

# QUADELPROP LNG bunker ship

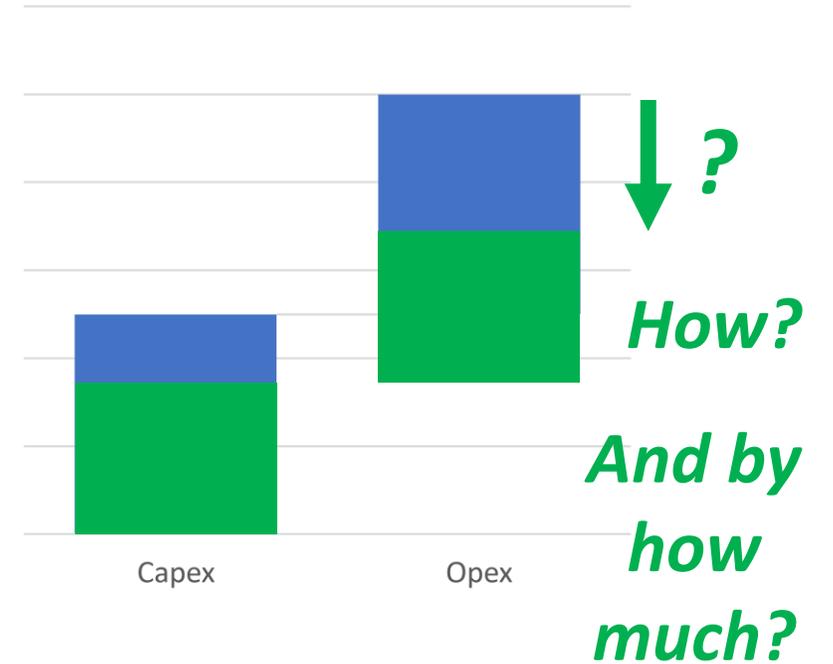
*A new approach to ship-to-ship LNG bunkering*

# LNG price breakdown

LNG price breakdown (USD/mmbtu)



