

Highly customized designs to meet the most demanding technical requirements.

Case study: mooring vessel “Forth Constructor”.

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INTRODUCTION

- Growing offshore vessels market.
- Increasing number of marine renewable energy projects.
- More demanding regulations, security standards and comfort onboard.
- Specialization of offshore vessels is encouraged due to tasks as:
 - New installations.
 - Maintenance.
 - Signalling.
 - Personnel transport.
 - Equipment transport and supply.



This is the framework in which FORTH CONSTRUCTOR takes place.

INTRODUCTION – FORTH CONSTRUCTOR

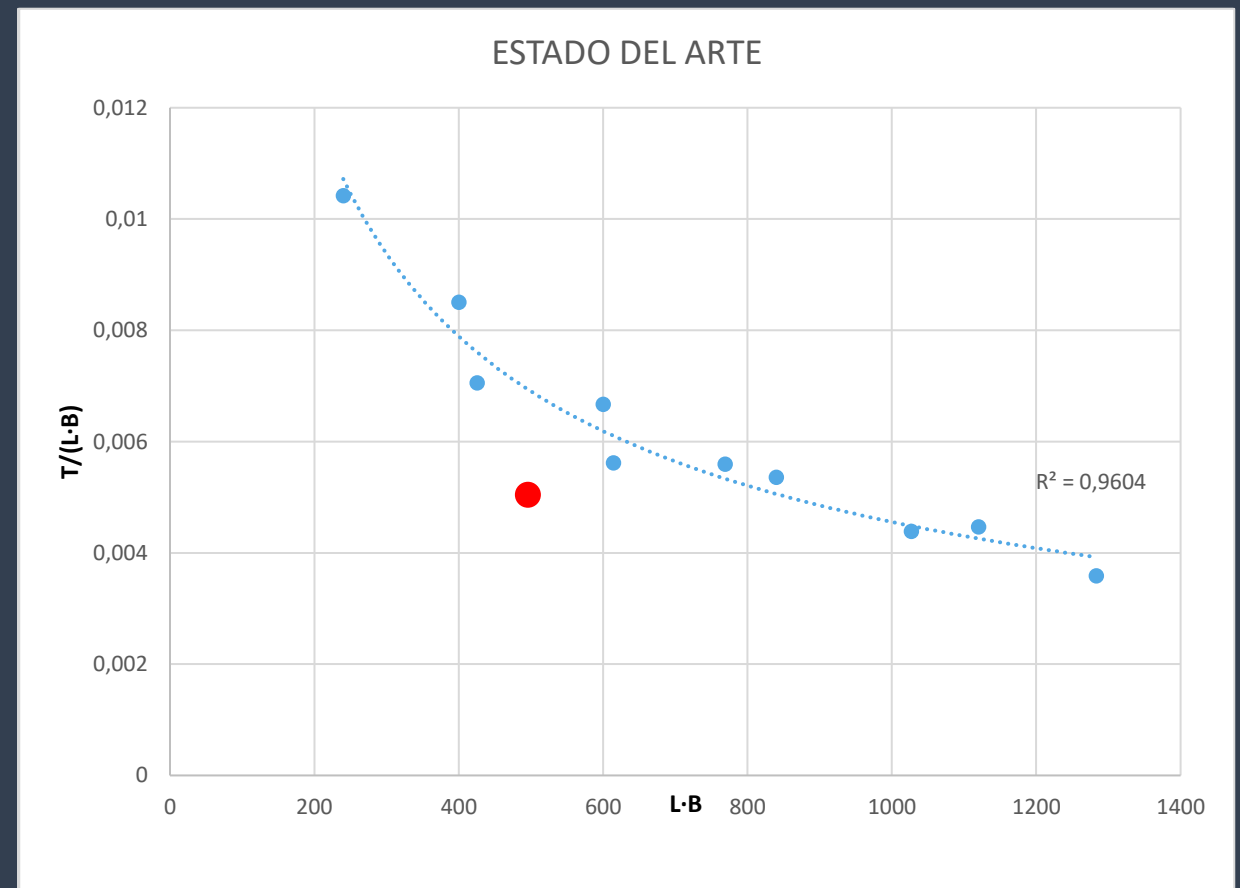
- Highly customized Offshore support and maintenance vessel.
- Owner requirements:
 - Wide working deck.
 - Large storage capacity under deck.
 - 30 t cargo on deck at 2.5 m draught.
 - 75 t cargo on deck at 2.6 m draught.
 - Speed: 11 knots at design draught.
 - Bollard pull: 20t.
 - 40 m total length.
- Compact vessel.



