MAN Energy Solutions
Future in the making

Optimized propulsion systems

from a propeller perspective

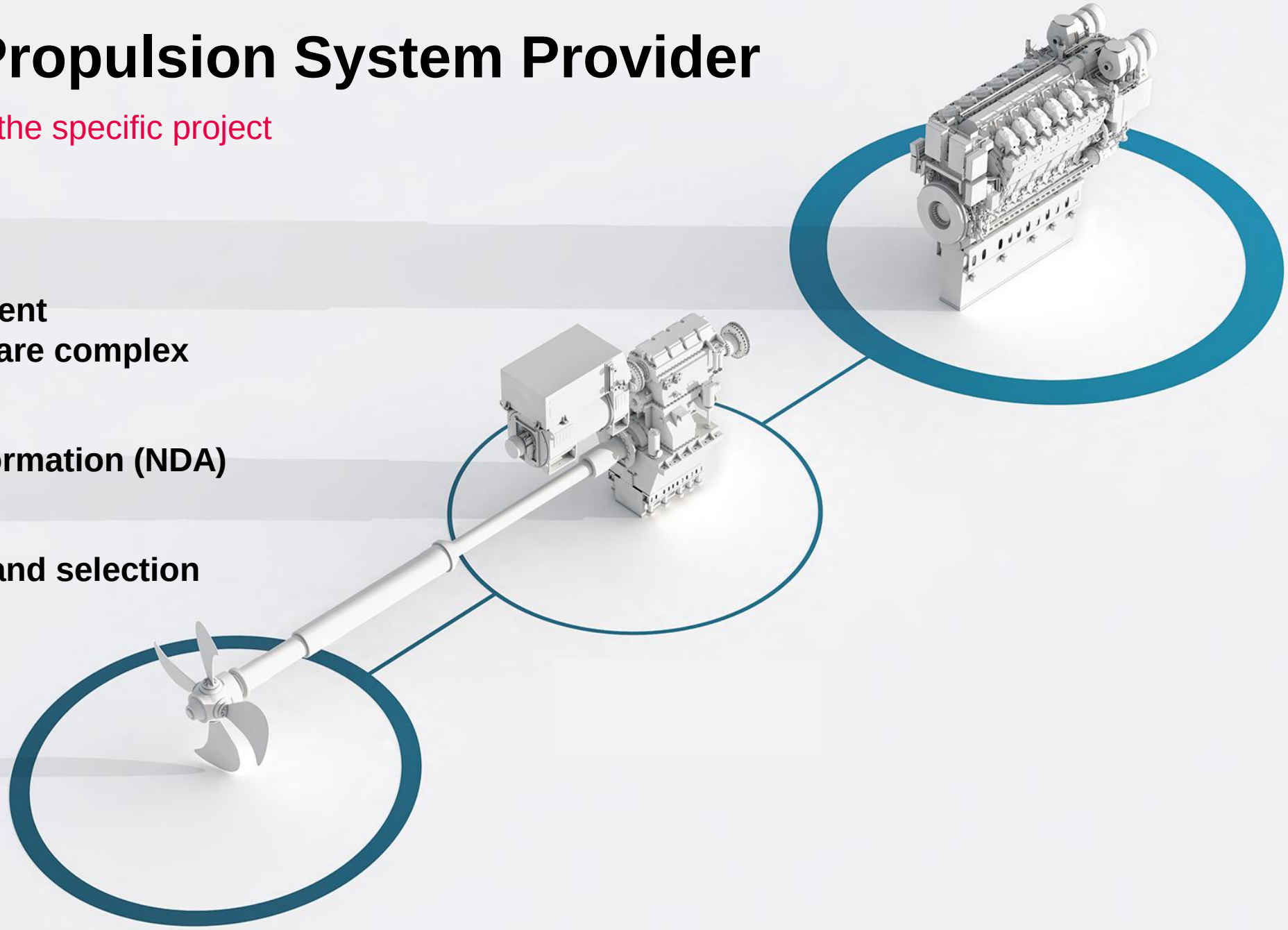
Presentation in Athens on 7 Nov. 2024 at the Ferry Shipping Summit


- Propeller and plant preoptimization
- Balancing URN and vibrations
- Water lubricated stern tubes

MAN ES – A Propulsion System Provider

Optimized and tailored to the specific project

- **Early project involvement**
  Supplier portfolios are complex
- **Share the relevant information (NDA)**
- **Transparent decision and selection process**



