

Introduction to Wärtsilä Seals & Bearings Complete Packages

Marine offering & competencies

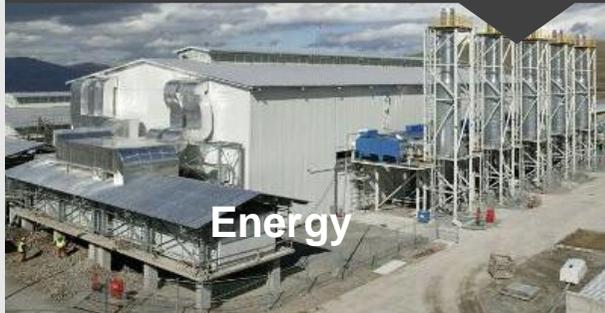
General product presentation

By Annie Phui, Seals & Bearings, Middle East & Asia

Wärtsilä CORPORATION



Solutions for



Energy



Marine

Ø18 856 professionals
 Ø 70 Countries
 Ø200 Locations
 ØGlobal service network



Marine Solutions comprises 5 segments

Marine Solutions
34% (36)



Energy Solutions
22% (23)

- Listed in Helsinki
- 5,029 billion € turnover
- Solid financial standing

Services
44% (41)

Merchant	Offshore	Cruise and Ferry	Navy	Special Vessels

Contents

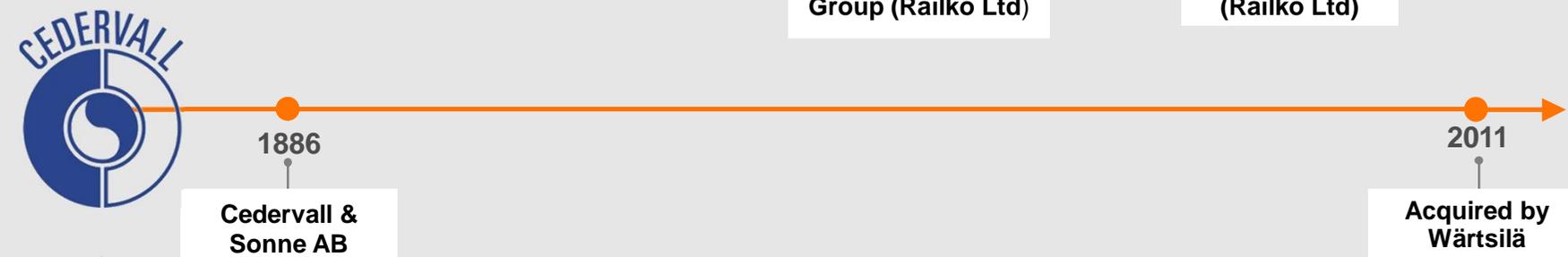
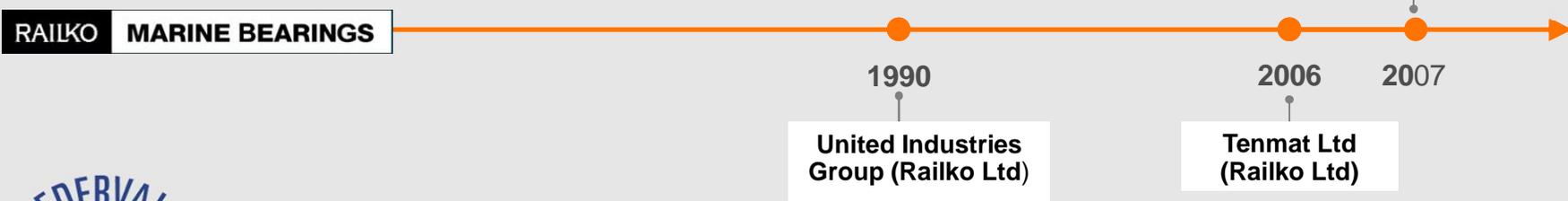
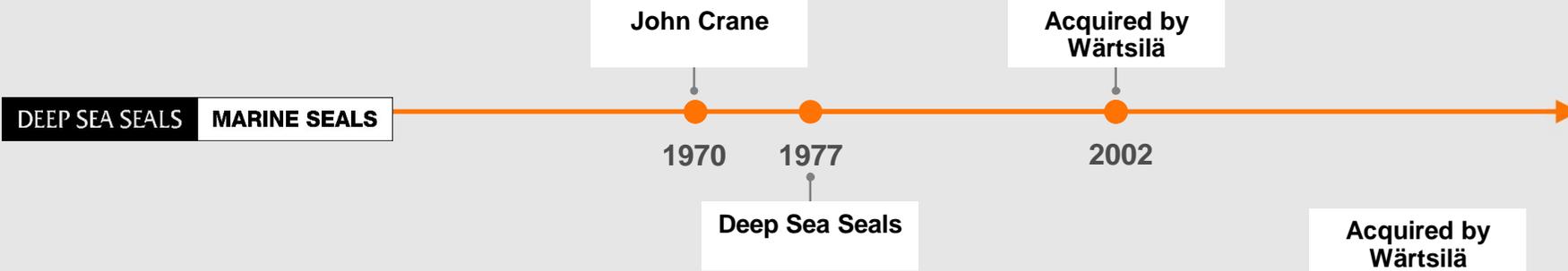
- Overview
- Oil lubricated solutions
- Water lubricated solutions
- Other products & services
- Complete package supply



Wärtsilä Seals and Bearings (S&B)

