



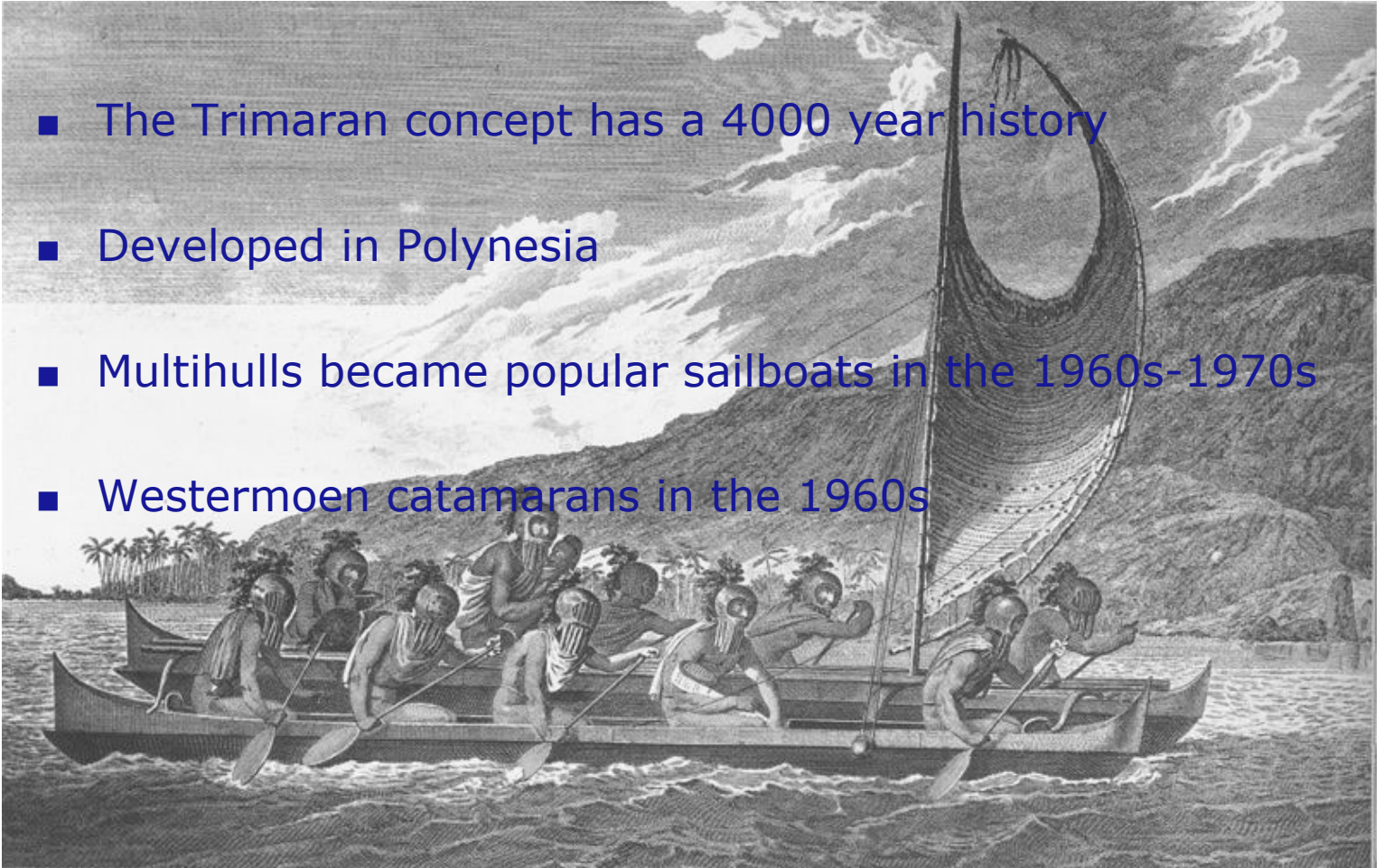
"Trimaran konsept for operasjon i nordlige farvann"

Erlend Hovland

seabed-to-surface

History

- The Trimaran concept has a 4000 year history
- Developed in Polynesia
- Multihulls became popular sailboats in the 1960s-1970s
- Westermoen catamarans in the 1960s



