RRS Discovery

Launch Day 06/4/2012

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Colin Day NOC
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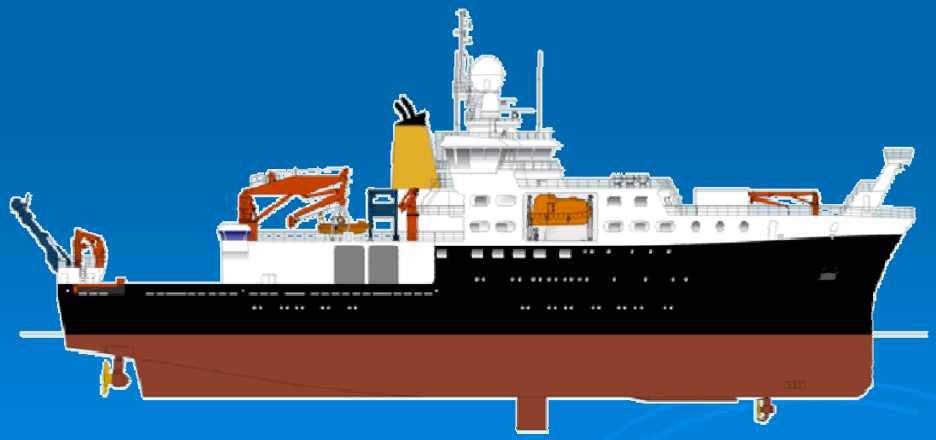
James Cook & new Discovery Compared



	Cook	Discovery
Length Overall:	89.50 m	99.70m
Breadth:	18.60 m	18.0m
Draft:	5.50-5.70 m	6.50m
Displacement:	5368t GRT	6075T GRT
Class:	Lloyds +100A1, Ice 1C, FS, +LMC, UMS, DP(AM) Research Vessel	Lloyds +100A1, Ice 1D, +LMC, UMS, IWS, EP, DP(AM), NAV1, IBS, Research Vessel
Maximum Speed:	15 kts SS4	15kts SS2
Cruising Speed:	12 kts SS4	12kts SS4
Maximum Endurance:	50 days	50 days
Science & Stores DW:	385T	380T
Scientific Berths:	32 singles	28 singles
Officers:	9 singles	12 singles
Crew & Technicians:	13 singles	12 singles
Open Deck Spaces (Afterdeck & Stbd Amidships) :	446 m^2	432 m^2
Total Lab Areas:	277.5 m^2	388.8 m^2

