



## Virtual Engineering ... ... Engineering Services for the Shipbuilding Industry

### Computer Simulation of Drive Systems in Shipbuilding & Special Marine Applications

#### Customer-Dedicated Engineering Services

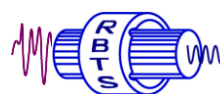
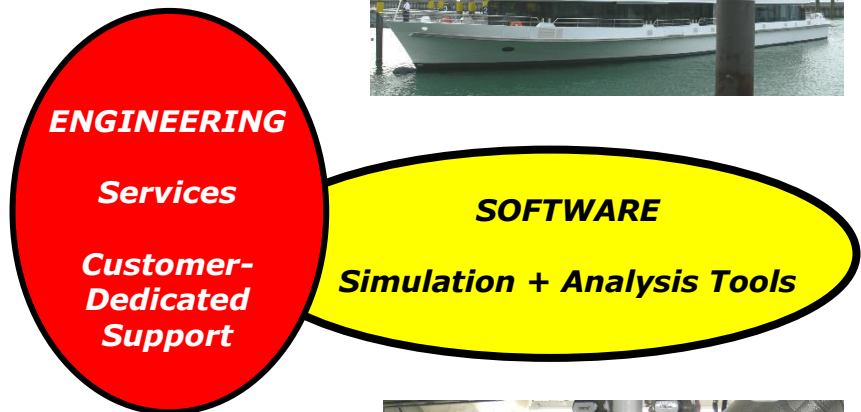
Application and Distribution  
of User-Friendly Software  
for PCs (Windows 10 and later)

Laschet Consulting is specialist in computer simulation technology. Due to longterm experiences in the simulation of complete drive systems, we offer a customer **CAE Service for Engineers** worldwide including consultation and analysis concerning the **DYNAMIC BEHAVIOR OF MAIN AND AUXILIARY (P.T.O.) DRIVELINES OF SHIPS** (to analyze **torsional & lateral vibrations**), e.g.:

- **Analysis of gear dynamics**  
(with all backlashes in the gear stages)
- **Special effects in marine applications**  
(maneuver simulations like "crash-stop", dredging effects)
- **Multi-parameter analysis of excitability**  
(natural behavior, vibration modes, CAMPBELL diagrams)
- **Interdependences of engine/E-motor & main transmission & P.T.O.**
- **Steady-state simulation to optimize dampers & absorbers**
- **Considering typical non-linear effects** (clutch; joint discs; angle-velocity-load dependent elasticities & dampings in rubber/soft couplings, dampers, absorbers, friction elements)
- **Engine/E-motor analysis with all auxiliary drives** (including misfiring effects etc.)
- **Special analysis of test rigs and mapping of test programs**

Our **CAE Service** provides the customer with a project-oriented analysis and interpretation of vibrations caused by external or internal excitation or parametrically excited disturbances. Nonlinear characteristics like backlash or torque-angle-hystereses can be taken into account, too. In order to meet all customers' requirements, **Laschet Consulting** uses and distributes high-sophisticated simulation software in close cooperations with software & engineering companies like **RBTS, Inc., USA** with the rotordynamic software **ARMD** ([www.rbts.com](http://www.rbts.com)).

We present "**Service for Engineers**" regularly at international conferences and exhibitions: ASME, POWER-GEN, SAE, IMechE, VDI, HdT, EFRC, etc. Please also visit our **International Rotordynamic Seminars** in close cooperation with our partner **RBTS, Inc., USA**.



