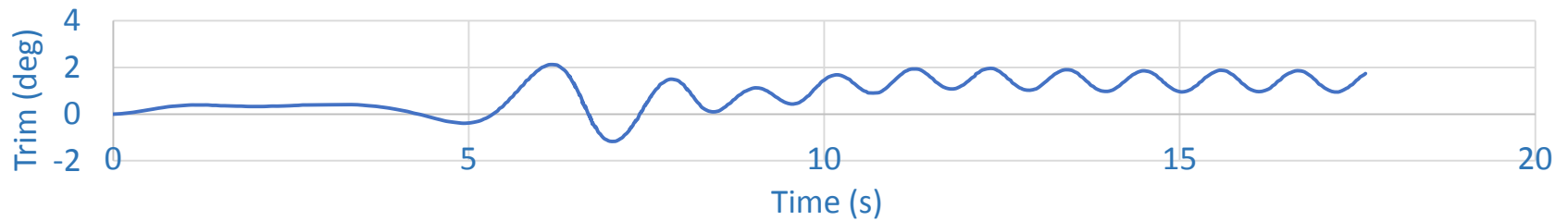


Wave Field Analysis Results

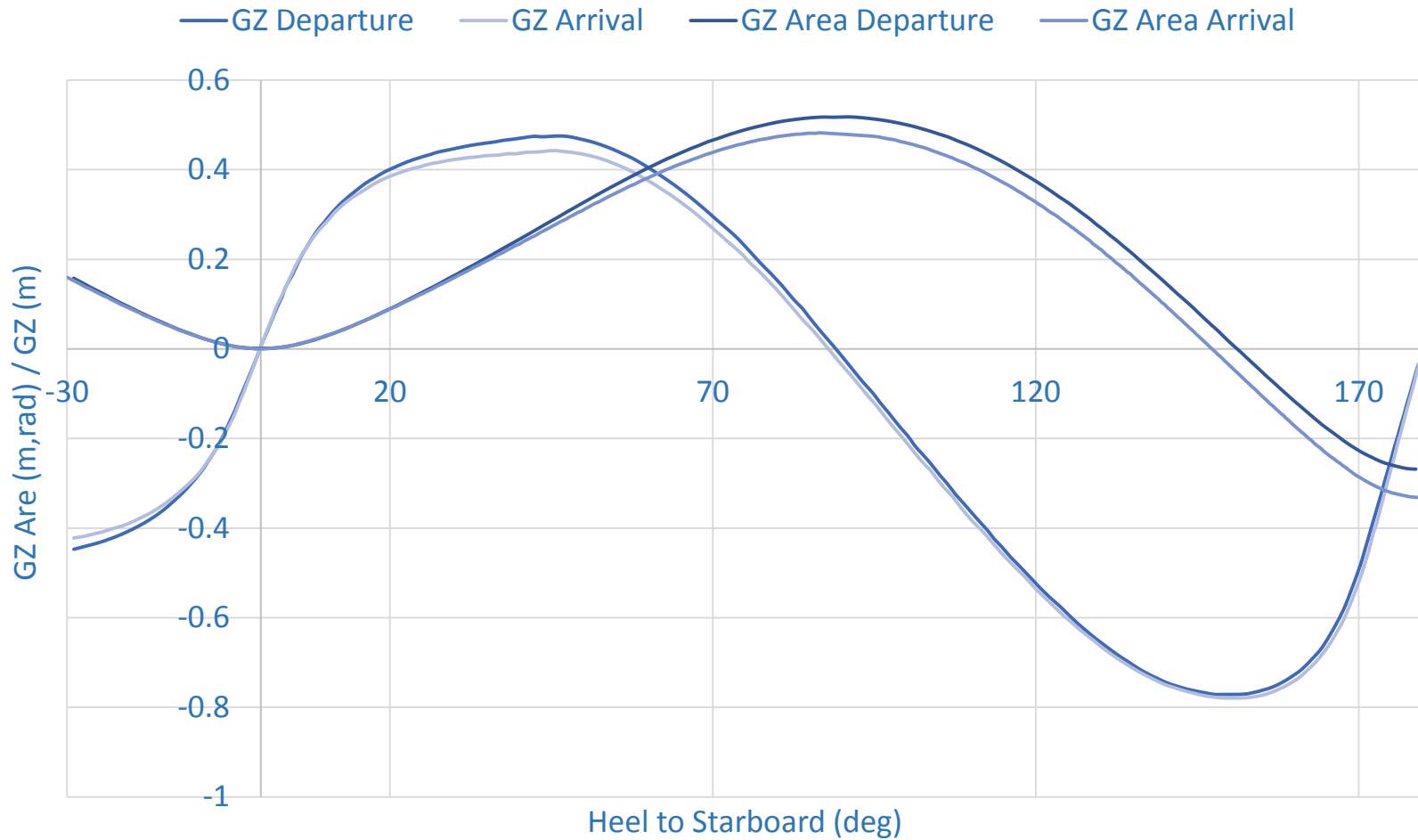
Waves at specific position in the field provide better understanding of wake