Last mile logistic capex / opex



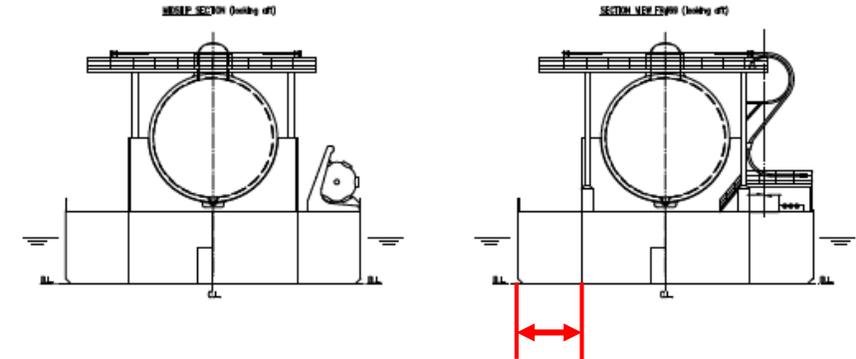
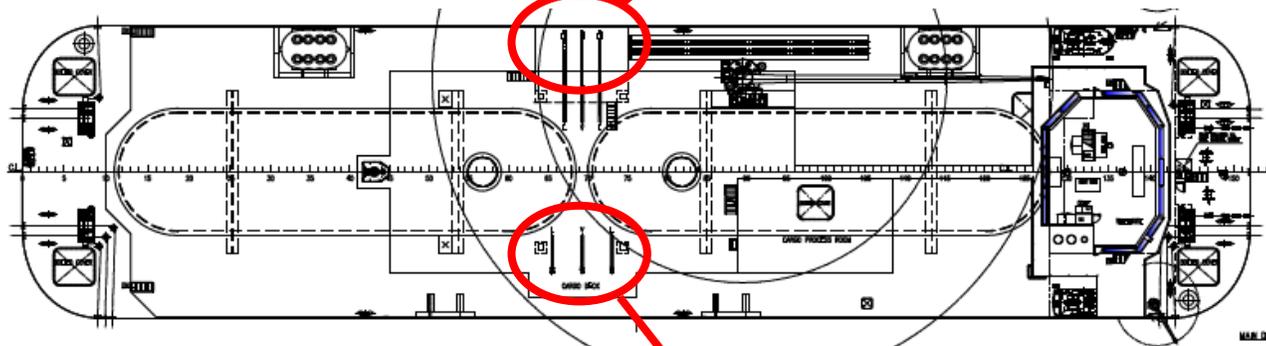
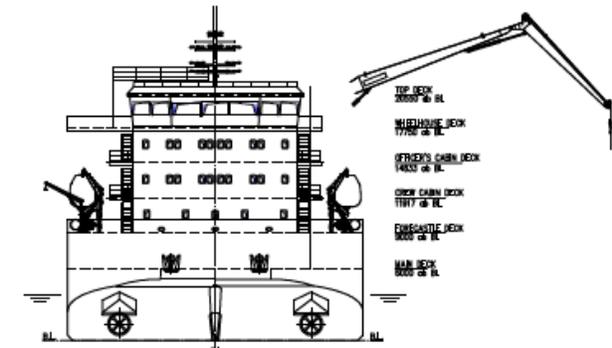
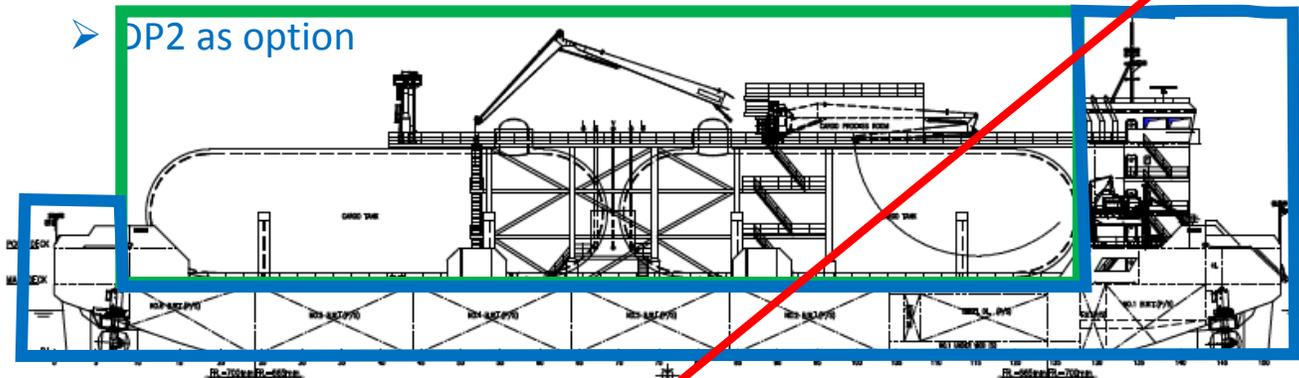
# Focus on:

