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)

Dr.-Ing. Andreas Laschet is specialist in computer simulation technology. Due to longterm experiences in the simulation of complete drive systems, I 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, ice 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**

My **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, I use and distribute high-sophisticated simulation software in close cooperation with software & engineering companies like *Concepts NREC, USA* with the rotordynamic software **ARMD** (www.rbts.com).

I present "**Service for Engineers**" regularly at international conferences and exhibitions: ASME, POWER-GEN, SAE, IMechE, VDI, EFRC, TVS, etc. Please also visit the **International Rotordynamic Seminar** in close cooperation with my partner *Concepts NREC, USA*.

Concepts NREC

International Seminar: ROTOR DYNAMICS & BEARINGS

Customer Trainings
Short Courses

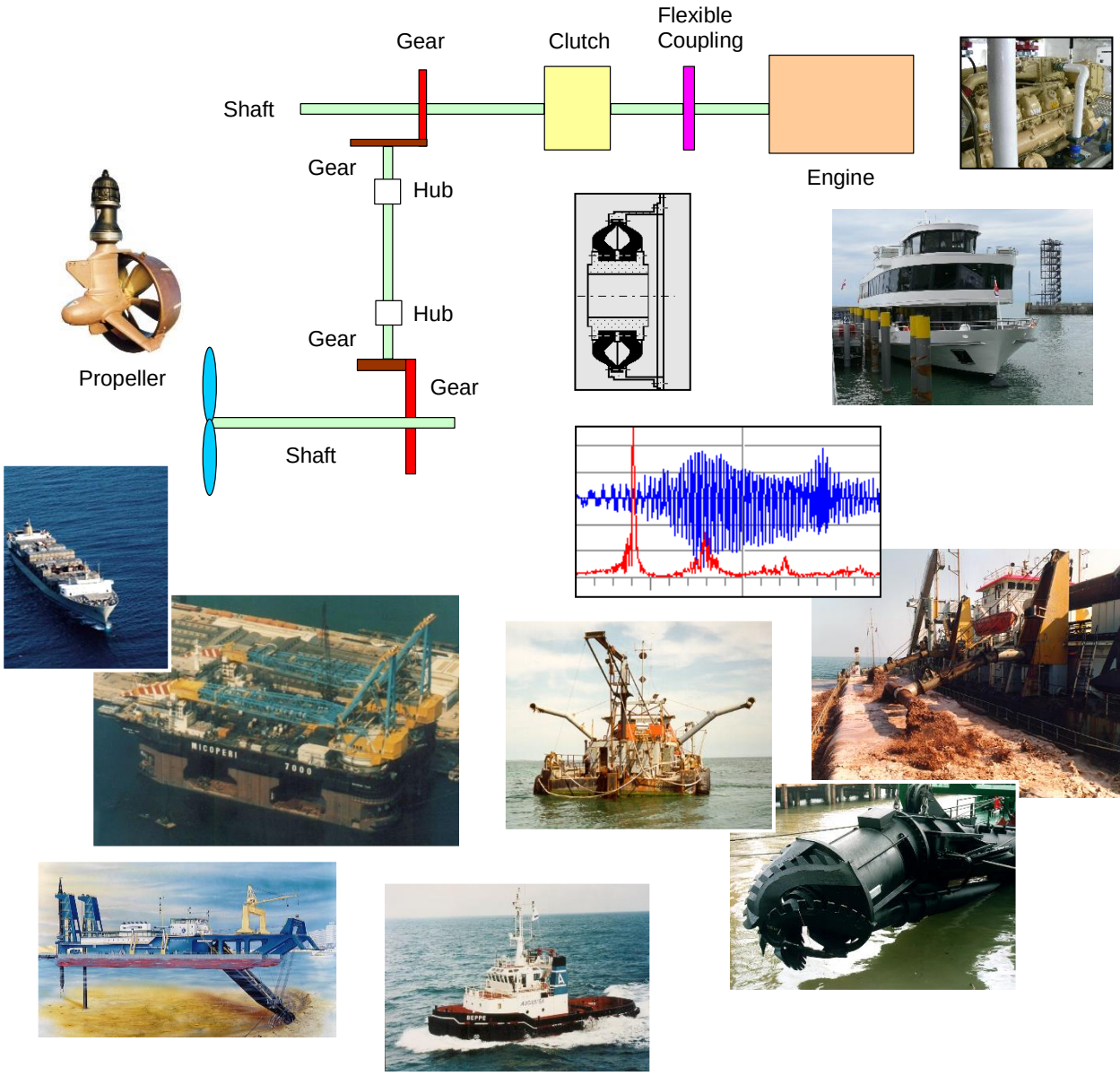
Dr.-Ing. Andreas Laschet • Apolloniaweg 6 • 51515 Kürten • GERMANY

Phone: +49 2268 901650 • E-mail: info@laschet.com • Internet: www.laschet.com

Virtual Engineering for the Shipbuilding Industry

The Professional Engineering Service ...

... supported by *Concepts NREC's* simulation software **ARMD**, and also other simulation tools



Measurements and on-site testings are done via cooperative partners worldwide. In all these cases, we combine the design results and offer the customer a **complete design solution including CAE and test results** – carried out by a professional team of experts. In some cases it makes sense to refine the computer model for a new and updated analysis – well tuned with the measurement results.

I am 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 "**Troubleshooting**" activities – if necessary also with a more detailed **expert report**.

Dr.-Ing. Andreas Laschet • Apolloniaweg 6 • 51515 Kürten • GERMANY

Phone: +49 2268 901650 • E-mail: info@laschet.com • Internet: www.laschet.com