- Leading experts in **tail shaft** solutions, supporting both **commercial** and **defence** sectors
- Supplying the marine market for over **60 years**
- Proven track record with installations on more than **30 000 vessels** worldwide
- Fully compliant solutions with all present and upcoming **environmental regulation standards**
- **Technologically advanced** solutions to keep you competitive
- Seals and Bearings manufacturing in **Japan, Spain, Sweden, United Kingdom & China**

SEALS & BEARINGS COMPANY HISTORY



S&B PRODUCT COMPANIES & FACILITIES



Wärtsilä UK
Face seal
Composite bearing
R&D facilities

Wärtsilä Sweden
Face seal
Foundry, R&D facilities

Wärtsilä Japan
Lip seals
White metal bearing
R&D facilities

Wärtsilä USA
Hydro

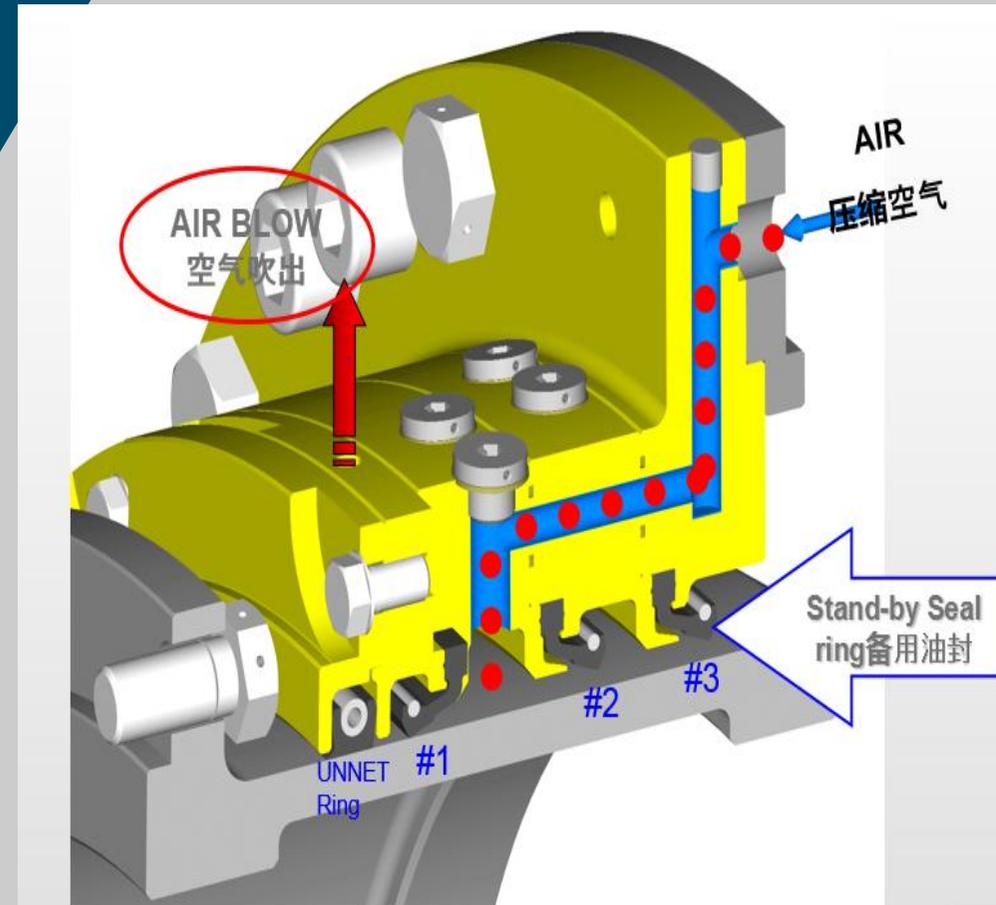
Wärtsilä Spain
Stern tube & white metal
ISB/thrust bearings
G-bearing / Fabrication, R&D