- **Safety**
- **Maneuvrability**
- **Simplicity & reliability of operations**
- **Lowering costs without compromising other aspects**
  - ✓ **Defining the real operating profile of the ship**
  - ✓ **Concentrating on the very mission of the ship: bunkering**
  - ✓ **Eliminating any features or items not absolutely necessary for the mission**
  - ✓ **Reducing interfaces**
  - ✓ **Avoiding « over-engineering »**
  - ✓ **Encouraging Frugal innovation**

# Exemple 1: QUADELPROP 5400

- 2 x 2700 m3 type C tanks with full capacity SCU (Sub-Cooling Unit)
- 4 x 750 kW azimuthal thrusters electric drive
- Diesel or DF power generation
- DP2 as option

**Manifold dedicated to LNG bunkering (interface with client ship)**

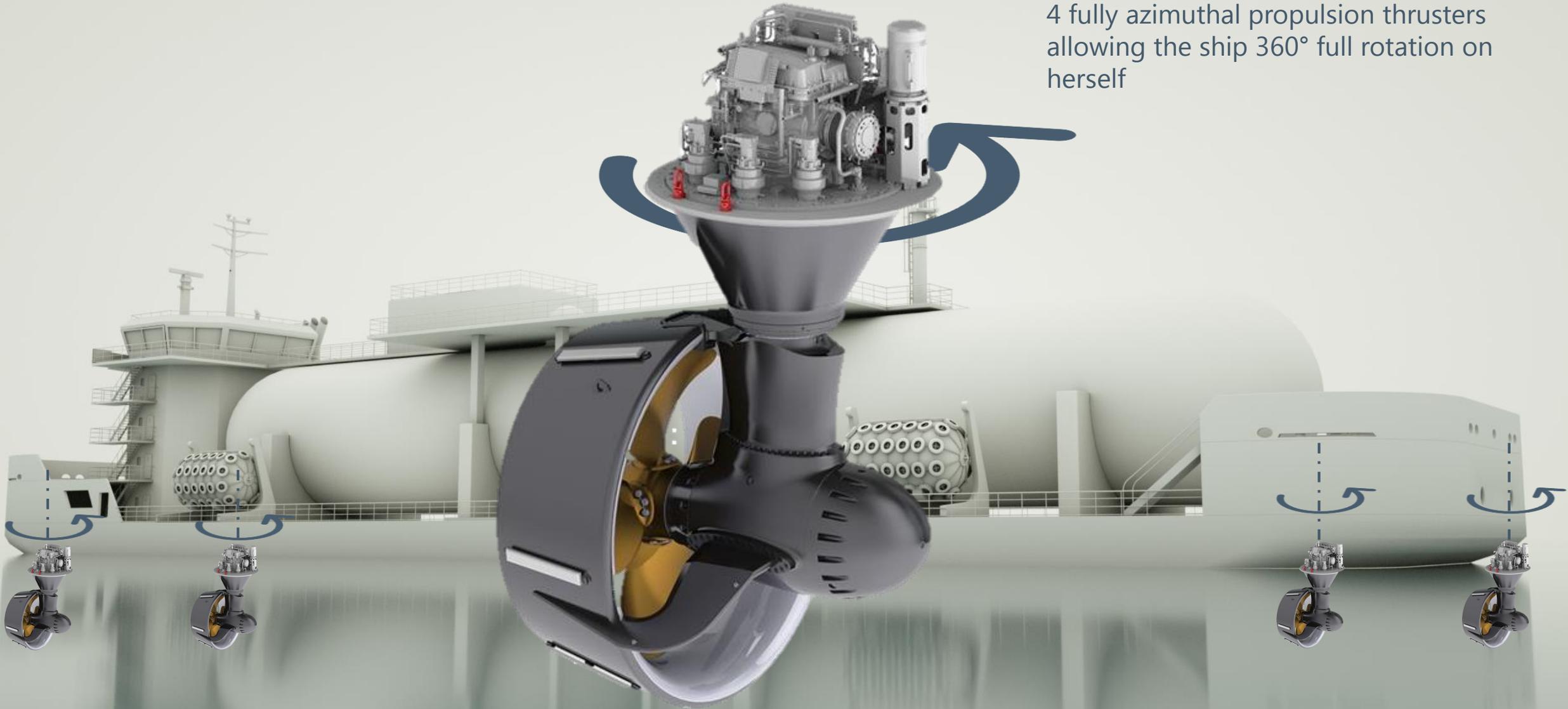


**B/5 : damage stab sustainability**

**Manifold dedicated to LNG loading (interface with LNG terminal)**

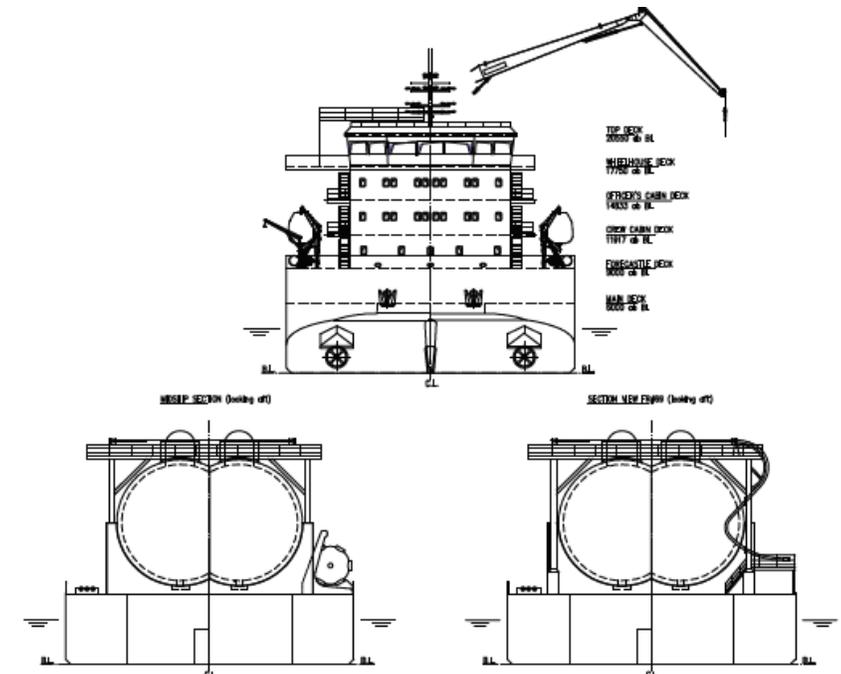
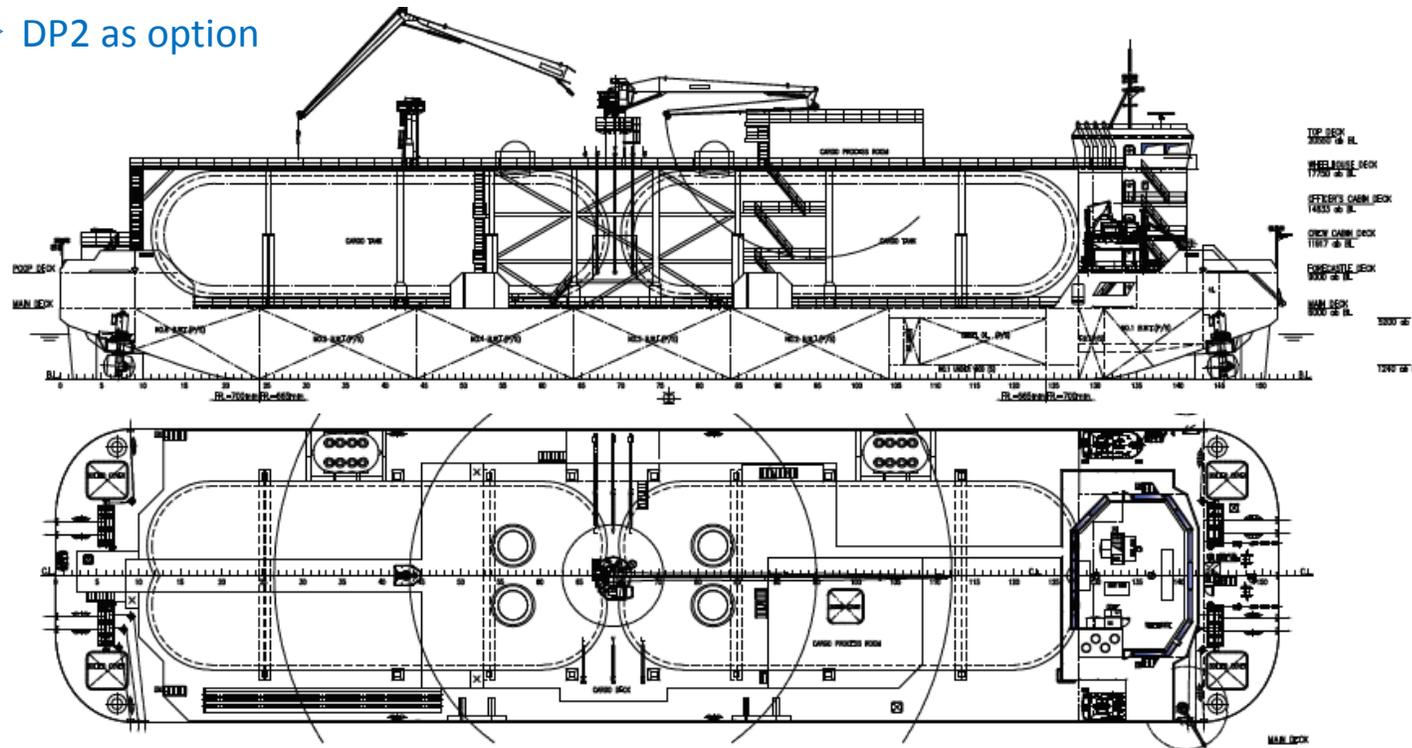
# Example: Quadelpop 5400

