BRIDGING THE GAP... MARIN fills in the VIV gaps of the Gravity Actuated Pipe (GAP) concept

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Over the last half year MARIN has worked extensively with SBM to study the challenging hydrodynamic aspects of the GAP system, using the High Reynolds VIV test set-up in the High Speed Basin. A 2D scale 1:5 model of 3.6 m length was extensively tested. The Reynolds numbers could be preserved in the tests by scaling the speed up by factor five.



uring the extensive test campaign, the bundle was heavily tested for all possible angles of the flow. Measurements are used to optimise the hydrodynamic design of the bundle and are also used as calibration input for Shear 7 VIV analysis. Three types of tests were carried out (see drawing below).

The GAP is an exiting new concept for SBM. The product transfer between floating systems in deep and ultra deep water is often more efficient if handled at minimal depth by mid-water pipe systems. The GAP concept for the transfer of multiple, live produced fluids between gathering satellites and an FPSO is such a system. The GAP consists of a neutrally buoyant bundle of steel pipes supported and tensioned at a near surface depth by chains and weights attached to floating systems. The floating systems transfer production fluids through the pipe bundle via flexible lines. This near surface transfer greatly reduces flow assurance problems of hydrates and waxing that would occur with a sea bottom-based SCR piping system. The GAP's neutrally buoyant bundle also greatly reduces the load placed on the floater when compared to SCR use, which is important when designing TLP tie-ins. MARIN