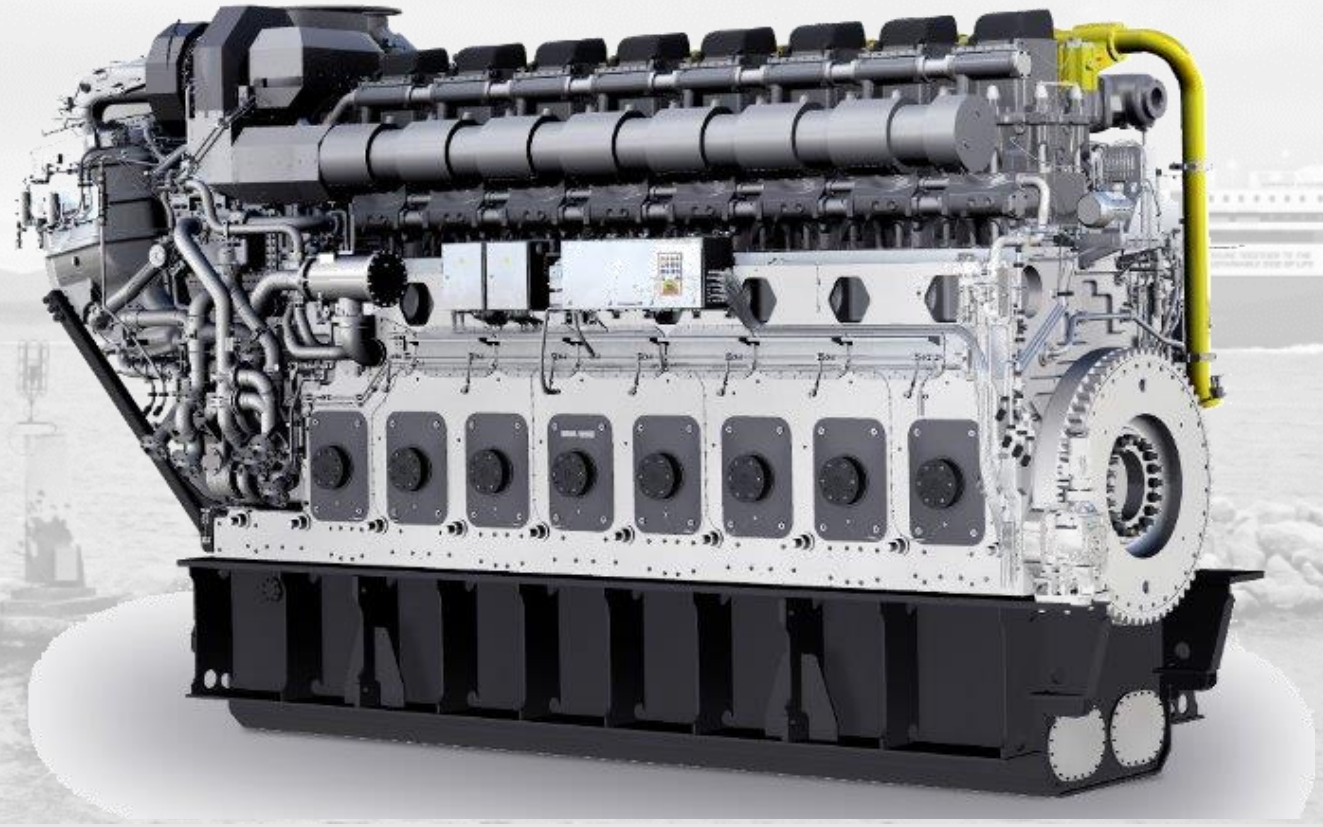
2 Stena RoPax vessels for charterer Attica Group

E-flexer No. 14 and 15:
Length: 240 m
Draught: 6.4 m
Beam: 27.8 m
Capacity: 1500 pax. and 3320 L.M. freight
Passenger cabins: 256
Speed: 24 knots