LNG Capacity : 2 x 2700 m<sup>3</sup> type C tanks  
102,8 m x 24,6 m x 3,8 m (design draft)  
4 fully azimuthal propulsion thrusters  
allowing the ship 360° full rotation on  
herself

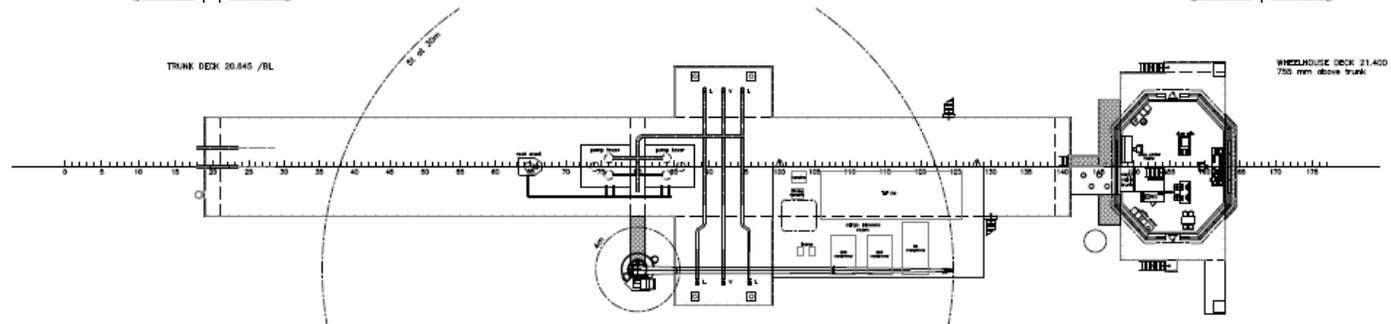
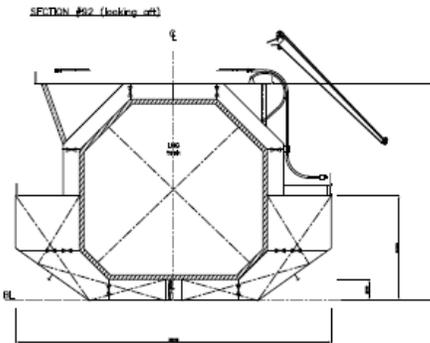
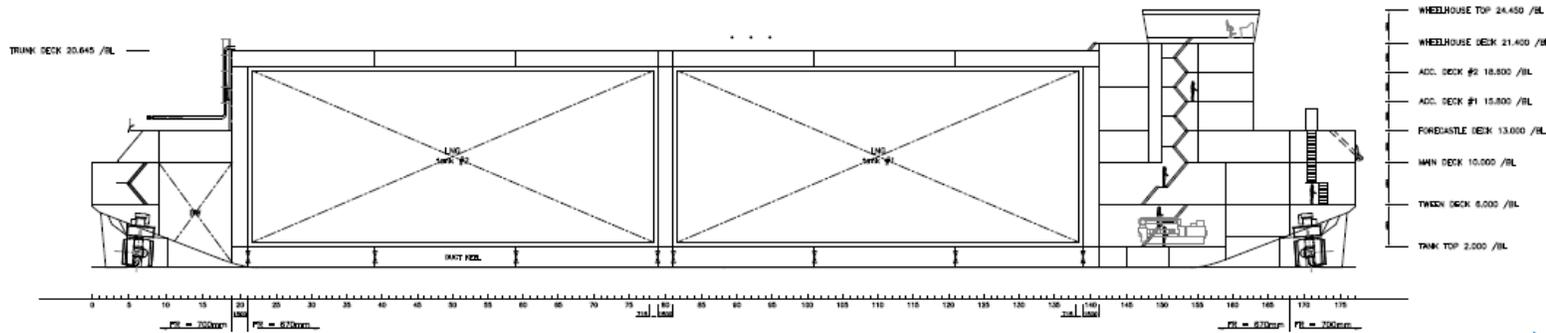
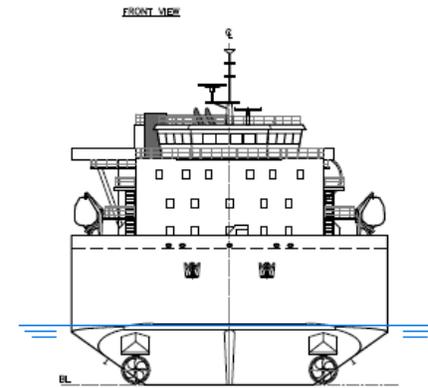
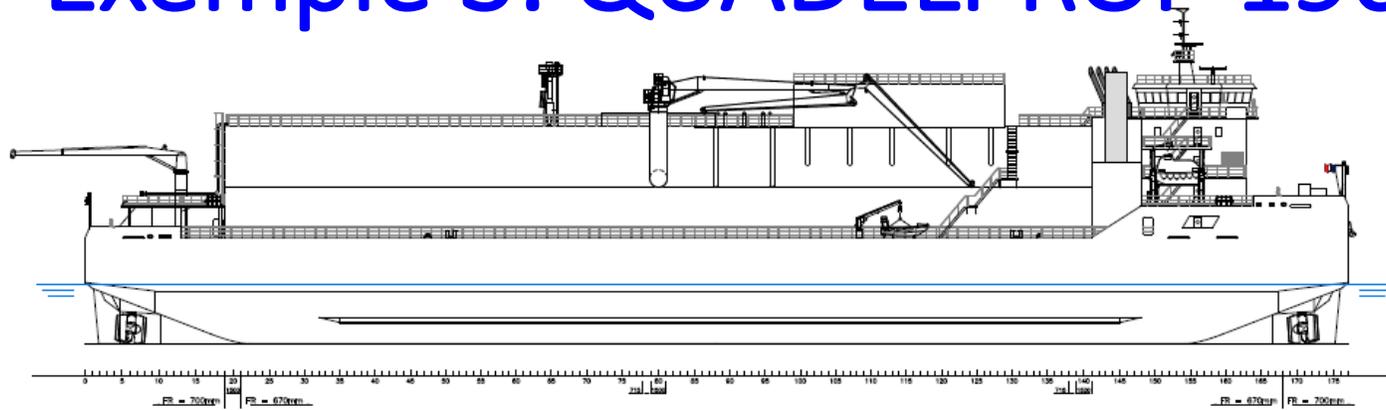


# Exemple 2: QUADELPROP 8700

- 2 x 4350 m3 bilobe type C tanks with full capacity SCU
- 4 x 750 kW azimuthal thrusters electric drive
- Diesel or DF power generation
- DP2 as option



