Dynamic Under Keel Clearance

Sep/Oct 2015
Association of Canadian Port Authorities

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What is Under-Keel Clearance
Under-Keel Clearance Rules

Must account for unknowns in:

- Wave motions
- Vessel squat
- Vessel heel
- Water levels/tides
- Channel depths
- Currents
- Manoeuvrability Requirements
- Vessel speeds
- Vessel drafts
Dynamic UKC is a consistent and scientific approach to UKC management. It integrates:

- real-time hydro/meteo data
- high density bathymetric data
- real time AIS, and
- advanced hydrodynamic and ship motion modelling

directly into UKC decision making
Real-time hydro/meteo data
High density bathymetry
Hydrodynamic models
Ship motion models
DUKC Computational Engine

Risk Mitigation

Sailing Windows

Maximum Drafts

Dredge Planning
Available Sailing Window (Hours per Day) - 30,000 DWT tanker 10.0m draft

- Existing Rules
- DUKC Rules
- Tide
- Swell
Maximum Drafts

![Graph showing maximum drafts over time, with a y-axis scale from -1.5 to 1.5 and x-axis representing dates from 2009-09-28 to 2012-04-30. The graph includes vertical lines at specific dates indicating significant changes in draft.](image-url)
Maximum Drafts

- Lisbon (Pt): +1.0m draft
- Dampier (Au): +60cm draft (~$300M p.a.)
- Port Hedland (Au): +65cm draft (~$340M p.a.)
- Montreal (Ca): +10cm draft
Dredge Planning
Dredge Planning

Taranaki (NZ):
Achieved $15M worth of dredging with $1.5M+DUKC

Port Hedland (Au):
High spot dredging increased drafts by 71cm
What is DUKC?

- Innovative e-Navigation system
- Science based, data driven decision making
- Risk mitigation tool
- Reduces unknowns
- Improves supply chain safety, throughput and efficiency