History



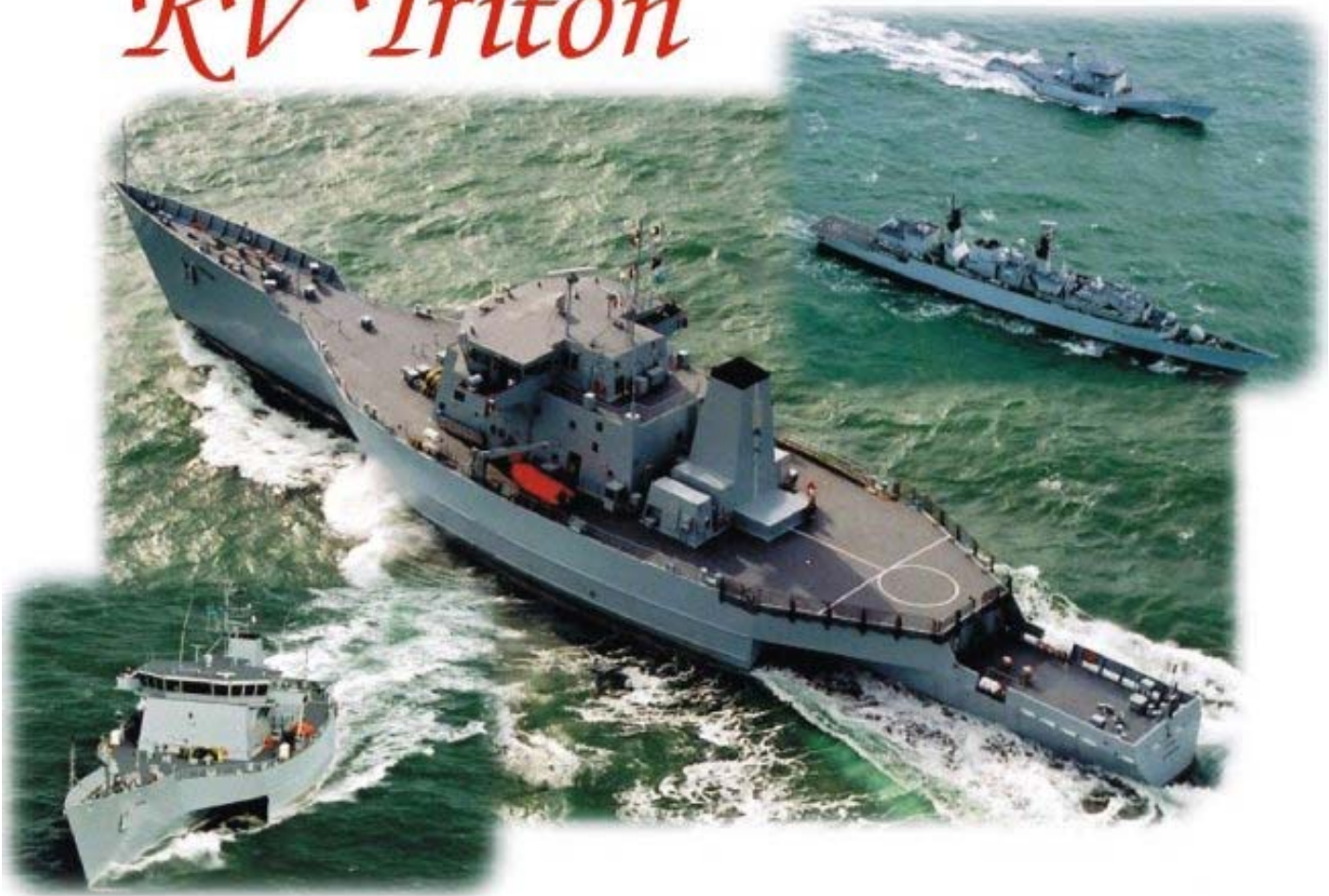
- Ilan Voyager (1988)
Loa 21.3m
 V_{\max} 28 knots
World record holder
circumnavigation



- Adventurer (1998)
Loa 35m
 V_{\max} 24 knots
World record holder
circumnavigation