Wärtsilä - Wuxi
Face seal & lip seal
Stern tube
ISB/G-bearing

OIL LUBRICATED SOLUTIONS

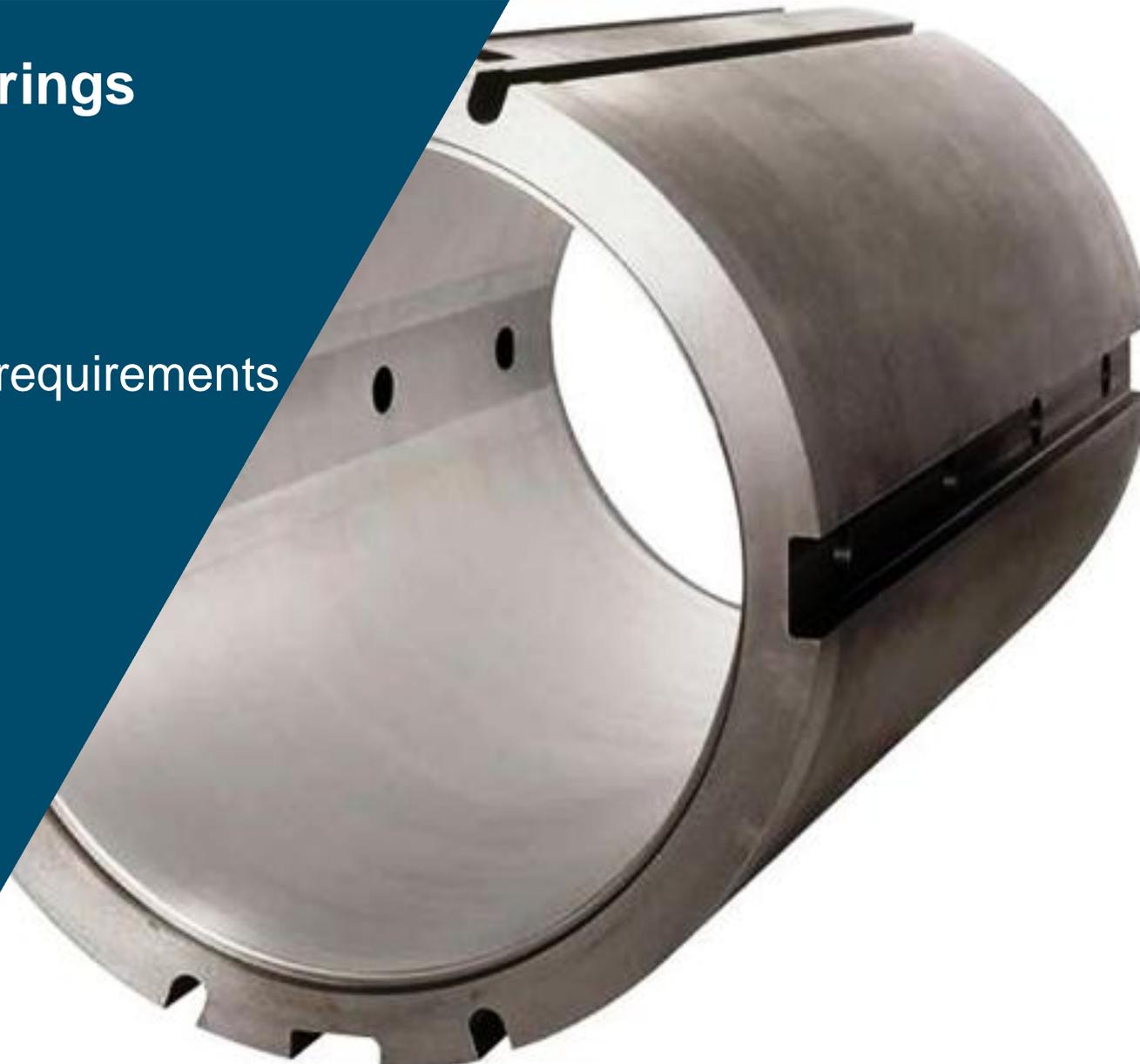
Oil Lubricated Stern Tube Sealing Solutions

- Standard, multi barrier with anti-pollution solutions available
- Higher pressure, abrasion resistance options with water & air flush
- Unlimited axial shaft movement possible
