AUSTRALIA'S MOST INNOVATIVE ENGINEERS

SIMON MORTENSEN — INNOVATION: NCOS ONLINE

Group Executive Ports & Navigation, DHI Water and Environment MSc (Civil), Technical University of Denmark (Den)

The Port of Brisbane (PoB) handles around $50 billion in trade annually and has a navigational channel 90 km long extending from the Sunshine Coast through Moreton Bay into the Brisbane River. Traditionally, the Harbour Master would use a simplistic dynamic under-keel clearance (UKC) system to allow safe navigation of vessels, but this approach resulted in a conservative estimate, limiting the maximum draft of vessels.

Looking to cater more towards larger ships, PoB considered deepening the channel via traditional dredging, which can be expensive and environmentally sensitive, before commissioning Simon Mortensen and his team to develop a smart solution that would optimise the navigational channel's operability while mitigating vessel grounding risk.

His solution, NCOS Online, allows each vessel to maximise its sailing window while maintaining optimal safety. It uses complex mathematical algorithms based on real time data to accommodate specific requirements for multiple user groups and key stakeholders through an intuitive user interface. It is a cloud-based service running on Australia's fastest supercomputer NCI to make millions of calculations a second incorporating forecasted, real time environmental, and weather data, vessel specifications and transit information to accurately produce optimal sailing windows for larger ships.

Below: Port of Brisbane operations.

Mortensen wrote the first prototype of NCOS during a Christmas break and it was developed using the port's shipping channel as a "living laboratory". In the first six months of operation in Brisbane, NCOS Online doubled the number of bulk carriers departing with a draft greater than 14 m, achieved a 167 per cent increase in container ships with a draft greater than 13 m compared to the year prior and allowed the longest container vessel ever to visit Australia. ●

"It is a cloud-based service running on Australia's fastest supercomputer NCI to make millions of calculations a second."