Australian Government
Australian Maritime Safety Authority

6th Co-operation Forum
Bali, Indonesia (7-8 Oct 2013)

Under Keel Clearance Management System for Torres Strait

Implementation Presentation

Conrad Adams
Principal Pilotage Officer
Australian Maritime Safety Authority (AMSA)

Overview of Presentation

- Where is the Torres Strait UKCM area?
- Why a UKCM System?
- Implementation & UKCM Framework
- System overview (screen shots and sensors)
- Where to from here? (Making UKCM mandatory)

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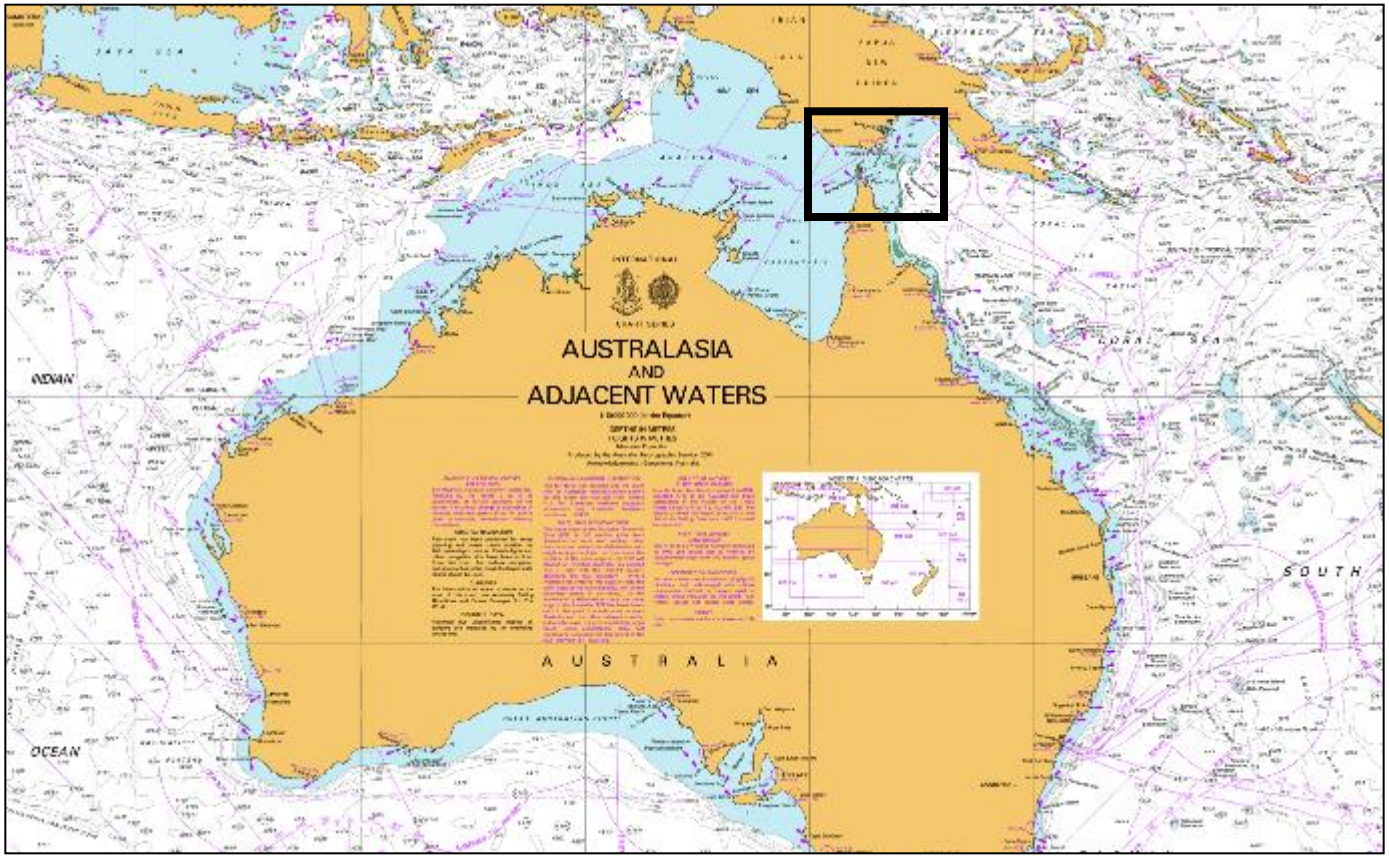
Why Torres Strait? Where is Torres Strait?



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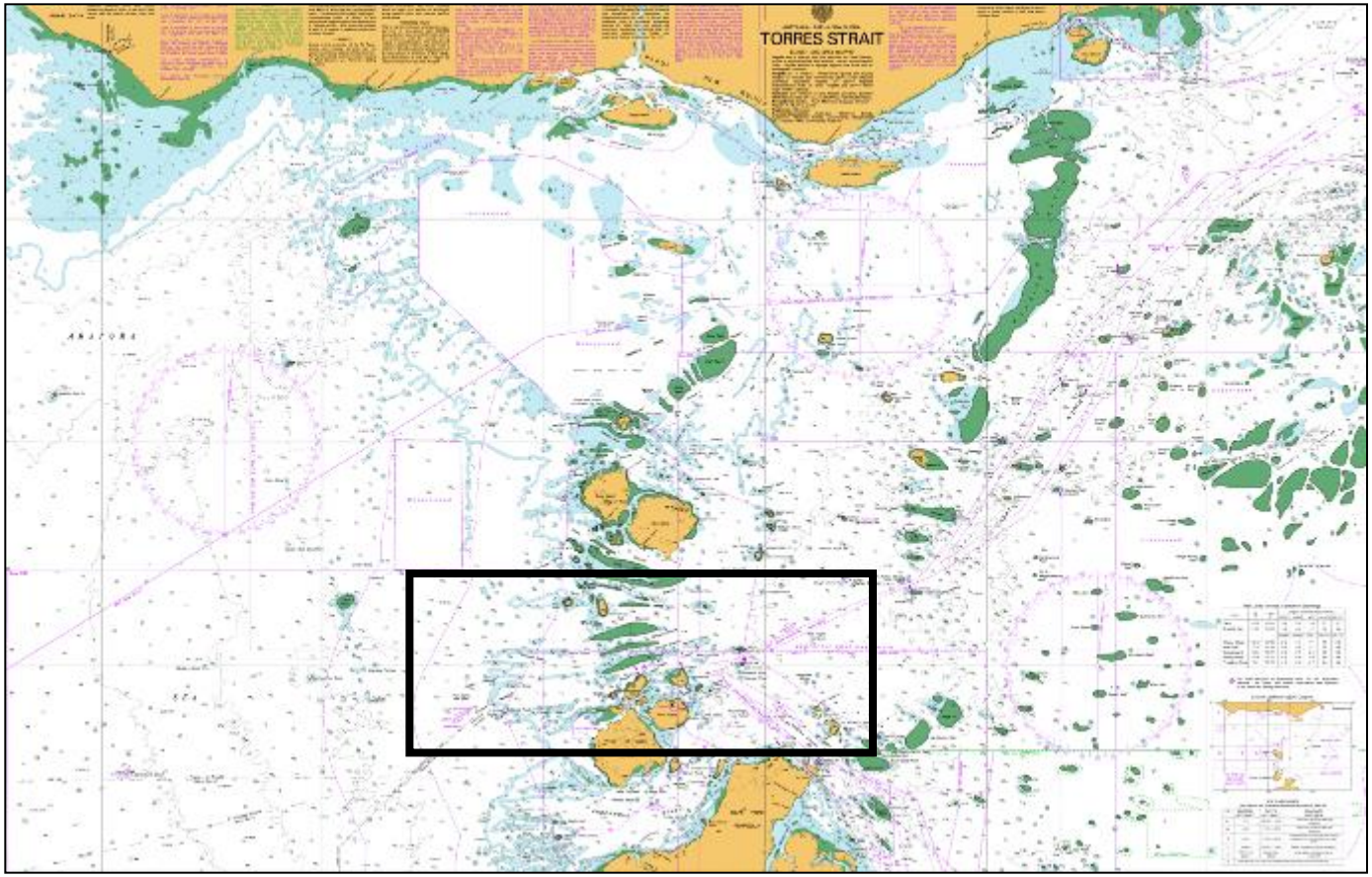
Why Torres Strait? Where is Torres Strait?



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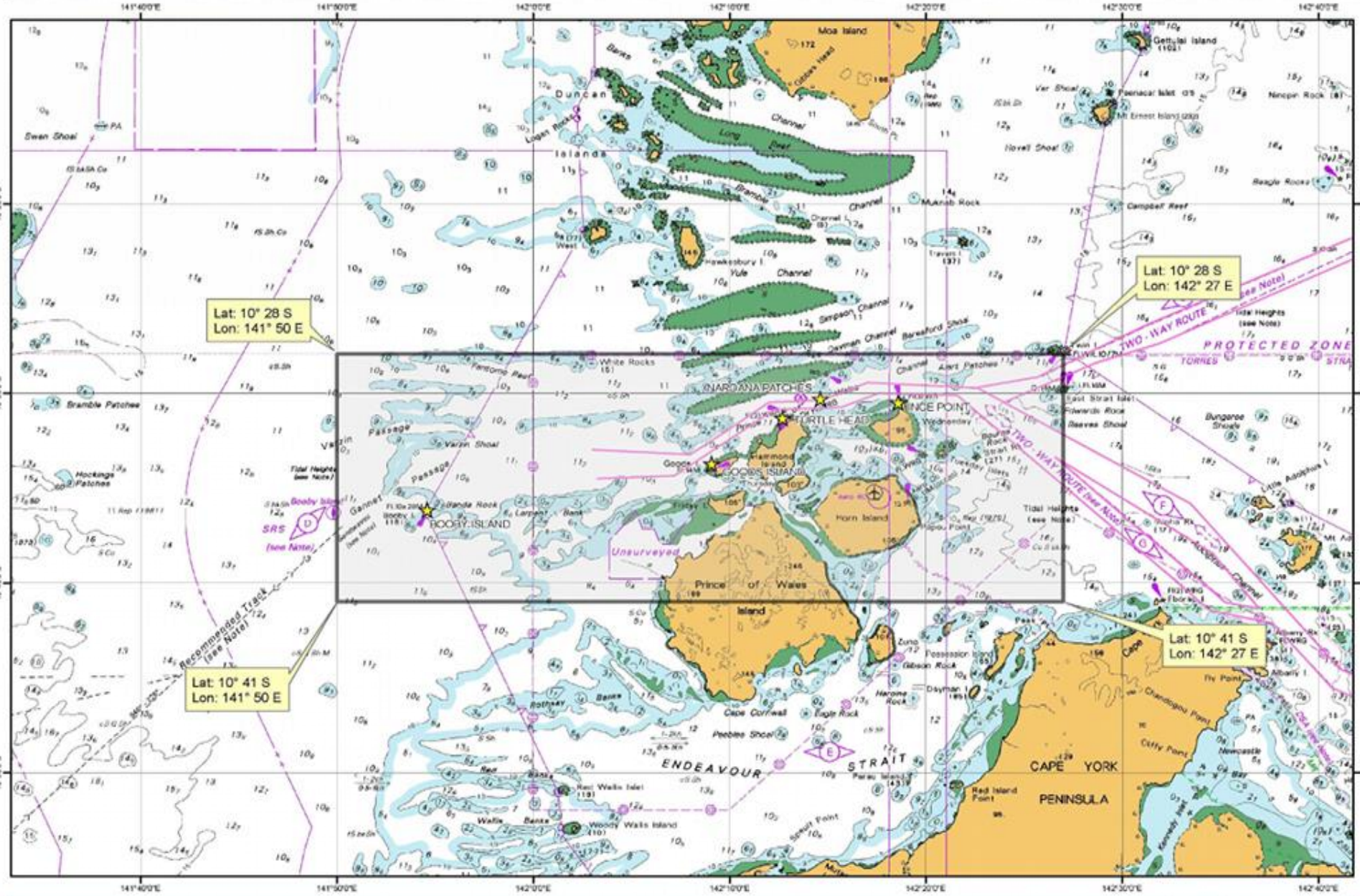
Under Keel Clearance Management Area in the Torres Strait