History

RV Triton



History



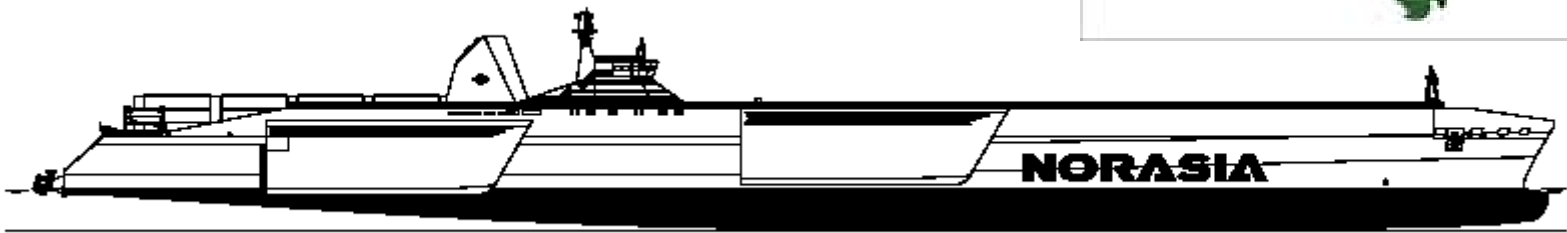
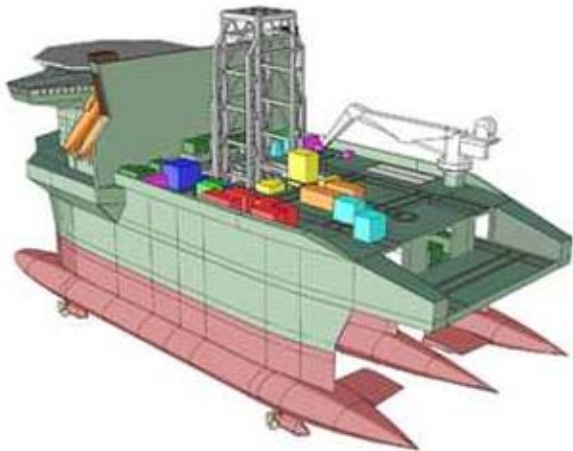
- Benchijigua Express

Loa: 127m

V: 40+ knots



Future?



Development of a Trimaran for Offshore Applications

"Evaluation of Vessel Concepts for Subsea Operations in Northern Seas"

3 year study financed by Acergy Norway AS and Statoil

In co-operation with The University of Stavanger

Develop and evaluate vessel concepts for oil and gas related activities in areas with a harsh environment, typical Northern Hemisphere locations, such as

- North and Norwegian Sea
- East Coast Canada
- West of Shetland
- Barents Sea



Problems with vessels in operation

- Lack of deck space
- Excessive use of ballast
- High roll motions
- Low transit speed
- Dayrate/Efficiency



Solution: Trimaran!

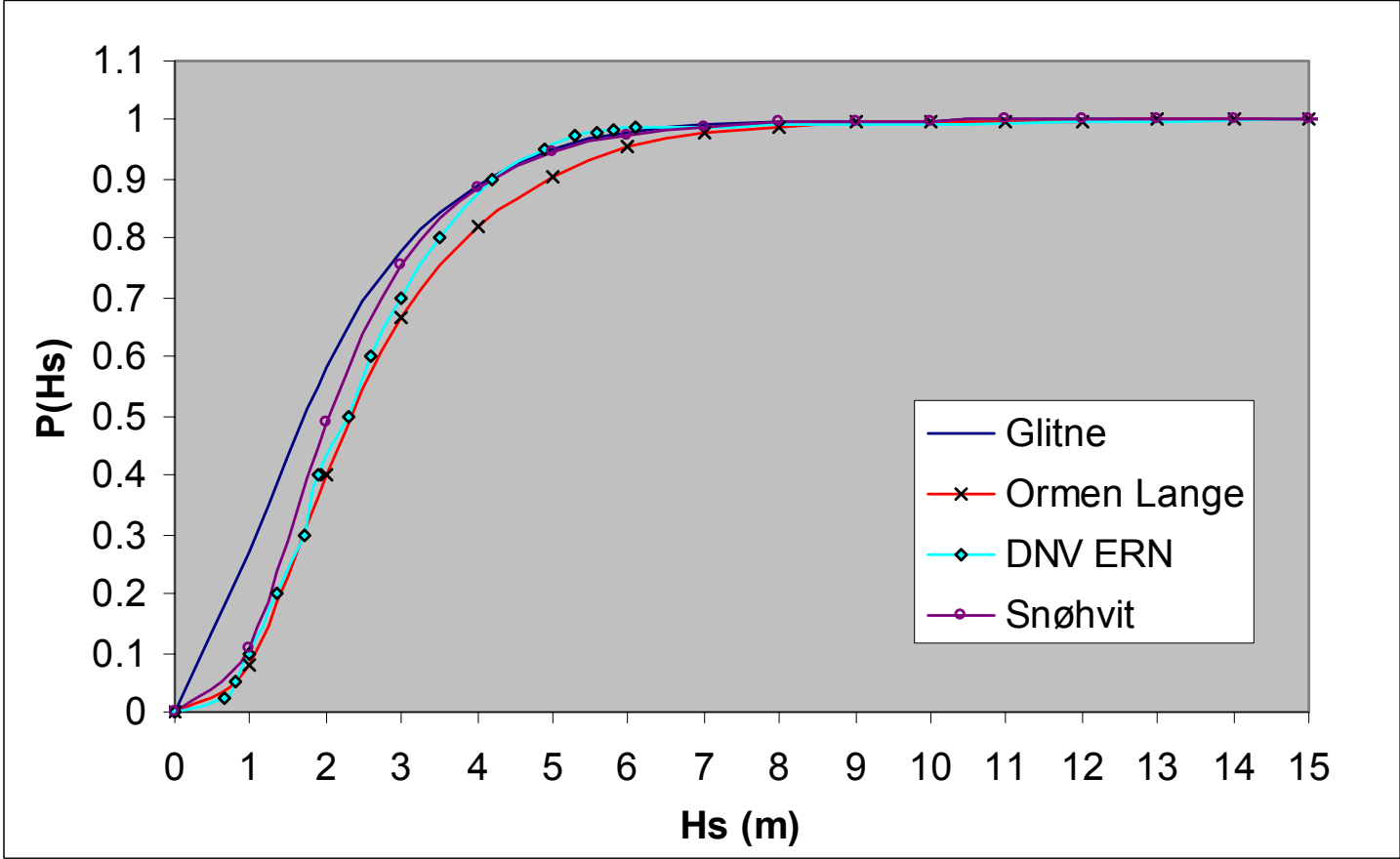
Offshore Vessels - Desired Characteristics