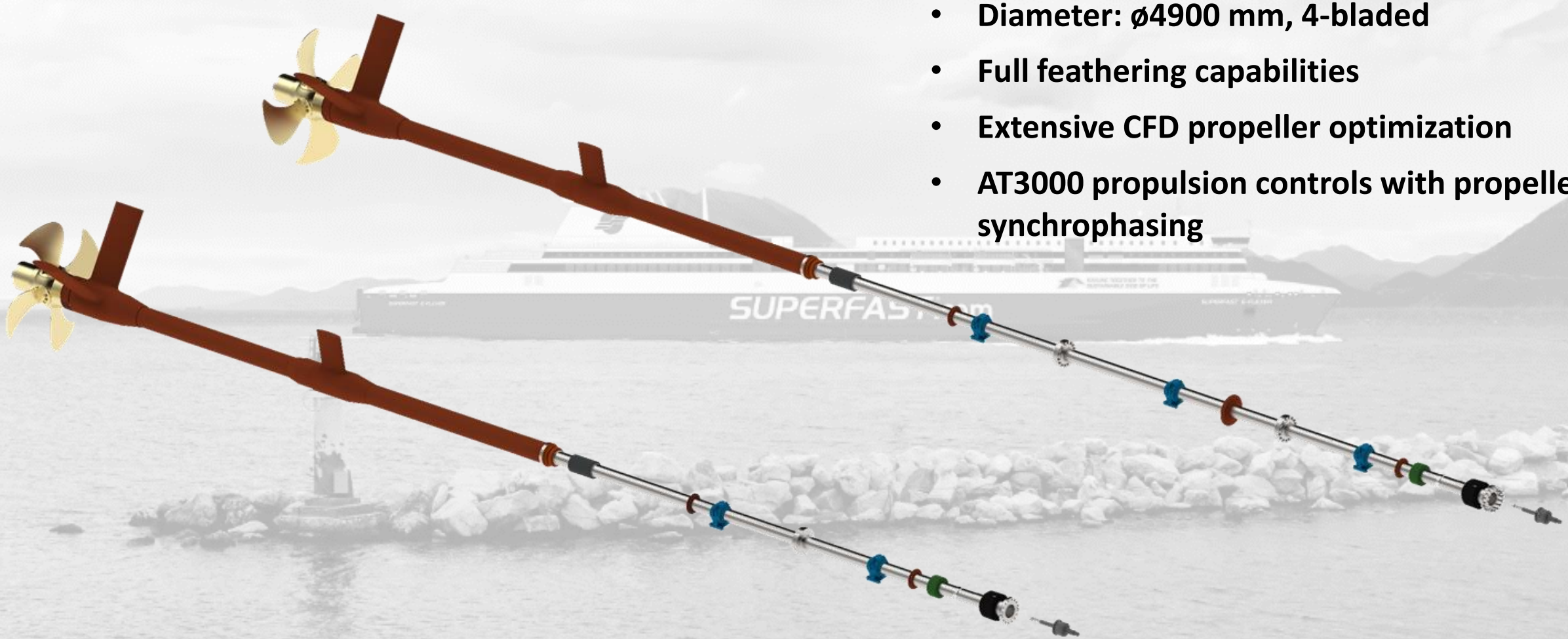
2 Stena RoPax vessels for charterer Attica Group