Seakeeping Qualities for Safe Operation

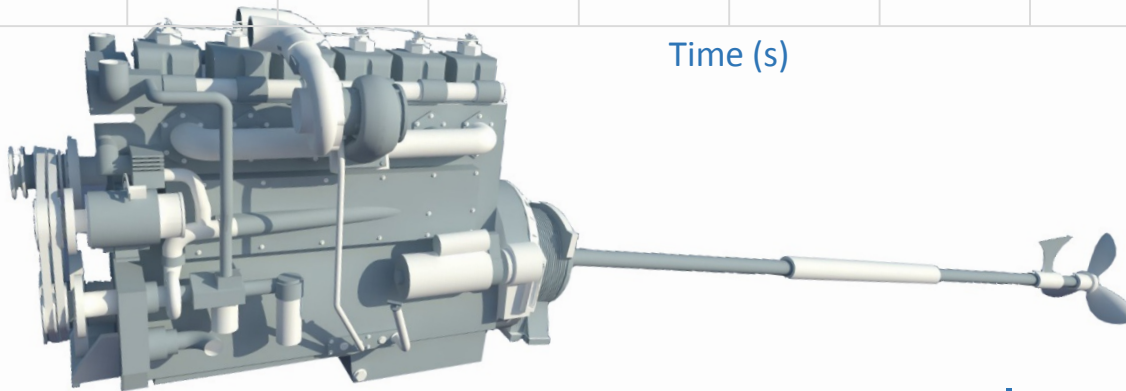
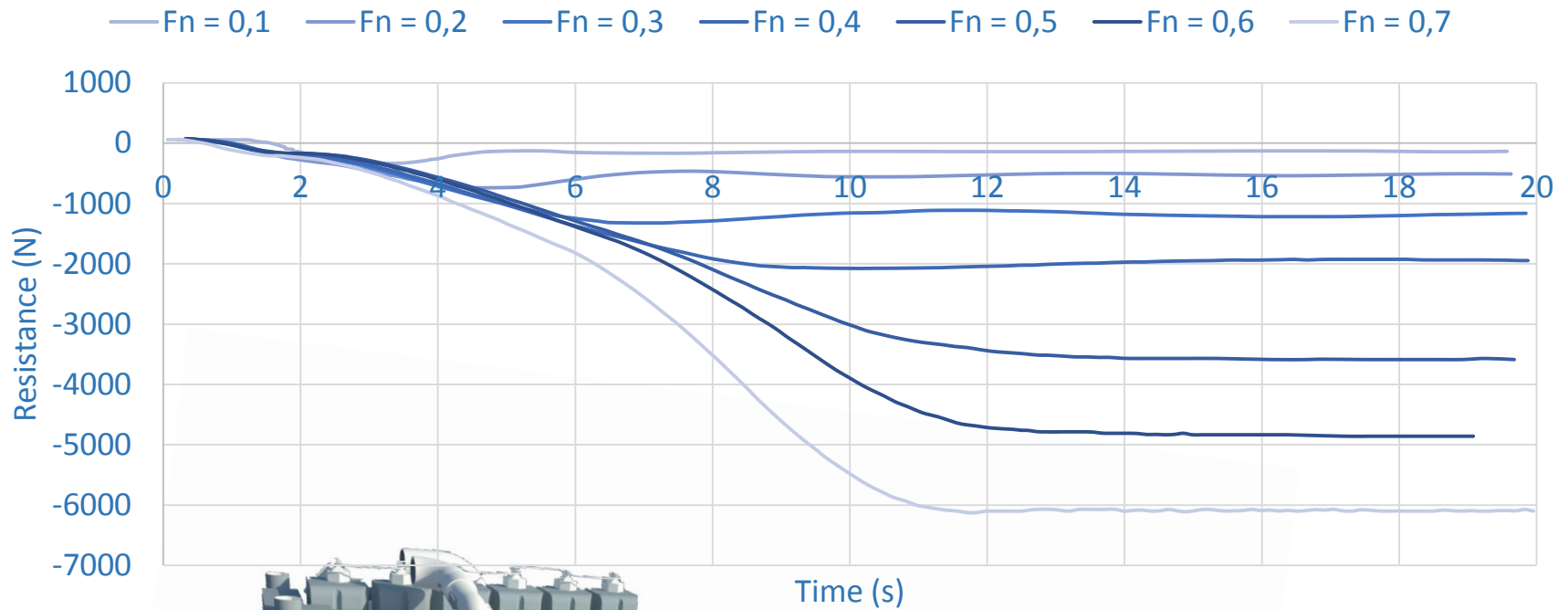