- Low dayrate / high efficiency
- High payload / good stability
- Favourable vessel motions / high operational seastate
- High speed / low resistance
- DP capability
- Large deck area
- Positions for launch and recovery

Sub-Arctic Operations - Desired Characteristics

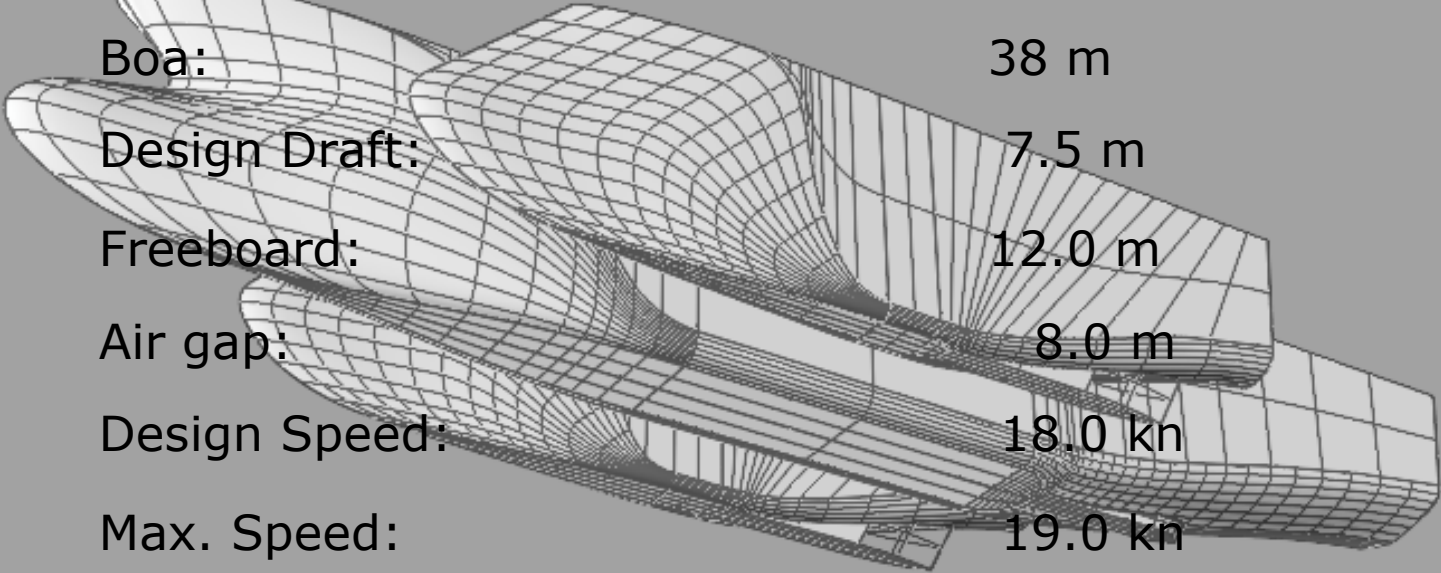
- Good stability to cope with extreme icing
- High Freeboard to prevent seaspray icing on deck
- High transit speed
 - Long distances
 - Escape
 - Response time
- Stable work platform - high operational seastate
- High redundancy in systems
- Covered and heated work stations
- High efficiency in operations and ports

