SOMS UKC CONCEPT STUDY

6th CO-OPERATION FORUM
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Grand Inna Kuta
Bali, Indonesia

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Background

37th Tripartite Technical Experts Group

- Concept Study for real-time monitoring of UKC
- Benefits include:
  - UKC information for:
    - **SITUATIONAL AWARENESS**
    - **ENHANCING SAFETY OF NAVIGATION**
  - Optimising deep draft vessels management and operations
  - Leverage existing MEH infrastructure
- Importance of region
  - Great economic and natural significance

Source: Google Earth

Objectives

- Compile and Review
  - Present infrastructure, equipment, and data
  - UKC regulations and critical UKC areas
  - Shipborne equipment availability and suitability
- Propose a cost effective solution and road map
- GAP analysis to implement system
- Implementation
- Time lines
- Cost and Benefits

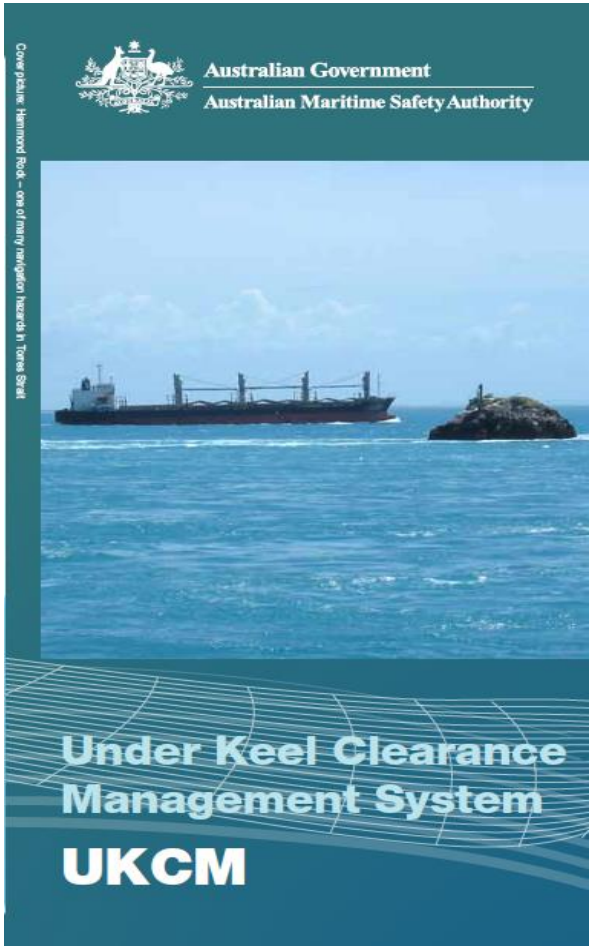
31st meeting of The Straits of Malacca and Singapore Revolving Fund Committee, 27 May 2010.

The Straits of Malacca and Singapore Revolving Fund Committee (RFC) consisting of members from the littoral States of Indonesia, Malaysia and Singapore, held its 31st Meeting in Singapore on 27 May 2010, amidst a concerted oil spill clean-up operation by the three States in the Singapore Strait.