AMSA Torres Strait Tide Gauges
UKC Boundary Area
Two Way Route

Note:
This chart exctract is not to be used for navigation or engineering purposes

Distance measurements will not be accurate in the coordinate definition

Base mapping material supplied by the Australian Hydrographic Office
Seafarer Geotiff Series

Chart AUS376

Horizontal Datum: WGS84
Coordinate Definition: Geographical

Scale: 1:250,000

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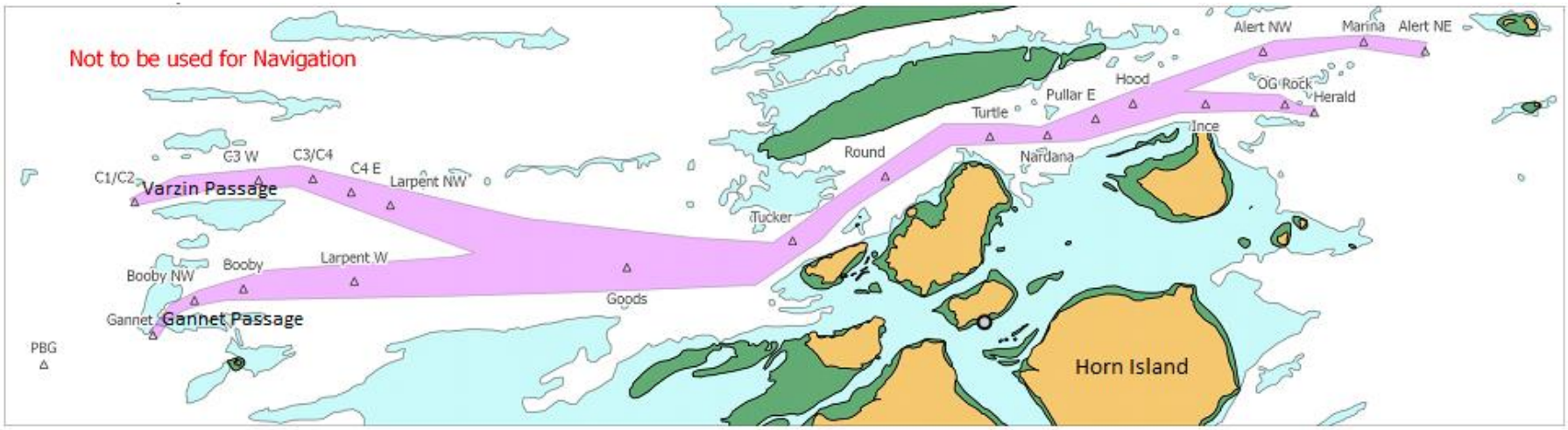
UKCM Area of Operations



- Varzin Passage
- Gannet Passage
- Prince of Wales Channel

Why a UKCM System?

- Remote environmentally sensitive area (IMO PSSA 2005)
  - The The Torres Strait lies between Papua New Guinea and the northern tip of the Australian continent and is a vital shipping route for the Asia-Pacific region. Numerous large ships transit Torres Strait and face many challenges to safe navigation due to the numerous reefs, shallow waters, complex tides and strong tidal streams.
- A UKCM system is a contemporary aid to navigation (AtoN) which enhances navigational safety

Why a UKCM System?

- Deliver enhanced safety and efficiency of navigation by:
  - validating the existing safety margin prescribed by Australian Law (minimum UKC of 1.0m or 10% of draught)
  - evaluate the appropriateness of the current draught regime (maximum draught of 12.2m)
  - Recommended for all vessels 9m draught or greater
- Mechanism to assess potential to move to a dynamic UKC regime (i.e. require only a minimum UKC / no draught restriction

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Marine Orders Part 54 (Coastal pilotage)

Provision 48 - **Under keel clearance requirements:**

48.1 This provision applies to a pilotage provider if the provider assigns a licensed pilot to the transit of a ship through the Prince of Wales Channel, the Gannet Passage or the Varzin Passage.

48.2 It is a condition of a pilotage provider licence to which this provision applies that the provider ensures the pilot complies with provision 94.

Provision 94 - Requirements for pilotage through certain areas:

94.1 It is a condition of a pilot licence that the pilot may pilot a ship through the Prince of Wales Channel, the Gannet or the Varzin Passages only if the ship:

(a) does not have a draught that exceeds 12.20 m; and

(b) has a net under keel clearance of:

(i) if the ship has a draught of less than 11.90 m — at least 1 m; or

(ii) if the ship has a draught of 11.90 m or more — at least 10% of the draught of the ship; or

(iii) for a ship piloted through the Gannet or Varzin Passages — at least 1 m.

A hostile shipping environment

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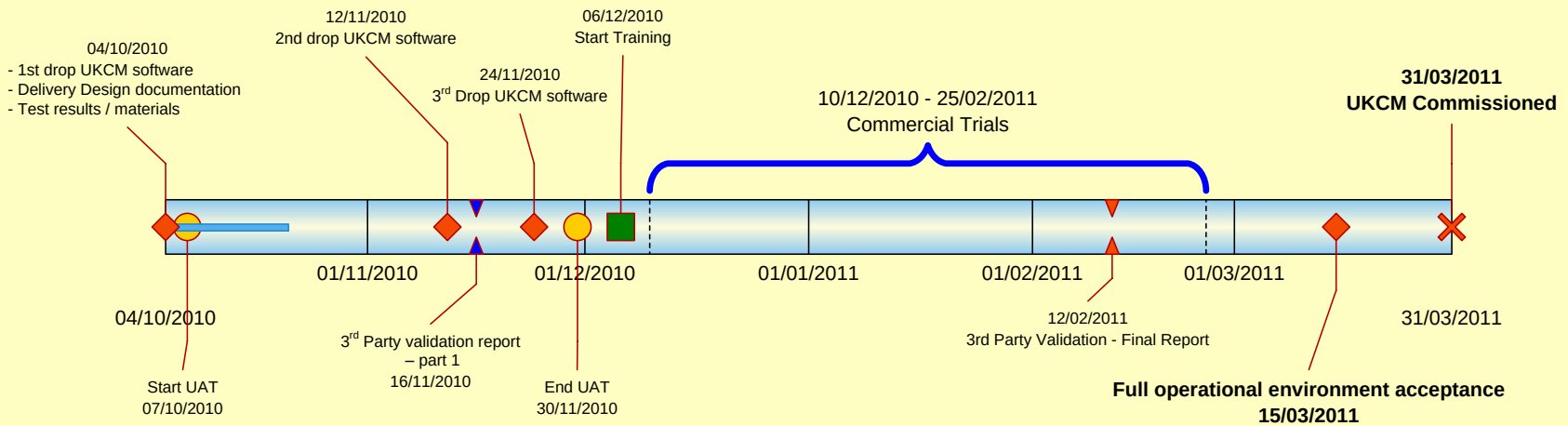
Implementation Timeline

Project Timeline - Under Keel Clearance Management System



Implementation: Key Milestones

- Needs analysis.
- Contract award (OMC International). May 2010. (Funded by Australia's Marine Navigation Levy).
- Design & Configuration Phase. System testing and initial evaluation. (Oct 2010).
- System validation (commercial trials – pilots & providers). Feb 2011.
- Refinements incorporated and then system acceptance.
- System commissioning (December 2011).
- System operational usage (now).
- Mandating compulsory usage (planned for Jan 2014).