Operational Seastate



Trimaran Offshore Vessel

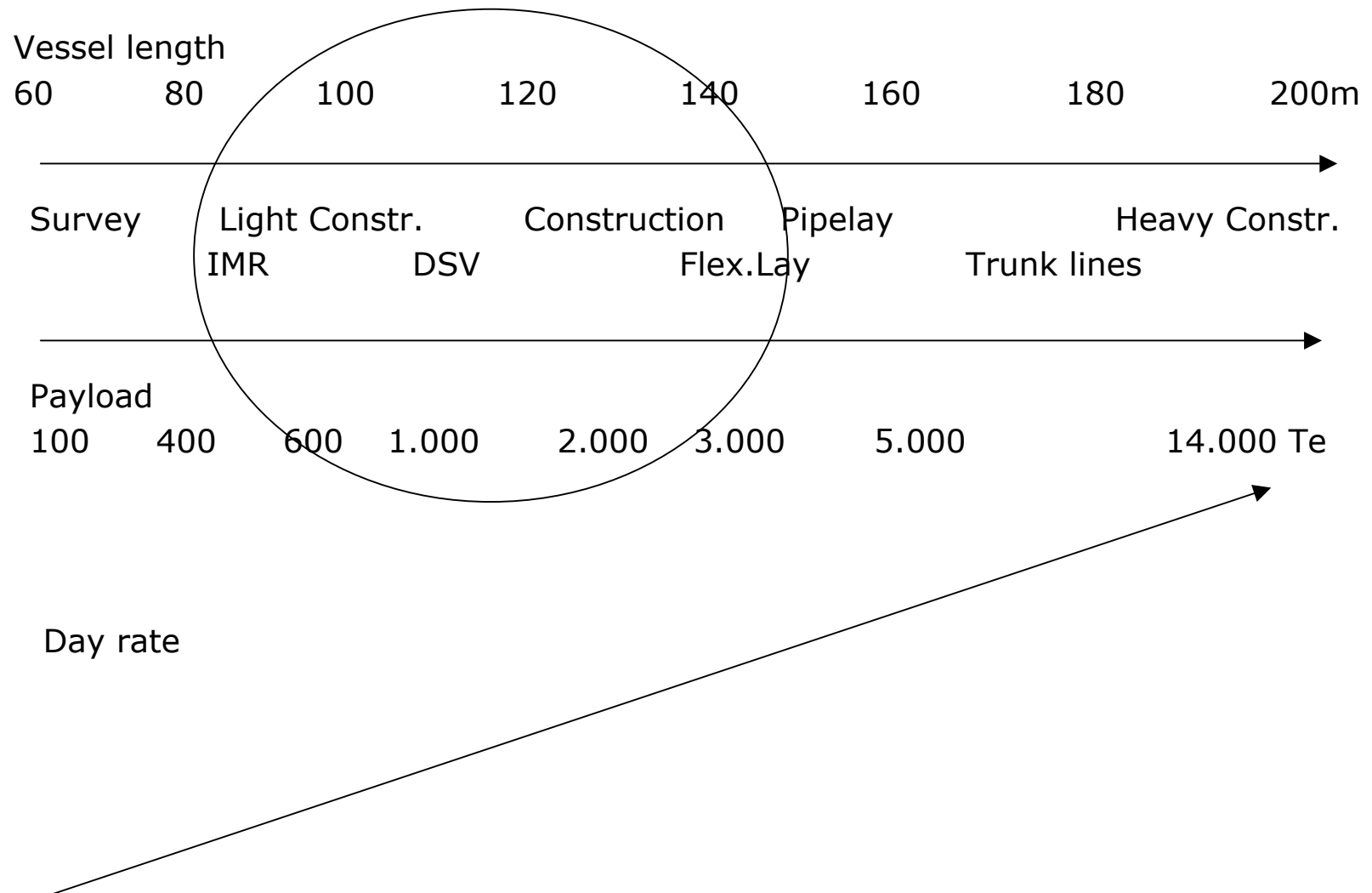
Main Dimensions:



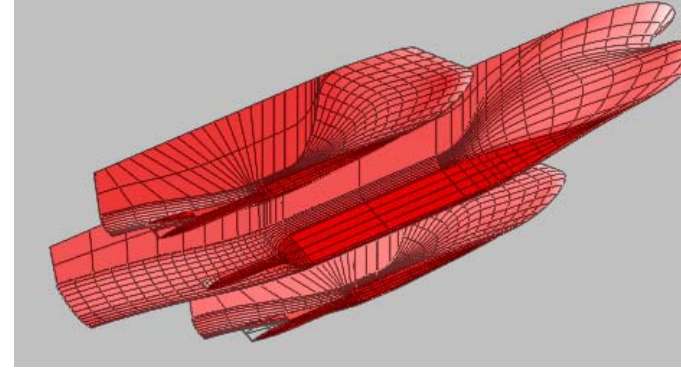
A 3D wireframe model of a trimaran offshore vessel, showing the hull structure and deck layout. The vessel has three hulls, with a central hull and two side hulls. The model is rendered in a light gray wireframe style, highlighting the complex geometry of the hull and the deck area.