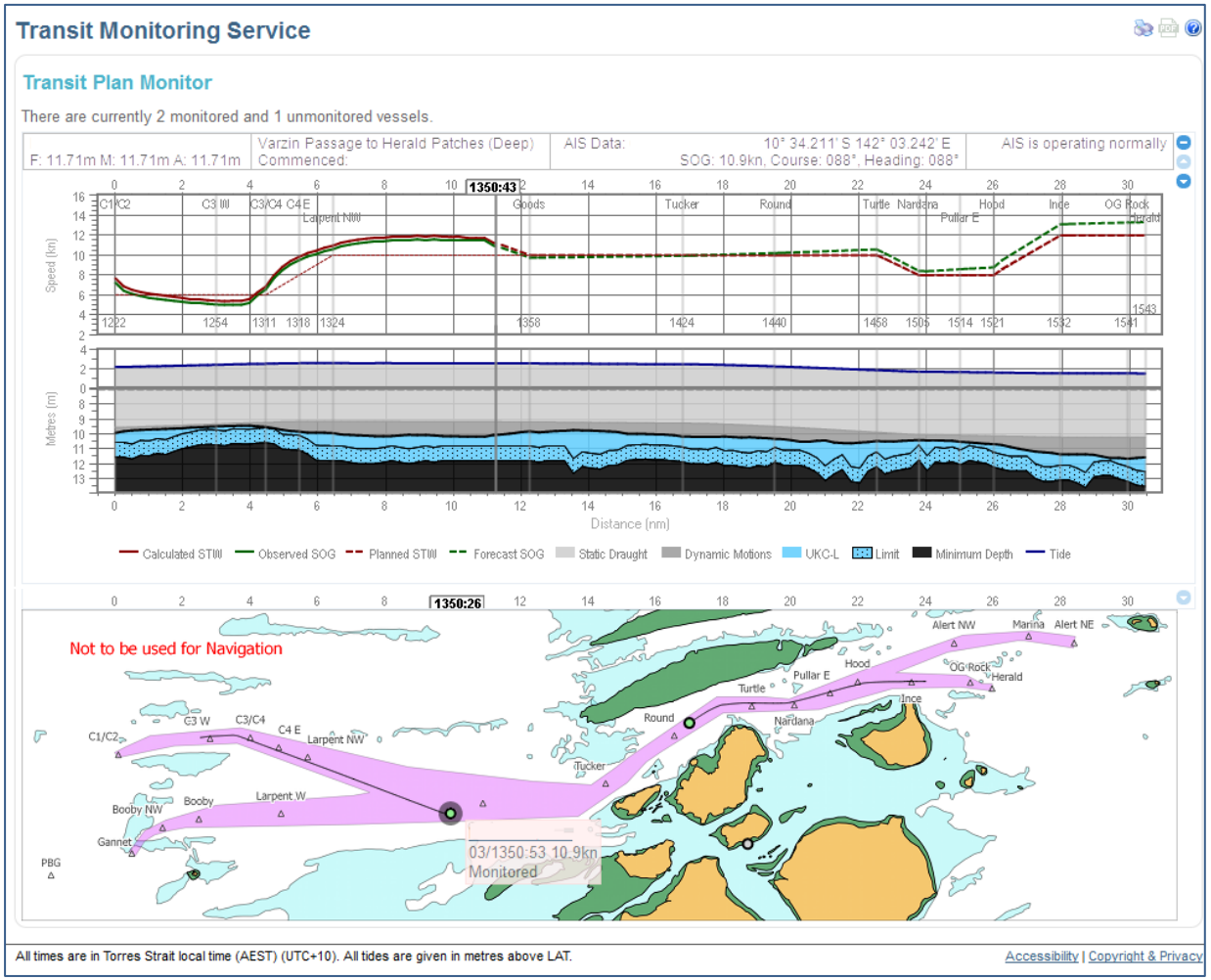
http://www.oilspillnews.net/oil-spill-clean-up/singapore-continues-oil-spill-cleanup-efforts-gov-monitor/

Existing Systems

- Traffic Separation Schemes
- Straitrep
- MEH
  - Provides most of IT Infrastructure
  - Co-ordinates data/systems between littoral States
- Region precedence
  - AMSA Torres Straits UKCM
  - https://ukcm.amsa.gov.au