# Exemple 3: QUADELPROP 19000

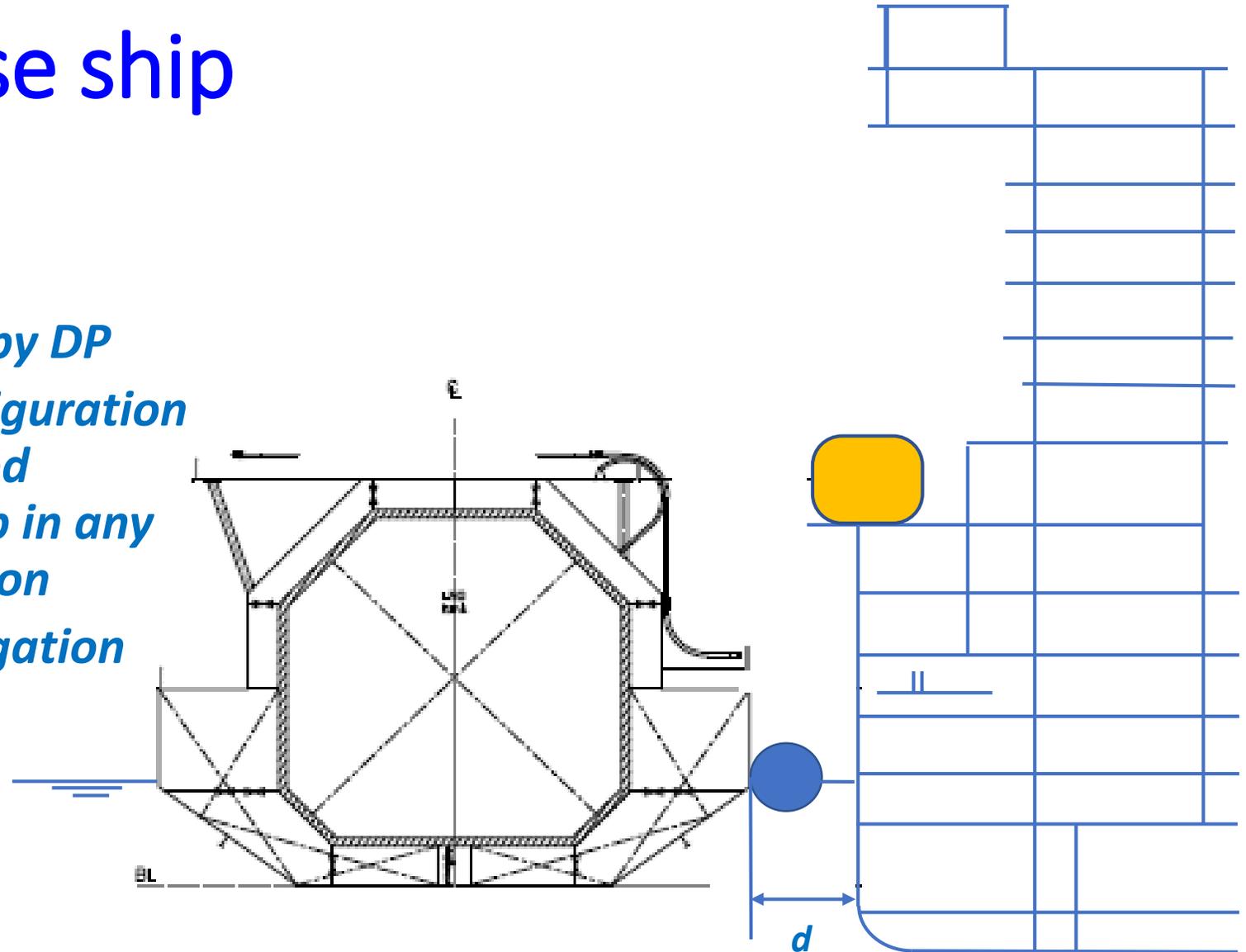


- 2 x 9500 m3 GTT Mark3 Flex membrane tanks with full capacity SCU & GCU
- 4 x 1100 kW azimuthal thrusters electric drive
- Diesel or DF power generation
- DP2 as option