Implementation – UKCM Framework

Information:	Real-time met-ocean sensors and hydrographic data (including period re-surveys)
	Generates transit windows to maintain required UKC
System:	User-Web interface
Users:	Pilots, Pilotage Providers and Vessel Operators
Regulatory:	Marine Orders Part 54 (Regulations – Australian Law)
Monitoring:	Ongoing ‘validation’ of system performance

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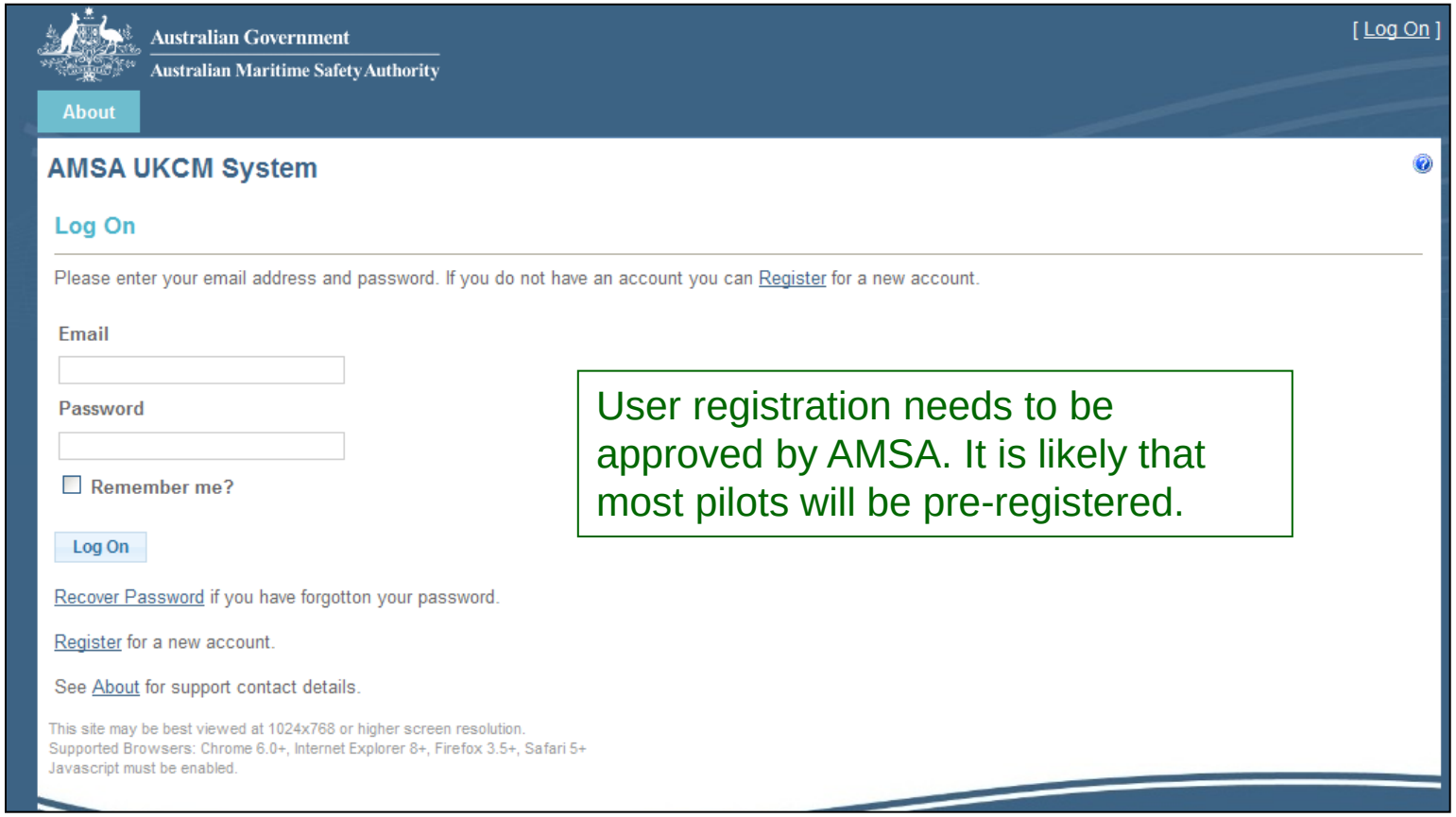
System Overview: User Registration / Logon



User registration needs to be approved by AMSA. It is likely that most pilots will be pre-registered.

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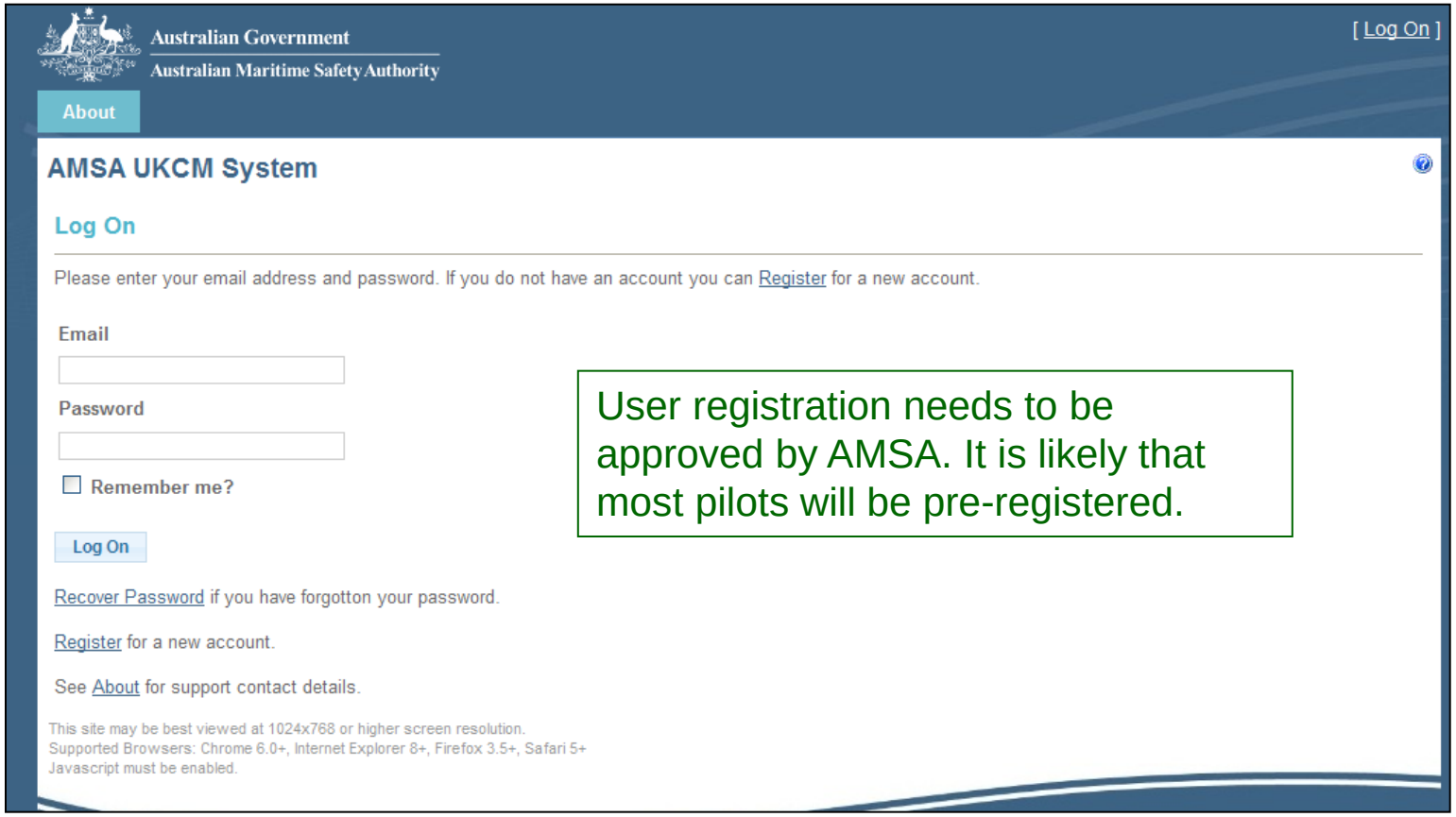
System Overview: User Registration / Logon



User registration needs to be approved by AMSA. It is likely that most pilots will be pre-registered.

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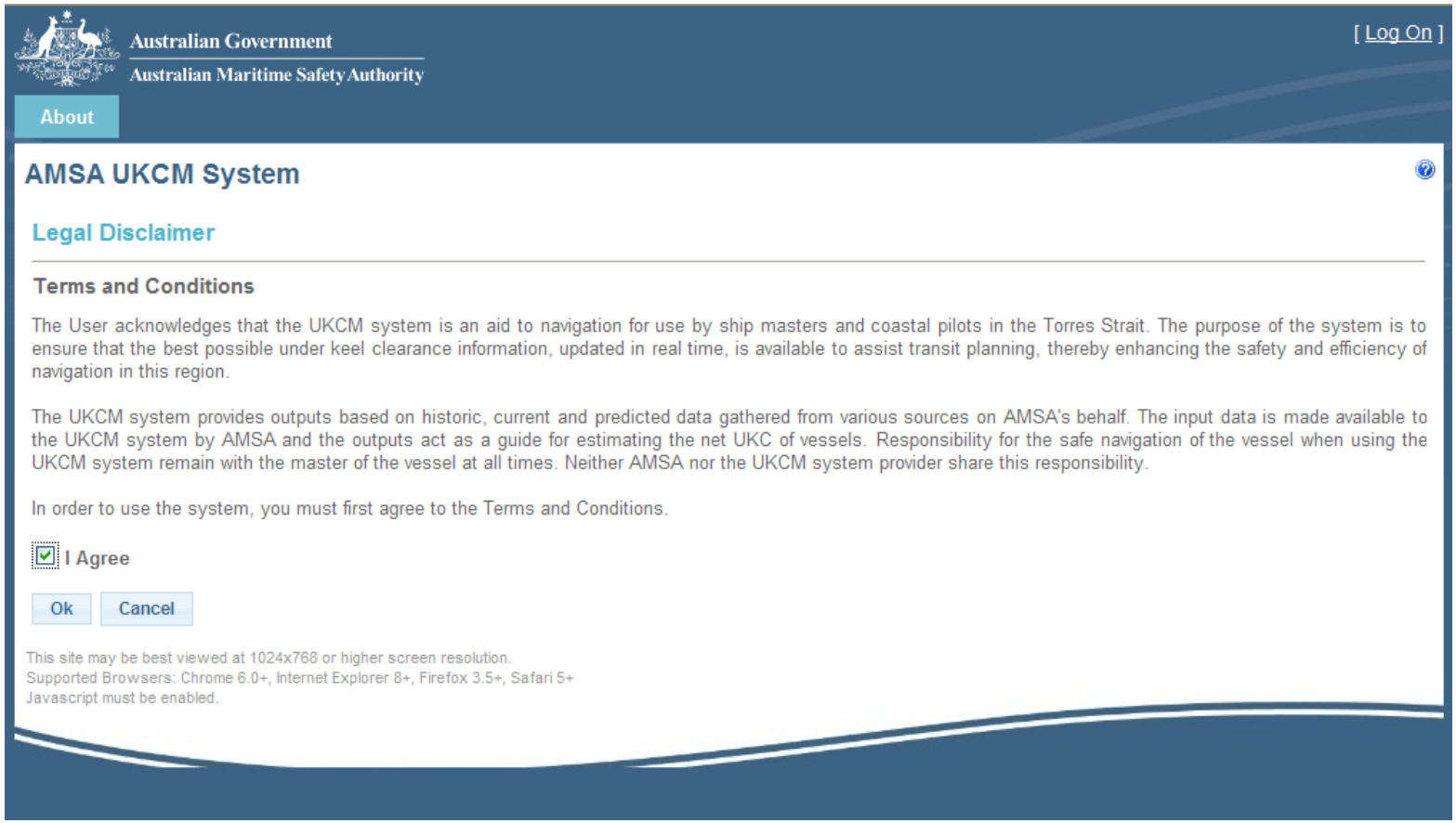
User Registration / Logon – Legal Disclaimer



AMSA UKCM System

Notifications

12th April 2011 1900

- AMSA has finished its interruptive testing and the UKCM site is available again for use.
- The UKCM site has a new web address. The new address is:
  - https://ukcm.amsa.gov.au/
  - Up to the end of May the old web address will remain working and will redirect you to the new site.
  - Please update your bookmarks accordingly.
- Additionally, the UKCM system has received a minor update. New features include:
  - Tidal stream predictions for Varzin Passage, Harrison Rock, Hammond Rock and Alert Patches are now accessible in the Met Ocean Service. Previously only Nardana Patches predictions were available.
  - The actual UKC and speeds can be viewed and downloaded after a transit plan has been finalised.

