



# Wildlife inspires MARIN in DP-JIP

**MARIN takes its inspiration from many places but here Report looks at one of the more unusual sources.**

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In a recent initiative, MARIN has embarked on a Joint Industry Project on Dynamic Positioning technology (DP-JIP). The objective is to develop a 'plug-on' tool (RTEFE - Real Time Environmental Force Estimator) for DP-systems that estimates the total environmental force on a vessel. Experts from IHC Caland, BPAmoco, Kongsberg Simrad, IZAR Fene and MARIN have co-operated in the development of the Work Scope, which comprises model tests and full-scale measurements.

In nature, many species depend on extremely efficient 'station keeping' abilities, where the efficiency is hinged on the small energy margin between life and starvation. Observe for instance the stunning station-keeping of a trout in a turbulent river or a hovering falcon on a windy day. These animals sense the force acting on them and their stationkeeping efficiency is based on the immediate counteracting of these forces.

## **RTEFE Technology**

Although human mechanical skills still need further development to approach wildlife efficiency, there are moves to narrow the gap. In an effort to narrow the technology/nature gap, a real time estimate of the wave drift forces, wind forces and current, is needed. Wind force estimating is a well known technique. The principle of applying a wave drift force estimate has been tested on model scale and



DP trials with Loch Rannoch.

has shown performance improvements between 20% and 40%. When real time wave and wind forces are known, the steady current field can be estimated by the DP system.

Relative wave motion and ship motion measurements are used in the RTEFE for the estimation of real time wave drift forces, on the basis of a wave direction estimator and a wave group related modulation of the mean drift force. In addition they are used for the prediction of a directional sea spectrum and they are useful for decision support and for assessing the mean drift force level acting on the ship.

## **Full-Scale Measurements**

A data logging system has been installed on "Loch Rannoch", a shuttle tanker operated by BP Shipping to export oil from the Schiehallion Field. Ship motions, thruster actions, DP control signals and the relative water motions at six locations are measured. Wave information also comes from the Schiehallion Field wave buoy.

A series of five specific DP trials have been carried out in the Yell Sound, the Northern approach to the Sullom Voe oil terminal on the Shetland Islands. The project is now half way and the full-scale monitoring campaign will continue until late summer 2002.