Main engines: 2 x 14V49/60

Rating: 18,200 kW each at 600 rpm



2 Stena RoPax vessels for charterer Attica Group

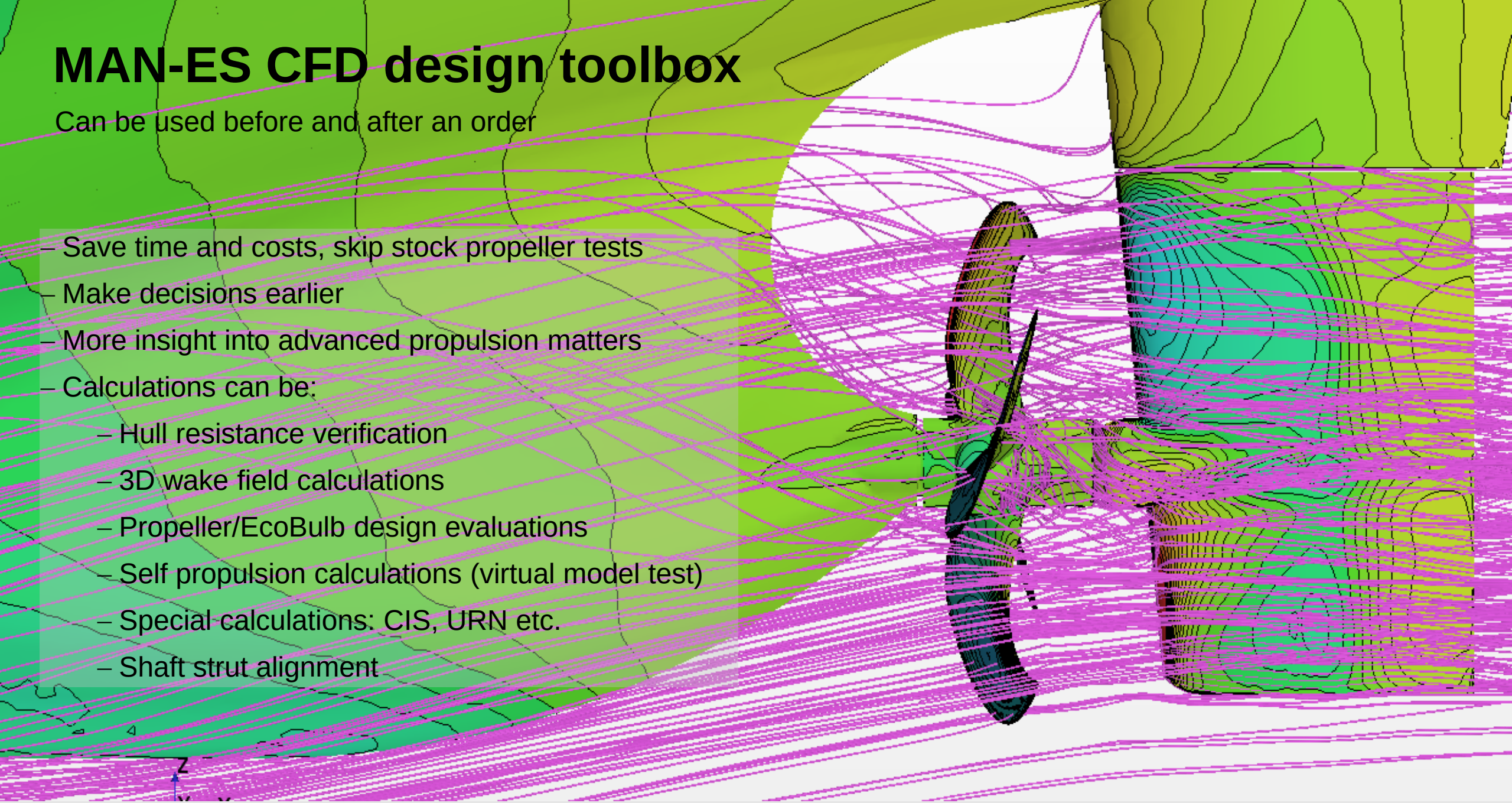


- CP propellers: 2 x VBS1450 with EcoBulb
- Diameter: ø4900 mm, 4-bladed
- Full feathering capabilities
- Extensive CFD propeller optimization
- AT3000 propulsion controls with propeller synchrophasing