Archived Notifications

Status

- Trial system

Support

- **UKCM System Support**
  Email: support@omc-international.com.au
  24-Hour Support: 1300 66 77 06
- **UKCM Admin Support**
  Email: Brett.Brace@amsa.gov.au
- **UKCM Policy Support**
  Email: Brett.Brace@amsa.gov.au

Vessel Service

Recent | Search | New | Edit | Delete | Clear recently used vessels list

Vessels recently used by Brett Brace

IMO Number	Vessel Name	MMSI	Call Sign	Vessel Type	LOA (m)	LBP (m)	Beam (m)	Summer Draught (m)	Vessel Flag	Source	Last Update
8321084	RISHIKESH	419081000	VVJT	BULK CARRIER	189.00	182.20	30.43	11.82	INDIA	ShipSys	22Dec2010 2128
9520792	NALUHU	371883000	3FOW9	BULK CARRIER	190.00	185.60	32.26	12.80	PANAMA	Manual	03May2011 1543
9296303	STX QUEENSLAN	371356000	3ECI6	BULK CARRIER	176.80	170.00	28.80	9.81	PANAMA	ShipSys	22Dec2010 2352
9341914	RTM WAKMATHA	235057131	MVTW4	BULK CARRIER	236.00	226.00	43.03	12.80	UNITED KINGDOM	ShipSys	23Dec2010 0430
8508230	QIAN LI SHAN 15	515810000	XUBY5	GENERAL CARGO/MUL -PURPOSE SHIP	129.40	120.00	32.90	7.60	CAMBODIA	ShipSys	19Apr2011 1517
9303390	ALAM SAKTI	564443000	9V8217	BULK CARRIER	177.00	168.50	28.40	10.02	SINGAPORE	ShipSys	19Apr2011 1555
9174828	ARATERE	512071000	ZMII	RO-RO PASSENGEF SHIP	150.00	137.00	20.50	5.50	NEW ZEALAND	ShipSys	23Dec2010 0139
-1000083	TEST	110011001	TEST2	BULK CARRIER	220.00	210.00	32.20	12.00	NETHERLAN	Manual	13Apr2011 1357
9455959	MEREDITH VICTORY	353806000	3EYA5	BULK CARRIER	291.70	283.50	45.00	18.19	PANAMA	ShipSys	23Dec2010 0306

Showing 1 to 10 of 10 recently used vessels

First | Previous | 1 | Next | Last

Recent | Search | New | Edit | Delete | Clear recently used vessels list

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Transit Planning Service

(User enters ship particulars including stability data

Transit Planning Service

Current | Search | Edit | New | Delete | Monitoring

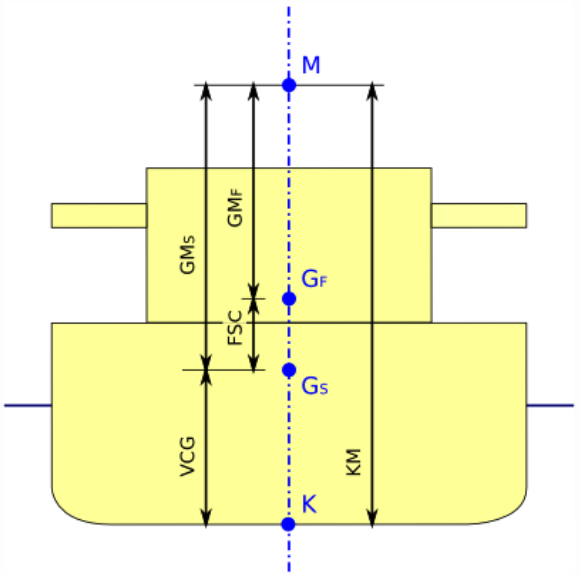
New Transit Plan

Vessel

9232709 New

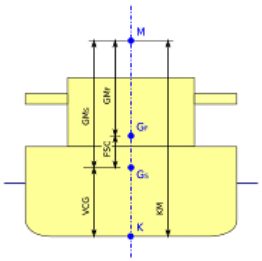
Vessel name	DA QING 451
IMO	9232709
MMSI	412623000
Call Sign	BUSS
Vessel Type	OIL TANKER
LOA (m)	192.90
LBP (m)	184.00
Beam (m)	32.20
Summer Draught (m)	11.40
Vessel Flag	CHINA
DWT (t)	
Source	SHIPSYS
Latest Updated Date	03 Jun 2010 10:00 AEST
Updated by User	admin

Stability Diagram



Stability Data

Stability Class	LOADED TANKER	KM (m)	20
Draught FWD (m)	11.4	- VCG (m)	8
Draught Amidships (m)	11.4	GMs (m)	12
Draught AFT (m)	11.6	- FSC (m)	2
Displacement (tn)	45000	GMf (m)	10
Water dens (t/m3)	1.025		



Status

DRAFT

Transit

Origin	Varzin
Destination	Herald Patches
Transit commencement (local time)	2010-10-23 16:28
Transit plan comments	

Save and Calculate | Reset | Cancel

Voyage Planning Service

Current | Search | Edit | New | Delete

Voyage Plan for RTM WAKMATHA (9341914)

(Other plans for RTM WAKMATHA)

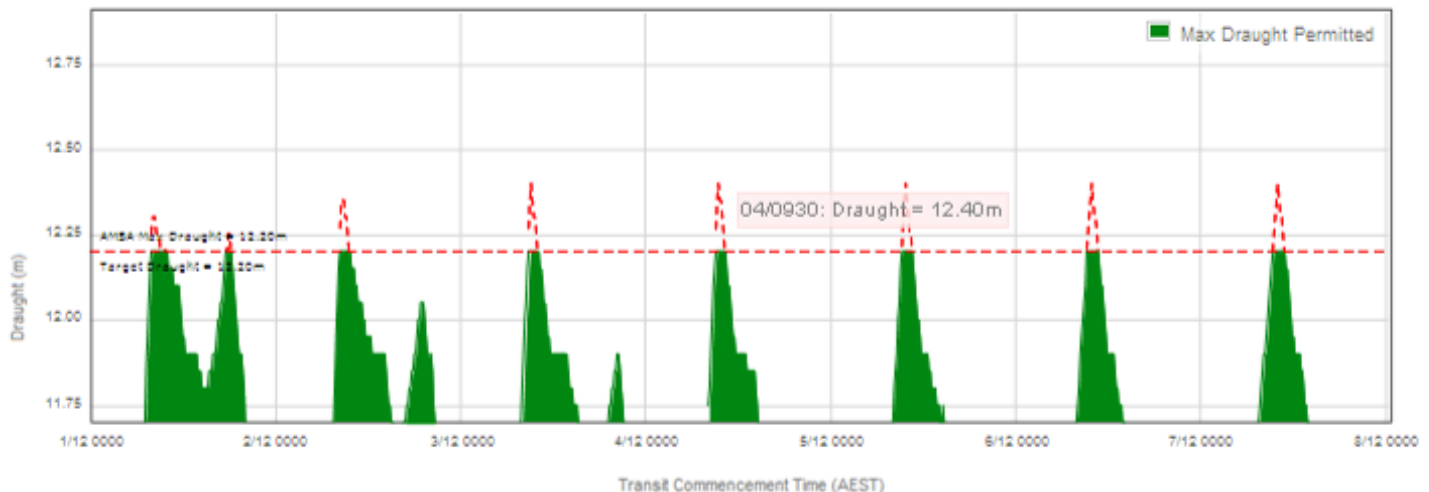
ID	207.1 View History	Direction	Eastbound
Created by	Brett Brace	Earliest commencement date	01Dec2011 0000
		Latest commencement date	08Dec2011 0000
		Target Draught	12.20 m

Maximum Draughts

01Dec2011 0750 : 12.20 m 01Dec2011 1730 : 12.20 m 02Dec2011 0820 : 12.20 m 02Dec2011 1850 : 12.05 m 03Dec2011 0850 : 12.20 m
03Dec2011 2020 : 11.90 m 04Dec2011 0910 : 12.20 m 05Dec2011 0920 : 12.20 m 05Dec2011 1440 : 11.75 m 06Dec2011 0920 : 12.20 m
07Dec2011 0930 : 12.20 m

Commencement windows for target draught: 8

Window open	Window close	Duration	Window open	Window close	Duration
01Dec2011 0750	01Dec2011 0950	2 hrs 0 mins	04Dec2011 0911	04Dec2011 1020	1 hrs 9 mins
01Dec2011 1730	01Dec2011 1810	0 hrs 40 mins	05Dec2011 0920	05Dec2011 1039	1 hrs 19 mins
02Dec2011 0820	02Dec2011 0940	1 hrs 20 mins	06Dec2011 0920	06Dec2011 1050	1 hrs 30 mins
03Dec2011 0850	03Dec2011 1000	1 hrs 10 mins	07Dec2011 0931	07Dec2011 1100	1 hrs 29 mins



Transit Planning Service

Current | Search | Edit | New | Delete

Transit Plan for POWHATAN (9105578) 10Apr2011 1900

(Other plans for POWHATAN)

ID	420.0 View History	Transit	Varzin to Herald Patches, commencing at 10Apr2011 1900 (test data)
Created by	brett.brace@amsa.gov.au	Load State	Disp:74425.00t KM:13.34m VCG:10.11m GMs:3.23m FSC:0.51m GMf:2.72m
Status	DRAFT (Status cannot be changed until a valid result is calculated)	Draughts	F:12.20m M:12.20m A:12.20m

⚠ The Transit Plan calculation indicated that UKC constraints could not be satisfied for the intended transit.