INTRODUCTION – STATE OF THE ART

- The challenge of shallow water operations:
 - Limited draught.
 - High performance.
 - Powerful propulsion system

Highly customized design



VESSEL DESCRIPTION

- Offshore support and maintenance vessel.
- Propulsion system: Diesel-electric with two azimuth propellers.
- Dynamic positioning DP2.
- Four point mooring system.
- Wide working deck.



VESSEL DESCRIPTION – MAIN ROLES

- Undertake the inspection, servicing and replacement of navigation marks and light moorings.
- Transport and installation of replacement components.
- Support for diving operations.
- ROV operating platform.
- Survey operations.
- Marine civil engineering tasks.



VESSEL DESCRIPTION – WORKING DECK

- Wide working deck. 180 m².
- Wooden protected deck.
- Full equipped for mooring operations.
 - Aft and side Rollers
 - Winches.
 - Aft and Side Tow pins.
 - Removable capstans.
 - Areas reinforced with HARDOX plates.
- MOONPOOL for sub sea operations.
- Stern A-Frame up to 20 t.



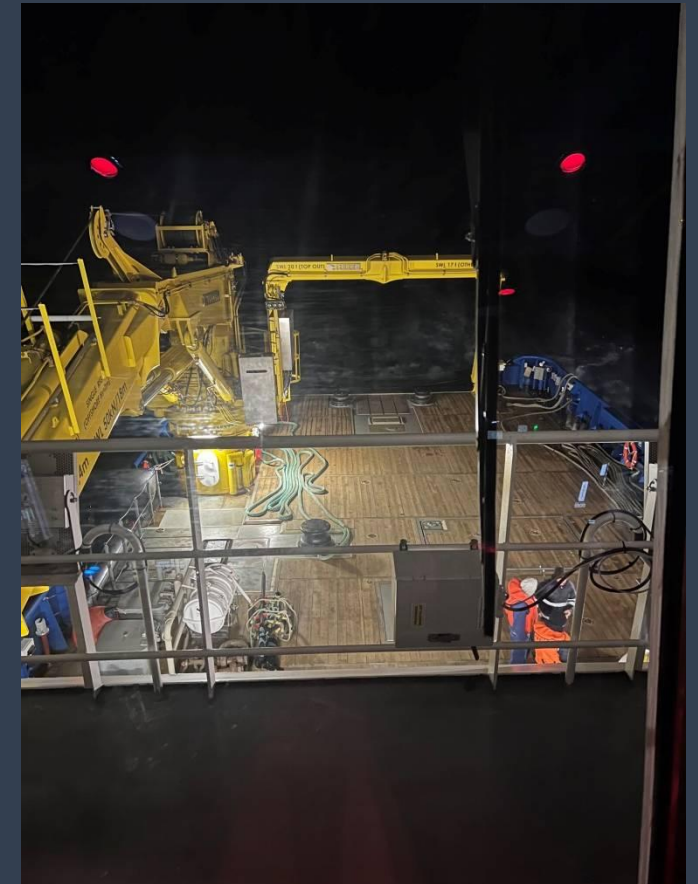
VESSEL DESCRIPTION – WORKING DECK

- Deck crane up to 25 t.
- 5t/m² cargo on deck:
 - Directly stowed.
 - Container cargo secured with flush sockets.
- Complemented with large storage capacity under deck.
- CTV ladder at starboard side.



VESSEL DESCRIPTION – WHEELHOUSE

- Great visibility all around.
- Aft control station for deck operations.
 - Good visibility of the working deck.
- Additional control station at each side.