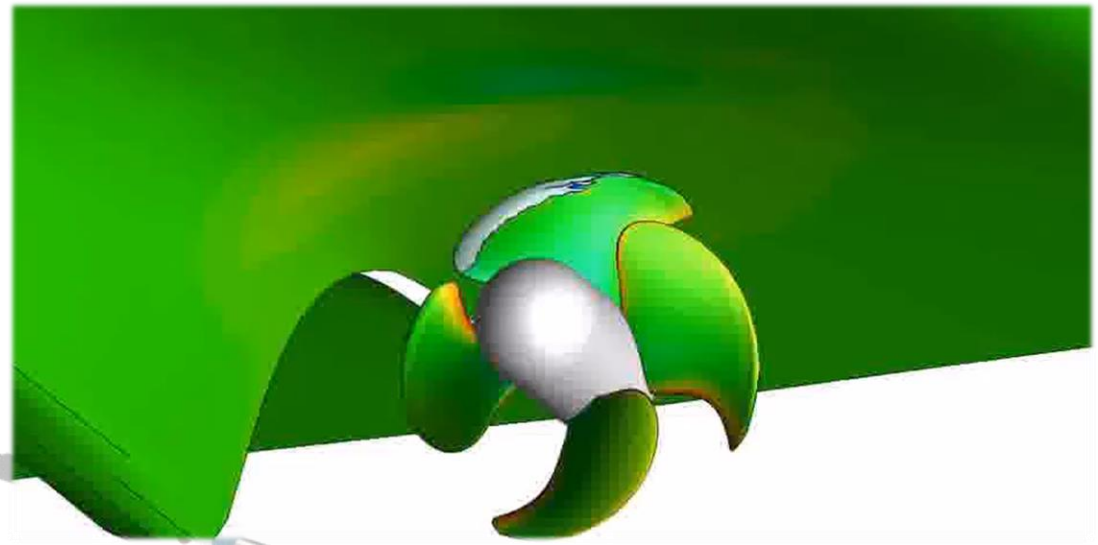
MAN-ES CFD design toolbox

Can be used before and after an order

- Save time and costs, skip stock propeller tests
- Make decisions earlier
- More insight into advanced propulsion matters
- Calculations can be:
  - Hull resistance verification
  - 3D wake field calculations
  - Propeller/EcoBulb design evaluations
  - Self propulsion calculations (virtual model test)
  - Special calculations: CIS, URN etc.
  - Shaft strut alignment

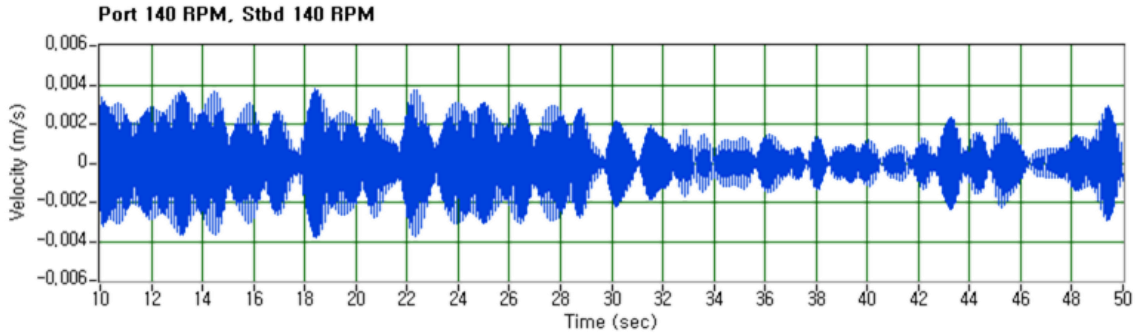


Propeller synchrophasing



Propeller synchrophasing:

- Propellers introduce pressure impulses
- This generates vibration beating
- Operate the propellers with fixed phasing
- Reduce vibration levels by 50-70%



Adding struts to the propeller scope of supply

Benefits by struts from MAN ES

– **High propulsive efficiency/ low noise**. Optimized propeller/strut interaction, hydrodynamically (in-flow, clearances etc.)