Operational Systems



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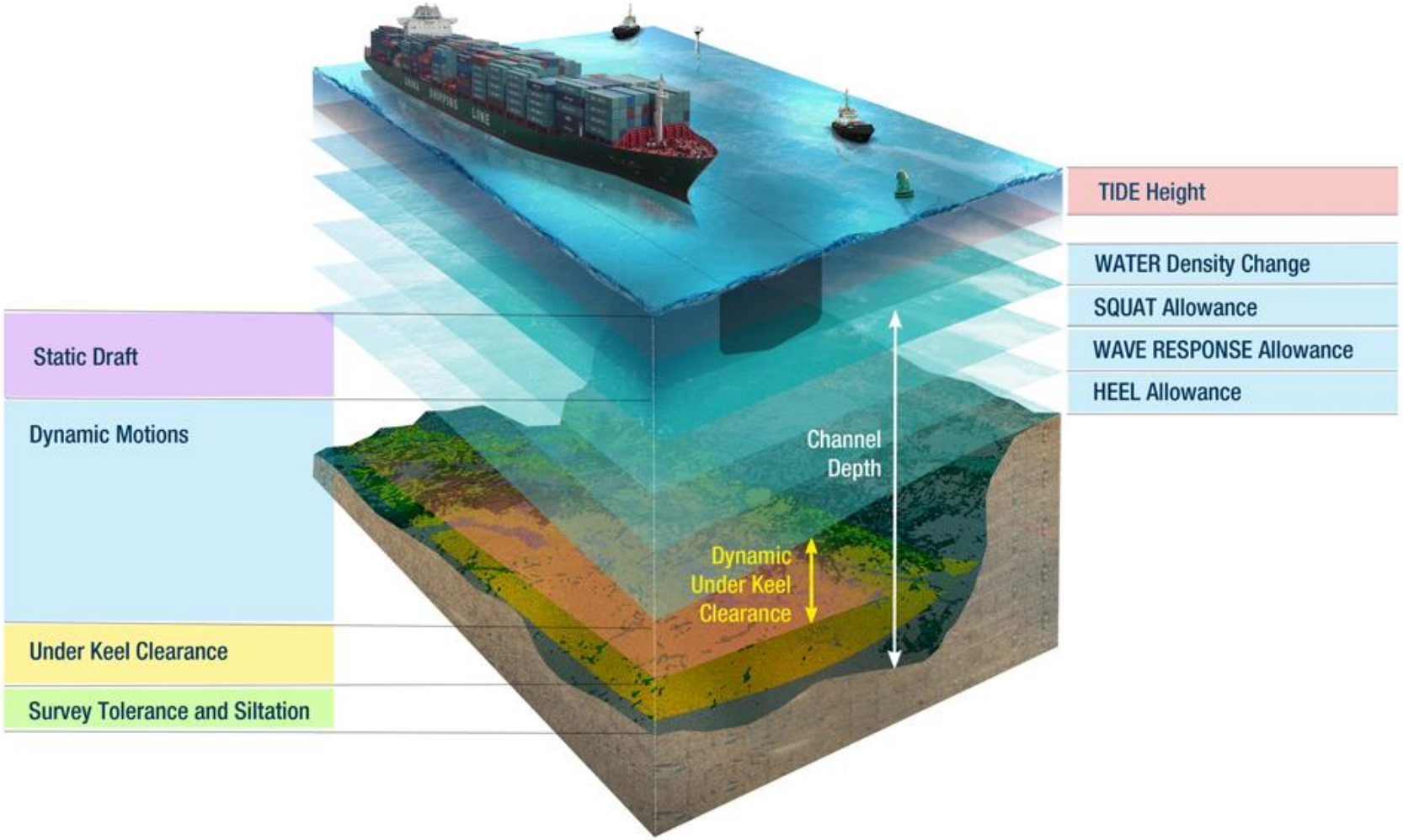
UKC Factors



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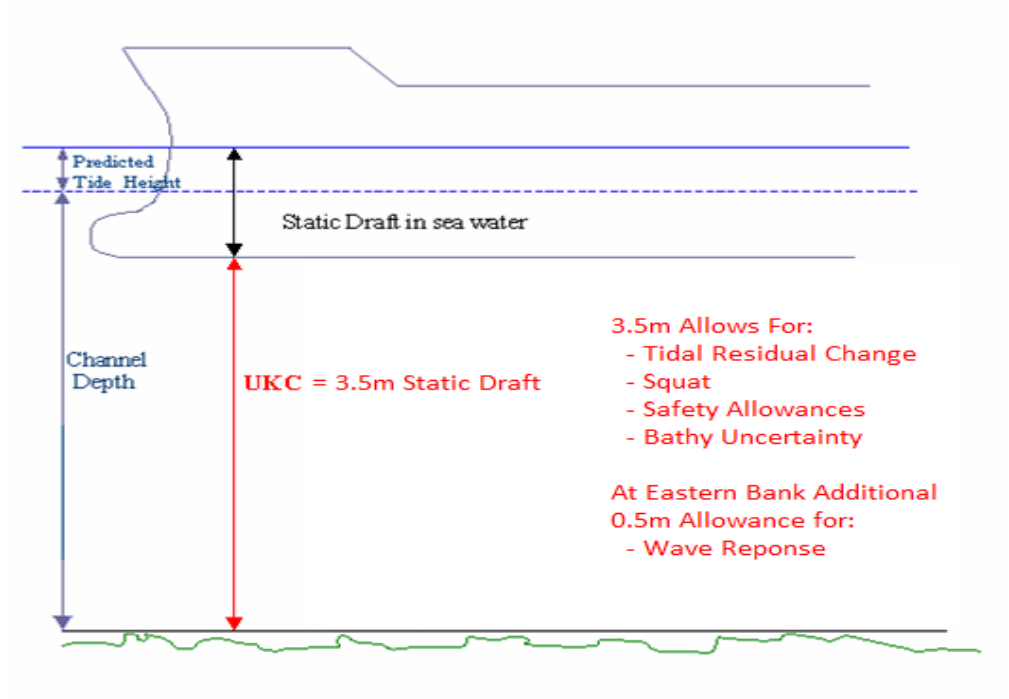
UKC Management

