OMC's Melbourne-invented technology helps Port Hedland to maximise port throughput

OMC International's innovative maritime technology, which has won a prestigious international safety award, is helping Port Hedland maximise port throughput and channel capacity.

OMC's recently developed Dynamic Port Capacity Model (DPCM®) is a 'new application' of their world-leading dynamic under keel clearance (DUKC®) system, which won the prestigious 2015 IBJ Safety in Bulk Handling (Marine) Award.

DPCM® allows a port or a port user to clearly identify bottlenecks in port, waterway or terminal throughput and also enables critical evaluation of potential investments and proposed changes to operations before funds are invested. It is aimed at making more efficient use of existing infrastructure and facilities rather than taking on the capital expense of building new ports or harbours.

DPCM® is a tool for modelling port capacity and offers an optional stand-alone extra capability to DUKC® Series 5. It was developed to enable the identification of additional capacity available at Port Hedland.

CEO Peter O'Brien, who manages OMC's day-to-day operations from the company's Melbourne headquarters, said DPCM® will assist Port Hedland and its users to maximise throughput from the Inner Harbour for a fraction of the cost (<10%) that would have been required from a $20 billon Outer Harbour development.

In a Ministerial Statement published late last year (13 November 2015), the Western Australian Government Transport Minister Dean Nalder announced that this new DPCM® modelling had helped pinpoint opportunities to increase Port Hedland's forecast capacity from 495 million tonnes a year to 577 million tonnes.

As Minister Nalder announced, the modelling also integrated recent operational changes implemented by Pilbara Port Authority (PPA) which has resulted in increased sailing drafts, the shipper's move to larger and more draft efficient ships, and the port's ability to sail more ships on a tide. (DUKC® Series 5 has played a major role in these benefits.)

OMC's Dynamic Port Capacity Model has been developed to highlight all areas and options where port throughput from Port Hedland's inner harbour can be increased to allow the maximum tonnage of iron ore "to be squeezed out of it". This new DPCM® application should ultimately greatly assist the integration of the complexity of factors to be considered when determining a safe UKC in Australia's large bulk ports.

The DPCM® accurately simulates port operations and all the complex interactions that occur between the fenderline and the sea. The model can be tailored to suit the needs of the port but interactions include loading operations, available berths, available water depth, weather conditions, under keel clearance restrictions and operational rules including dynamic UKC, inbound and outbound traffic, ship movement protocols, tug availability and piloting requirements.

The DPCM® models port capacity through Discrete Event Simulation (DES) and is the first application where an operational DUKC® system has been incorporated directly into port capacity modelling.

The modelling includes consideration of planned and future fleet evolutions, port operational procedures and restrictions and port infrastructure upgrades.

Mr O'Brien said the Port Hedland Series 5 system together with high spot dredging and the Tidal Model Project for which PPA was awarded the prestigious Premiers Award has resulted in a significant increase in ship sailing drafts and tidal windows. This has allowed PPA to significantly increase its export capacity, well demonstrated on 28 February 2015 where eight cape-size bulk carriers sailed out with a record tonnage of 1,511,977 tonnes.

OMC's successful roll-out of DUKC® Series 5 continues, with Rio Tinto signing off in October last year for the Series 5 systems to be installed at the ports of Dampier and Cape Lambert. DUKC® Series 5 has also been installed in Torres Strait (AMSA, 2011), Port Hedland (2013), Fremantle (2014), Montreal-St Lawrence River (2014), and last year in Napier, Newcastle, Arrium Spencer Gulf and Geelong (Victorian Regional Channels Authority).

VRCA's Captain Peter McGovern said DUKC® was installed in Geelong "as a way of admitting large ships with more cargo, without requiring any changes to the channel infrastructure".

In the right circumstances, Captain McGovern said DUKC® technology could lead to cargo increases of 1350 to 3000 tonnes per ship. He said DUKC® means companies can fill bulk carriers to maximum draft and still safely navigate the Geelong channel.

** In the Queen's Birthday Honours List in June 2015, OMC International Executive Director Dr Terry O'Brien was appointed a Member (AM) of the Order of Australia for "significant service to maritime engineering, to the development of innovative marine navigation equipment and to education".*

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