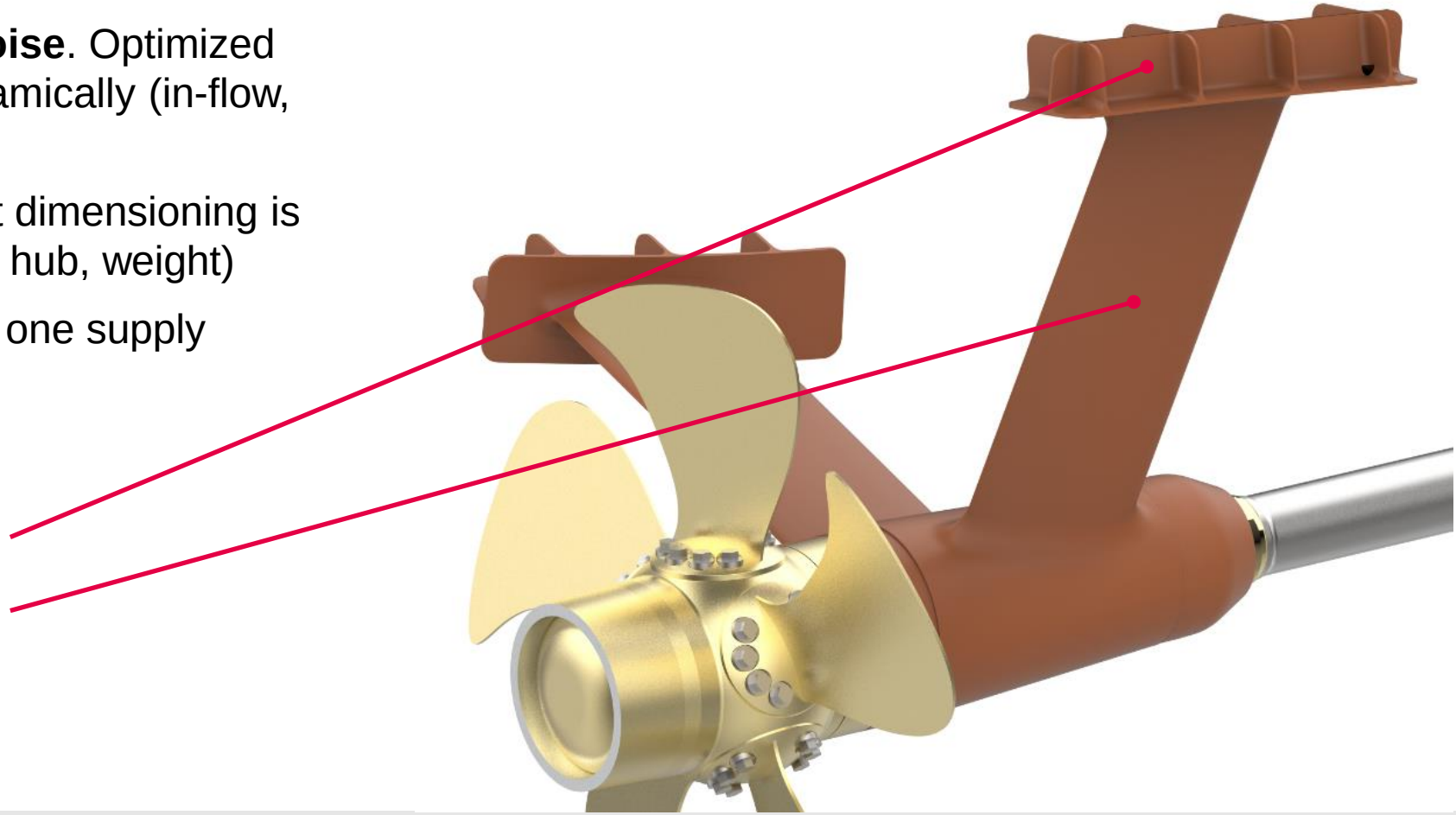
– **Dimensioning by MAN ES**, as strut dimensioning is closely linked to the propeller (shaft, hub, weight)

– **Simplicity/low risks**. One contract, one supply

Interfaces to consider

– Strut/hull connection (mechanical)

– Strut alignment (hydrodynamic)



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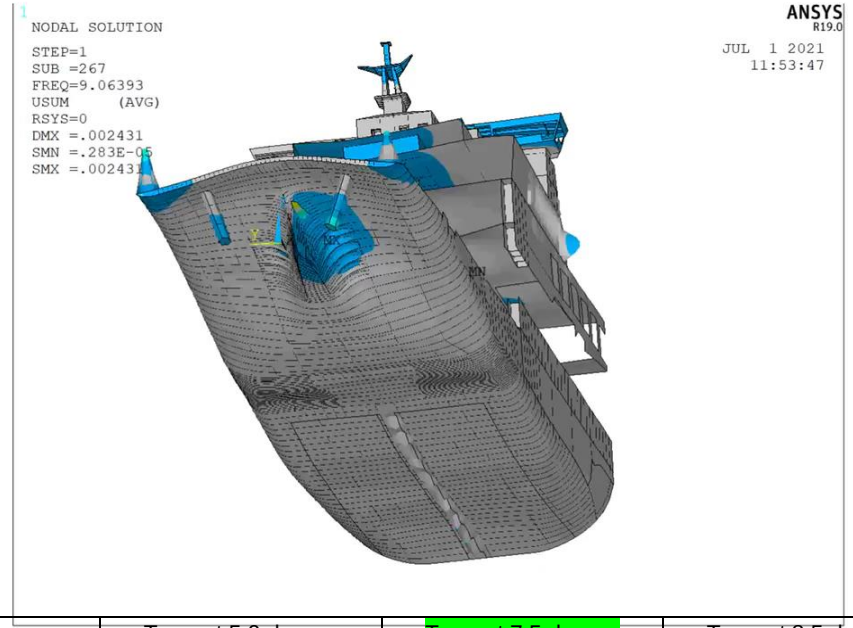
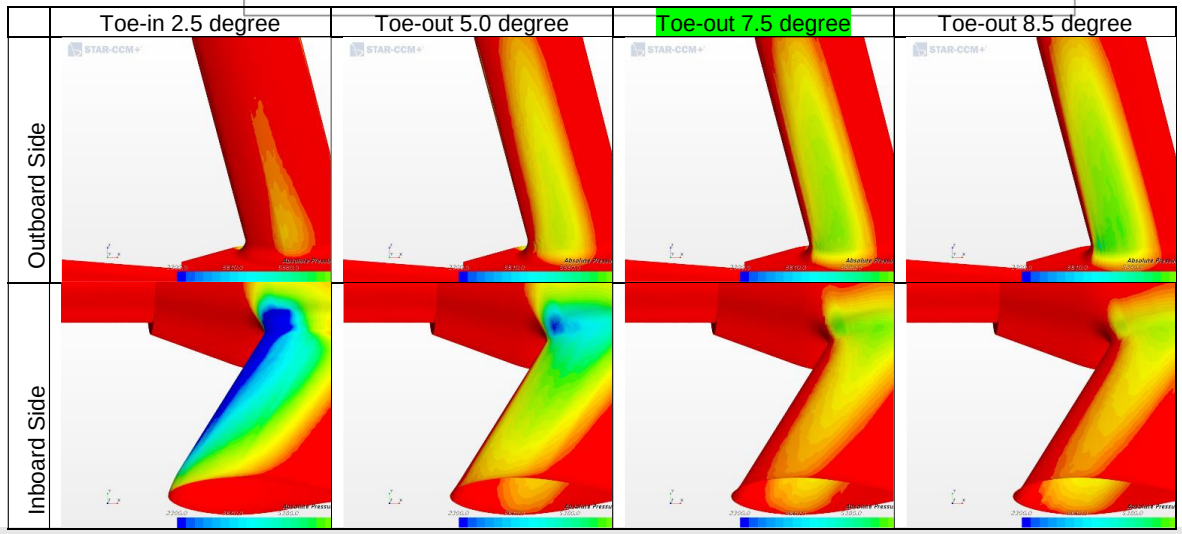