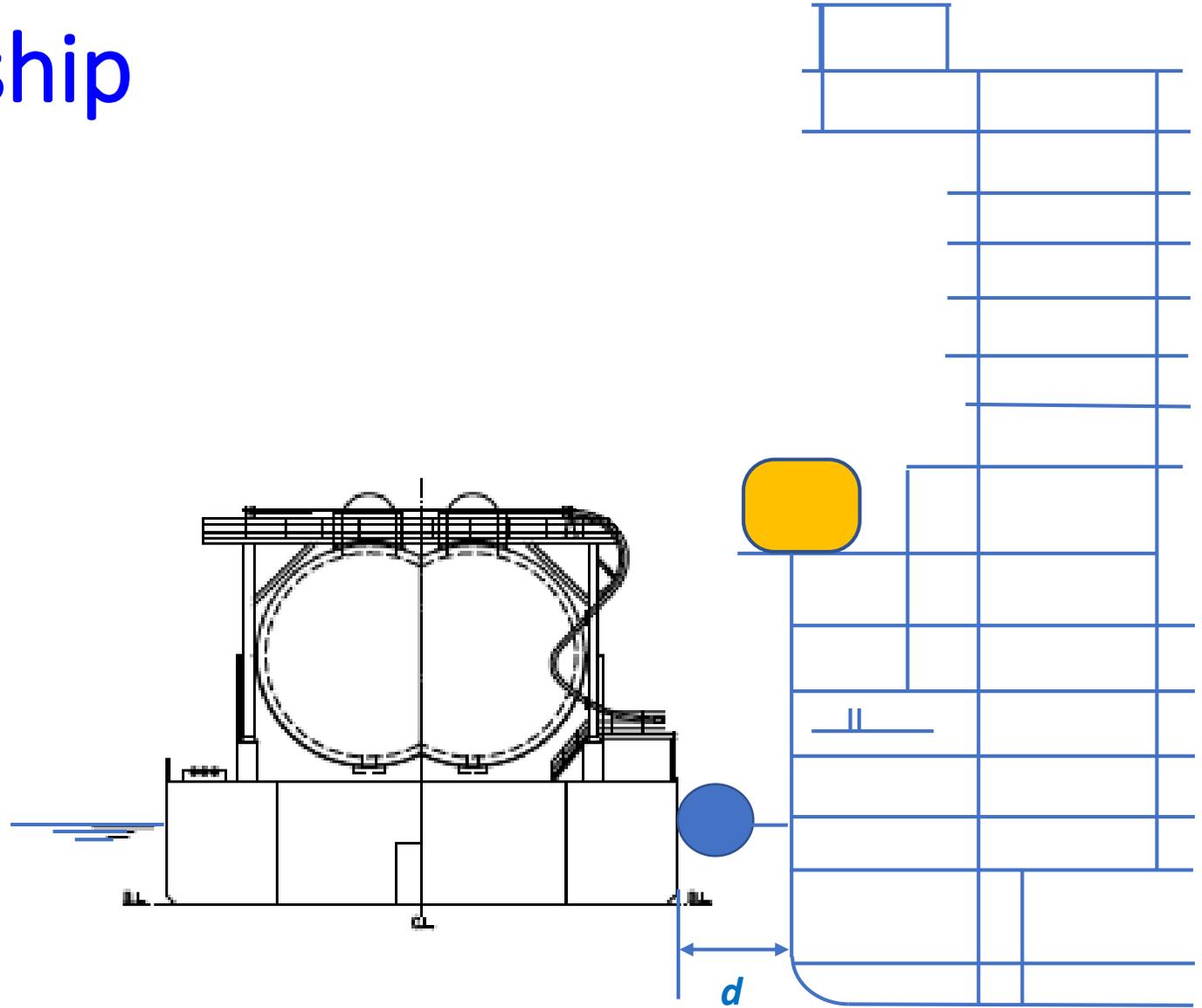
# Bunkering cruise ship

## ➤ In DP mode

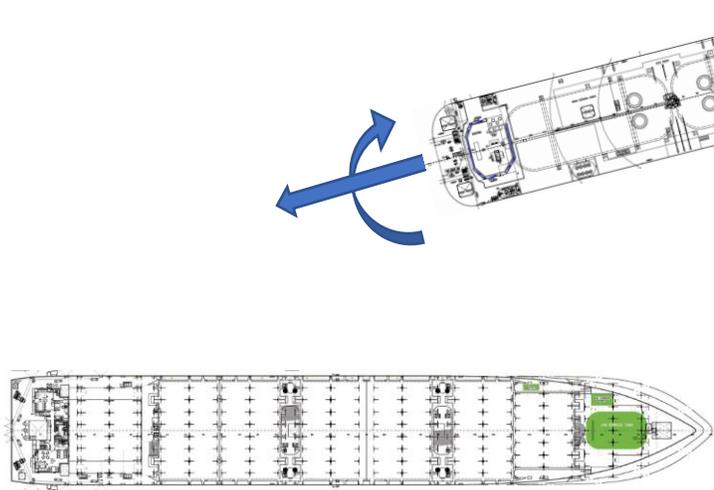
- ✓ No mooring lines
- ✓ Clearance 'd' controlled by DP
- ✓ Bunker ship section configuration adapted to maintain good clearance with client ship in any draft, roll & pitch condition
- ✓ Fenders in water as mitigation measure