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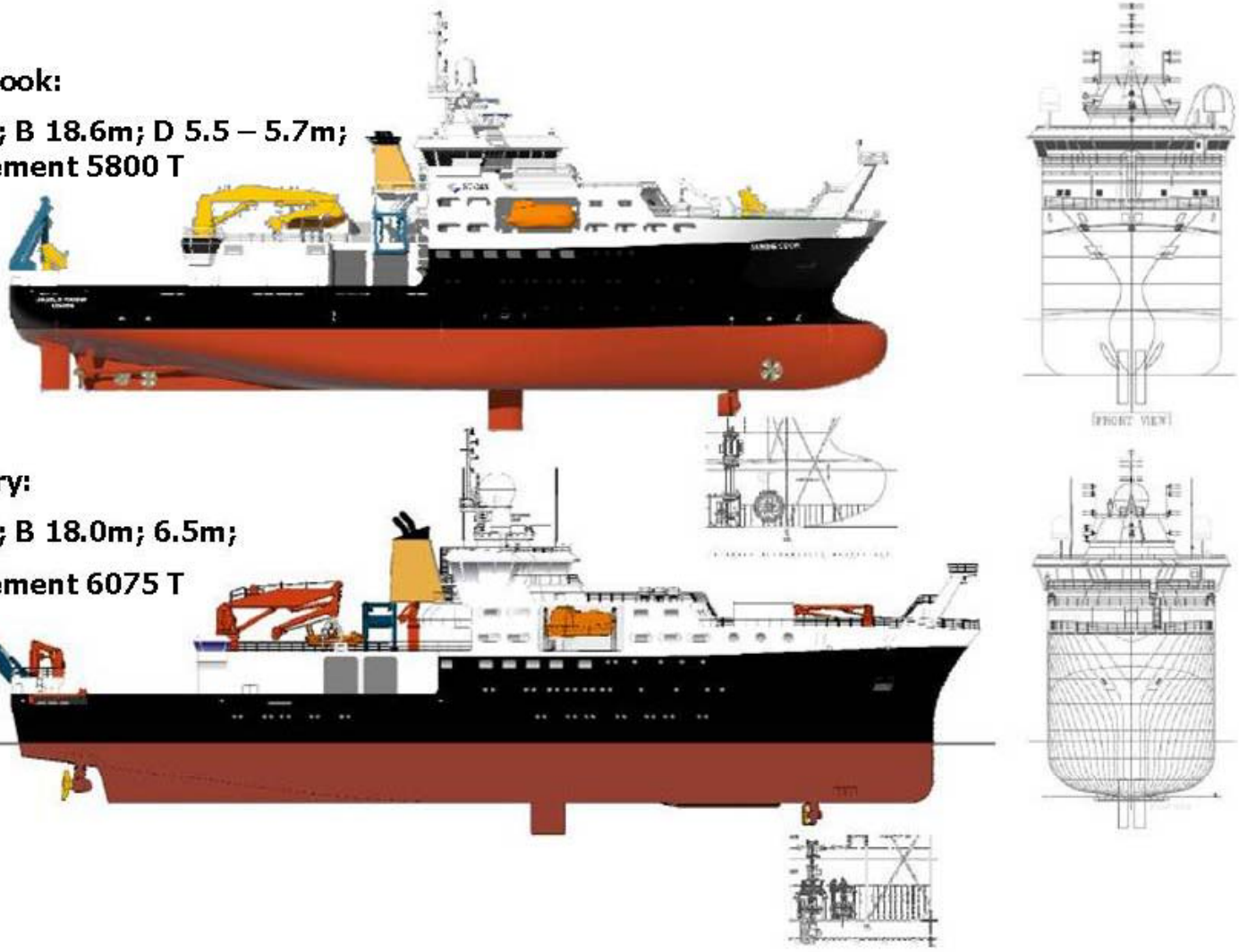
RRS James Cook / Discovery Replacement Comparison

James Cook:

L 89.5m; B 18.6m; D 5.5 – 5.7m;
Displacement 5800 T



Discovery:

L 99.7m; B 18.0m; 6.5m;

Displacement 6075 T

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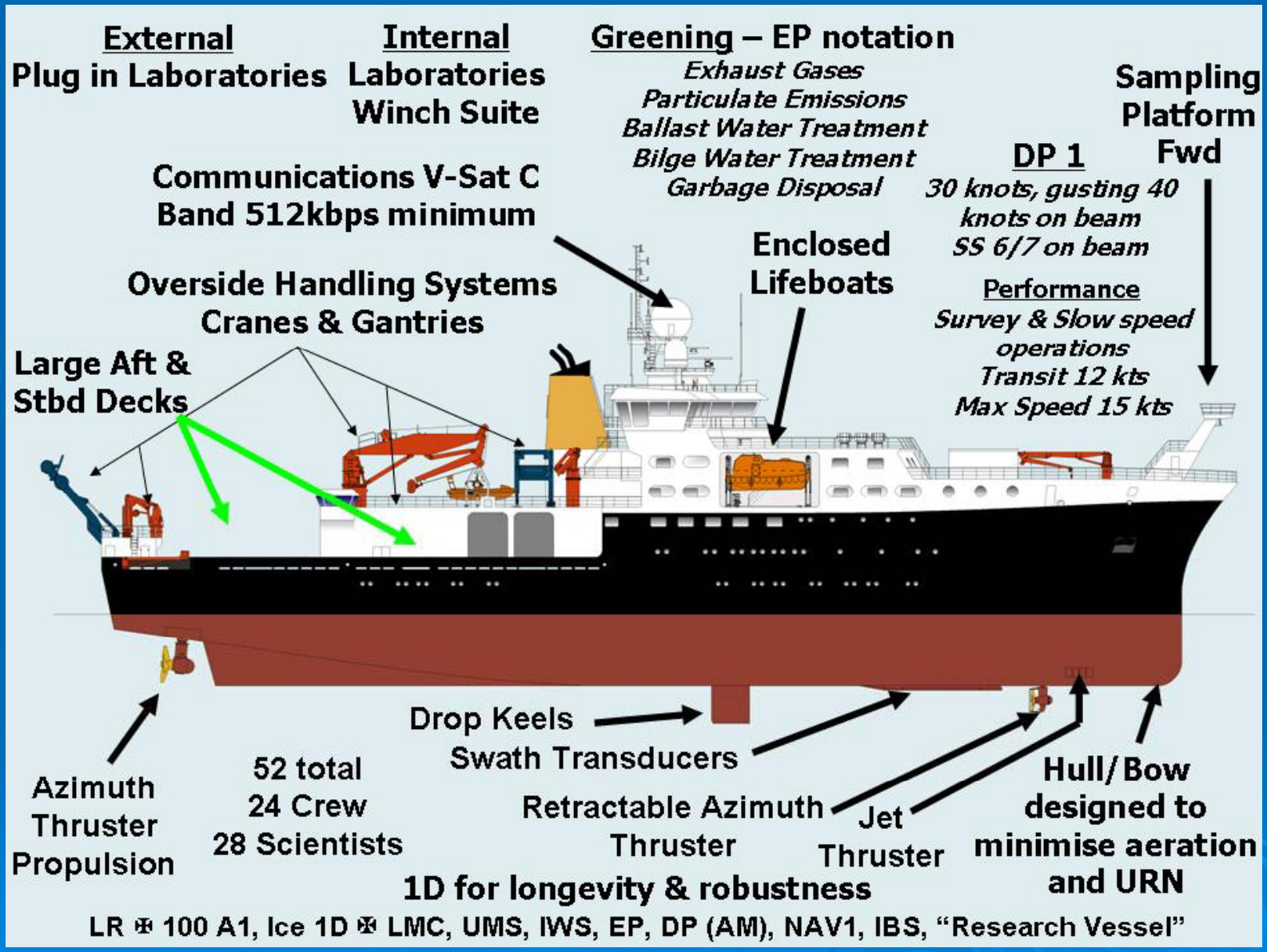

