60’s

1992 – 2013/4

Discovery Replacement Project

Robin A Williams OBE

Project Technical Adviser to the Natural Environment Research Council

RVOC 2010

70’s & 80’s

2013 onward

RRS Discovery Replacement

Shipbuilder: Construcciones Navales P. Freire, S.A., Vigo, Spain

Designer: Skipsteknisk AS, Norway

Contract placed 29th March 2010

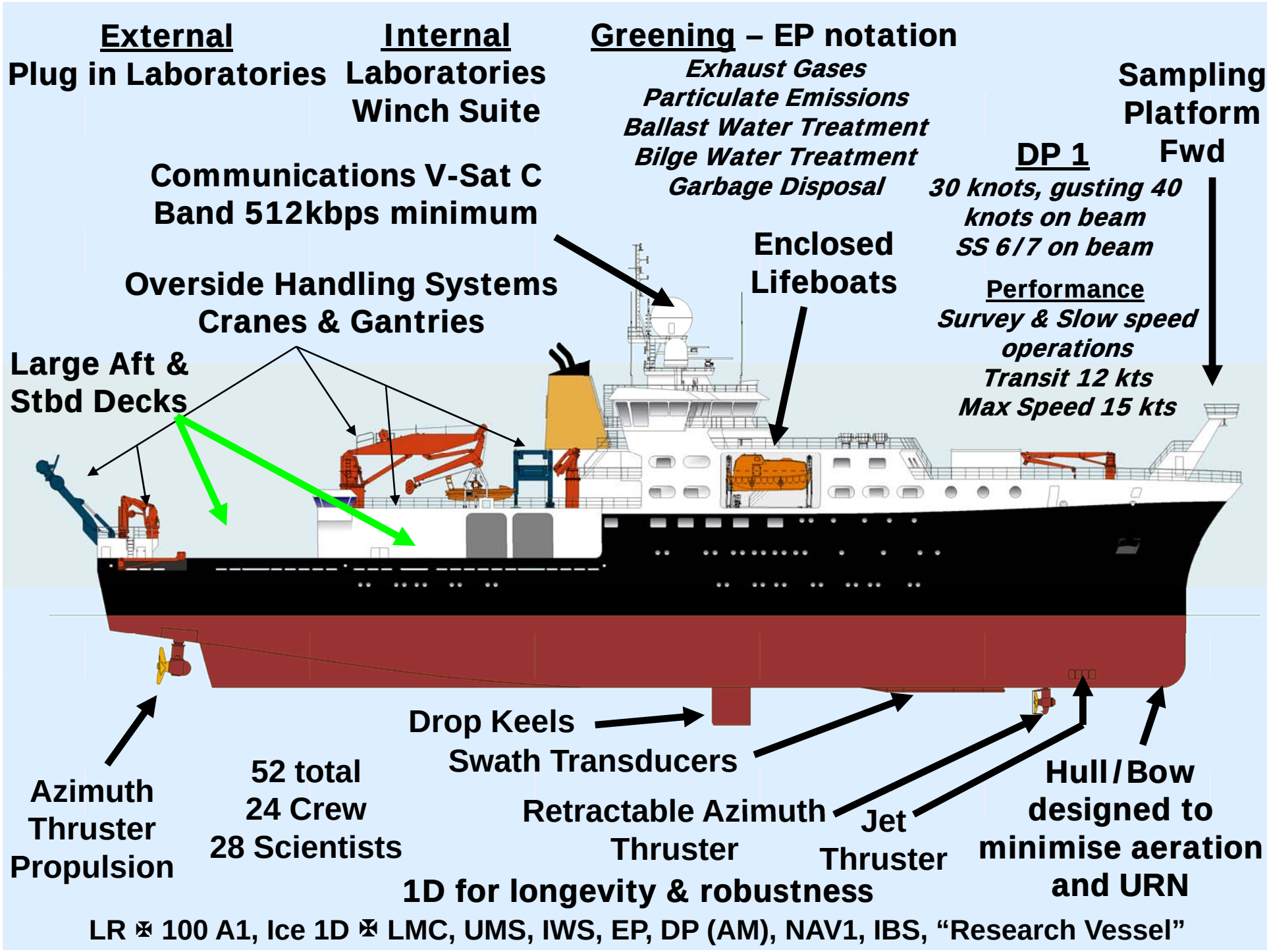
A new multi-role oceanographic vessel to be delivered Q2/Q3 2013

Science Programme commencement 2014

Before then technical familiarisation and configuration trials.

Expected Outcome

- 50 days endurance (L 99.7m, B 18m, D 6.5m)
- Scientific Transit Speed – 12 knots maximum
- 24 Officers & Crew (includes 1 Training Berth)
- 28 Scientists & Technicians
- DP Capable (DP1) SS6/7
- Multidisciplinary
- Seismic capability
- Multibeam(s) & Sub Bottom profiler
- Minimal Ice Class – for hull life (Lloyds 1D)
- Overside/overstern lifting – 20 tonnes
- Drop Keels
- Low URN but not ICES 209
- Propulsion – 2 x Azimuthing Units Aft
  Azimuthing Thruster Fwd, Manoeuvring Thruster Fwd
- Oceanographic Winch Suite – 4 wires and 1 synthetic + portable
  Metal Free CTD Winch


External
Plug in Laboratories
Internal
Laboratories
Winch Suite
Greening – EP notation
Exhaust Gases
Particulate Emissions
Ballast Water Treatment
Bilge Water Treatment
Garbage Disposal
Sampling Platform Fwd
DP 1
30 knots, gusting 40 knots on beam
SS 6/7 on beam
Performance
Survey & Slow speed operations
Transit 12 kts
Max Speed 15 kts
Communications V-Sat C Band 512kbps minimum
Enclosed Lifeboats
Overside Handling Systems
Cranes & Gantries
Large Aft & Stbd Decks
Drop Keels
Swath Transducers
Azimuth Thruster Propulsion
52 total
24 Crew
28 Scientists
Retractable Azimuth Thruster
Jet Thruster
Hull/Bow designed to minimise aeration and URN
1D for longevity & robustness
LR ✠ 100 A1, Ice 1D ✠ LMC, UMS, IWS, EP, DP (AM), NAV1, IBS, "Research Vessel"

Timescales as it has happened or still in the future

- ✓PQQ Re-issued August 2009
- ✓ITT Re-issued 29th September 2009
- ✓Tender Clarification / Evaluation Jan/Feb 10
  6 Bids, 3 LOT1 only, 3 with LOT 2
- ✓Gateway 3 “Investment Decision”. February 10
- ✓Preferred Bidder Decision – 25th Feb 10
- ✓Funding Award confirmation from BIS (LFCF) & HMT received 17/3/2010
- ✓29th March 2010 Contract Award
- •Build Period 2010 – Q1/Q3 2013
- •Commissioning & Trials Q3/Q4 2013
- •Available for Science Programmes 2014

