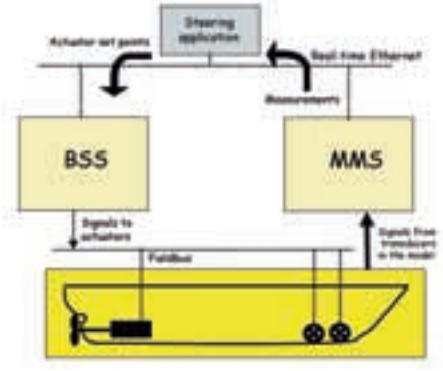
New measurement and control systems - the integrated approach

Demand is growing for increasingly complex model tests, where a ship's hydrodynamic behaviour and its propulsion capabilities are measured and controlled by the basin's measurement and control systems. Haite van der Schaaf and Edwin van de Bunt report on how MARIN is rising to a very precise technological challenge.



MMS, BSS, steering application and their relations to an instrumented model.

The main thrust of MARIN's response to the shipping and offshore sector's need for increasingly complex model testing is provided by its two newest assets: the Seakeeping and Manoeuvring Basin and the Offshore Basin.

Meeting new and tougher requirements

Both facilities have features which strongly increase model testing efficiency and are more than able to meet new, tougher requirements for measurement and control systems. Today, the reality in testing is that more channels from different sources must be recorded with higher accuracy and higher sample rates than ever before.

In recent years MARIN concentrated considerable effort to develop new measurement and control systems - and software applications to deploy these systems in an efficient and user-friendly manner. Parts of MMS and BSS were developed in co-operation with manufacturers of state-of-the-art hardware and software for signal conditioning and motion control systems. The new available systems and components are:

- The MARIN Measurement System (MMS) capable of measuring up to 160 channels with better than 1 promille accuracy. The maximal sample frequency depends on the number of channels used and can be up to 40 kHz for an individual channel. For fast on-line evaluation of measurement results, MMS has built in calculation functions.
- The Basic Control System (BSS) for control of devices like motor systems, stroboscopic lighting systems and camera equipment. BSS offers operators features for flexible configuration, inspection and control of these devices. In addition to operator control the devices can also be controlled and monitored by applications using BSS.
- Applications dedicated to the execution of e.g. manoeuvring or steering algorithms are implemented as software components based on Windows-NT. These applications communicate directly with MMS and BSS.

Interconnectivity of MMS, BSS and applications is based upon de facto techniques and standards like Ethernet, TCP/IP, OPC™ (OLE for Process Control)[1] and CAN fieldbus.

Availability

- MMS will be installed in the new Seakeeping & Manoeuvring Basin, Offshore Basin as well as the renovated Depressurised Towing Tank.
- BSS is already operational in the Seakeeping and Manoeuvring Basin and Offshore Basin and will be introduced in the Depressurised Towing Tank.
- Manoeuvring and steering applications are already operational in the Seakeeping and Manoeuvring Basin. Other test dependent applications are being developed for all facilities.

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