Loa:	130 m
Boa:	38 m
Design Draft:	7.5 m
Freeboard:	12.0 m
Air gap:	8.0 m
Design Speed:	18.0 kn
Max. Speed:	19.0 kn
Displacement:	13 000 Te
Deck Area:	2 700 m ²

Market combinations



Why a Trimaran?



- High Efficiency
 - In operation
 - In transit
 - In mob/demob
- Stability
 - Good stability in combination with low resistance
 - Good stability in combination with low roll response
- Large deck area
- Possibility to spread launch and recovery positions for intervention equipment over a larger area

Compared with traditional design

- Approx. 15% more expensive to build
- Capital costs of a vessel is approx. 30% of the dayrate
- Due to higher efficiency; 4-8% increased operational time p.a.
- Result:

2-10% cost savings compared to traditional design

!WOW! and marketing value

Tank Trials

MUN

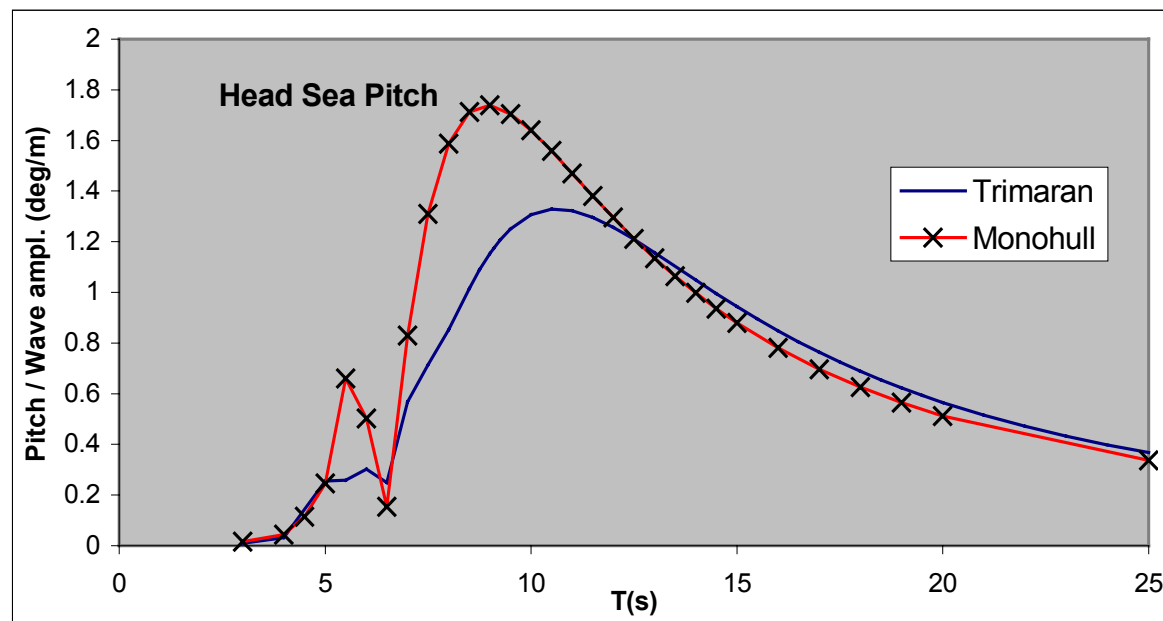
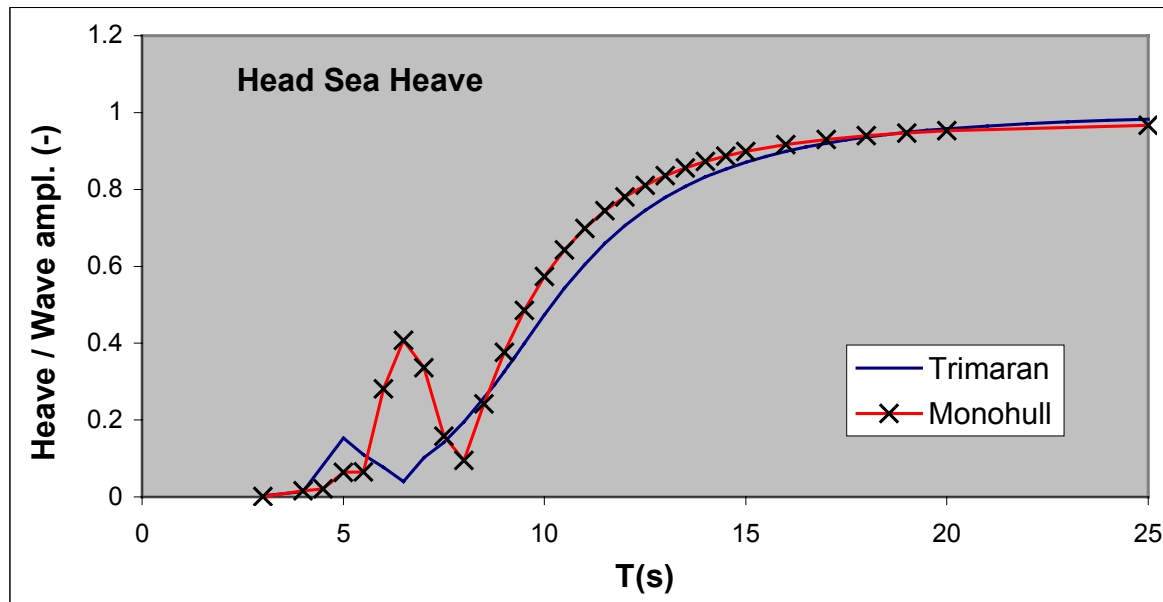
- A 1:50 scale model was built and tested at the 60m tank at Memorial University of Newfoundland
- Tests included model resistance and response in regular waves at 0 Fn for head, beam and quartering seas.
- Tank test results were compared with theoretical analysis and gave good consistency.



