

## **Solution to reduce risk and cost in a channel deepening project at the Port of Lyttelton in New Zealand**

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In 2018, the Lyttelton Port Company Limited (LPC) undertook the largest redevelopment in its history, including a channel deepening project. To accommodate larger vessels, LPC started a channel deepening project to lengthen the 7km shipping channel by 2.5km, widened by 20m and deepened to increase maximum vessel drafts from 12.4m to 13.3m to allow for larger and deeper ships.

By enabling larger ships to call at Lyttelton Port, local importers and exporters get the best possible and most cost-effective international shipping solutions (container vessels carry up to 5,500-6,500 TEUs- Twenty foot Equivalent Units after the redevelopment work).

LPC implemented a state-of-the-art Dynamic Under Keel Clearance (DUKC®) technology which uses precise measurements and modelling of waves, currents, tides and ship motions to provide optimal sailing advice for each vessel transiting the new channel.

To accurately measure the complex water level fluctuations, two radar gauges were installed combined with numerical and empirical modelling to establish simultaneous wave measurements. These equations, fed with forecast offshore wave conditions, provided reliable estimates of the operational long wave climate at sites within the port.

The PIANC channel design required a dredge volume of 9.7M cubic metres. The DUKC® optimised channel design required a dredge volume of 5.5M cubic metres, a reduction of 4.2M cubic metres or 43% resulting in a significant saving in capital expenditure and an ongoing reduction in operating risk.

The presentation will describe this advanced solution used to expand the port in order to welcome larger vessels and how it benefits in terms of cost optimisation.