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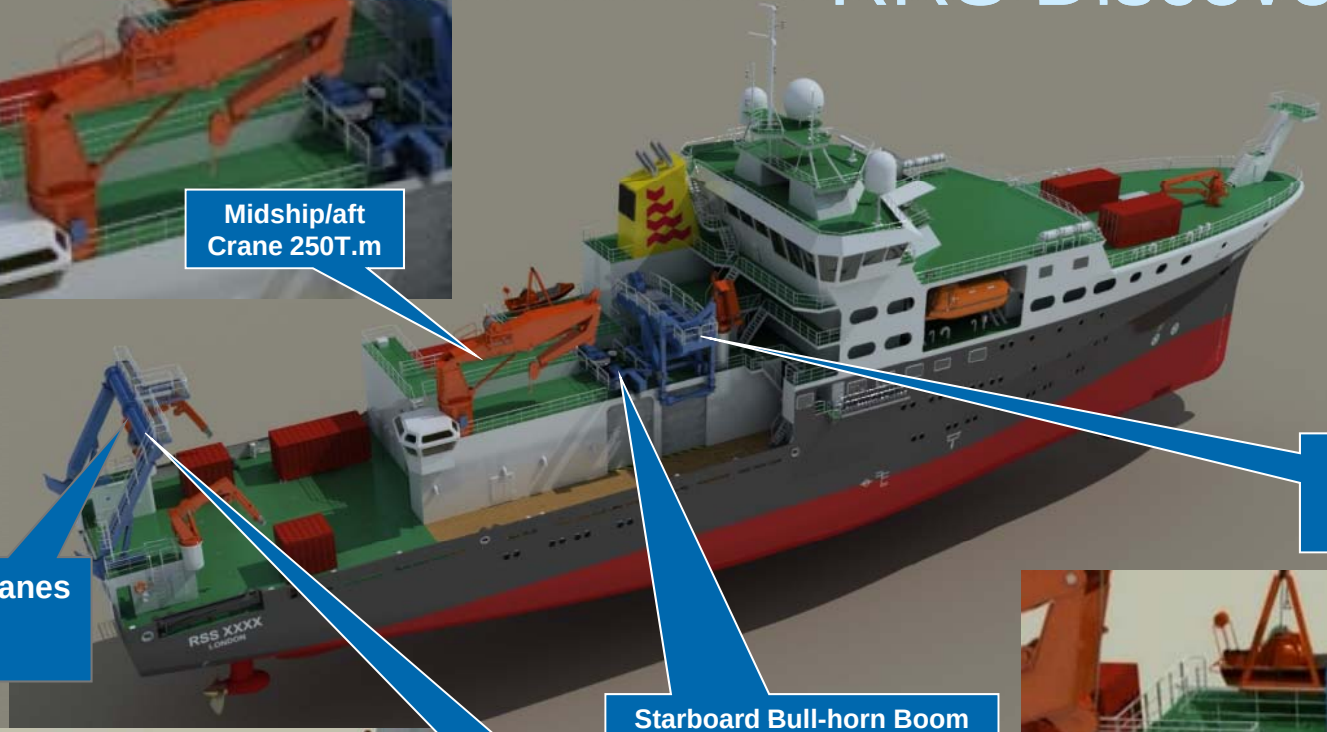
Over side handling
RRS Discovery

