Real-Time Simulations for the Juliana Canal Bend near Elsloo

The Juliana canal is a part of the Maas route for inland waterway vessels. This canal has been designed for vessels of 137 x 14 x 3 metres. In future the canal will have to be accesible for two barge push tows of 176 metre length. However, the maximum vessel size for the bend near Elsloo was only 110 x 12 x 3 metres. The aim of the real-time simulations was to investigate:

- The possibility of passing the bend with 137 metre ships in the existing situation;
- The possibility of an encounter of the 137 metre vessel and a class III vessel in the bend;
- The effect of a bow thruster on the safety of the manoeuvres;
- The required widening of the canal bend in order to allow two barge push tows.

The simulations were performed simultaneously at two real-time simulators. Both simulators were equipped with a visual system to display the canal, the surrounding hills, the ownship's bow and the encounter vessel. Experienced inland waterway captains sailed on each simulator one of the following five types inland waterway vessels:

- Class III motor ship (67 metre length);
- Class Va motor ship (94 metre length) with bow thruster;
- Class Va one barge push tow (110 metre length);
- Class VII one barge push tow (137 metre length) with bow thruster;
- Class Vb two barge push tow (176 metre length) with bow thruster.

For the widening of the canal, different alternatives with respect to cross section shape and cross section area were tested.
An important factor for a safe and smooth passage of the blind bend was the propor use of the ship-to-ship VHF traffic to arrange the encounter manoeuvre at the right point and at the right time.

Actual situation

Simulated visual image of the actual situation

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