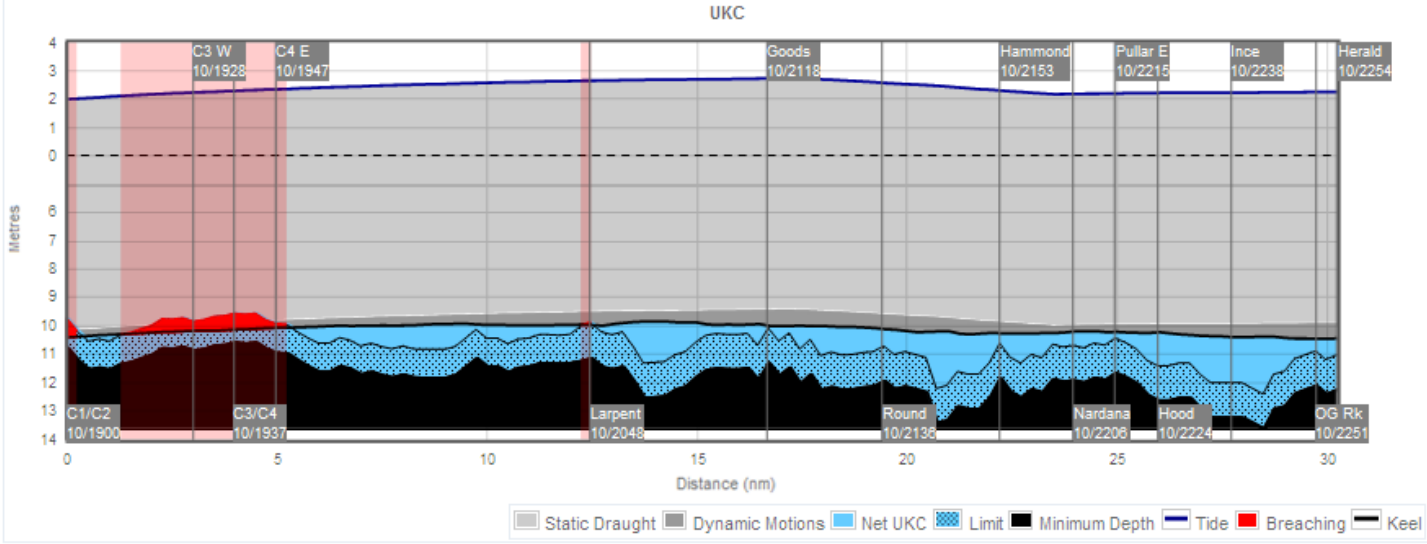
Calculated: 08Apr2011 1552

Available Windows: 10/2019 to 10/2303, 11/0440 to 11/0500* (* Window is open at the start or end of the scanned period)

Transit Commencement: 10Apr2011 1900

	C1/C2	C3 W	C3/C4	C4 E	Larpent	Goods	Round	Hammond	Nardana	Pullar E	Hood	Ince	OG Rk	Herald
STW (kn)	6	6	6	6	8	8	8	8	6	6	6	8	8	8
Time (AEST)	10/1900	10/1928	10/1937	10/1947	10/2048	10/2118	10/2136	10/2153	10/2206	10/2215	10/2224	10/2238	10/2251	10/2254
Squat (m)	0.24	0.23	0.23	0.25	0.42	0.56	0.51	0.39	0.19	0.24	0.25	0.45	0.52	0.53
Tide (m)	1.99	2.23	2.28	2.34	2.64	2.72	2.56	2.29	2.17	2.19	2.21	2.22	2.24	2.24
UKC-L (m)	-0.72	-0.38	-0.62	-0.20	-0.12	0.02	0.53	0.28	0.43	0.15	1.12	1.54	0.36	0.51

Recalculate



Transit Planning Service

Current | Search | Edit | New | Delete

Transit Plan for POWHATAN (9105578) 10Apr2011 2020

(Other plans for POWHATAN)

ID	420.1 View History	Transit	Varzin to Herald Patches, commencing at 10Apr2011 2020 (test data)
Created by	brett.brace@amsa.gov.au	Load State	Disp:74425.00t KM:13.34m VCG:10.11m GMs:3.23m FSC:0.51m GMf:2.72m
Status	DRAFT Change Status	Draughts	F:12.20m M:12.20m A:12.20m

The Transit Plan was successfully calculated.

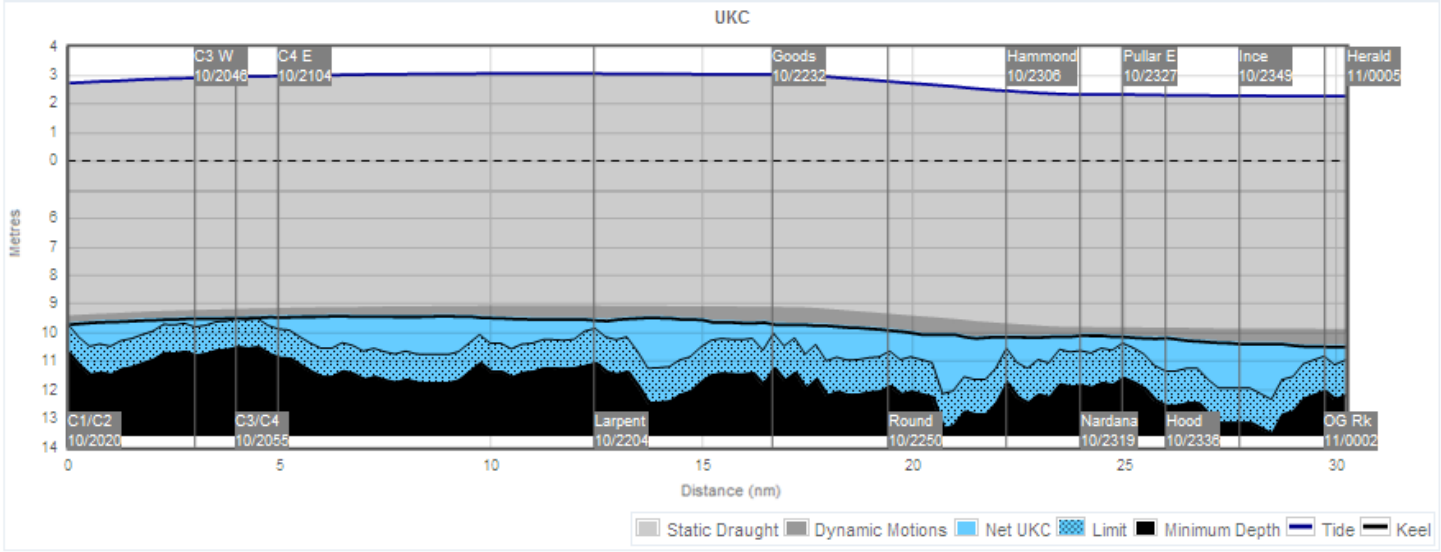
Calculated: 08Apr2011 1602

Available Windows: 10/2017 to 10/2302, 11/0437 to 11/0620* (* Window is open at the start or end of the scanned period)

Transit Commencement: 10Apr2011 2020

	C1/C2	C3 W	C3/C4	C4 E	Larpent	Goods	Round	Hammond	Nardana	Pullar E	Hood	Ince	OG Rk	Herald
STW (kn)	6	6	6	6	8	8	8	8	6	6	6	8	8	8
Time (AEST)	10/2020	10/2046	10/2055	10/2104	10/2204	10/2232	10/2250	10/2306	10/2319	10/2327	10/2336	10/2349	11/0002	11/0005
Squat (m)	0.23	0.22	0.22	0.24	0.40	0.55	0.50	0.39	0.19	0.24	0.25	0.45	0.52	0.53
Tide (m)	2.72	2.91	2.95	2.98	3.07	3.03	2.77	2.43	2.30	2.29	2.27	2.25	2.23	2.23
UKC-L (m)	0.03	0.32	0.06	0.45	0.31	0.33	0.75	0.42	0.56	0.25	1.19	1.57	0.36	0.49