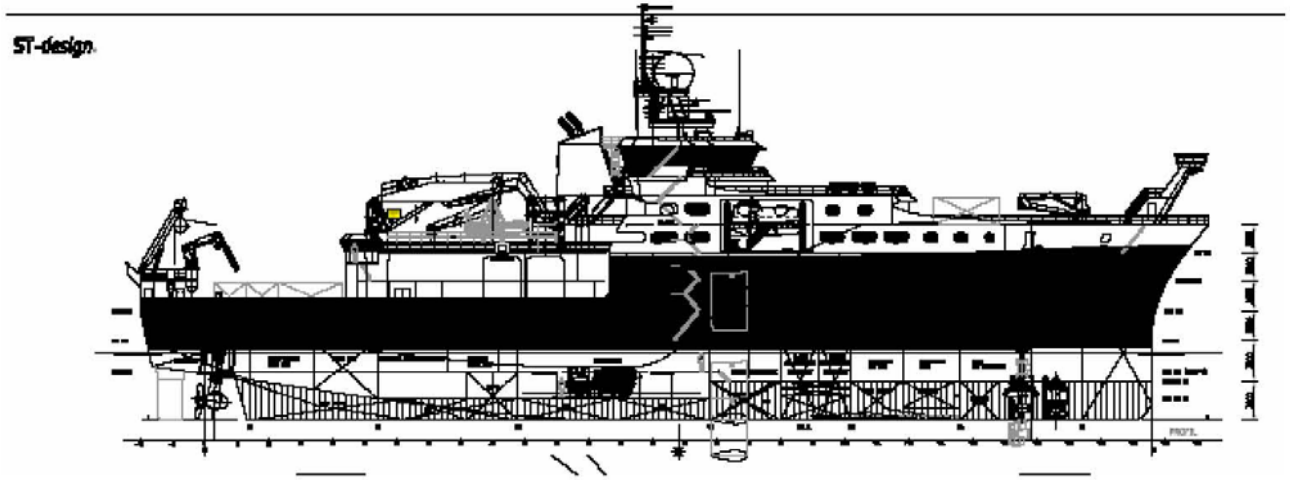
Funding – note no "Stimulus Package" in the United Kingdom

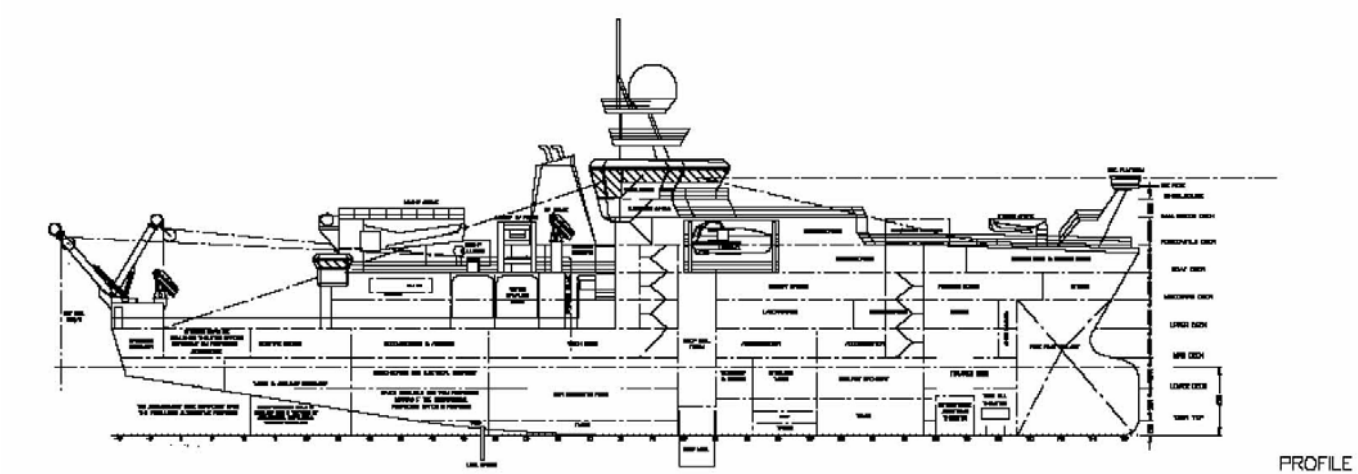
- Total Project - £75m equates to US$115m
  - Ship Build & Design
  - Project Office and Oversight
  - Training & Commissioning Trials
  - Spares
- Funded from HM Treasury £48m
- Remainder of £75m from NERC

NERC CONTRACT RULES

- We are only allowed to issue an output specification i.e. a Statement of Requirements
- The Contractor must take full responsibility for the finished product
- We therefore cannot develop and present a detailed Specification
- Research vessels are ‘one offs’ and are only built on 20 year cycles
- Result is that no shipyard really understands their needs particularly as each nation has their own priorities for science
- Our approach is to prepare Concept General Arrangement, CGA, along with Quality standards and illustrative Schedules for guidance only
- The Statement of Requirements is written in detail set against the CGA which has itself been developed through consultation with the science community
- This was successful with the James Cook (exactly on time & price) and hopefully this will be repeated for the Discovery