"Deep-draft vessels and VLCCs shall allow for an under-keel clearance (UKC) of ***at least 3.5m at all times*** *during the entire passage through the Straits of Malacca and Singapore"*



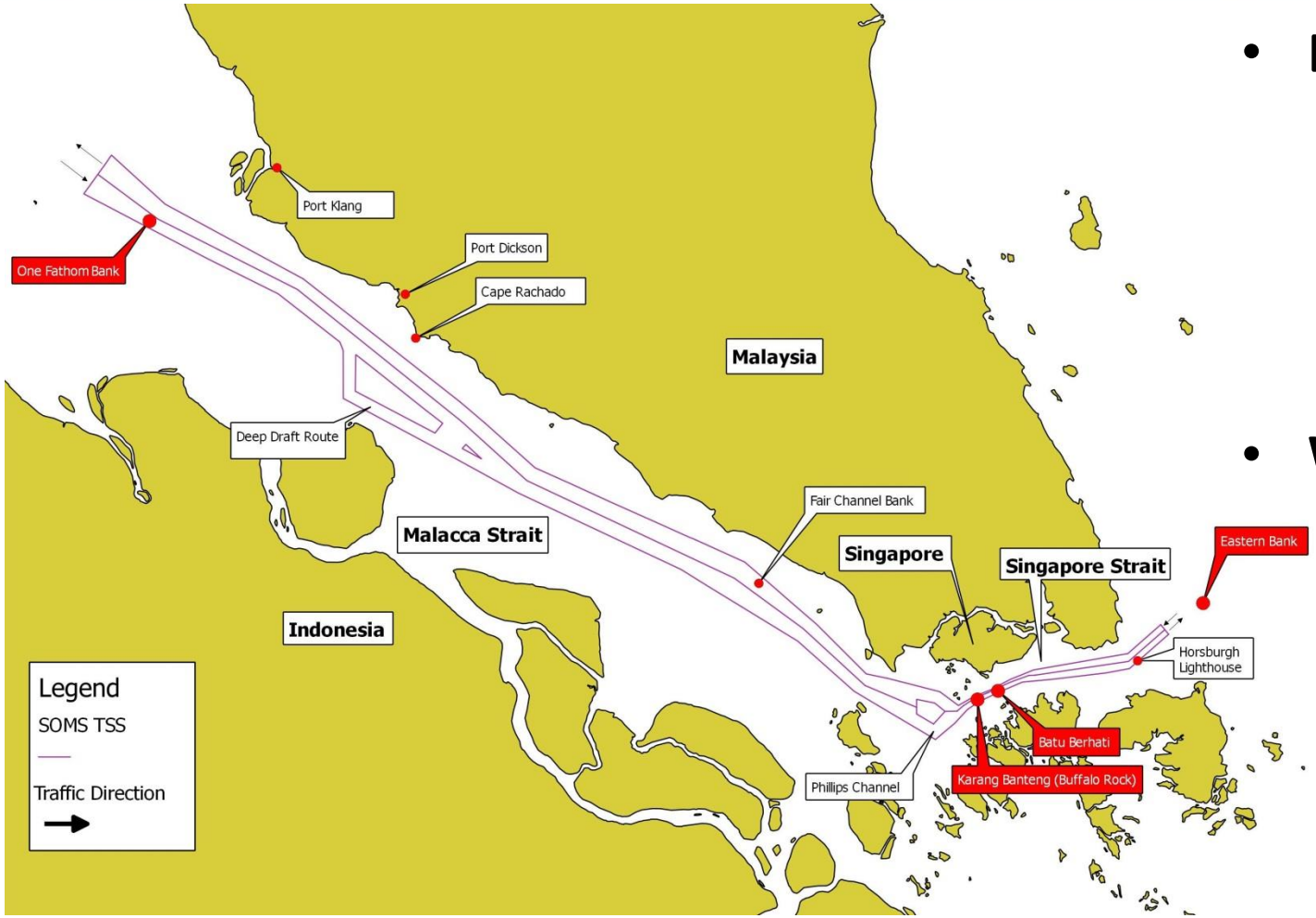
Ambiguity: "at least" has been interpreted as:

- **Gross (includes all allowances),** or
- **Nett (excludes allowances, primarily squat)**

Existing UKC Uncertainties

- UKC rule interpretation
- Vessel draft discrepancies
- Water Levels
  - Predicted astro source tide variances
  - Environmental (actual) tidal differences
  - Transit planning variances (ETA, speed, currents, water levels)
- Bed Depths
  - Lack of recent survey data (UKHO 1950-1970 data)
  - Sand Waves (13m+; sailing directions highlights depth uncertainties)
- Squat
  - Planned speed v Actual speed
  - Formulae used and significant variation
  - Actual currents to predict squat from SOG

SOMS – Critical UKC Areas



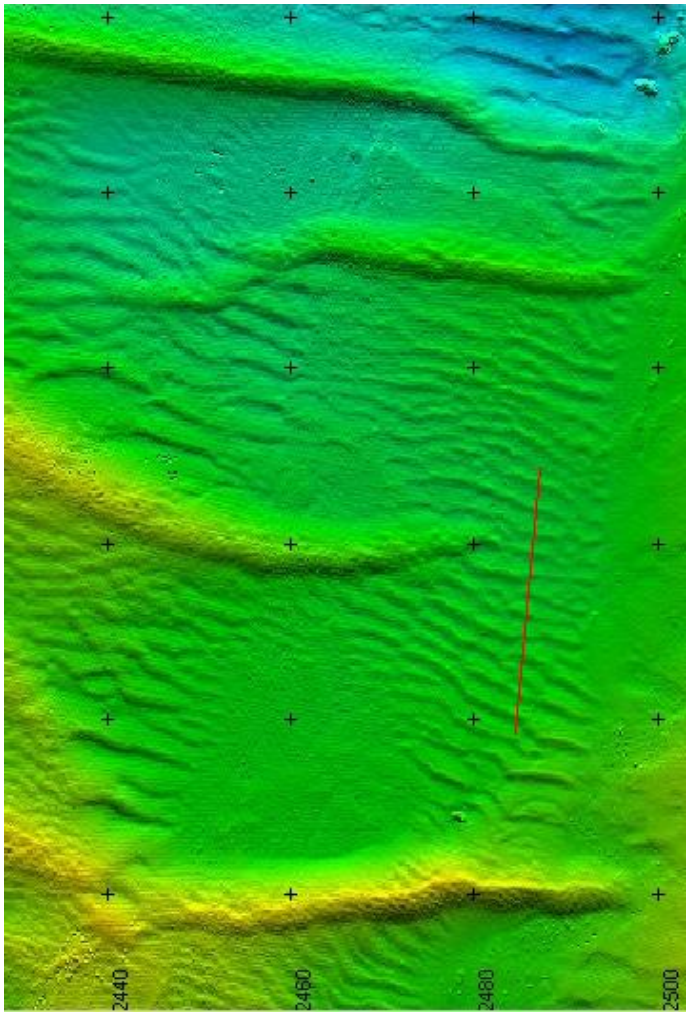
- **East Bound**
  - **One Fathom Bank**
  - **Kareng Banteng (Buffalo Rock) ***
  - **Eastern Bank#**
- **West Bound**
  - **No major areas for vessels <16m**