Stability in Accordance to BV rules



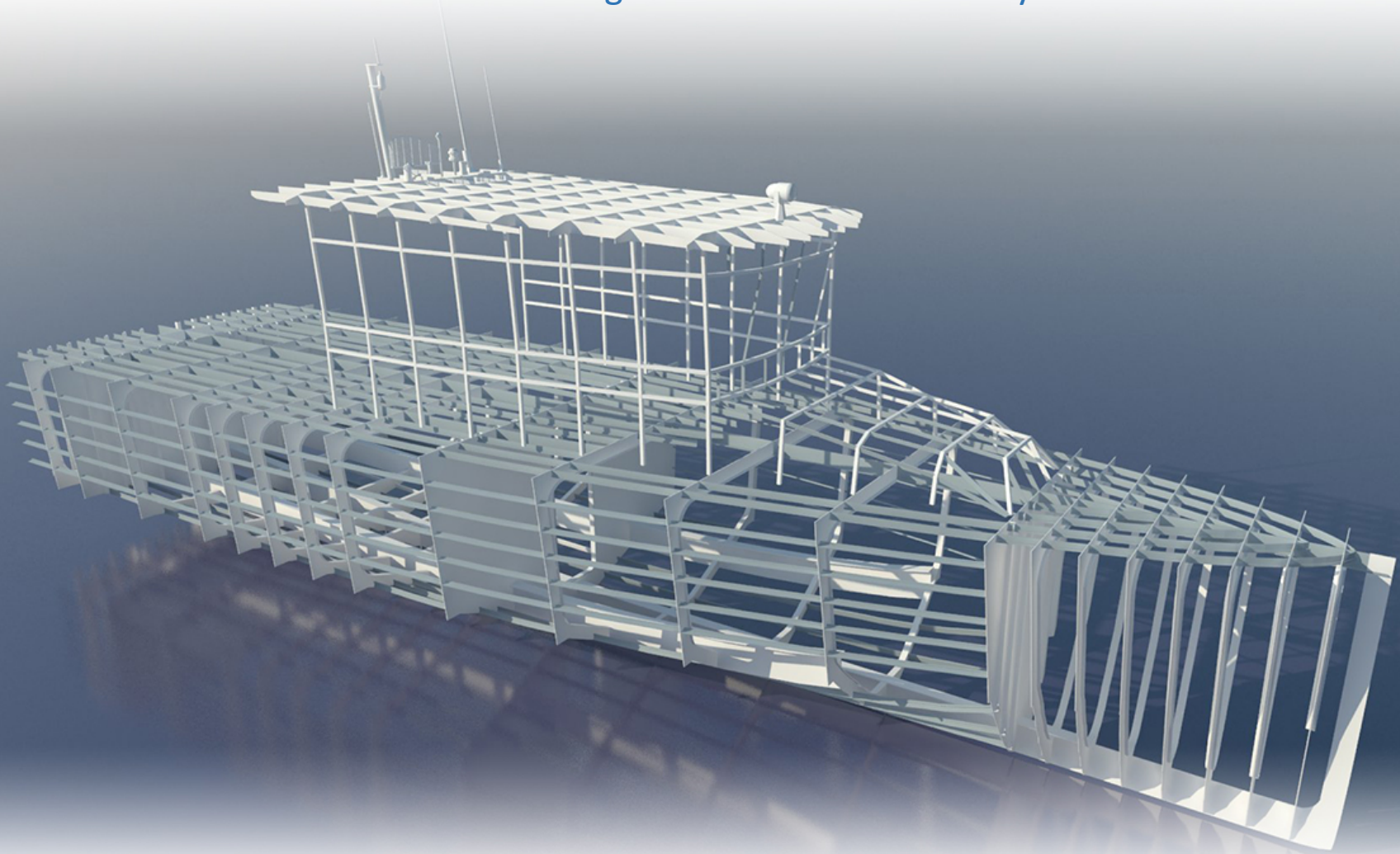
Power and Propulsion

In-line system for prolonged and maintenance-free use



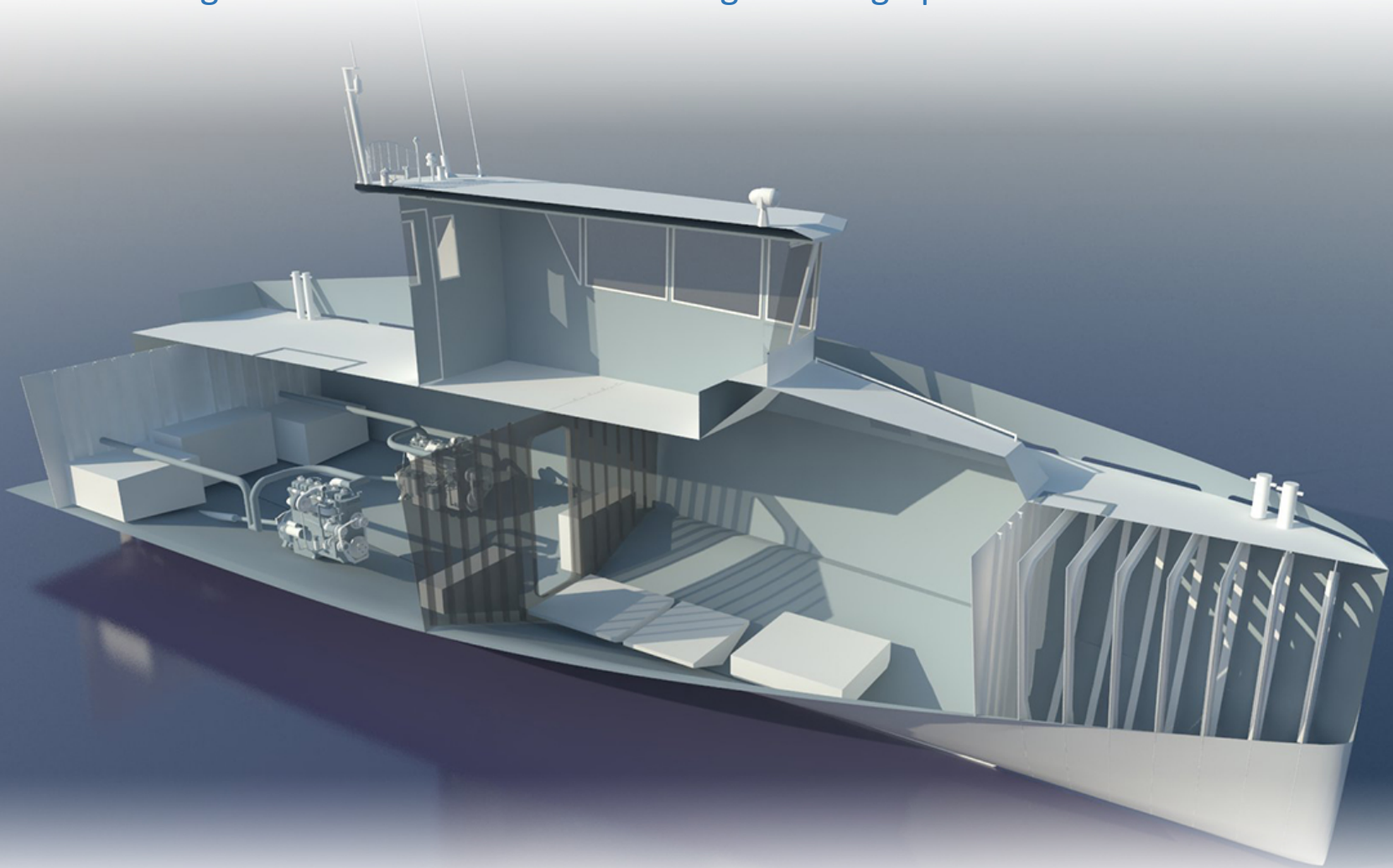