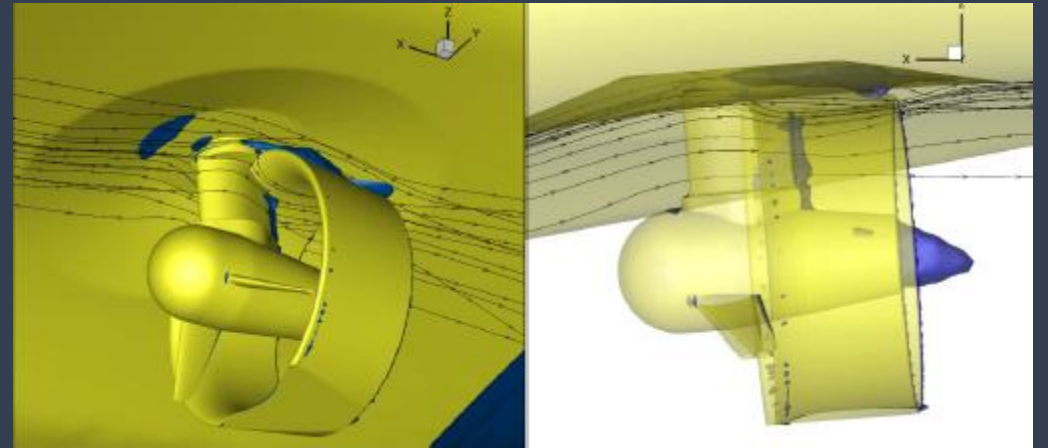
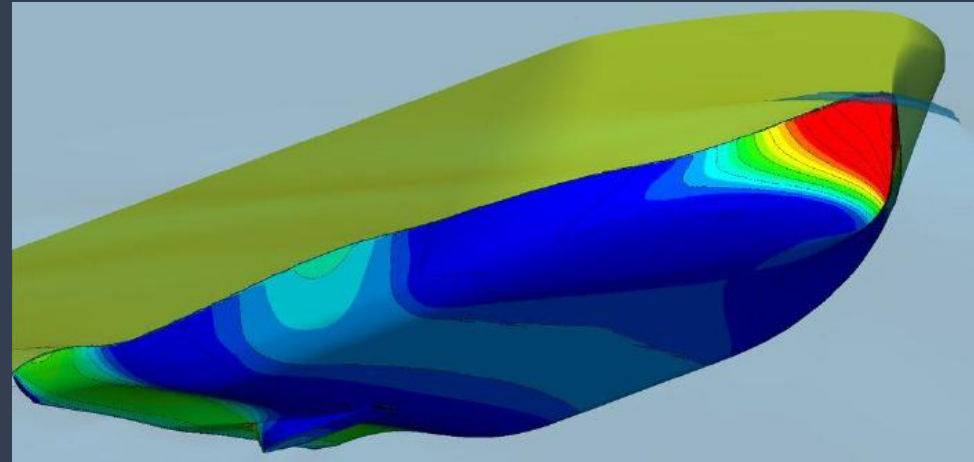
BASIC DESIGN

- Space definition.
 - Accommodation Spaces
 - 6 crew
 - 10 passengers
 - MLC Compliant
- Equipment and Supplier Selection.
- Hull optimization.