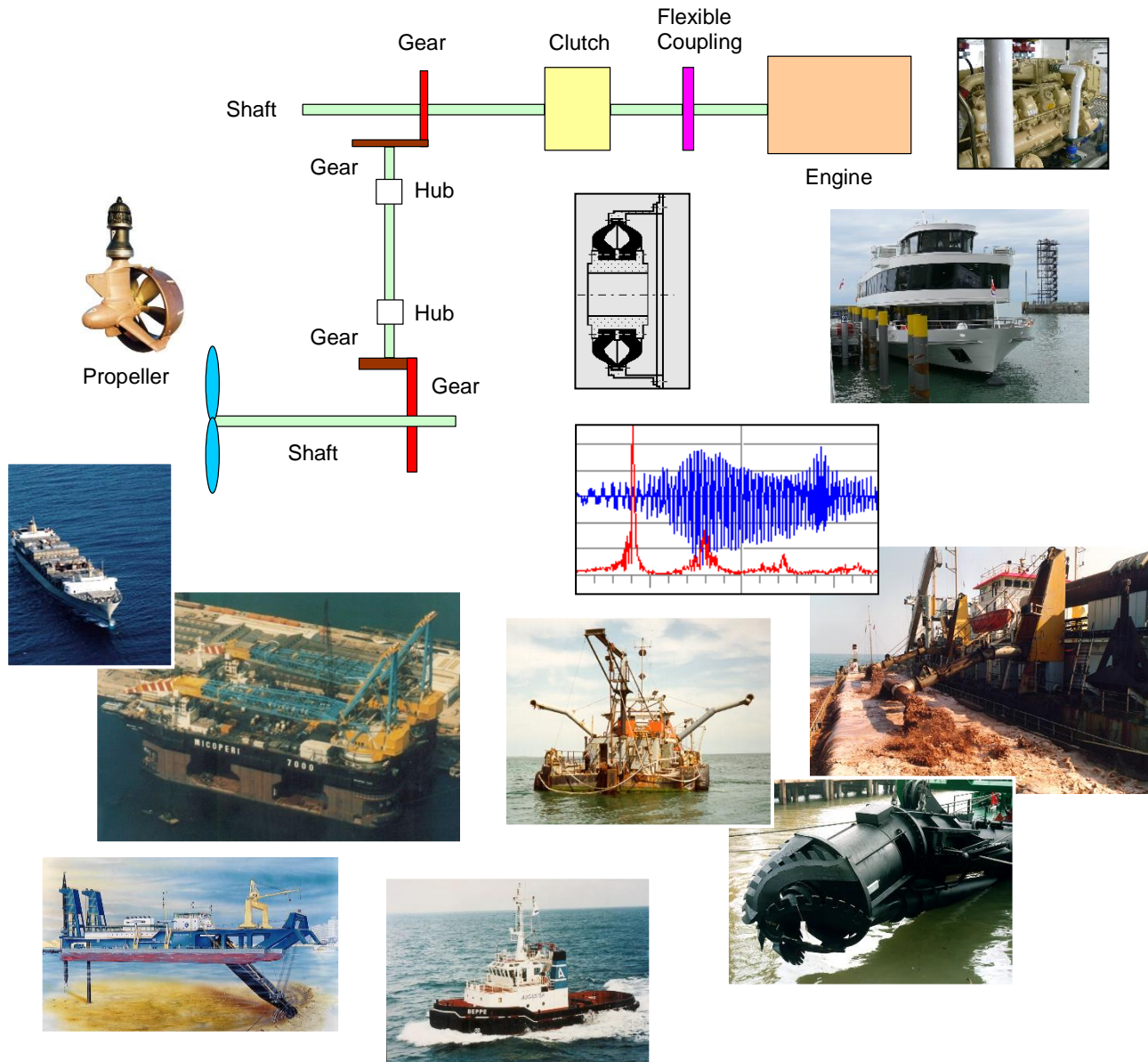
International Seminar:  
**ROTOR  
DYNAMICS  
& BEARINGS**

Online Trainings  
Online Short Courses



## The Professional Engineering Service ...

... supported by RBTS' simulation software **ARMD** and other simulation tools



**Measurements and on-site testings** are done via our cooperative partners worldwide. In all these cases we join the engineering results and provide a complete customer engineering solution including the CAE and test results. In some cases it makes sense to refine the computer model for a new analysis – well tuned with the measurement results.

**Laschet Consulting** – your partner to analyze torsional vibrations in **complete ship drivelines** (main drives, auxiliary & P.T.O. drives) and also to solve and prevent driveline problems in case of “**Trouble Shooting**” actions (if necessary also with **expert reports**).