*Batu Berhanti shallower but has wider channel and can be safely avoided

Outside TSS (and report scope) but controls and must be considered

Bathymetry

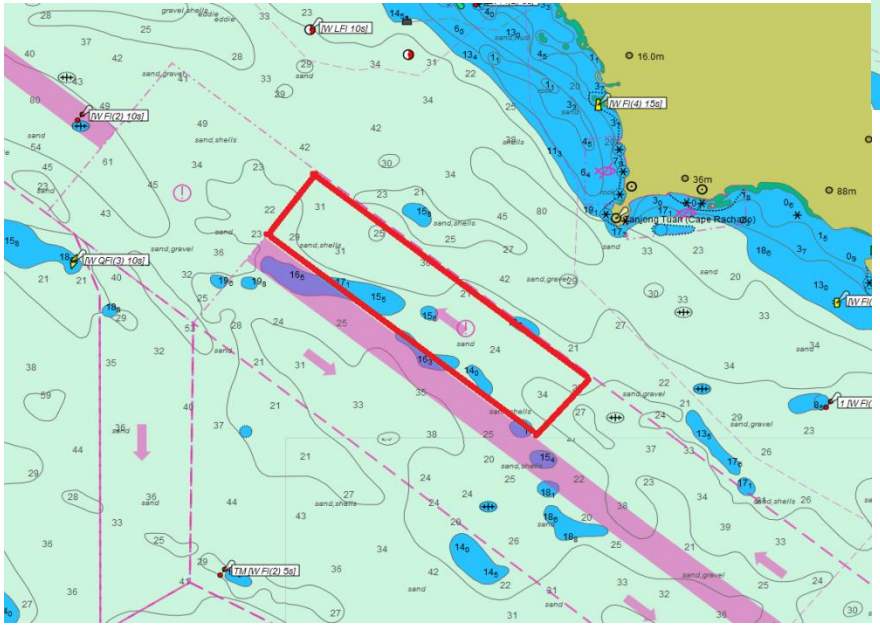
- Largest uncertainty
- Sand wave data from 1970's
  - Literature suggests relatively stable
  - Shipping Community Monitoring
- Data
  - Recent surveys conducted
  - Data not incorporated into commercial charts
- ENC production
  - Up to date survey data
  - Higher contour resolution