- In-situ service & retrofit options
- Monitoring capabilities



Oil lubricated stern tube bearings

- Excellent performance
- Suitable for both std & high load requirements
- Shaft range 65 – 1172 mm
- Variety of supply options
- Composite option available



WATER LUBRICATED SOLUTIONS



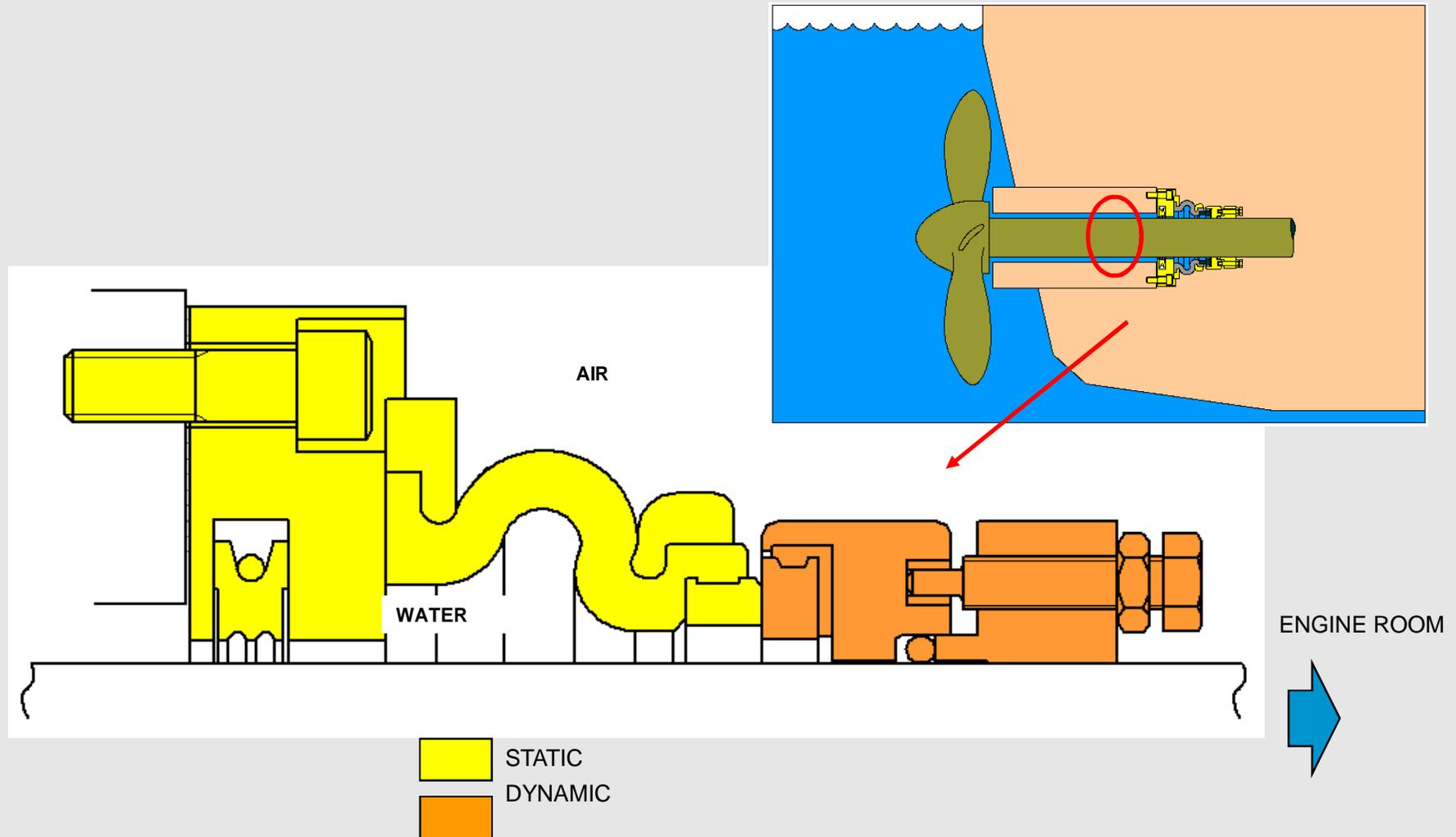
Water Lubricated Stern Tube Sealing Solutions