Recalculate



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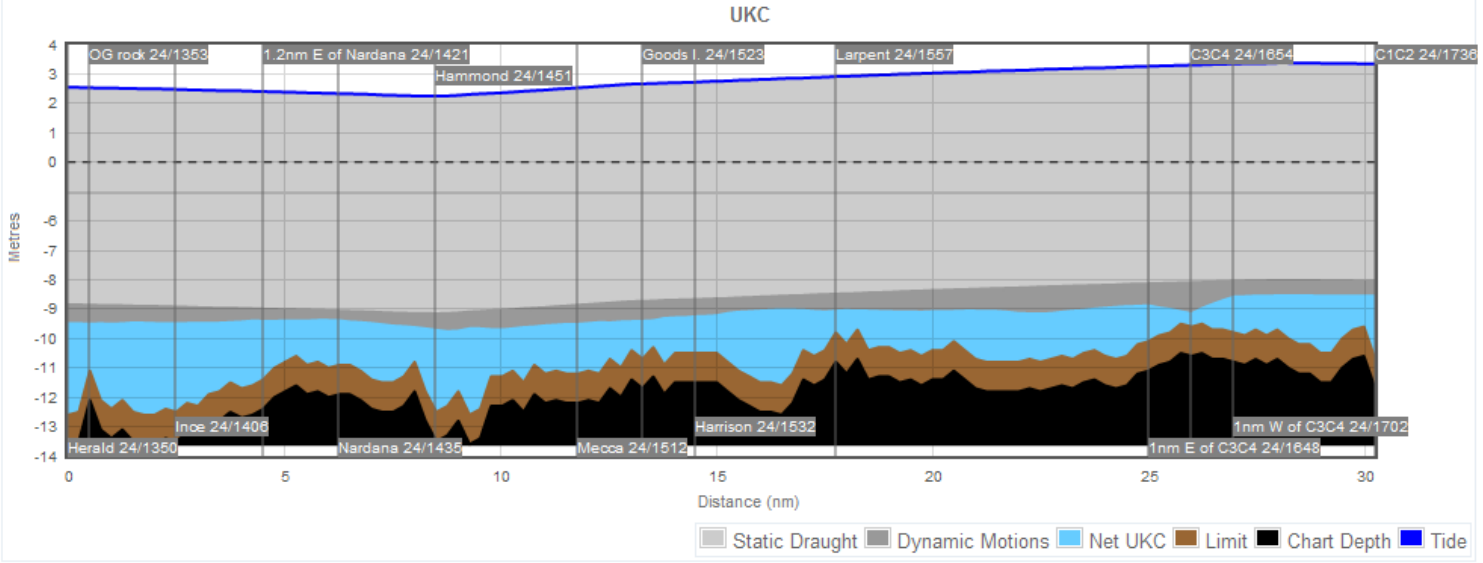
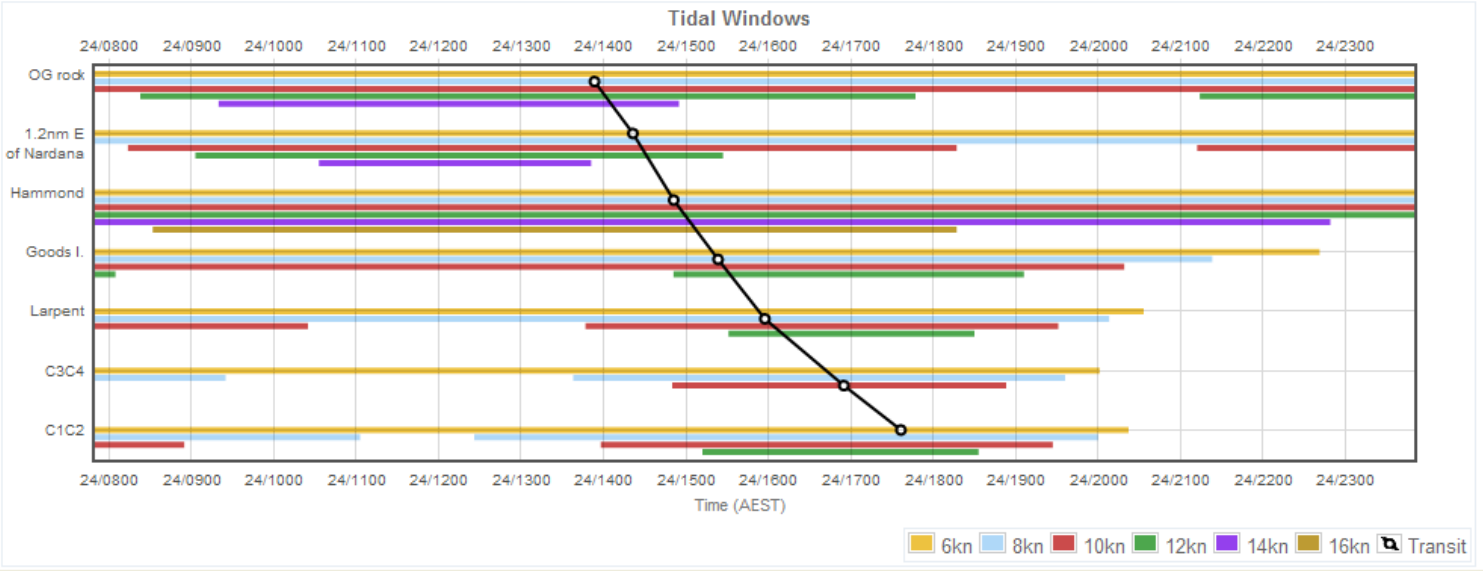
Transit Planning Service

Transit Plan (2)



Show Speed and Dynamic UKC Charts

Tidal Windows



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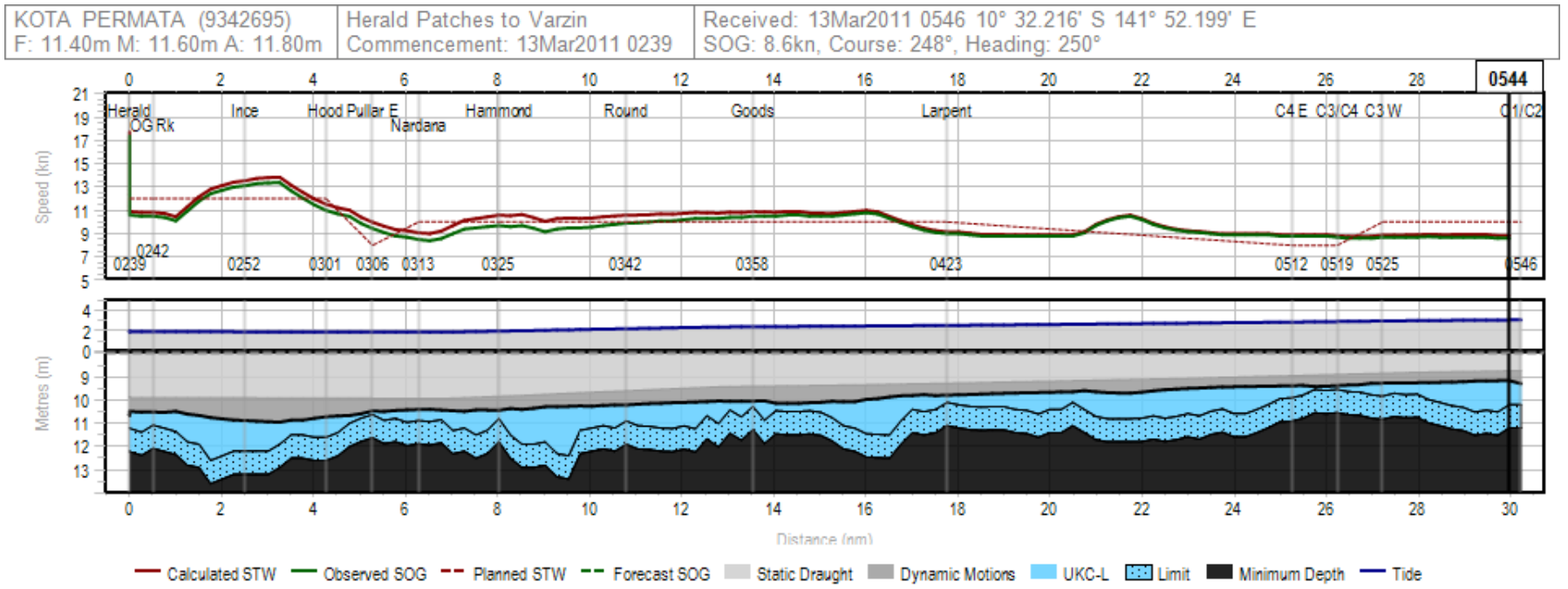
UKCM – Monitored Transit



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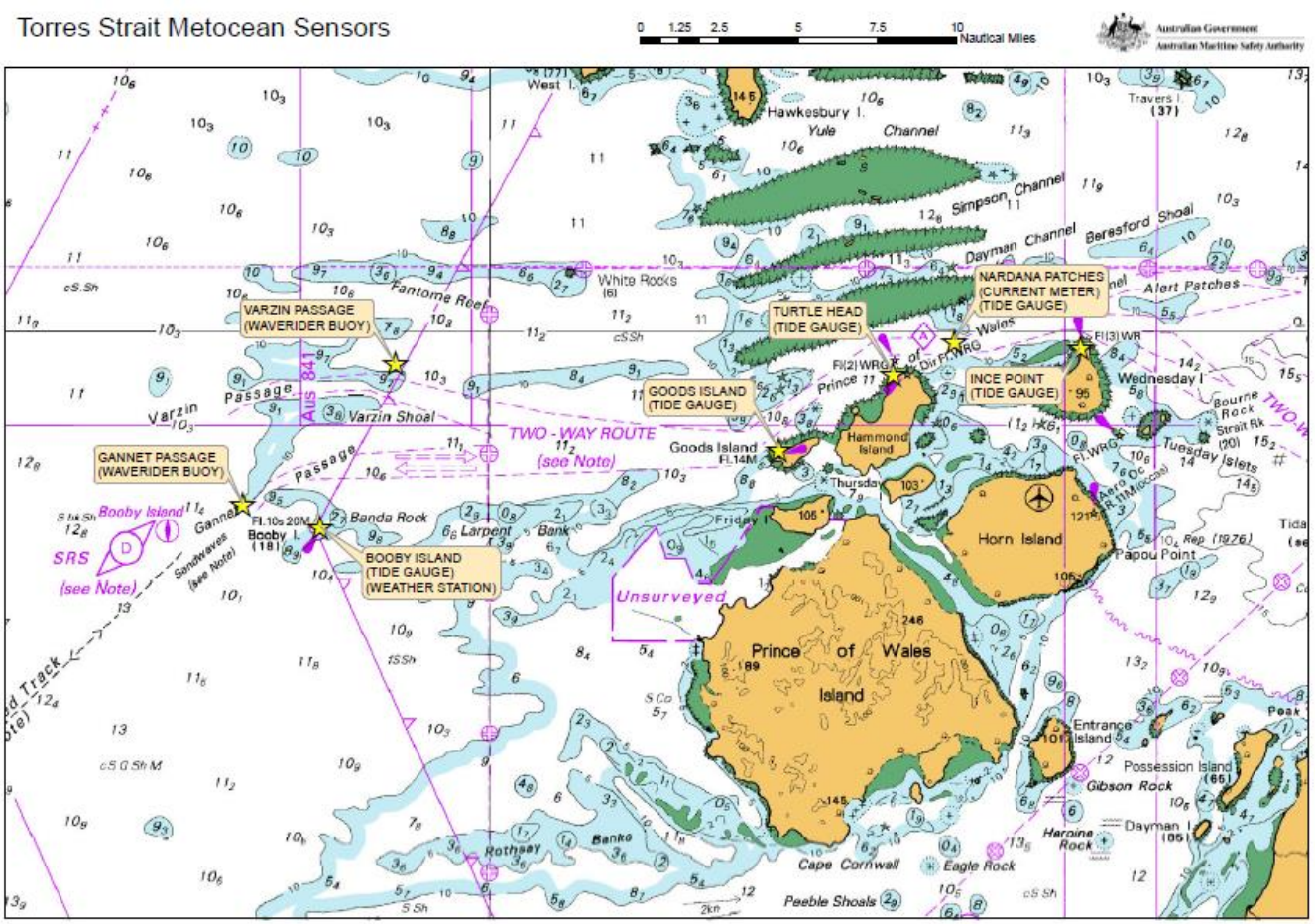
Sensors and real-time information