Comparison with a monohull

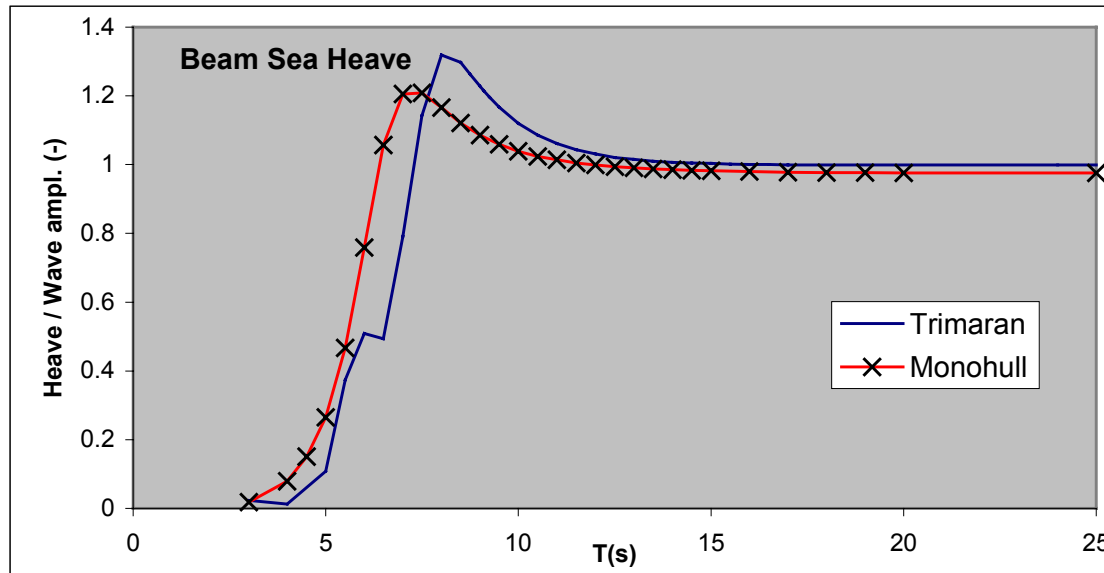
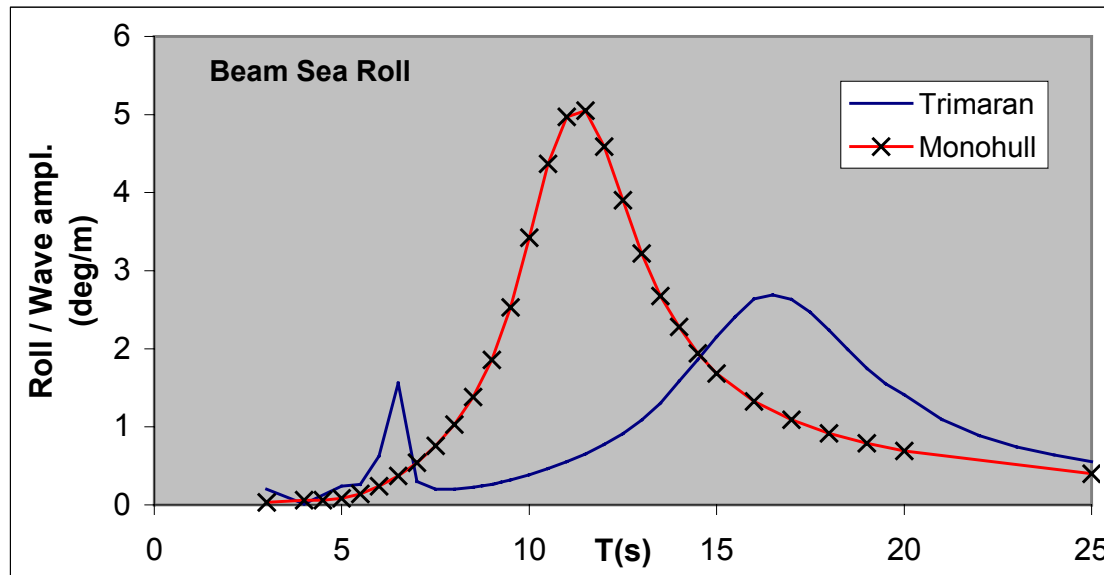
Motions