Design Features and Benefits/设计特色和优点

- 100% pollution free
- Accommodate large & repeated shaft movements
- High abrasion resistance
- In-situ service & retrofit options
- Inflatable seal for emergency or service
- Fully split options

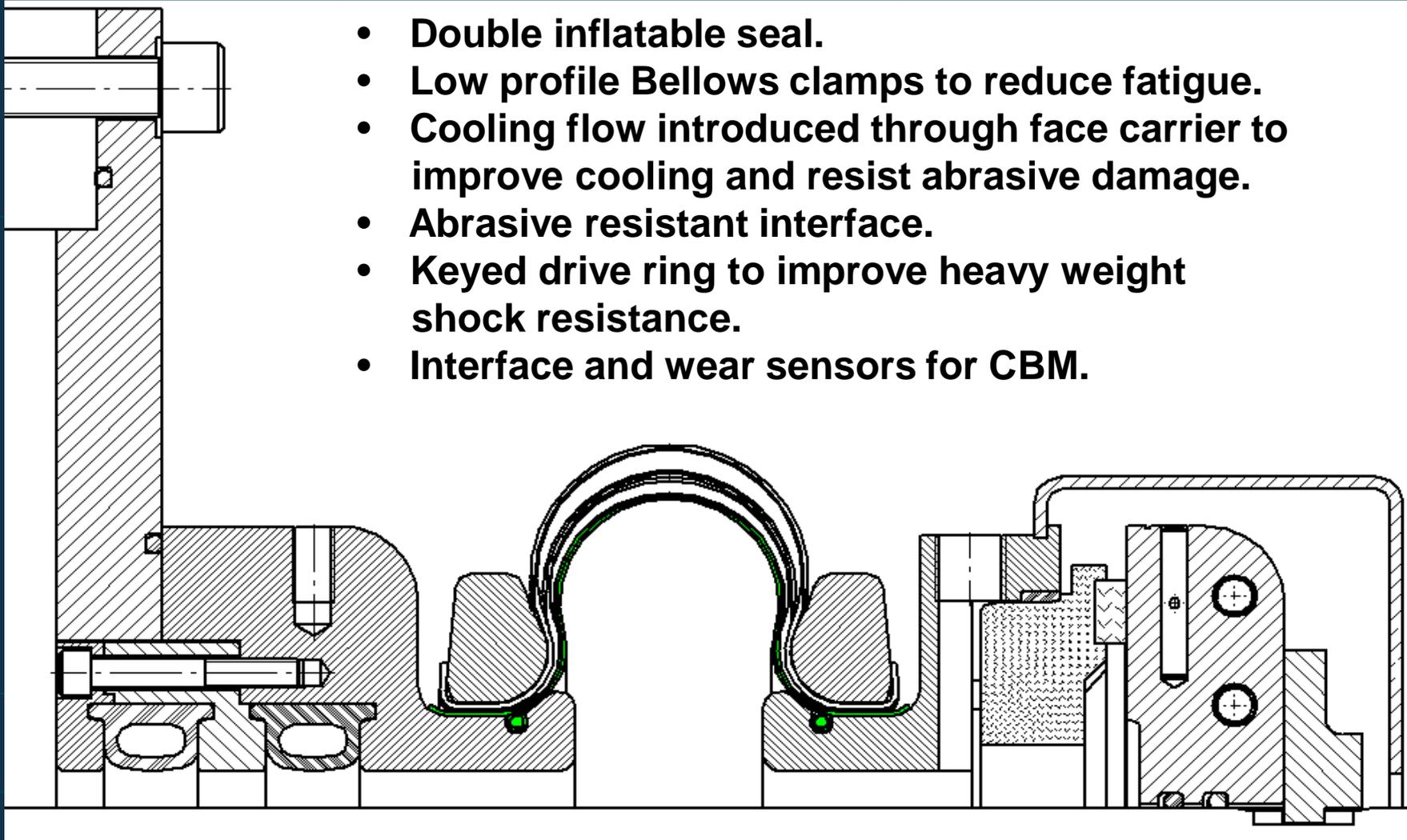


PSE Seals – Open Stern Tubes

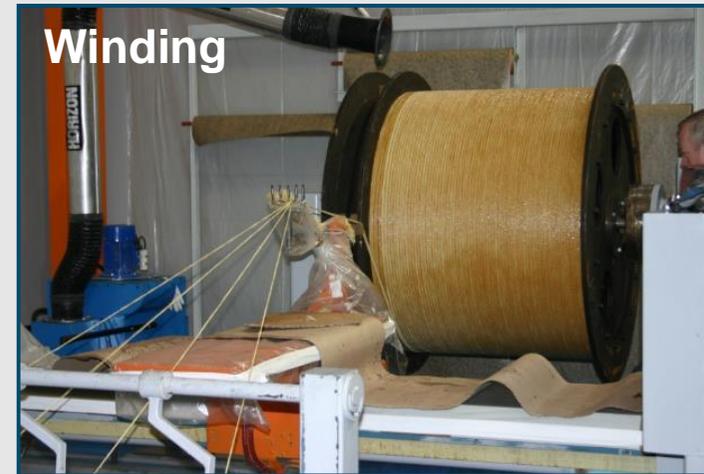
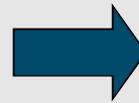


M SEALS - SUGGESTED UPGRADE

- Double inflatable seal.
- Low profile Bellows clamps to reduce fatigue.
- Cooling flow introduced through face carrier to improve cooling and resist abrasive damage.
- Abrasive resistant interface.
- Keyed drive ring to improve heavy weight shock resistance.
- Interface and wear sensors for CBM.