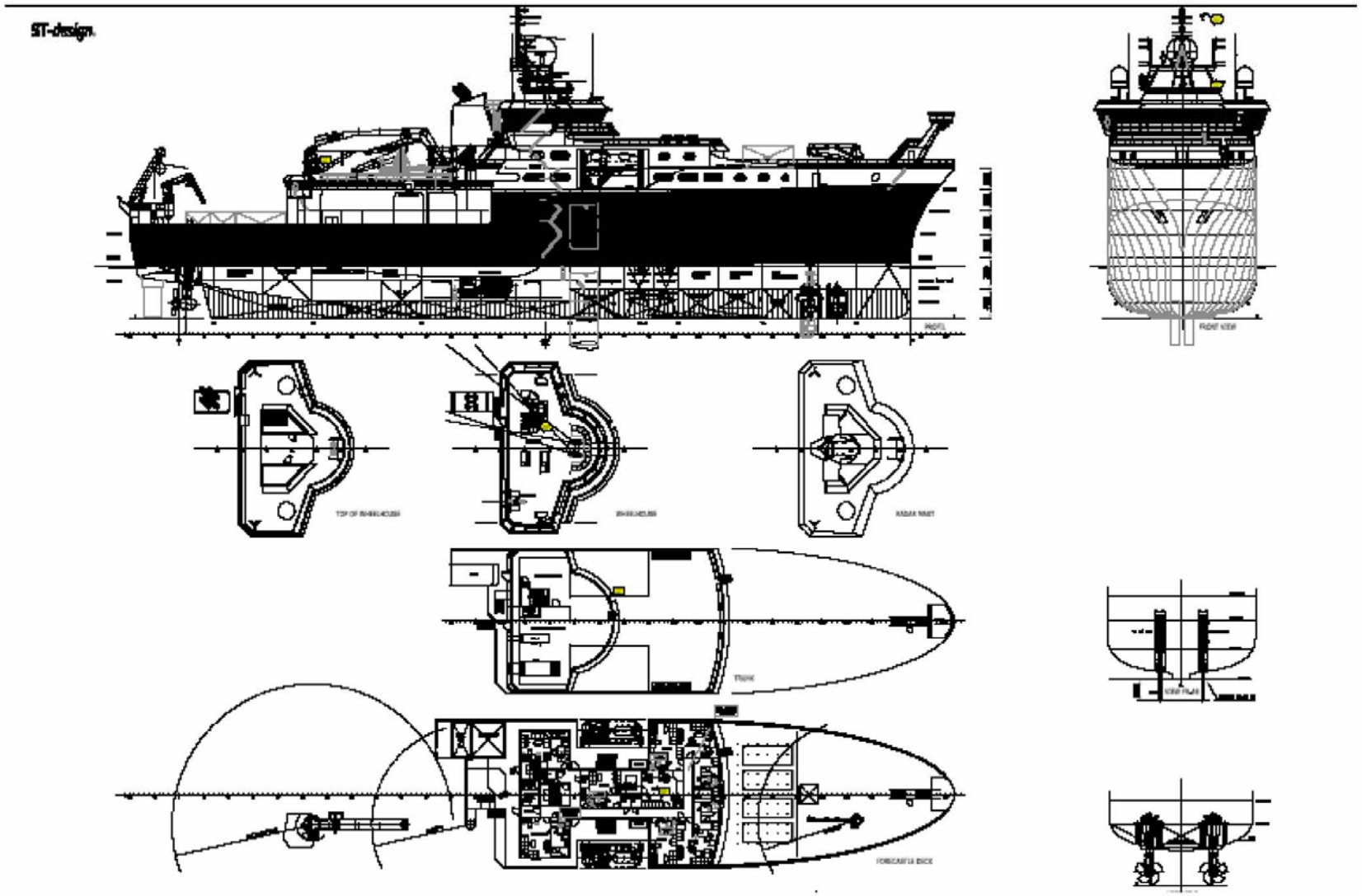
ST-design



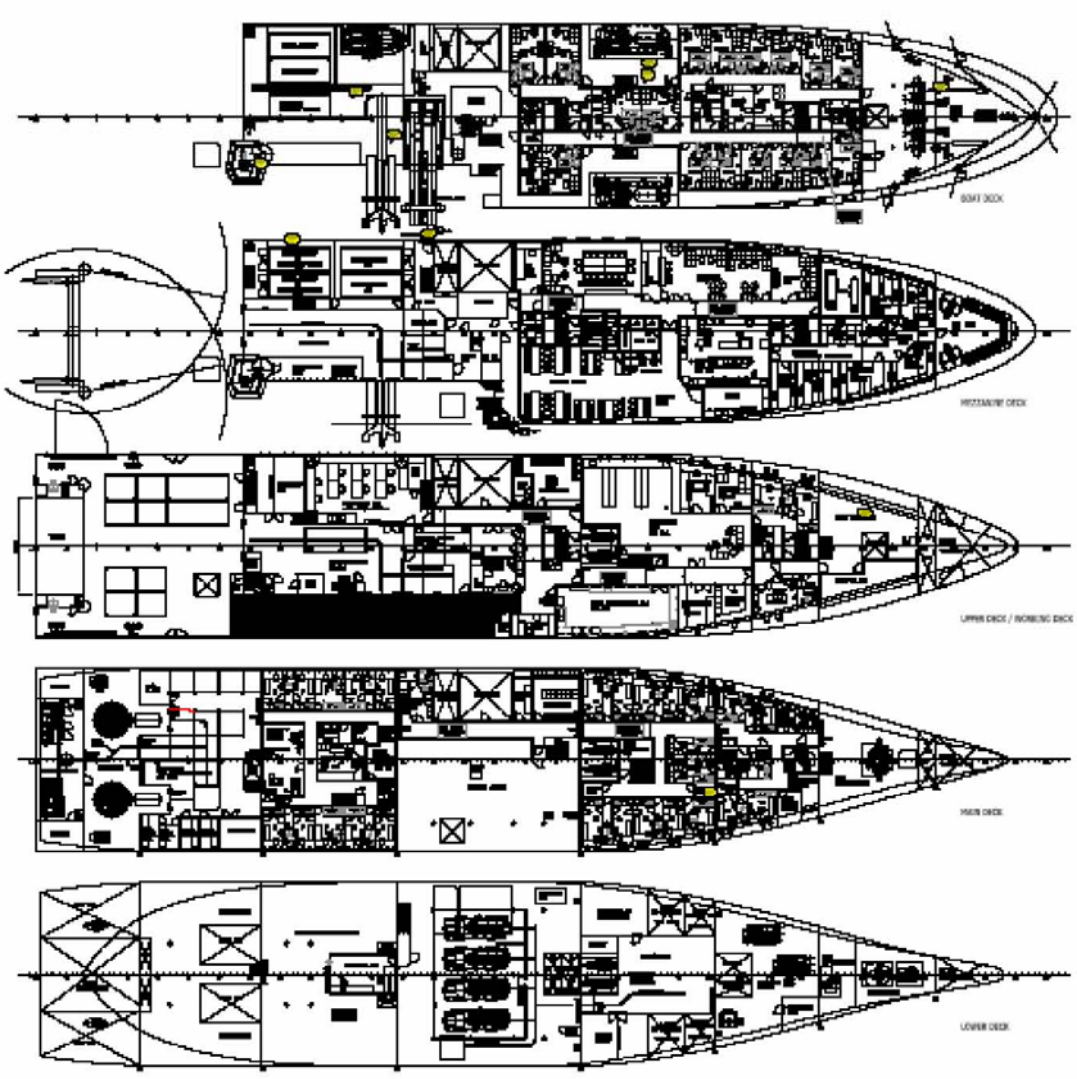


PROFILE

GENERAL ARRANGEMENT



GENERAL ARRANGEMENT



MAIN DIMENSIONS

LENGTH O.A.	99,20 m
LENGTH B.P.	80,80 m
BREADTH	15,80 m
DEPTH TO MAIN DECK	7,40 m
DEPTH TO UPPER DECK	10,20 m
DEPTH TO MEZZANINE DECK	13,00 m
DEPTH TO BOAT DECK	15,60 m
DEPTH TO FORECASTLE DECK	10,20 m
FRAME SPACING	600 mm