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Sensors and real-time information

Met Ocean Data Service

Summary

Tide

Booby Island	Goods Island	Turtle Head	Nardana Patches	Ince Point
10May2011 1318	10May2011 1318	10May2011 1318	10May2011 1318	10May2011 1318
1.55 m Tide	1.37 m Tide	1.13 m Tide	0.99 m Tide	0.98 m Tide
+0.14 m Residual	+0.14 m Residual	+0.11 m Residual	+0.06 m Residual	+0.04 m Residual

Wave

Varzin Passage 1		Varzin Passage 2	
10May2011 1231		10May2011 1232	
Sea	Swell	Sea	Swell
0.5 m Height	0.1 m Height	0.6 m Height	0.1 m Height
4.5 s Period	8.6 s Period	4.5 s Period	8.6 s Period
197 ° Direction	210 ° Direction	199 ° Direction	216 ° Direction

Tidal Stream

Nardana Patches
10May2011 1318
0.3 kn Rate
089 ° Direction

Wind

Booby Island
10May2011 1318
3.1 kn Speed
4.7 kn Gust
197 ° Direction

Meteorological

Booby Island
10May2011 1318
1009.4 hPa Pressure
28.2 °C Temperature
58 % Humidity

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Met Ocean Data – Tide Detail

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Australian Maritime Safety Authority

Met Ocean Data – Wave Detail

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Welcome, **ianl_yh@y7mail.com**
Settings | Log Off

Home | Vessels | Voyage Planning | Transit Planning | **Met Ocean Data** | Reporting | About | User Management

Met Ocean Data Service

Varzin Passage Waverider	
21 Oct 2010 11:18	
1.15 m	**0.07** m
Hs Sea	Hs Swell
4.17 s	**7.14** s
Tp Sea	Tp Swell
188.40 ° (T)	**189.80** ° (T)
Sea Direction	Swell Direction

Summary

Tide
- Booby Island
- Goods Island
- Turtle Head
- Nardana Patches
- Ince Point

Wave
- Varzin Passage Waverider

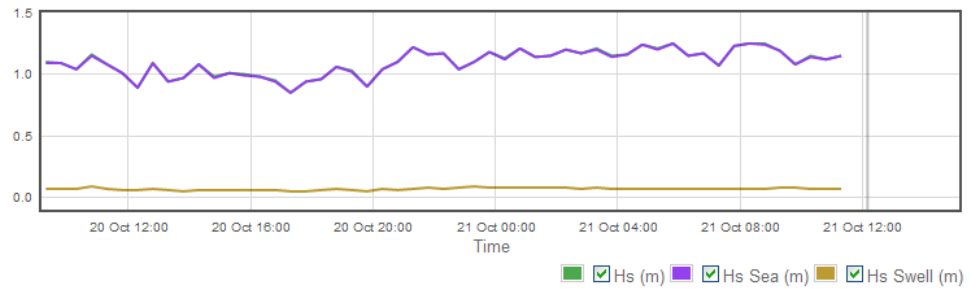
Tidal Stream
- Nardana Patches

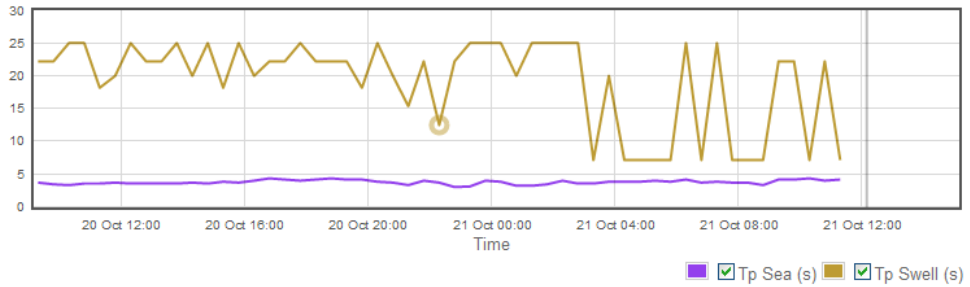
Wind
- Booby Island

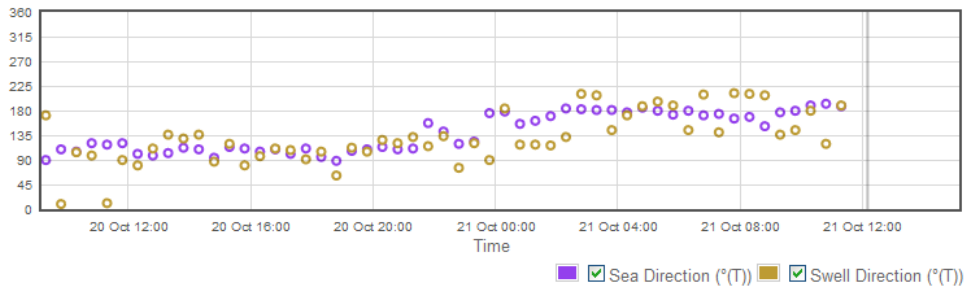
Meteorological
- Booby Island

Wave - Varzin Passage Waverider

Refresh | Show: 1 2 3 days | Scroll: < now >







Met Ocean Data – Tidal Stream detail

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Settings | Log Off

Home | Vessels | Voyage Planning | Transit Planning | **Met Ocean Data** | Reporting | About | User Management

Met Ocean Data Service

Nardana Patches
21 Oct 2010 12:18
2.10 kn
Speed
260.76 °(T)
Direction (to)

Summary

Tide
- Booby Island
- Goods Island
- Turtle Head
- Nardana Patches
- Ince Point

Wave
- Varzin Passage Waverider

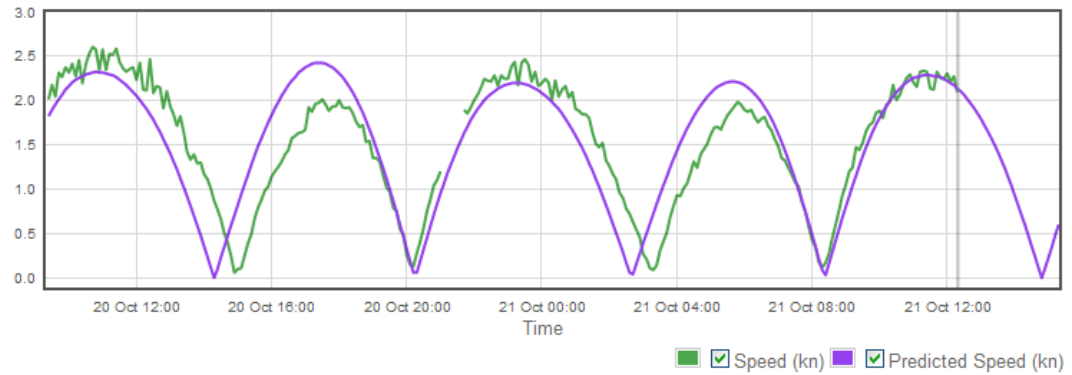
Tidal Stream
- Nardana Patches

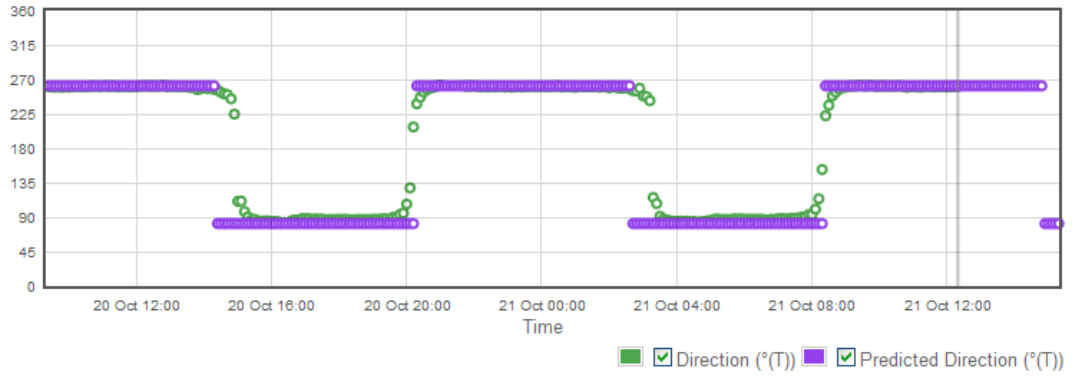
Wind
- Booby Island

Meteorological
- Booby Island

Tidal Stream - Nardana Patches

Refresh | Show: 1 2 3 days | Scroll: < now >





Met Ocean Data – Wind Detail

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Settings | Log Off

Home | Vessels | Voyage Planning | Transit Planning | **Met Ocean Data** | Reporting | About | User Management

Met Ocean Data Service

Booby Island
21 Oct 2010 12:16
22.20 kn Speed
25.70 kn Gust
80.00 °(T) Direction (from)