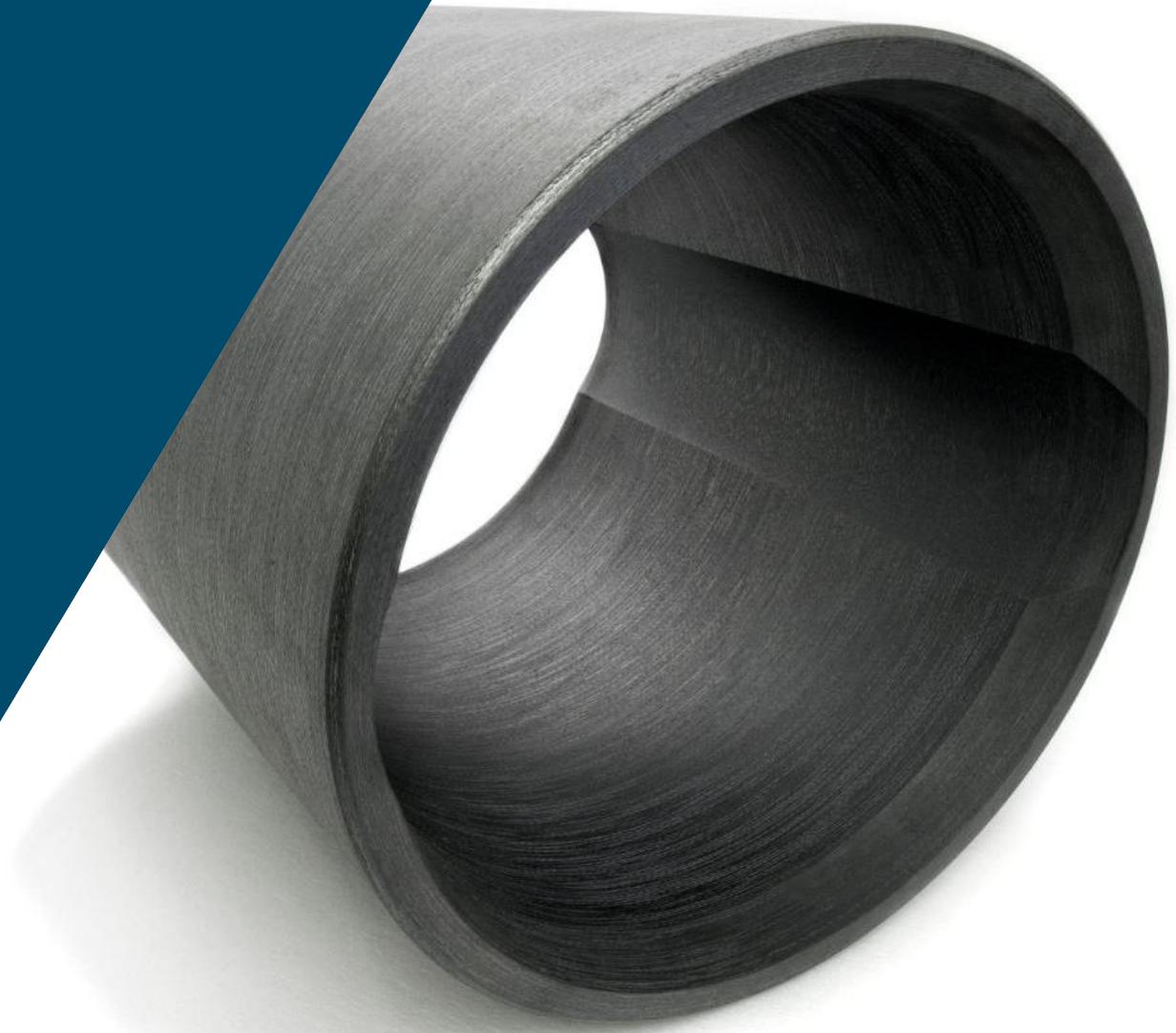
COMPOSITE BEARINGS – PROCESS OVERVIEW



Water lubricated bearings

Wärtsilä Envirosafe

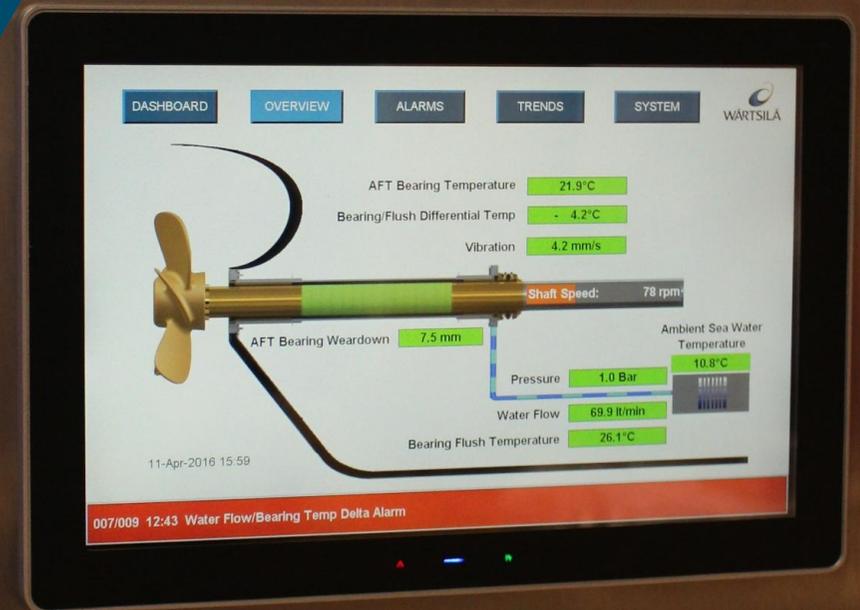
- Environmentally friendly
- Long life expectancy
- High abrasion resistance
- Low wear
- Thermally stable
- Suitable for both blue and brown water applications
- Low speed hydrodynamic