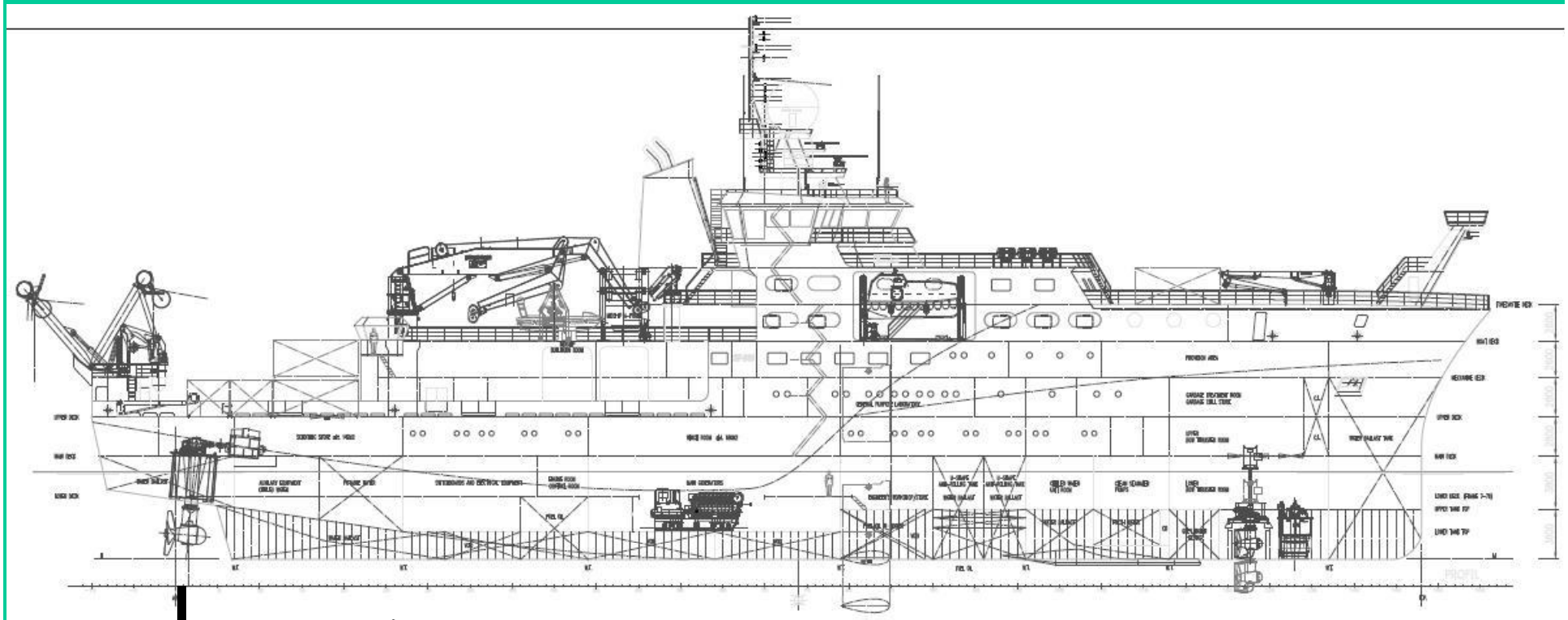
ACCOMMODATION: 60 PERSONS, 24 CREW + 36 SCIENTISTS

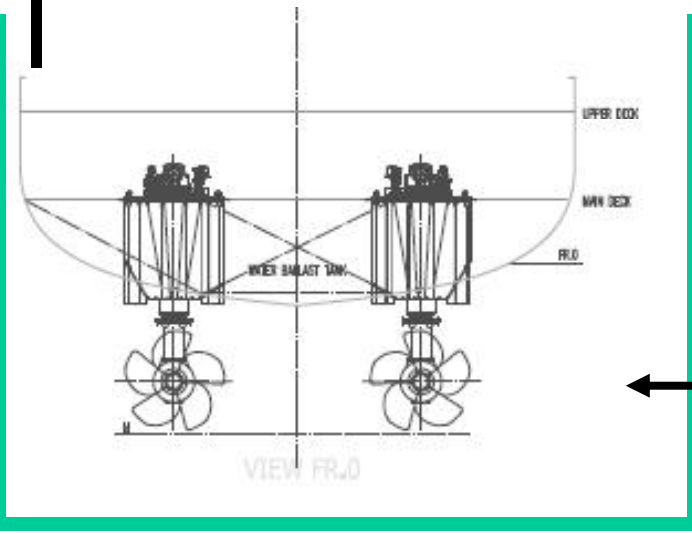
CLASS
[illegible] (ice 1C), LRC, UMS, EARS, HAM, ISS, "Research Vessel"

To be compliant with IMO Resolution MSC.[illegible]
CODE OF SAFETY FOR SPECIAL PURPOSE SHIPS 2008