Summary

Tide
- Booby Island
- Goods Island
- Turtle Head
- Nardana Patches
- Ince Point

Wave
- Varzin Passage Waverider

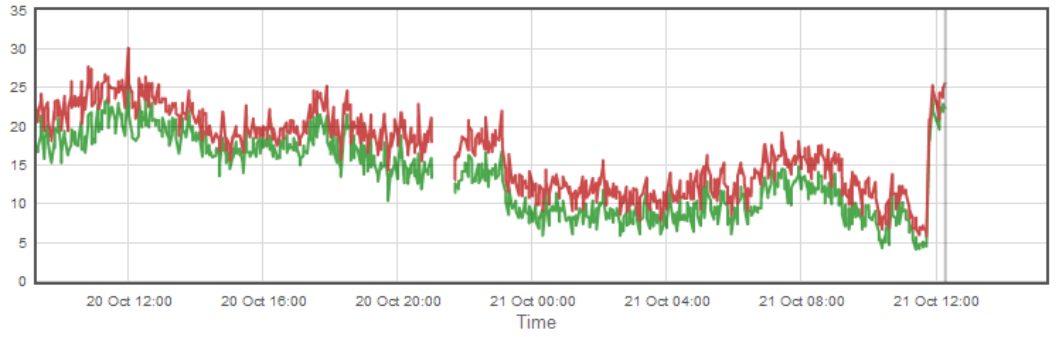
Tidal Stream
- Nardana Patches

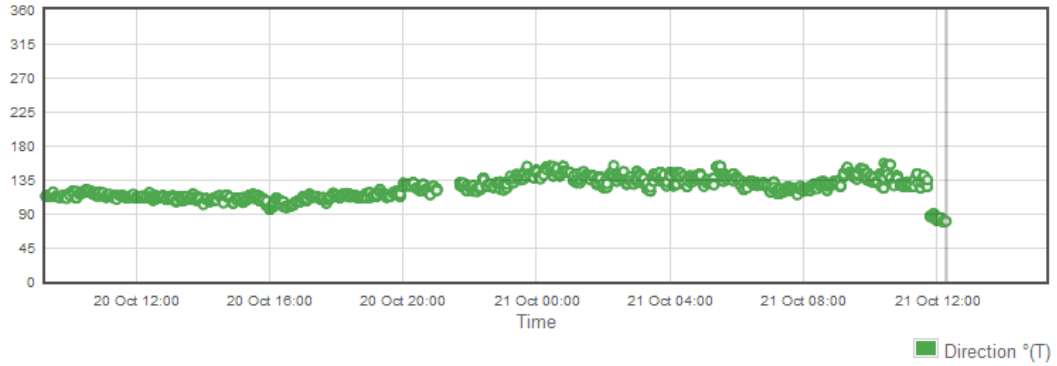
Wind
- Booby Island

Meteorological
- Booby Island

Wind - Booby Island

Refresh | Show: 1 2 3 days | Scroll: < now >





Met Ocean Data – Meteorological

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Welcome, **ianl_yh@y7mail.com**
Settings | Log Off

Home | Vessels | Voyage Planning | Transit Planning | **Met Ocean Data** | Reporting | About | User Management

Met Ocean Data Service

Booby Island
21 Oct 2010 12:20
1007.20 hPa Pressure
26.70 °C Temperature
75.80 % Humidity

Summary

Tide
- Booby Island
- Goods Island
- Turtle Head
- Nardana Patches
- Ince Point

Wave
- Varzin Passage Waverider

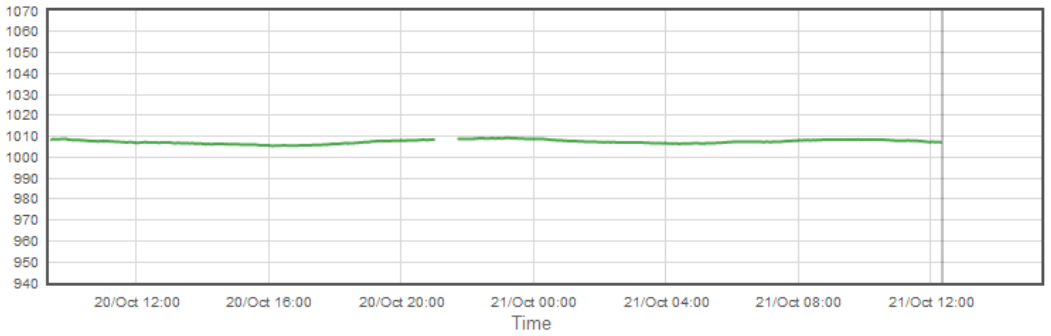
Tidal Stream
- Nardana Patches

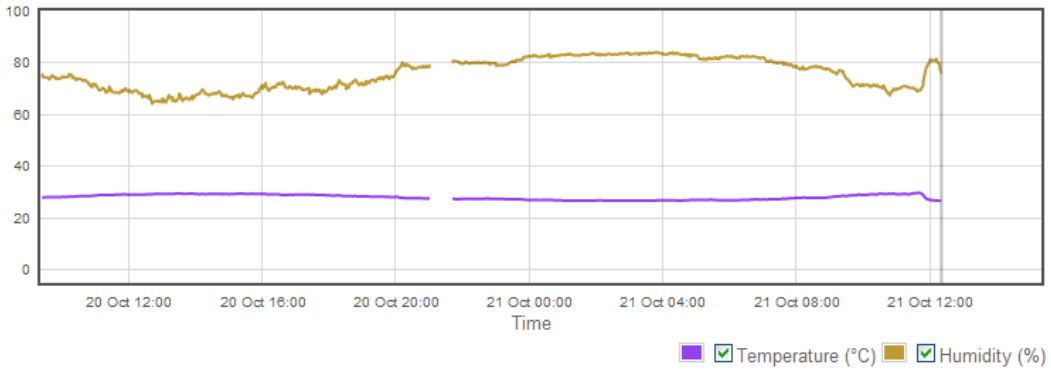
Wind
- Booby Island

Meteorological
- Booby Island

Meteorological - Booby Island

Refresh | Show: 1 2 3 days | Scroll: < now >

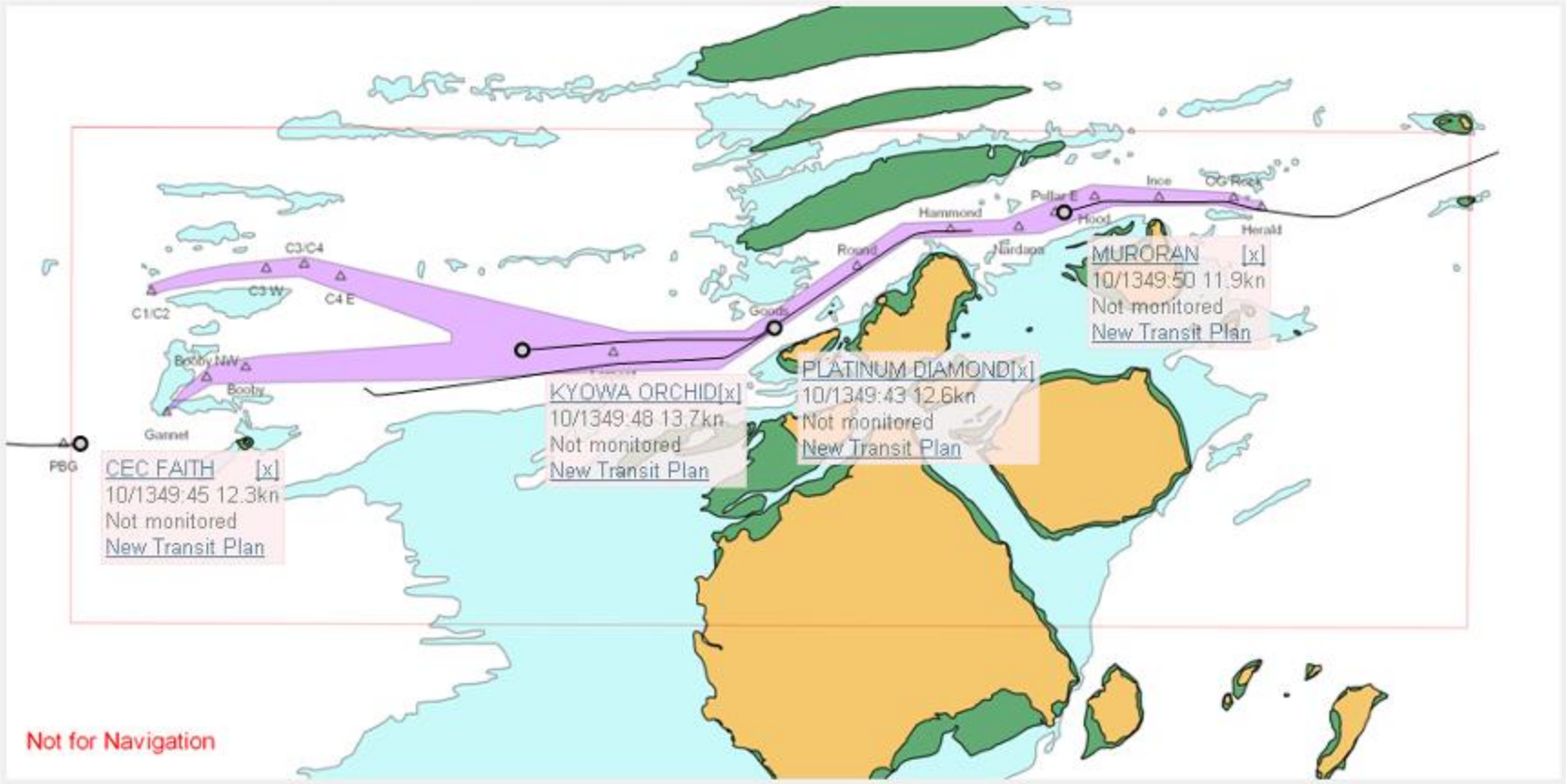




Transit Monitoring Service

Transit Plan Monitor

There are currently 0 monitored and 4 unmonitored vessels in the UKCM area.



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UKCM System – Where to from here?

Mandatory Use - Key Milestones:

- Updating Marine Orders Part 54 (Law)
- Developing a ‘Risk Management Plan’
- Developing a communication strategy (external stakeholders)
- Training and assessment of Coastal Pilots (system usage competence)

Mandatory Use – Risk Management Plan

Key Components to Consider:

- Initial and ongoing pilot training and competency
- Maintenance, availability and redundancy of the sensors
- Maintenance, availability and redundancy of the system
- REEFVTSO roles, procedures and information streams
- Internal notification and response procedures (including REEFVTS)

Mandatory Use – Pilot Competency

The competency of pilots (end-users) of the UKCM system is a crucial component of the ‘road-map’ to mandatory usage of the system.

AMSA will require all coastal pilots to complete:

- An online learning course for the UKCM system; and
- A remote 1-on-1 online practical competency assessment.

System Overview

The AMSA UKCM System has the following characteristics:

- Is an AMSA-owned system hosted and supported under licence by ‘OMC International’, the system developer.
- Is a web-based application accessible using everyday internet browsers.
- Produces complex proprietary UKC calculations integral to the Voyage and Transit Plans.
- Accounts for squat, heel and environmental influences based on vessel’s speed profile.
- Is highly configurable with various user and system settings able to be adjusted if required.
- Accurate hydrographic survey data underpins the entire system.

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Thank You – *Terima Kasih*.