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## OMC unveils new safety product prompted by graveyard of the pacific study

OMC iHeave - a ship motion measurement instrument



OMC International (OMC) has announced that its new safety product OMC iHeave - a ship motion measurement instrument - was developed as part of a DUKC desktop study now finalised for North America's 'graveyard of the pacific'.

Executive Director Dr Terry O'Brien OAM said his Melbourne-based maritime engineering firm delivered the final report to the Columbia River Bar Pilots (CRBP) last Friday (July 20). Dr O'Brien said the research project, commissioned by CRBP with funding from the Oregon Department of Transportation, aimed to investigate the commercial and safety benefits of installing a DUKC (Dynamic Under Keel Clearance) system at the Columbia River Bar. This treacherous entrance to North America's Columbia River, which flows into the Pacific Ocean, is known as the 'Graveyard of the Pacific' because it has claimed about 2000 ships and 700 lives since 1792.

"I am optimistic that this desktop study will be followed by the commissioning of a customised DUKC system for the Columbia River Bar because our technology will ensure maximum safety for large vessels moving through this challenging waterway," he said.

Dr O'Brien said this North American project was the original prompt for OMC's engineers to develop, and then commercialise, OMC iHeave. "Accessing the bow and transferring DGPS equipment by helicopter during winter at the Columbia River Bar was regarded as too dangerous and would have prevented us from measuring the very ship motions the pilots were most concerned about so a group of our engineers chose to develop OMC iHeave as a practical approach to assist the pilots gather vital ship motion data for a wide array of ships in this very challenging environment," he said.

Dr O'Brien said OMC iHeave, which gives results of similar accuracy to a full DGPS set-up, was developed in-house by a team of engineers led by the Head of the Research Department Dr Giles Lesser.

This light-weight self-contained unit, which is about the size of a shoebox, is normally carried onboard by marine pilots and can be set up on the ship's bridge within two minutes. It can continuously monitor ship movements during the entire transit, and directly measure all six degrees of ship motions in waves - in all weather conditions - from just one internal location on the ship's bridge.

Dr Lesser said OMC's traditional measurement techniques of setting up multiple DGPS instruments, outside on a ship's bow and bridge wings, could be dangerous for engineers to mount, or even impossible in some weather conditions, such as on open sea voyages when ships pass near cyclonic swells.

"With OMC input, the Columbia River Bar Pilots themselves easily set up and operated OMC iHeave to accurately measure the wave response of 24 ships crossing the Columbia River Bar under moderate to high swell conditions in just four months between November 2011 and March 2012, which is a huge achievement," he said. "From North America, these pilots electronically submitted their recorded data to OMC's Melbourne office and OMC engineers then sent back a short report on the ship motions of each vessel. This sets a new standard for analysis and prediction of UKC at exposed ports.

"OMC iHeave was designed specifically for use by pilots to allow them to gather hard data on ship motions under the conditions that are of concern to them. For those ports, or pilots, where wave response is a concern for UKC, they now have the option of using OMC iHeave to find out just how risky their transits really are. OMC is now offering this vessel measurement and analysis service to other clients.

"Having a good database of measured wave response motions clarifies whether or not a UKC problem exists and also provides an invaluable validation of the

wave response modelling performed by the DUKC? system. This in turn provides DUKC? users with confidence in the DUKC? system results.

"I believe that the Columbia River Bar Pilots will find these study results useful in refining their procedures for managing UKC at the Columbia River Bar. It would not have been possible to gather the quantity and quality of data that was achieved over the winter without the development of the iHeave? device.

"As the wave response of vessels, by its very nature, depends on the waves the ships are exposed to, measuring the relatively uncommon, large wave response is challenging because it doesn't happen very often, and it is very expensive or impractical to have engineers and equipment on standby to 'catch' interesting events. Also, when the waves are large it can be dangerous or impossible for extra personnel and bulky equipment to be transferred to and from the ships to be measured."

OMC iHeave? was first tested and validated in Bass Strait with the assistance of Toll ANL Bass Strait Shipping, which twice allowed OMC engineers onboard their ships operating between Melbourne and Burnie in order to directly compare OMC iHeave? and DGPS vessel motion measurement results. Dr O'Brien also acknowledged the Port of Melbourne's assistance in helping the OMC engineers gain access to ships in port so as to test early concepts for the fixing and alignment of OMC iHeave?. "These visits were essential to allow OMC to develop a self-contained unit that was simple and practical for a pilot to operate unaided," he said.

OMC iHeave? will complement DUKC?, OMC's award-winning software navigation system. All DUKC? products, including the recently released DUKC? Series 5 web-based system, use Dr O'Brien's SPMS numerical model for their core ship motion computations. It is a predictive system and is not replaced by OMC iHeave? because ship masters and pilots must know in advance of their transit that they will have sufficient water underneath their ships to reduce the potential risk of grounding in shallow waters. This technology mathematically predicts how much under keel clearance ships have as they come down shallow channels, while OMC iHeave? only takes direct measurements of ship motions. These measurements can be used to verify that the DUKC? predictions were accurate.

DUKC? has been safely operating for nearly 20 years, in most major Australian ports including Port Hedland and Port Melbourne, and also overseas. In most cases, it allows large vessels to load more cargo and/or sail with wider tidal windows. It is so accurate that, under extreme weather conditions, a 250,000 tonne bulk carrier can negotiate a channel within a metre's clearance to the seabed.

**Source: OMC International**