Interfaces to consider

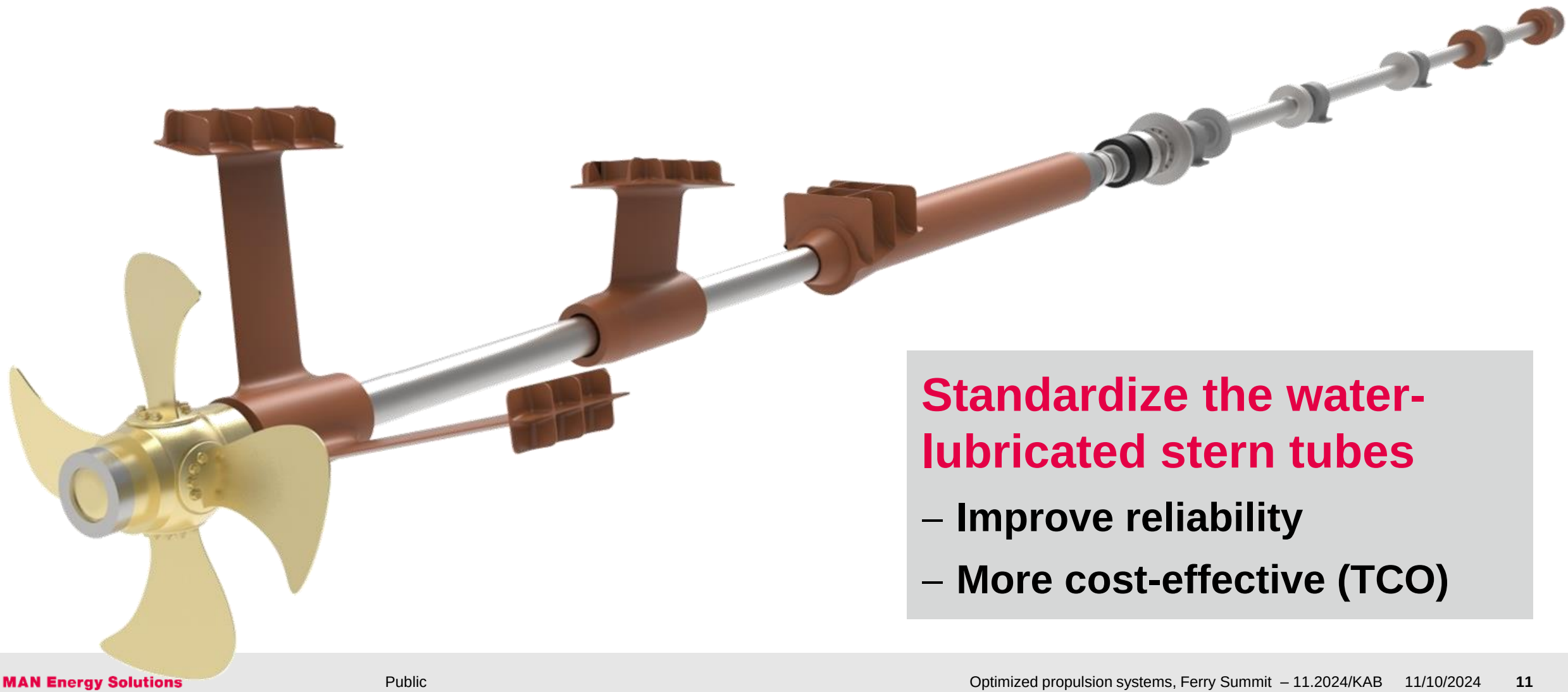
– Strut/hull connection (mechanical)
MAN requirements to stiffness, class rules not sufficient

