

SUMMARY

To review the German Guidelines 'Cross Currents from Discharge and Inlet Structures in Waterways' and to support the PIANC INCOM WG 141 'Design Guidelines for Inland Waterways', a parameter study to assess the additional navigation width needed in the reach of the structures in a straight channel was carried out, using both a Real-time Ship Bridge Simulator (MERMAID 500) at SIPORT XXI, as well as the SHIPMA simulation program. The cross flow fields considered were calculated using the NaSt3D code of BAW. The interpretation of the simulations showed the expected nearly linear dependence of the additional width on the

cross flow velocity and its width at the ship path, satisfying existing experiences from scale model tests. But there was an unexpected large influence coming from the lateral flow velocity, which is caused e. g. by the large scale turbulence in the mixing zone between cross and longitudinal flow in case of a strong and wide outlet structure. Basing on fundamental principles of ship motion in a cross current field, a semi-empirical formula could be derived and calibrated by the simulations to assess the additional navigational width e.g. for fairway design purposes.