

7 – NATIONAL MATTERS

7.7 Finland

National Matters Update by Finland

Impact of COVID-19

The pandemic has not affected the service level of AtoN and VTS services in Finland. Both fairway maintenance work and operation of VTS centres have continued normally and the ongoing fairway investment projects have progressed without delay. However, as a precaution, it is recommended to work from home whenever possible, and when working in the office, it is recommended to use facemask. All travelling abroad as well as within the own country has been stopped, unless absolute necessary for carrying out ones duties.

Major AtoN installation project completed

A new approach channel leading to the port of Oulu was commissioned in October 2020. The depth of the new channel is 12,5m and its length is about 80 km. The channel is marked with a combination of fixed and floating AtoNs. The outermost fixed AtoNs are installed more than 60 km from the shoreline. AtoNs include:

- 5 fixed Edge Marks founded on the seabed
- 3 Leading Marks founded on the seabed
- 2 Leading Marks installed onshore
- number of floating Atons

During the 2020 open water season, five fixed Edge marks and three Leading Marks were founded on the seabed. The water depth in the area varies between 8 to 17 meters, but the solid load-bearing seabed is at a depth of tens to one hundred meters. During winter season, the maximum ice load in the area can reach 10 MN. The combination of soft seabed and high ice loads required very heavy foundation solutions.

The largest base piles are almost 40m long with 4.2m diameter and weight of 250 tons. The total length of the largest mark is about 55 meters (Figure 1). All marks are equipped with ice cone and also with remote monitoring and control units.

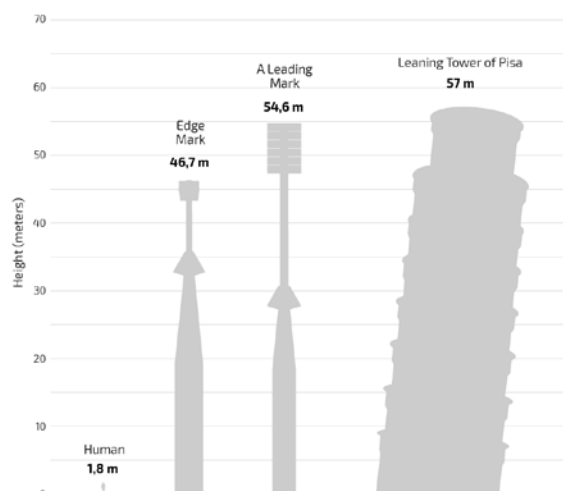


Figure 1. Size of the Edge and Leading Marks

Installation of the base piles required softening blasts to make sure that the piles reached the target level and additional mass exchange was performed for three marks, 20 000 m³ of crushed stone per each. The total cost of the project including planning, construction and installation work was about 24M€. The installation operation is presented in Figure 2 and the results in Figure 3.



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Figure 2. The transportation (left) and installation (middle and right) of the base piles was carried out by a special vessel TAKLIFT 4 (Home Port: Rotterdam, Flag: Singapore).

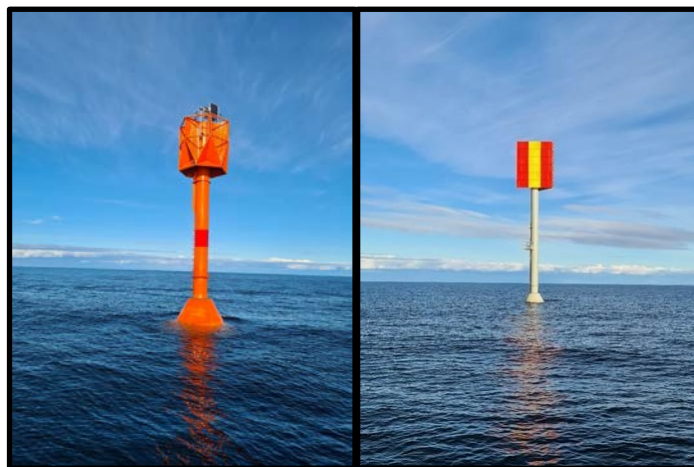


Figure 3. Installed new Edge Mark (left) and upper Leading Mark (right). Total height of the Edge Marks above MSL is 12m and total height of the upper Leading Mark above MSL is 25m.