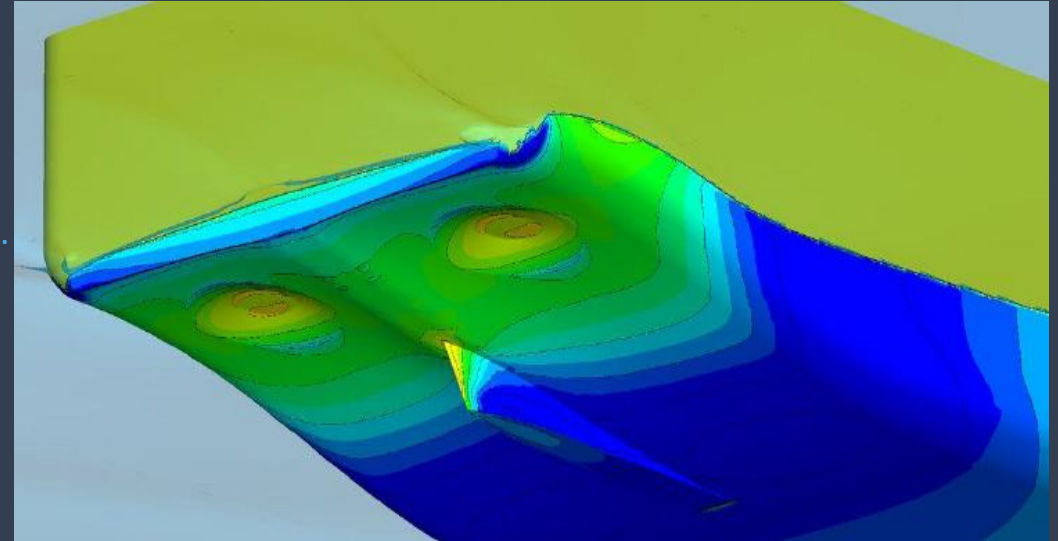
BASIC DESIGN – HULL OPTIMIZATION

- Workboat -> low length/beam ratio.
- Restricted draught.
- Speed requirements.
- Azimuth propellers integration.
- Optimization program by CFD.



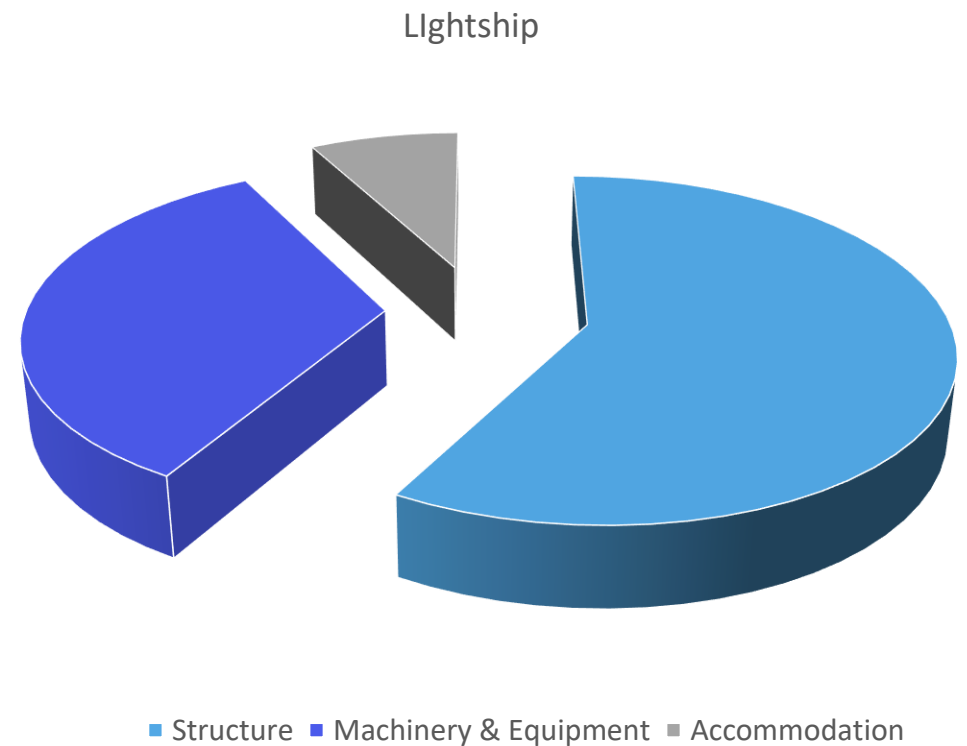
BASIC DESIGN – HULL OPTIMIZATION

- Final results:
 - Equilibrium between the different project requirements.
 - Propellers integration, ensuring good hydrodynamic performance.
 - The results indicate that the vessel will meet the expectations.