Midship/aft
Crane 250T.m



Aft Cranes
40T.m

Starboard 'A' Frame
Capacity – 20t
Max. Height – 5m

Starboard Bull-horn Boom
Capacity – 20T
Max. Height – 4.5m

Stern 'A' Frame
Capacity – 20t
Max. Height – 8m

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RRS Discovery hydro graphic suite

	RRS Discovery				Comment on installation Issue
	Blister	Port drop keel	Stbd drop keel	Pole	
EM122 1° x 1° 12kHz MBES	√				The RRS James Cook has an EM120 (hull mounted), the RRS Discovery has an EM122 blister mounted.
SBP120 3° x 3° sub-bottom profiler	√				
EM710 2° x 2° 70-100kHz MBES	√				EM710 moved to blister from the drop keel. More stable location.
75kHz ADCP	√				On RRS James Cook the ADCPs acoustic path could be obstructed by the starboard drop keel causing signal loss.
150kHz ADCP	√				
Hydrophone –(Acoustic background & system performance)	√				New installation for the RRS Discovery
EA600 12kHz single beam sounder		√			
10kHz single beam echo sounder		√			Moved to port drop keel on RRS Discovery.
CCTV underwater camera		√			New installation for the RRS Discovery
EK60 Bio echo sounder; 18kHz, 38kHz 70kHz, 120kHz, 200kHz, 333kHz			√		Additional frequency transducers included on RRS Discovery
Scanmar S-1004/s-1007 hydrophone			√		New installation for the RRS Discovery
Hydrophone – (background flow noise monitoring/system performance)			√		New installation for the RRS Discovery
Ultra Short Base line (USBL)				√	

Main Discovery over side handling systems – 20T starboard P-Frame

The starboard parallelogram handling system (P-Frame) is positioned fwd of the starboard 20T beam system.
The P-Frame is designed to handle all the ships wires, cables and ropes.
The P-Frame geometry allows a package to be lifted off the starboard deck, over the bulwark with out using the winch.

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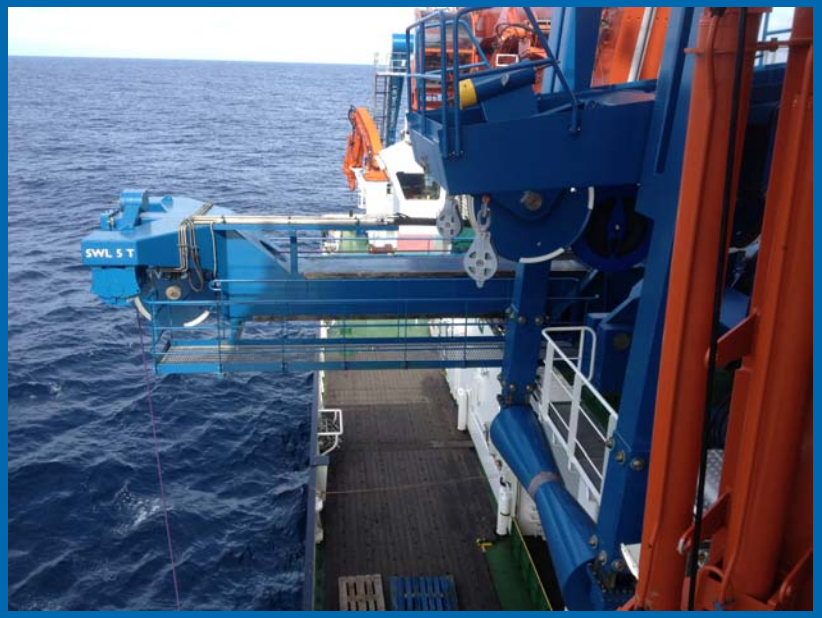
Main Discovery over side handling systems – 20T Starboard beam



