

Torres time for DUKC

Any technology that reduces the risk of grounding is likely to interest seafarers, shipowners and port operators. **Margaret Freeth** looks at how technology can make the calculation of under-keel clearance safer and more effective

► **Being able to accurately predict under-keel clearance** for a large bulker, container ship or tanker transiting a shallow, tidally restricted waterway makes for safer and more efficient navigation for masters and crews. For the ship operator it can also mean more cargo loaded on the vessel and greater flexibility in the timing of port calls.

Almost all of the iron ore and most of the coal exported from Australia is shipped out under advice provided by the Dynamic Under Keel Clearance (DUKC) management system produced by OMC International. The company has recently updated the web-based fifth version of its system.

Key to the system is the numerical ship motion model that enables calculation and forecasting of the interaction of waves, tides, currents and vessel dynamics in real time. The port-based system enables long-term planning of maximum safe draught as well as earliest and latest sailing times, which is then refined from 48 hours ahead of transit time right up to the time of sailing.

Peter O'Brien, chief executive of OMC, emphasised to *SASI* the importance of DUKC as a risk management tool. "Reliance on pilots to manage the risk of grounding in severe events by applying discretion without the assistance of modern analysis tools cannot be considered an adequate risk management technique," he argued. "The planning of tidally restricted sailings where UKC requirements are determined based upon a static rule does not allow for risk to be adequately quantified or managed," he added.

A conservative static rule can prove uneconomic for ships in terms of cargo carried, he maintained, while "conversely, if a waterway operates under a static UKC rule which is known to provide inadequate assurance against the risk of grounding in a high proportion of environmental events, the requirement to adequately manage risks is not being met".

The Australian Maritime Safety Authority (AMSA) has selected DUKC for the shallow and environmentally sensitive Torres Strait, which separates the northern tip of Australia's Cape York Peninsula from the southwestern portion of Papua New Guinea. Installing

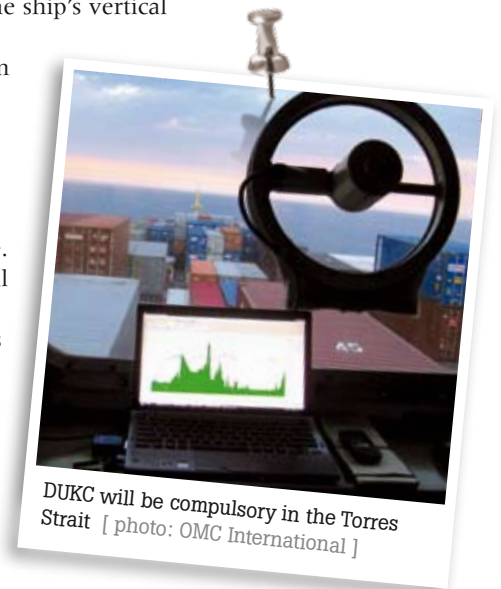
DUKC will be compulsory for all deep-draught vessels, regardless of whether they transit the waterway regularly or not.

Pilots will access the DUKC on board the vessel to ensure safe UKC for the transit through the Torres Strait. When the vessel is loaded and the pilot embarks, s/he accesses DUKC by laptop and is able to use it to optimise safe vessel speed and to receive advice on any unexpected circumstances, such as vessel breakdown. The VTS tower monitors the passage, tracking the ship's vertical as well as horizontal movements. The system will enable AMSA to validate the existing safety margin for such ships and evaluate the appropriateness of the current draught regime.

There is also potential for efficiency benefits, O'Brien pointed out, as the 150km-wide, reef-strewn Torres Strait is a busy channel for international shipping and currently a serious bottleneck.

The system is due to come into operation early next year. "The waters through the Torres Strait are highly variable and complex with strong tidal currents and tidal gradients occurring over a hard bottom in the remote waterways," he explained. "Assessment of the response of a particular vessel to a particular environmental condition (prevailing and forecast) is a complex process."

Further benefits for port and ship operators are likely to come from work OMC is undertaking for Port Hedland Port Authority. In June 2009 the port set a record of five bulk carriers loaded with iron ore sailing on one tide (a window of two to three hours) and would like to replicate this, as growth is planned. At the moment, the average is two to three ships on a tide. OMC has been commissioned to develop and install a DUKC Optimiser program to maximise throughput over a tide cycle. ◀



DUKC will be compulsory in the Torres Strait [photo: OMC International]