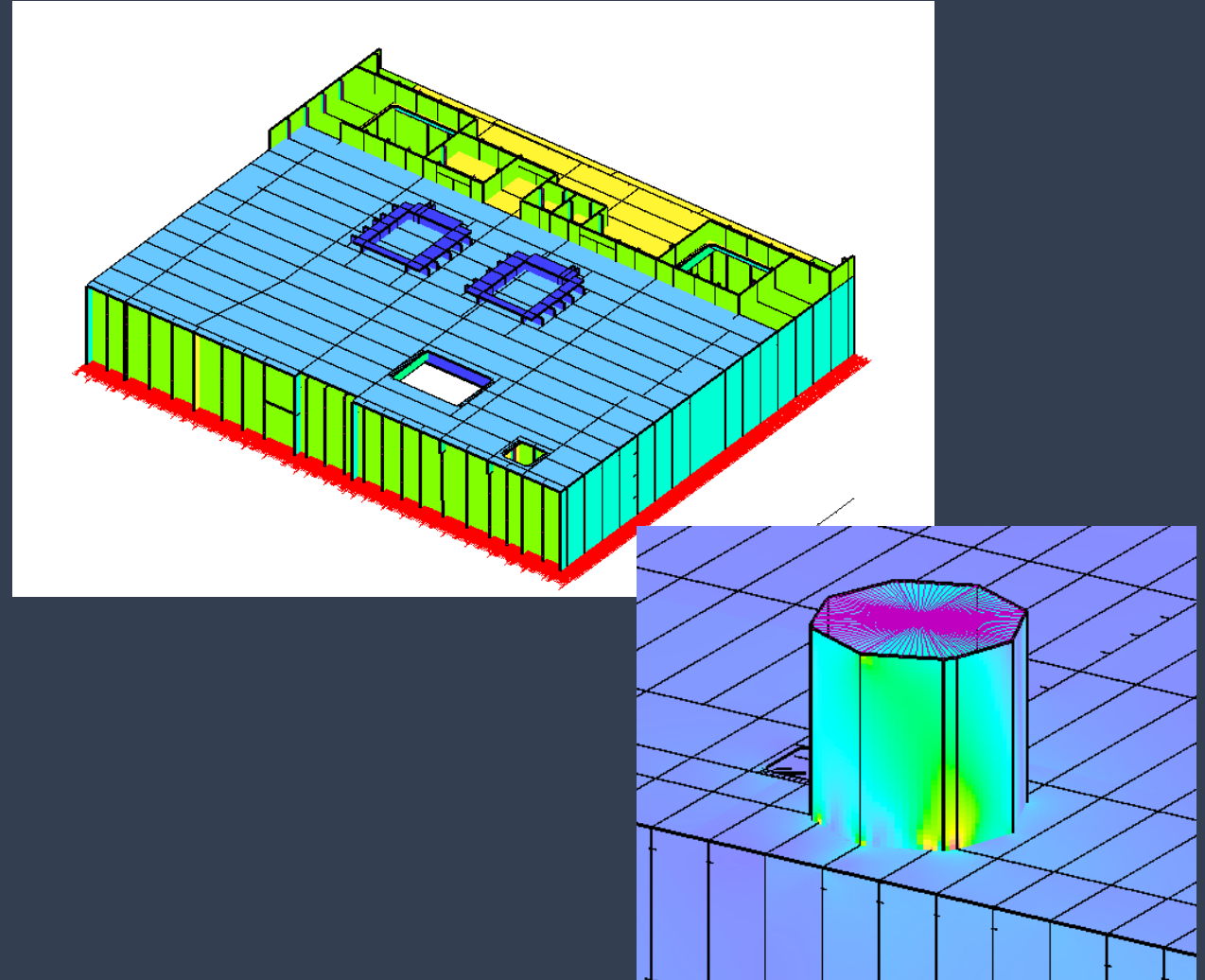
BASIC DESIGN – EQUIPMENT SELECTION & WEIGHT ESTIMATION

- Detailed preliminary lightship calculation.
- Exhaustive weight control.
- Equipment definition from earlier stages of the project.
- Necessary space for under deck equipment.
- Adequate weight distribution along the vessel.