ST-344

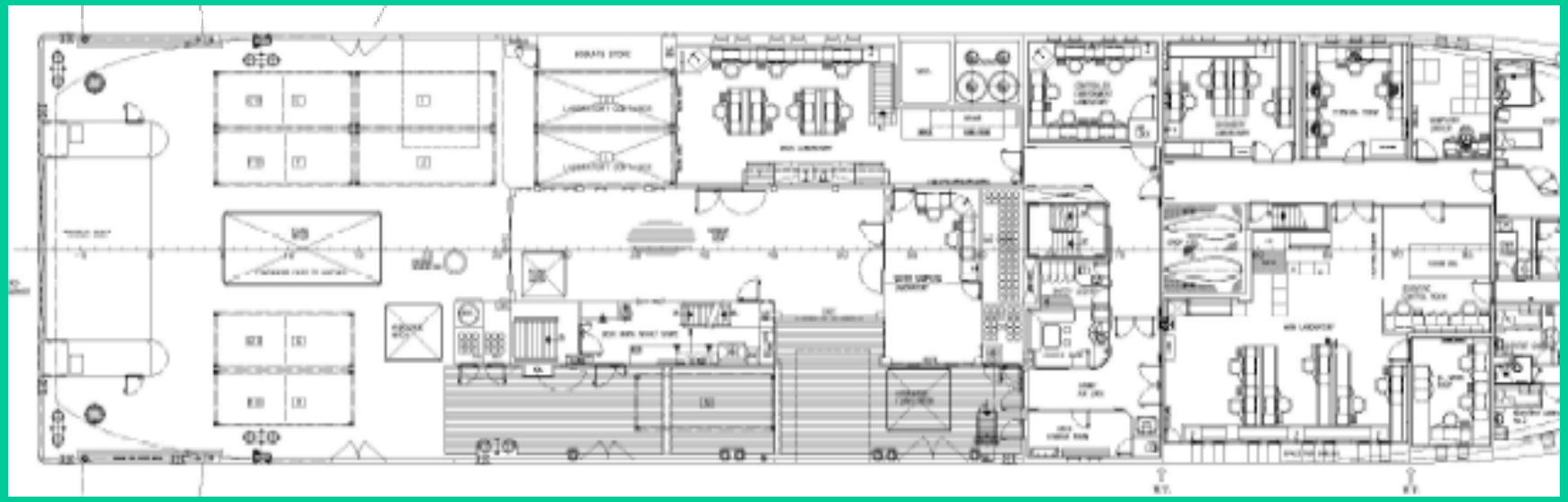
GENERAL ARRANGEMENTS



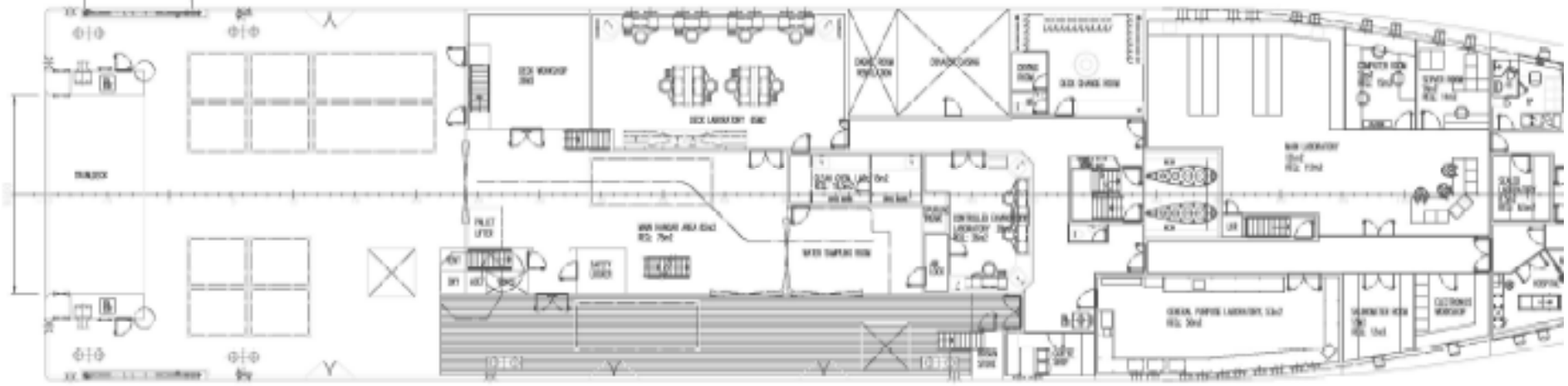


View at Frame 0

LABORATORY SPACES AND WORKING DECKS



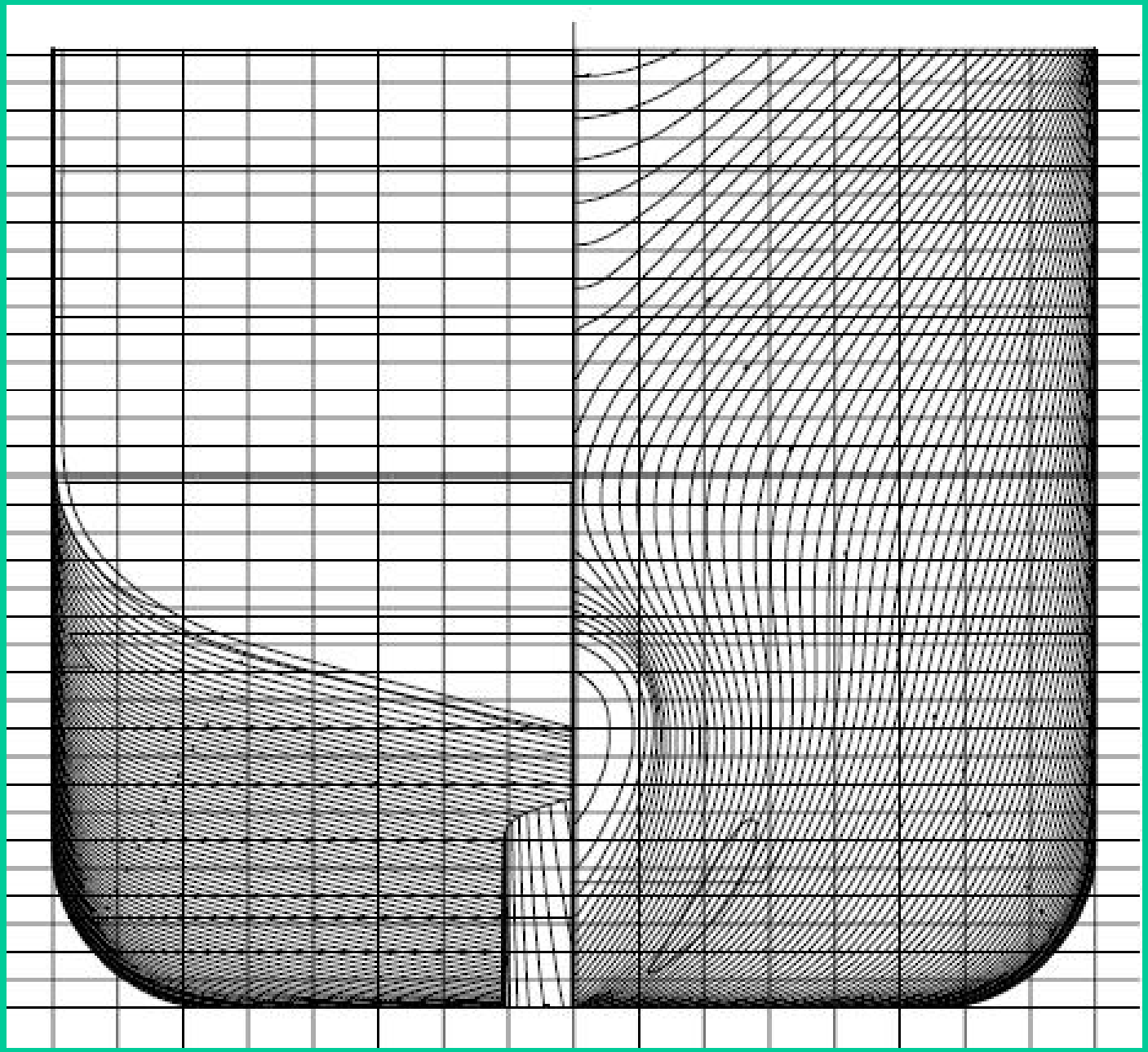
RRS JAMES COOK - 2006



RRS DISCOVERY - 2013

Bubble Sweepdown

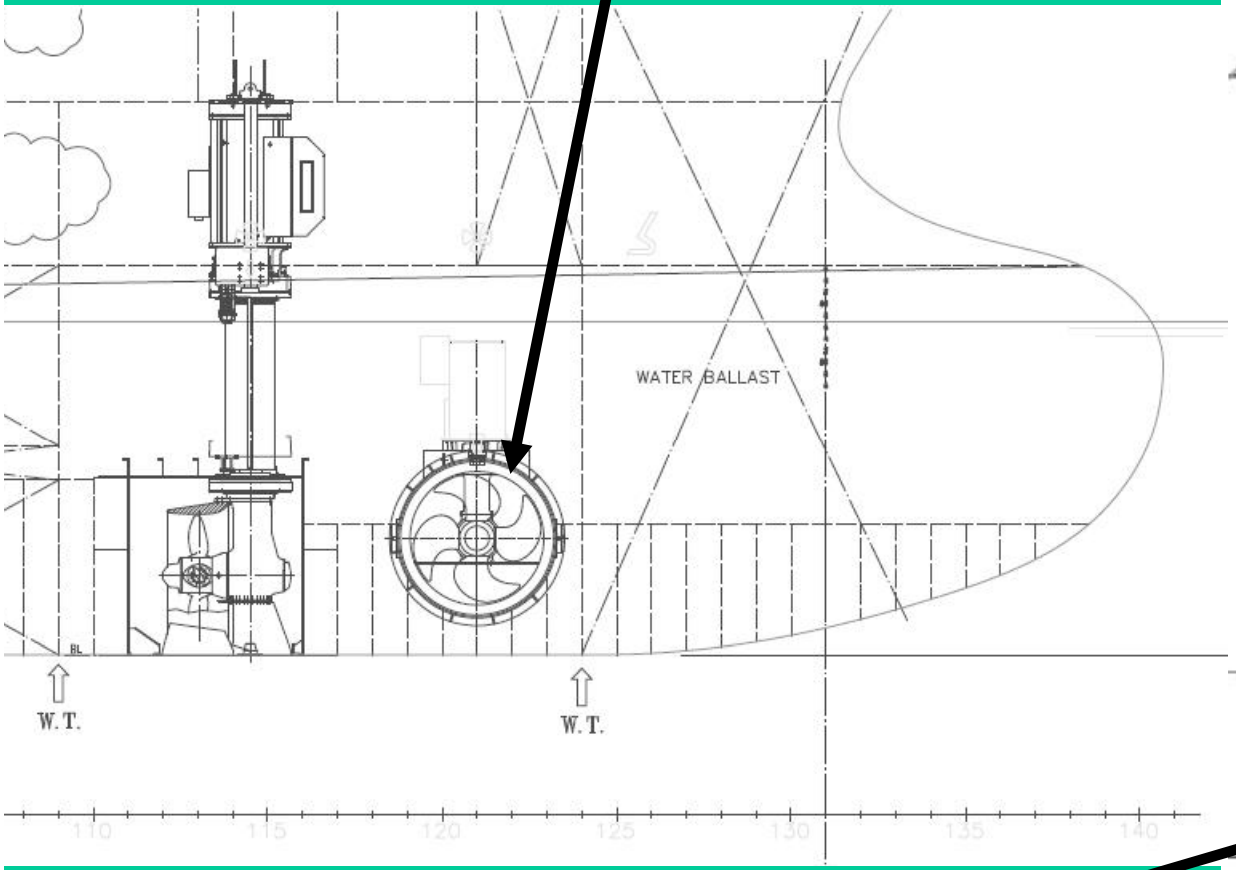
- Basic vessel is (compared to JC)
  - Longer, Deeper in the water, Slightly Narrower
  - This leads to reduced bow emergence
  - Block Coefficient JC 0.71; D4RP 0.57
- No form of bulb at the bow. Vertical stem instead.
- No large aperture for manoeuvring thruster.
- Will include a blister arrangement outside keel plate line due to rise of floor.
- Designer better informed
- Customer better informed
- Model Test Arrangements to include CFD modelling for flow lines
- Commercial approach via LD clauses