Comparison of RAO's



Motions

Comparison of RAO's

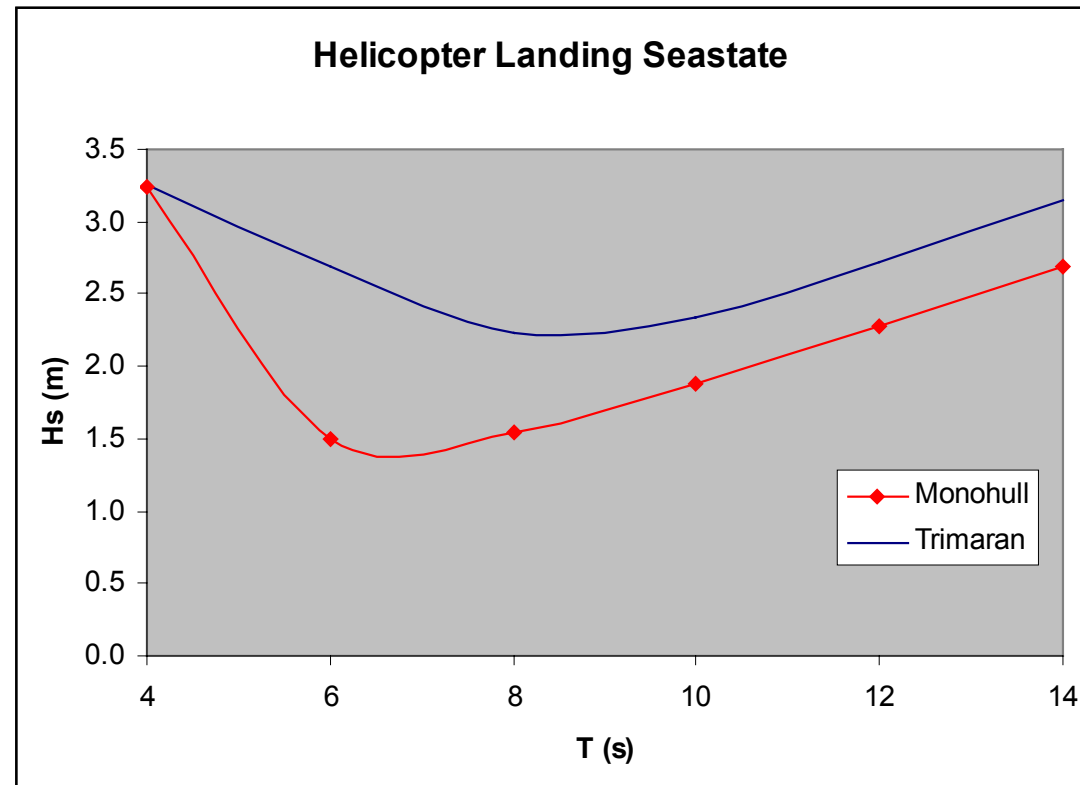


Practical example: Helicopter landing

Helicopter Landing Criteria (Norsk Helikopter)

Max values in a 20 min seastate:

Heave Velocity: 1m/s
Roll motion: 2 deg.
Pitch motion: 2 deg.



Conclusions

Conclusions

- The possibilities one have to include roll and pitch damping devices are larger on a trimaran than on a monohull.
- Another favourable quality with a trimaran is the possibility one has to position vital functions at ideal locations.
- There are no technical “show stoppers” in the trimaran concept
- Economics: Dayrate/days in operation may prove to be lower for the trimaran than a conventional design in the IMR market
- The trimaran for offshore operations is a concept worth further work and consideration. The vessel motions and resistance characteristics are good, the large deck and launch and recovery options for intervention equipment opens new possibilities.

Next Generation Offshore Vessel?