– Strut alignment (hydrodynamic)
Balance load and drag and include CPP design



Water lubricated stern tubes

Used for many years, but not matured



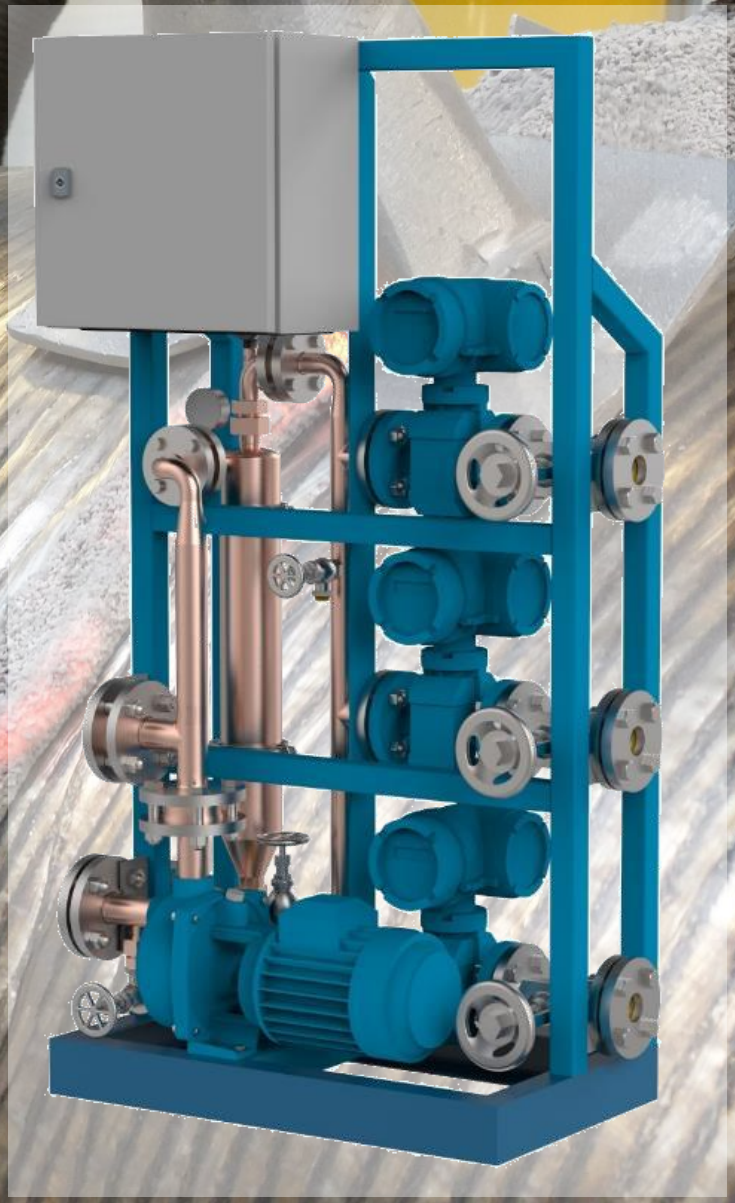
Standardize the water-lubricated stern tubes

- **Improve reliability**
- **More cost-effective (TCO)**

Coated shafts

SAW clad-welding – First tests

Clad-welded tailshaft



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Thank you

Questions?

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