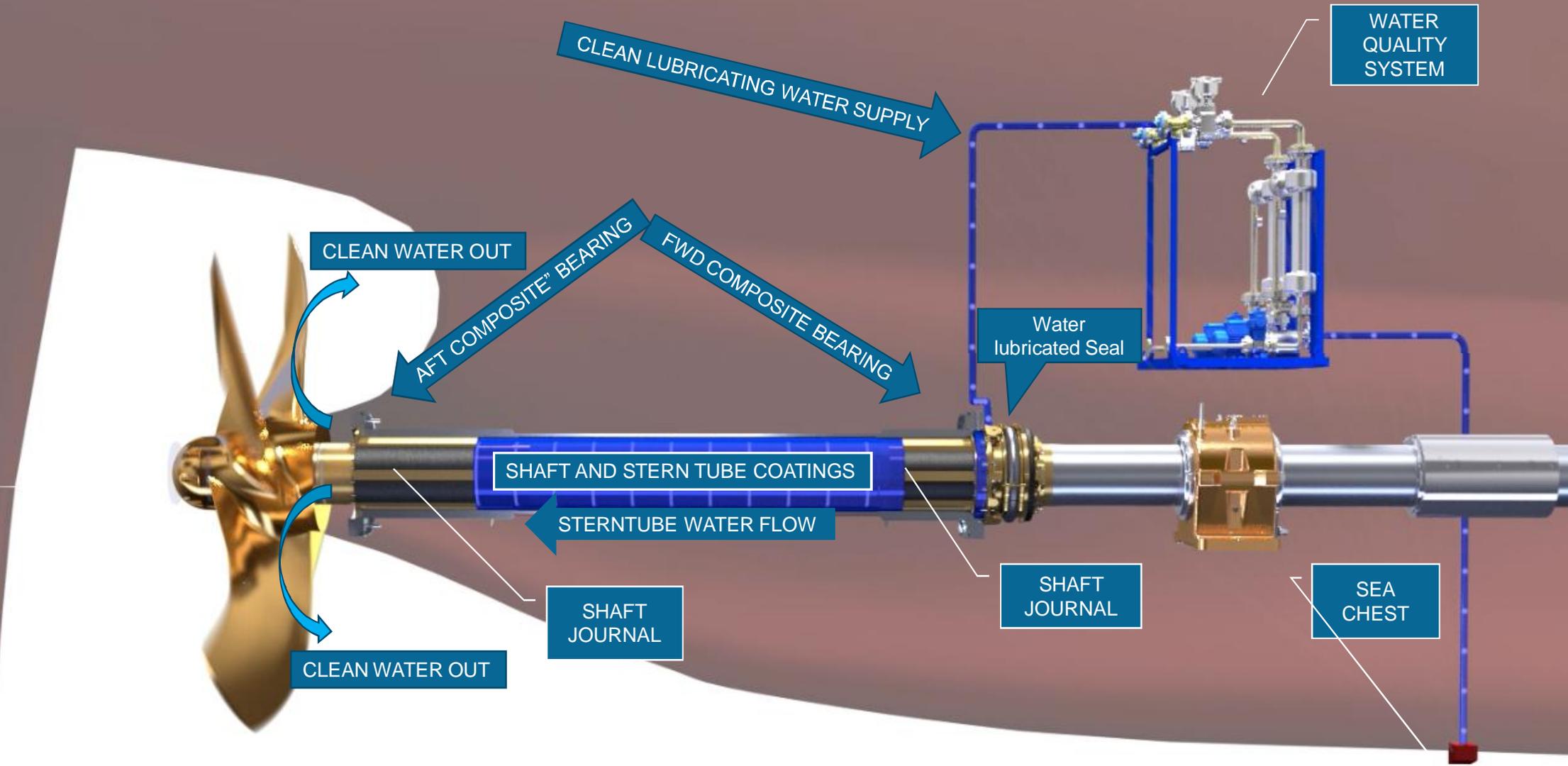
Wärtsilä Sea-Master Panel

Features and outputs of the Wärtsilä Sea-Master panel system

- Class approved stainless steel cabinet and panel
- Self contained enclosure for ease of installation
- Real time dash board display of primary sensors and values
- Touch screen colour display panel
- Historical data trends – providing early warning
- Alarm alerts – data capture and clearing protocols
- Data Integrity



WATER LUBRICATED SOLUTIONS



OTHER S&B PRODUCTS & SERVICES

Measurement & Alignment services

- Fast and accurate measurement
- Covers measurements, calculations, reporting, proposing and carrying out corrective actions
- Pinouts and live visual displays provided
- All work is done using class-approved methodology
- Realignment can be carried out in a couple of hours
- Increases operating time and productivity
- Reduces wear and downtime



ALIGNMENT - HOW TO TROUBLESHOOT

Static Alignment check

- Jack-up test
- Gyro laser
- Runout measurements

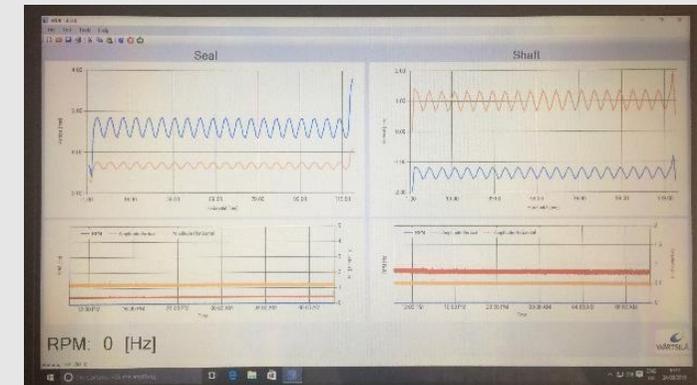
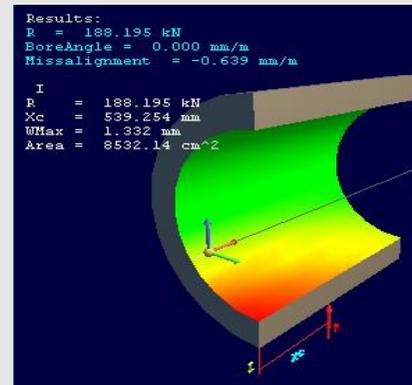
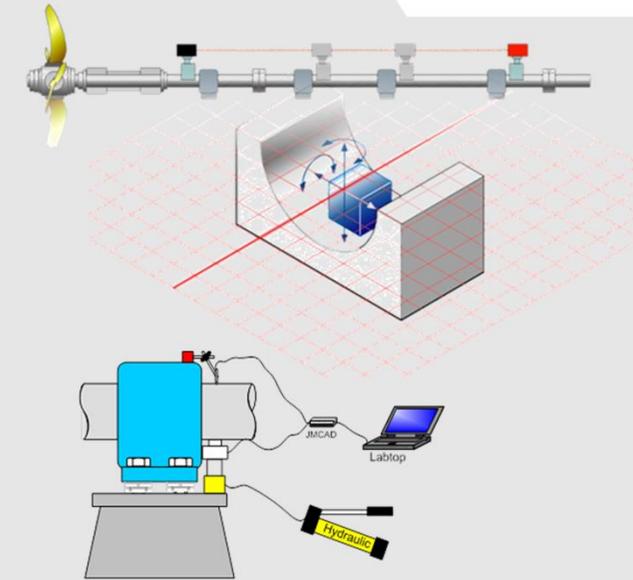


The new Wärtsilä technology (Dynamic Alignment check)