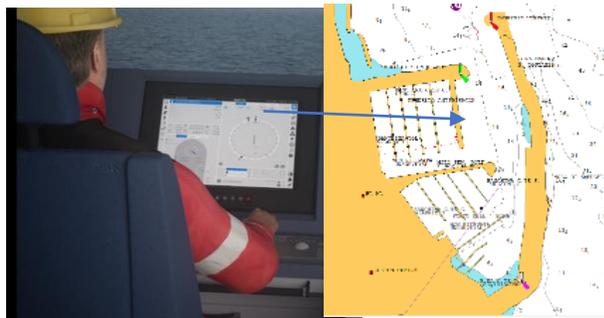
# Bunkering cruise ship



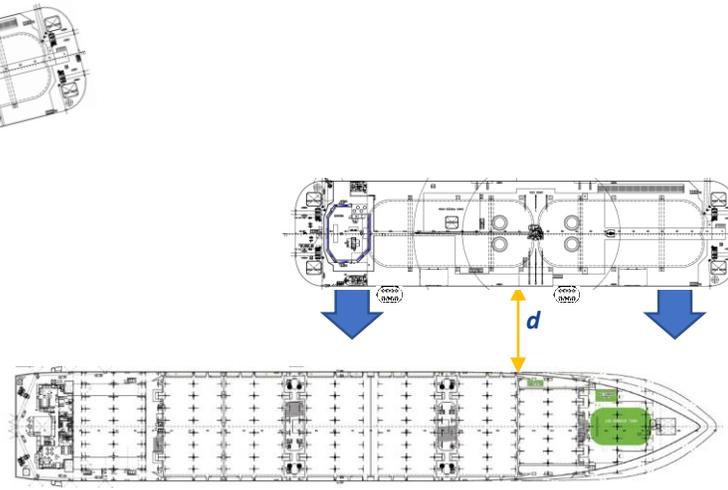
# Bunkering operation in DP mode



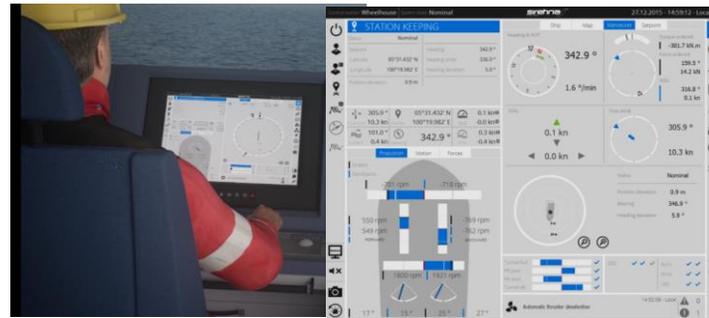
Step 1 : Approach Manoeuvre



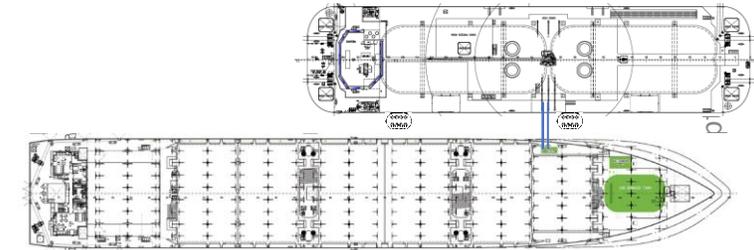
Navigation



Step 2: Final Manoeuvre



Go to way point at low speed



Step 3: Station Keeping



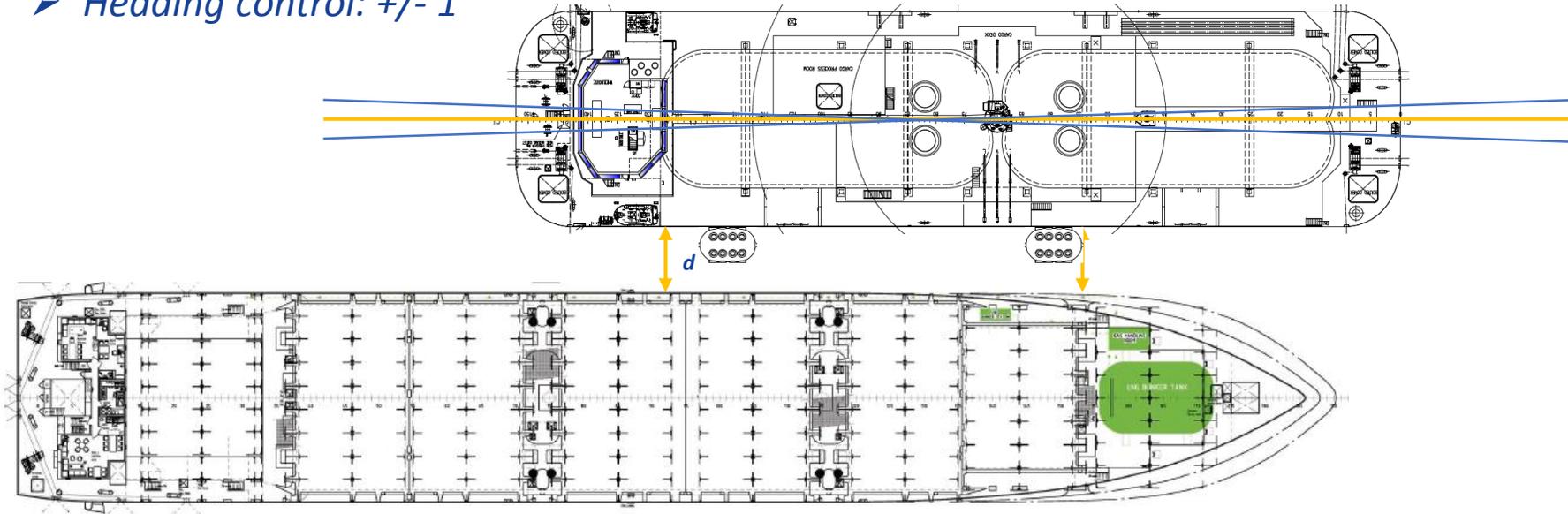
Keep position for a while

Connect transfer hoses and start bunkering

# Bunkering operation in DP mode

Relative positioning:

- Distance control:  $d \pm 0,5 \text{ m}$
- Heading control:  $\pm 1^\circ$



# Conclusion

- **High maneuverability:**
  - *well adapted for port operation (shorter LOA)*
  - *No need of tugs or pilots*
  - *DP2 ready*
- **Optimized for coastal navigation, lower Capex, lower Opex**
- **Simple and compact design:**
  - *Easy to build*
  - *Easy to operate*
- **AIP by BV pending (19k)**

# Thank you

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