Sand wave monitoring

One Fathom Bank

Offshore of Cape Ricardo

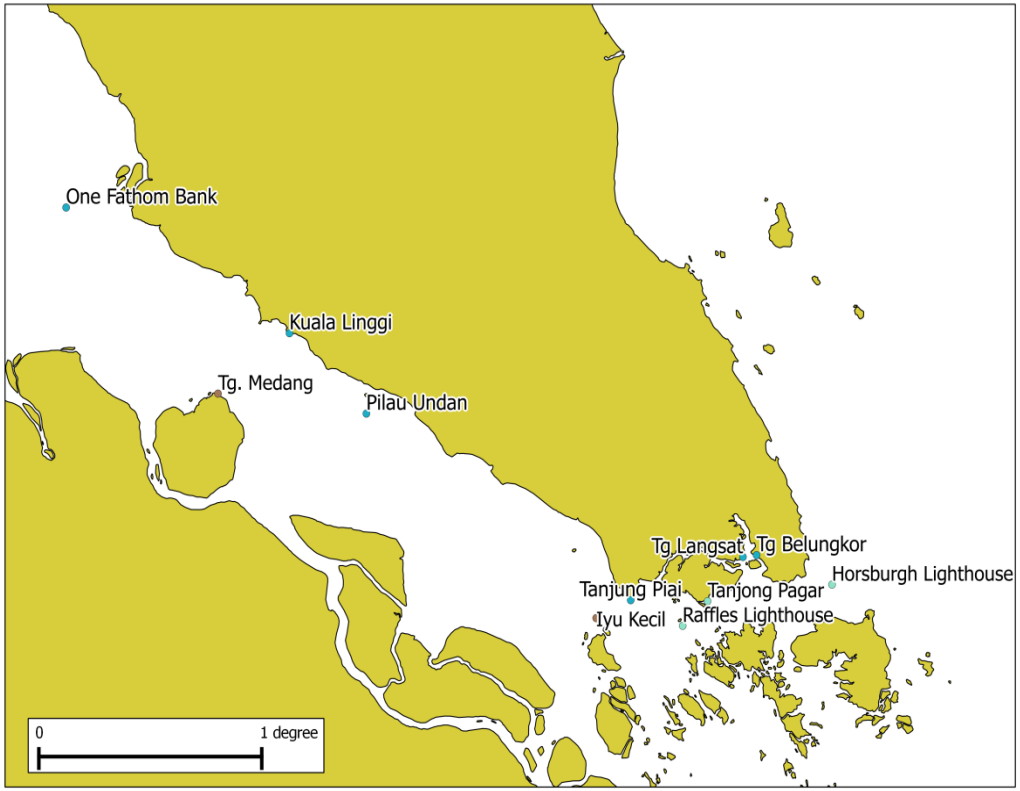


Regular monitoring recommended

- Regular surveying
- Shipping Community Monitoring

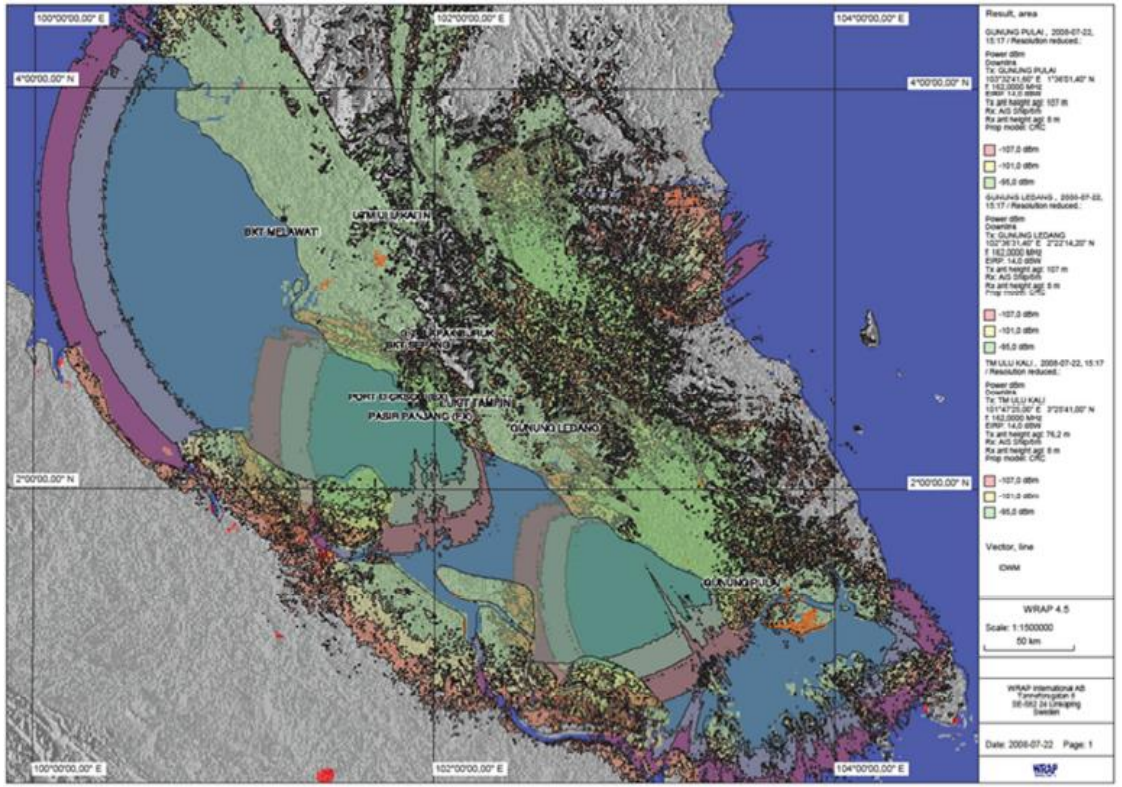
Real time data

- **Real-time tide data well covered**
  - Malacca 6 Stations
  - Singapore 5 Stations
- **UKC critical locations covered**
  - One Fathom Bank
  - Kareng Banteng
- **Real time currents**
  - 4 stations
  - Near UKC critical location



Shore Infrastructure

- AIS
  - SOMS coverage good
  - Initial communication technology
- Marine Broadband
  - 8x AIS data capability
  - Trial recommended
- VTS-MEH
  - Integration of VTS centre
  - data into MEH



GAP Analysis - Summary

- **UKC Monitoring System requirements are well covered by existing shore infrastructure**
  - Real time tide and current devices
  - Full AIS coverage
  - Central integration of SOMS data
- **No additional ship borne equipment required**
- **No significant barriers to implementation**

Vision

The effective MITIGATION of grounding hazards within the SOMS area

Accidents still happen

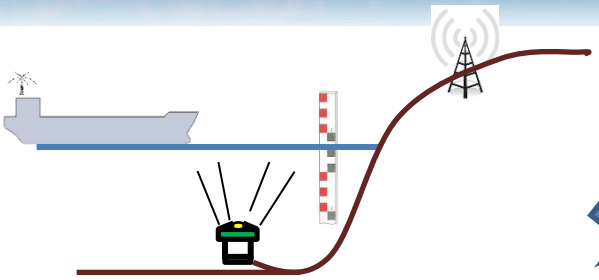
- mv “Smart”
- Richard’s Bay
- 19 August 2013
- 17.4m draft
- 22.0m channel