- Portable CBM
Vibration
Runout
Torque

Alignment

Generate a 3D shaft line calculation with various simulations



S&B OFFERING & COMPETENCIES

Water lubricated stern tube seals



Oil lubricated stern tube seals



Oil & water lub composite bearings



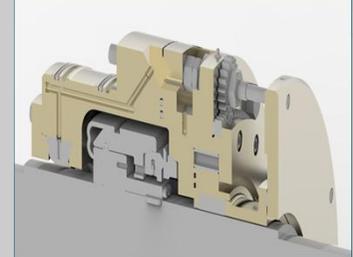
Oil lub white metal bearings



Thrust bearings



Submarine Seals



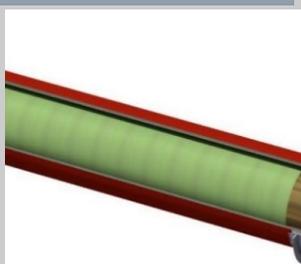
Bulkhead seals



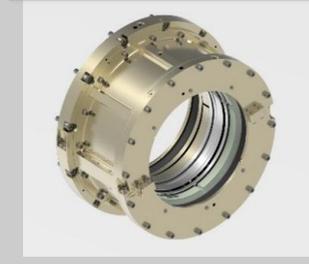
Line shaft bearings



Coatings & Journals



Water jet seals



Industrial bearings



Under water services



Hydraulic equipment



Ropeguard & cutter system



Stern tubes



Rudders, Nozzles & Steer fabrication



Digital condition monitoring systems



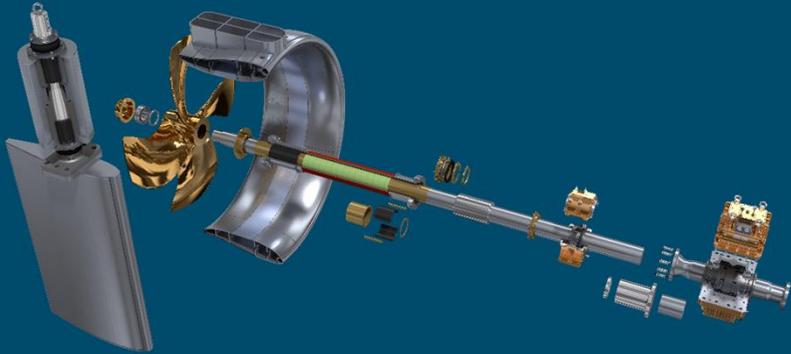
Field Services



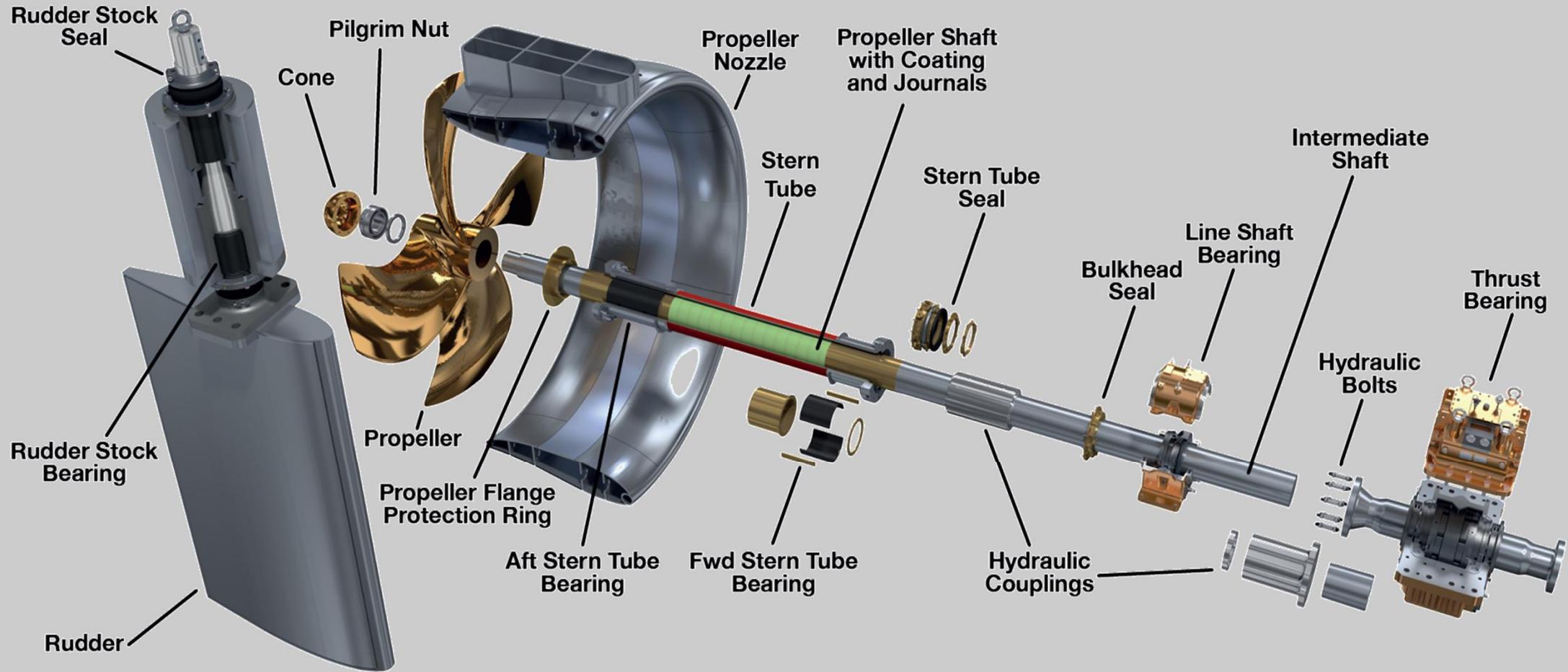
COMPLETE OFFERINGS

Wärtsilä Seals & Bearings stern tube packages

- Complete stern tube packages
- Custom designs to suit specific needs
- No need for in-situ machining
- Quick and easy installation
- Extended operational life of the seals and bearings
- Reduced lifecycle cost



S&B COMPLETE OFFERING



We Offer Complete Stern Tube Packages To Suit Your Needs
[Link to Animation](#)

Thank you



WÄRTSILÄ