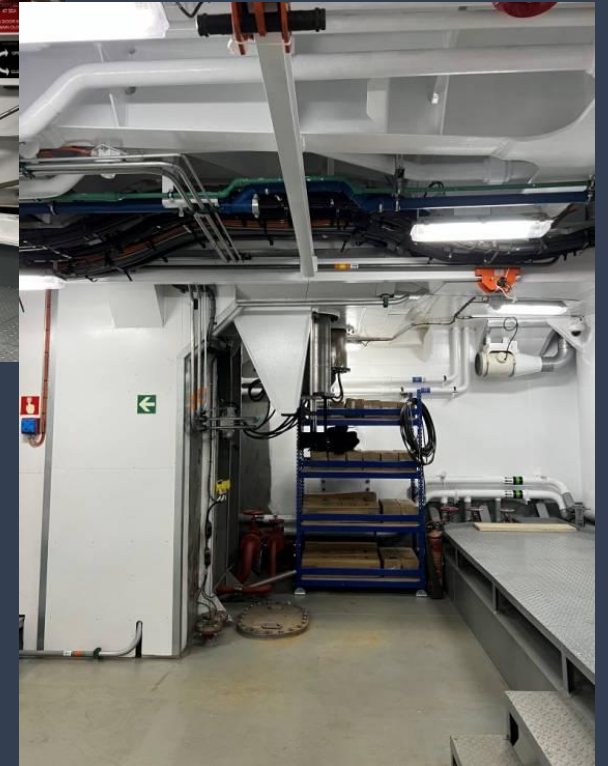
PROJECT DEVELOPMENT - STRUCTURE

- Workboat with high structural requirements.
- Commitment between optimized structure, speed and restricted draught.
- Optimized weight of the structure.
- FEM analysis for foundations and details.



PROJECT DEVELOPMENT - STRUCTURE

- Aluminium for superstructure and masts.
- Design of the working deck.
- Habitability and usage of the spaces.
- Maximized space in the cargo hold.



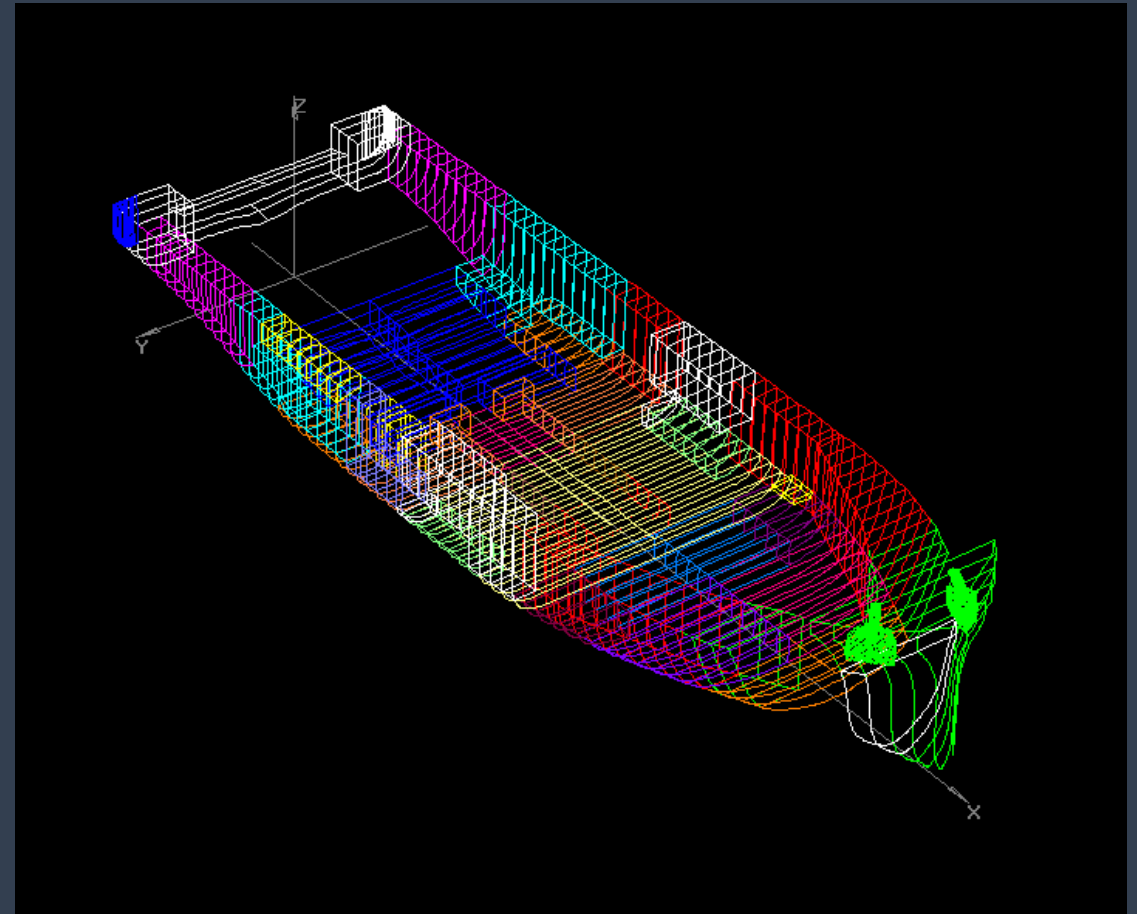
PROJECT DEVELOPMENT – ENGINE ROOM

- Available space.
- Atypical distribution of equipment.
- Integration of high-volume equipment with a highly demanding structure.
- Coordinate under-deck equipment and deck equipment position.
- Effect of equipment position in trim and heel.