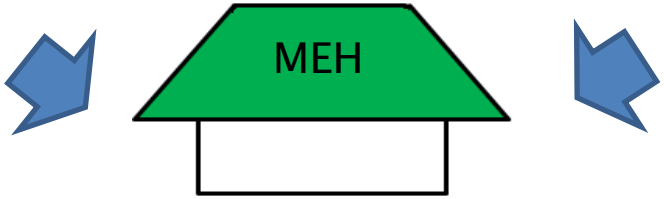
Solution - SOMS Real Time UKC

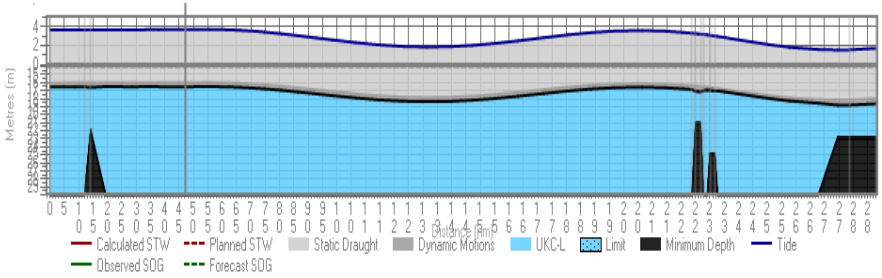
- NETT UKC regime with calculated UKC of every vessel
  - Specific UKC allowances/ accurate predictions and models

- Real time environmental data
- Shore based system
- Ship operator/vessel access
- Monitoring of deep draft vessels
- Accurate transit planning:
  (tidal window, speed control)
- Data archiving, auditing
  and reporting

SOMS Real Time UKC Monitoring



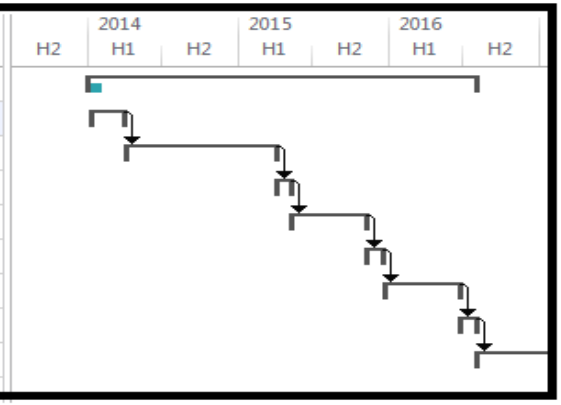




Implementation

- Phased implementation
- First stage
  - Operational within months
- Complete implementation
  - 2+ years

Task Name	Calendar Duration
Project Management	
Phase 1/Stage 1 - Passive UKC Monitoring and Reporting System	79 days
Phase 1 Trial	365 days
Phase 2/Stage 2 – UKC Regime Review	34 days
Phase 2 Approval	182 days
Phase 3/Stage 3 – Distributed UKC Results to Shipping	42 days
Phase 3 Trial	182 days
Phase 4/Stage 4 – Draft Planning and Dynamic Chart Overlays	42 days
Ongoing Support and Maintenance	



Real Time UKC Monitoring

- Prototype Demonstration

Cost Benefits

Approximate capital cost	**US$ 2 M**
Safety Benefits through a reduced risk of grounding.	**US$ 0.53 M pa**
Economic Benefits through potential vessel draft and tidal window increases.	
Stage 1 implementation	**US$ 37.5–88 M pa**
Stages 3/4 implementation (UKC uncertainty reduced)	**US$ 150–274 M pa**
NPV over next 10 years	**US$ 1.2 billion**

Final Thoughts

www.awesomeperak.com

A real time UKC monitoring system will provide

SAFETY and ECONOMIC benefits

- **Staged implementation with reviews**
- **Integrated with existing infrastructure (MEH)**
- **Identified GAPS do not impede implementation**
- **No additional shipborne equipment**

Improved and an Assured Safety Regime for Vessels

Thank You