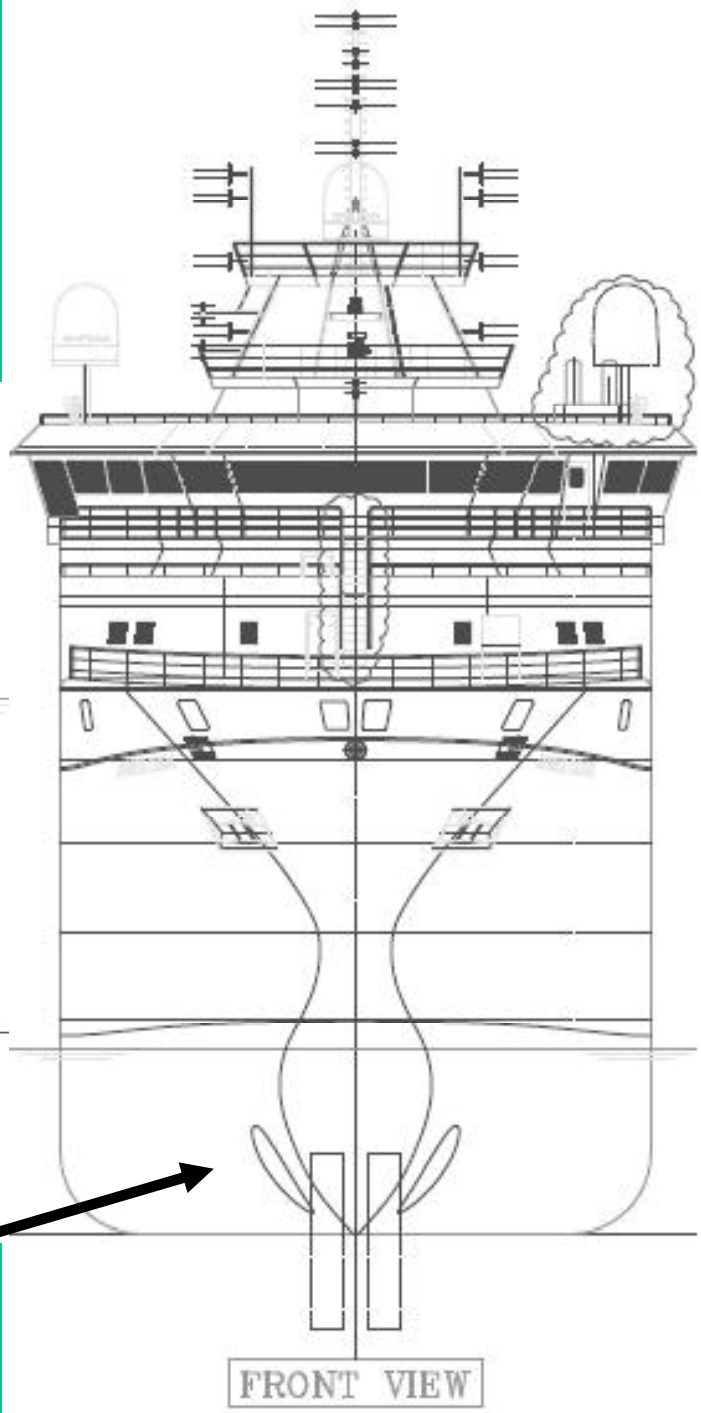


A REMINDER OF THE JAMES COOK HULL FORM

RRS JAMES COOK

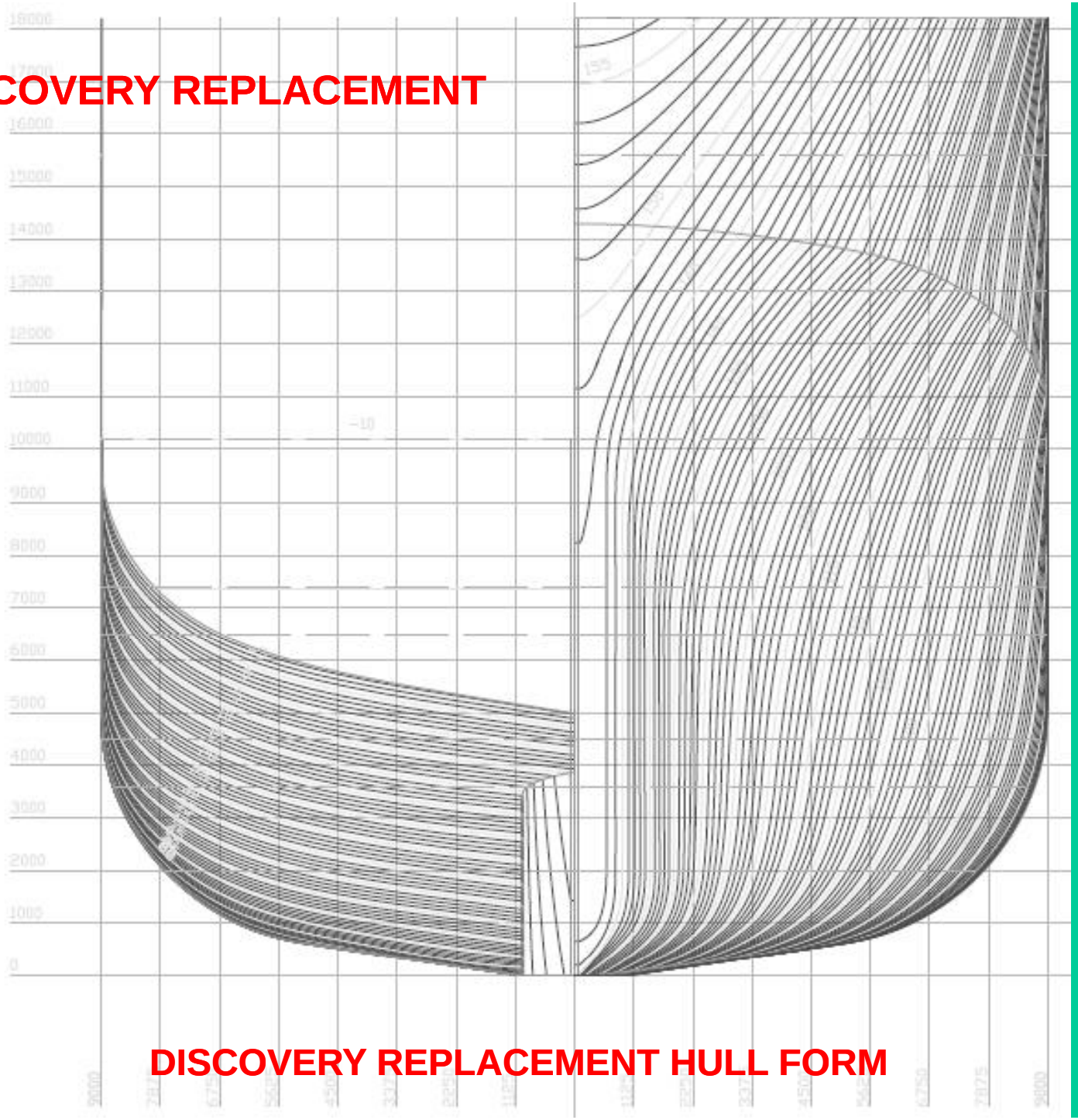
VIEW ON STBD BOW SHOWING BOW THRUSTER APERTURE





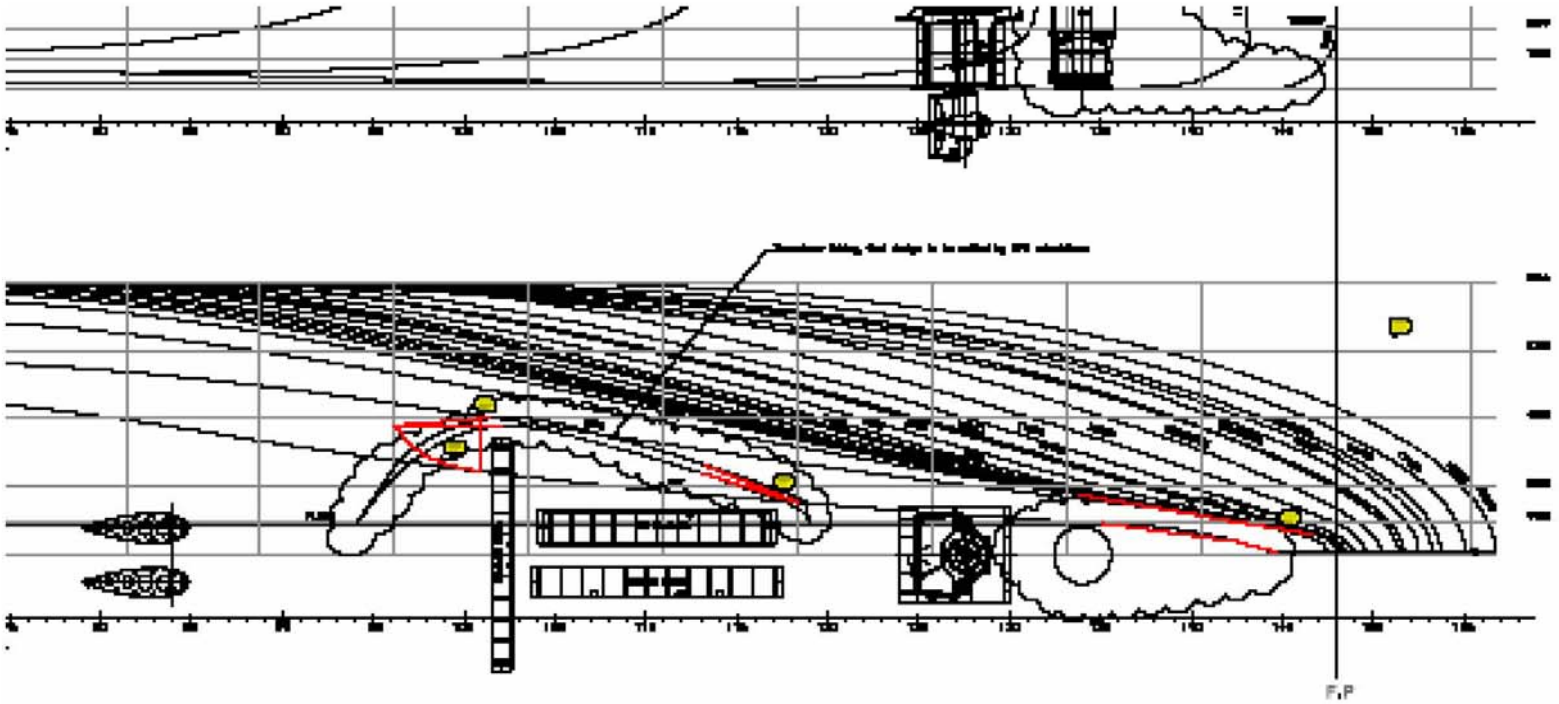
VIEW ON BOW SHOWING LINES JAMES COOK

RRS DISCOVERY REPLACEMENT



