The joint industry project PELS (Project Energy-saving air-Lubricated Ships) being carried out at MARIN is the focus of much public and scientific interest. Given the potential energy savings of this technique, MARIN has even found itself featured in prime time television news broadcasts. So what has caused such a media whirlwind?

Energy saving technique hits the headlines

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What remains invisible to the outsider is the hurricane of new developments that led to the successful application of this - in principle - old idea. In the meantime solutions are being found to potential problems. For instance, keeping the vessel horizontal by means of stabiliser fins has become a more accepted technique in naval architecture. Other problems still to be solved are further outlined.

MARIN Measurement System (MMS)

The compression of air is demanding energy, energy that needs to be saved by the frictional drag reduction of the ship. As the air has to be injected into a pressure ambient of at least the hydrostatic pressure at the draught of the vessel, this energy needs to be reduced in order to ensure an overall positive energy balance.

The pressure field generated by a sailing ship needs to be optimised in a way that the "natural" pressure field of the ship is already focussing the air and interfering well with air injection points. Model tests need to be conducted at a correctly scaled-down air pressure to ensure that the compressibility of the air at model scale is similar to that of the full-scale vessel. Therefore, the calm-water tests of the PELS project were conducted in the depressurised towing tank at MARIN – a unique approach.

During these tests all pressures and airflows were measured. Also the filling of an air-cavity was measured using a newly-developed gauge on the sealing wedge of an air-cavity. MARIN's measurement systems make all measured signals in real-time available for closed loop control applications by using industry standard OPC interfaces. For the PELS project, a new application was developed to control the airflow to the air-cavity through a mass-flow controller. This was responsible for filling the air-cavity in a way that the airflow was reduced to the required minimum.

MARIN prepared itself thoroughly in a bid to offer the best service and most accurate measurements on air lubricated ships and the proven net energy reductions achieved in the PELS project more than justifies these efforts.