PROJECT DEVELOPMENT – TANKS

- Special attention has been taken in tank arrangement.
- Double bottom and inner shell.
- Ballast tanks in both sides and in the double bottom along the vessel.
- Compensate heel and trim.



BUILDING PROCESS

- Working deck.
 - Reinforcements.
 - Electric and hydraulic installation.
- Accommodation area.
 - Insulations.
 - Outfitting.
 - Stairs.



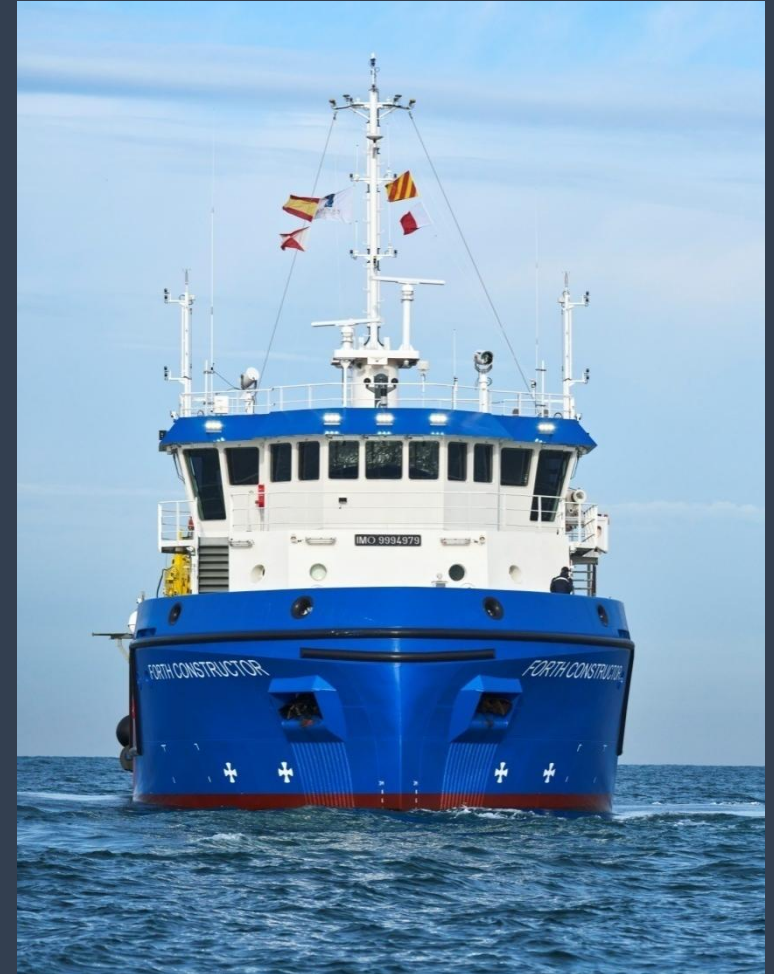
WEIGHT CONTROL

- One of the most significant tasks along the project.
- Extensive database from both, the Designer and the Builder.  Accurate initial estimations.
- Development monitoring.
 - Structure optimization.
 - Asymmetric equipment arrangement.
 - Tank arrangement.

Results according to the initial estimations.

CONCLUSIONS

- Offshore vessel market trend for fleet renewal and specialization.
- Increasing demand of high technological vessels.
- High customized projects is the best option when the requirements do not fit with the standards.
- FORTH CONSTRUCTOR is the example that highly personalized projects in which experienced companies collaborate is synonymous with success.
- The effort of monitoring, review and control during all stages of the project, has resulted in a vessel with great performance that meets the established requirements.



THANKS FOR YOUR ATENTION