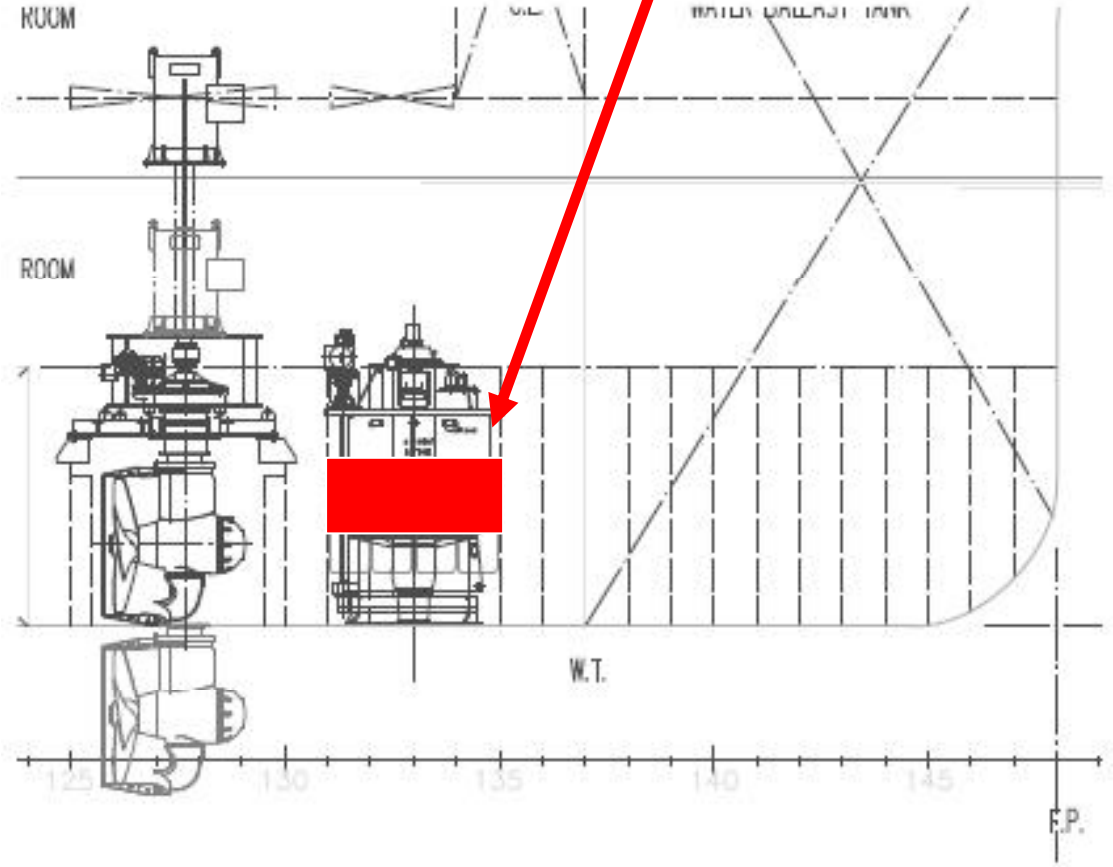
DISCOVERY REPLACEMENT HULL FORM

FORWARD LINES

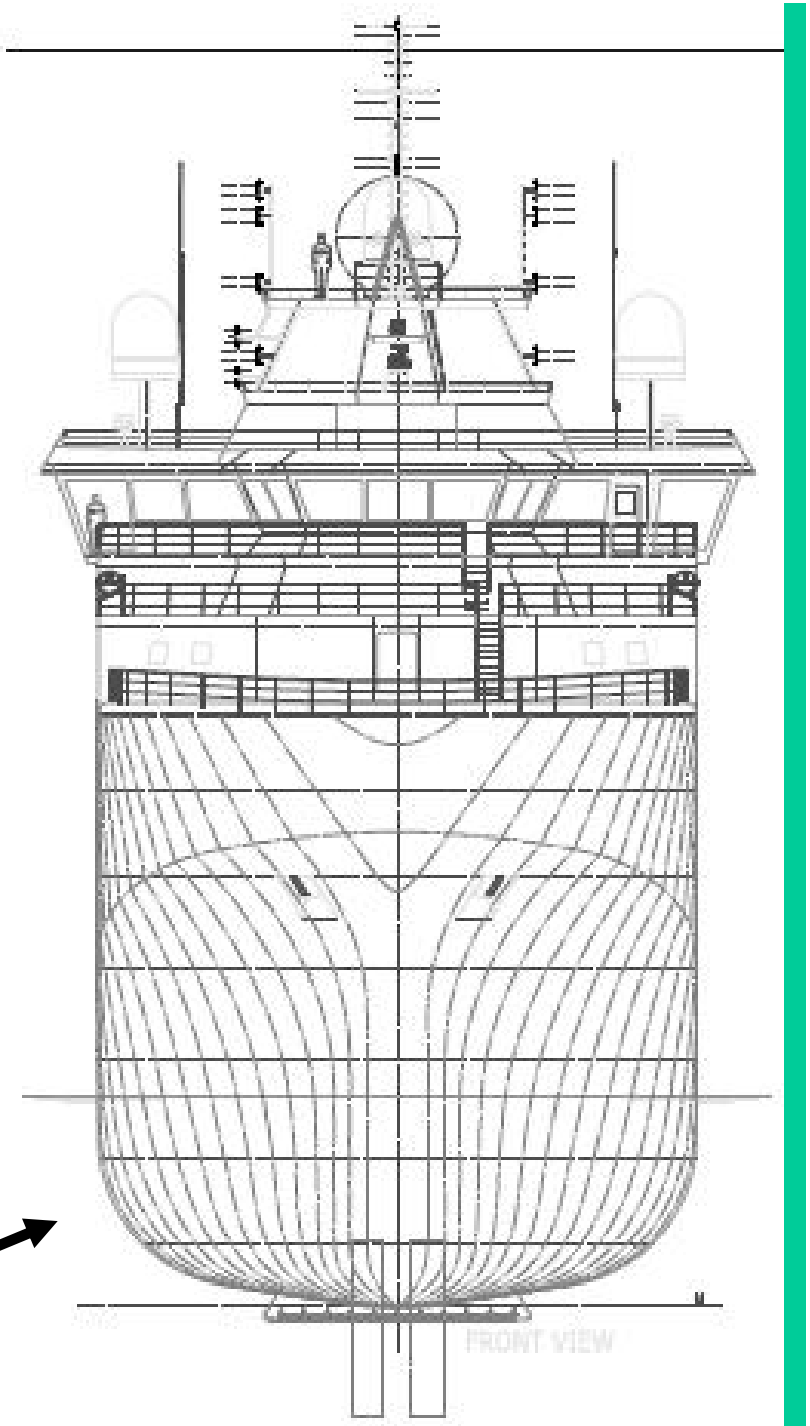


RRS DISCOVERY REPLACEMENT

VIEW ON STBD BOW SHOWING BOW THRUSTER APERTURE



VIEW ON BOW SHOWING LINES DISCOVERY REPLACEMENT



This is not The End

It's only the beginning!