Structure and Scantling

Aluminium structure in mixed longitudinal and transverse system



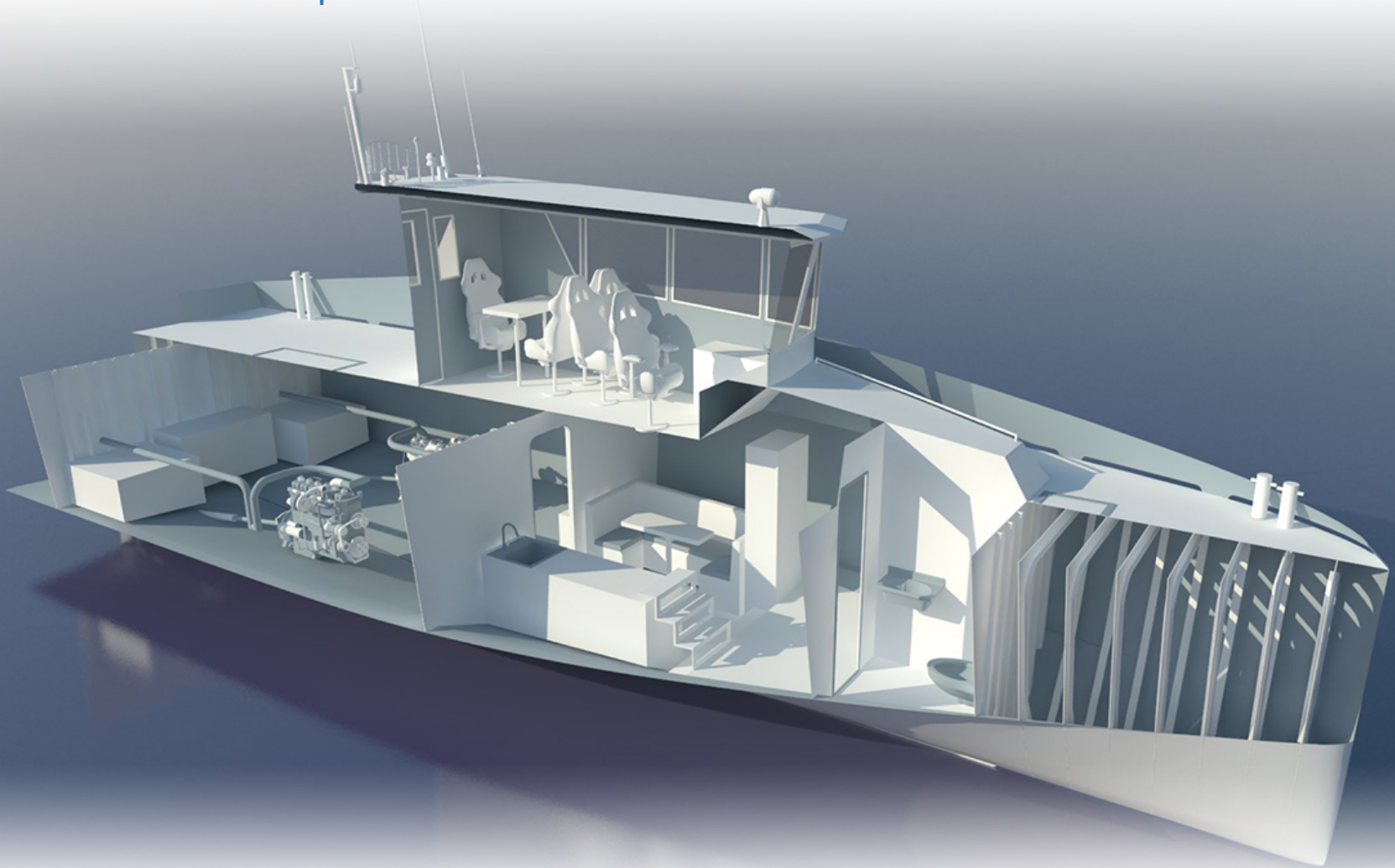
Tank Disposition