The starboard 20T beam handling system is positioned Aft of the starboard P-Frame system.
The beam is designed to handle all the ships wires, cables and ropes.
The beam can be fitted with a ROV handling frame with locking head

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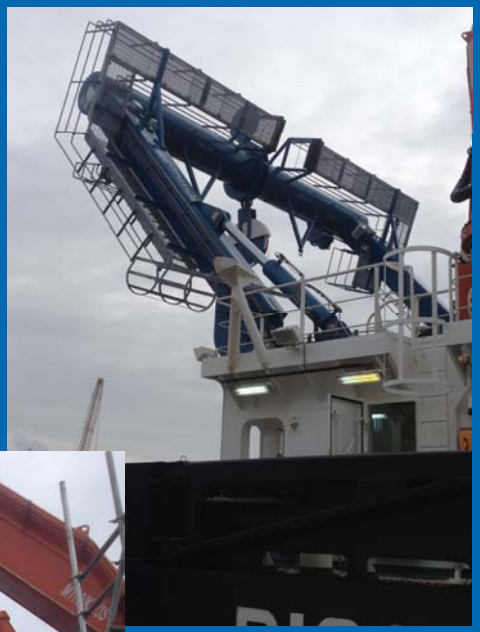
Main Discovery over side handling systems – 20T stern A-Frame

Stern 20Te A Frame:

Main central 20Te deployment block

4 auxiliary deployment points.

2 5Te auxiliary winches



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Ship fitted winch systems

WINCHES IN ODIM TESTSHOP 08/02/2012

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Ship fitted winch systems, wires, cables & ropes:

1. ROV / deep tow winch:
   - Traction winch
   - 12.5 Te maximum line pull
   - 2m/sec line speed
   - 10,000m steel armoured Electro-Optical cable (Rochester triple armoured, triple optic fibres, 3 copper core cable); MBL 20.9 Te

2. Standard steel CTD winch 1 & 2 –
   - Traction winch with 2 storage drums
   - 5 Te maximum line pull
   - 2m/sec line speed
   - 8,000m steel armoured Electro Mechanical 11.43mm cable; MBL 8.61 Te

3. General Purpose winch –
   - Direct pull winch
   - 11 Te at mid layer line pull
   - 2m/sec line speed at mid layer
   - 7,000m 3x25 RHO steel rope; MBL 18.56 Te

Ship fitted winch systems, wires, cables & ropes:

4. Trawl winch -
   - Traction winch
   - 12.5Te maximum line pull
   - 2m/sec line speed
   - 15,000m tapered steel rope; MBL 13 Te / 18.1 Te / 20.9 Te

5. Coring winch –
   - Traction winch
   - 20 Te maximum line pull
   - 2m/sec line speed
   - 8,000m synthetic Mechanical cable (Cortland 28mm 'Plasma' Dyneema); MBL 66.5 Te

6. Clean CTD winch –
   - Direct pull winch
   - SWL 4 Te at mid layer, 3.7 Te outer layer
   - 2m/sec line speed
   - 2.4 m/sec with AHC (6m@8sec)
   - 8,000m synthetic rope (Cortland Vectran braided rope); MBL 9.9 Te / WL 1.32 Te

Acceptance trials

- A range of marine acceptance trials and shallow winch trials were carried out locally to Vigo between March and July 2013
- Following these acceptance trials the ship was officially handed over to NERC but a number of issues still remained outstanding
- Deep sea winch trials carried out in the N Atlantic in September 2013
  - Tests were carries out to prove:
    - General operation of the winches
    - 24 hour operational capability of the winches
    - Effectiveness of cable and rope runs, routes and sheaves
    - Effectiveness of spooling systems
    - Reliability of control systems and user interface
- Following these trials modification and repair work was identified
- A further deep sea winch trials is planned for January 2014
- Hydro graphic trials were carried out in the N Atlantic in October 2013 which proved to be very successful!

Future trials and science activities

- 2nd deep sea winch trials planned for January 2014 in the N Atlantic; sailing from Southampton to Lisbon.
- Dry dock planned for Vigo in February 2014 to carry out modification work.
- 1st science cruise planned for March 2013
- Guaranteed dry dock planned for the summer of 2014