Positioning of tanks determines trim changes during operation



General Arrangement

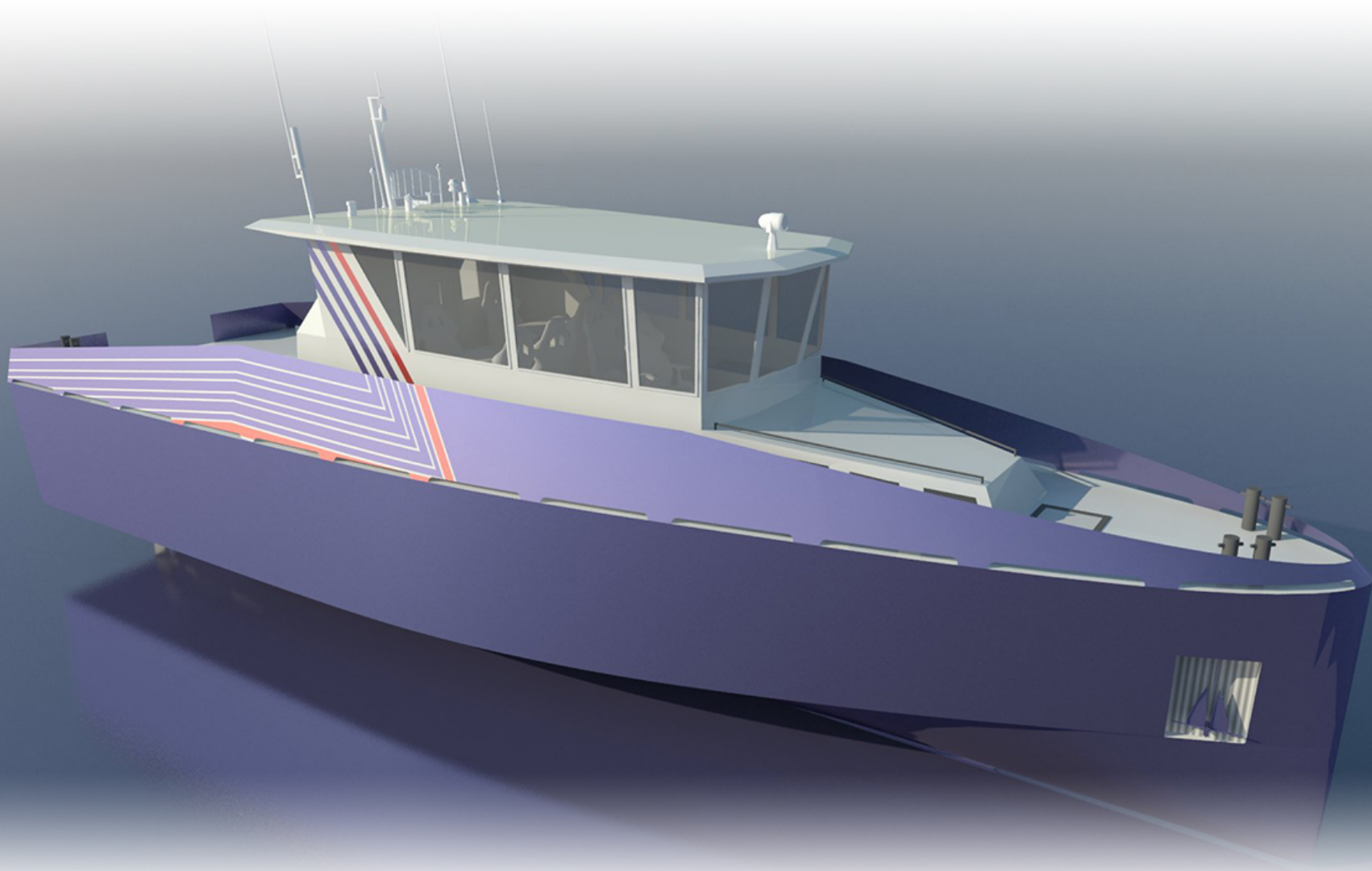
Multifunctional spaces without existence of unutilized areas



Final Product Look



Final Product Look



Keypoints

- Wake is a comprehensive pollutant
- Designing a hull means designing its wake
- Functionality is luxury that is often neglected