Vessel description

The RV icebreaker Laura Bassi, formerly known as E. Shackleton and Polar Queen, was acquired by OGS in 2019 to increase and extend its research capabilities in the polar areas and to support the Italian National Antarctic Research Program (PNRA). After her first Antarctic campaign conducted in the Ross Sea in 2019-2020 within the framework of PNRA project, the vessel is now about to undergo a refitting, aimed at increasing her research capabilities that will be done New Zealand in November 2020.

A series of transducers will be installed on the hull to implement and improve the geophysical, biological and oceanography research activities:

- two multibeam echosounders for shallow and deep water surveys;
- a sub bottom profiling system for the study of the subsoil up to few tens of meters;
- an acoustic doppler current profiler;
- a fishing echosounder to locate and map the biomass.

As for the decks equipment, a CTD winch and a streamer winch will be installed in the B-Deck sheltered area (Table 5 of this document), and a Coring winch will be installed on the starboard side of A-Deck (Table 4 of this document), to perform gravity and piston corings.
CLASS NOTATION
RINa C ✠
special service - research ship - unrestricted navigation
✠ AUT-UMS; ✠ DYNAPOS DP2 ; HELIDECK
ICE CLASS IA; WINTERIZATION (temp -30 °C)

THRUSTERS
Bowthruster 1  600 kW
Bowthruster 2  800 kW
Azimuth fwd  800 kW (retractable)
Sternthruster 1  600 kW
Sternthruster 2  600 kW

ROLL REDUCTION
2 x integrated roll reduction tanks

HIGHLIGHTS FOR CHARTERER’S SPECIAL USE
Water supply:
• Uncontaminated sea water supply
• Freshwater production: 2 x 25m³ Fresh Water Production

Hydraulic Power Pack:
• 2 x 120 ltr/min – 210 Bar, outlets in cargo holds and on deck
Gate Valve:
• DN400 (16”) in fwd HPR trunk

Utility SWB:
Utility SWB’s in engine work shop
Utility SWB no1, 450V - 630 A / Conn. 2 x 100A, 2 x 250A and 1 x 600A
Utility SWB no2, 450V - 630 A / Conn. 2 x 100A, 1 x 250A and 1 x 600A

Distribution boxes in cargo holds and aft deck:
Total 450 V - 320A (each box 160 A)
Total 230 V - 160A (each box 160 A)

MACHINERY AND PROPULSION

Main Engines
Make Bergan Diesel
Type BRG 6
Rated Power 2 x 2280 kW @ 720 rpm

Main propulsion
C/P Propeller: 1 o# in Nozzle
Make Ulstein
Blades 4
Bollard pull 100% pitch - 75 tonnes
75% pitch - 62 tonnes
50% pitch - 44 tonnes

Auxiliary Engines
Make Mitsubishi
Type S6R-MPTK
Rated Power 2 x 590 kW/1800 rpm

ELECTRICAL PLANT

Shaft Generators
Make AVK
Rating 2 x 2 200 kW

Auxiliary Generators
Make Mitsubishi
Rating 2 x 590 kW

Emergency Generators
Make Mitsubishi - AVK
Rating 1 x 152 kW, 3 x 450 V, 60 Hz

Emergency generator
El. Distribution
440 V, 230 V and 110 V all 60 Hz
**WORKSPACE AND DECK AREAS**

**Tank top:**
- Distributed load: 5.3 t/m²
- Container loads: 3 tiers 20 TEU max stack weight 72 t
  - Cargo handling vehicles with max axle load 15 t and single pneumatic tyres.

**C-Deck cargo area:**
- Distributed load: 1.65 t/m²
  - Cargo handling vehicles with max axle load 15 t and single pneumatic tyres

**B-Deck aft deck**
- Distributed load: 5.0 t/m²

**A-Deck**
- Distributed load: 1.65 t/m²
- Container loads: 1 tiers 20 TEU max weight 24 t
  - Cargo handling vehicles with max axle load 15 t and single pneumatic tyres

**DECK EQUIPMENT**

**Main Crane**
- **Maker:** Norlift
- **Type:** GPCO 900 – 5020 straight boom
- **Design:** LRS, Ch. 3 Section 2

**Specification**

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Outreach</th>
<th>Seastate</th>
<th>Fall</th>
<th>Hook speed</th>
<th>Hook speed</th>
<th>Hook travel</th>
</tr>
</thead>
<tbody>
<tr>
<td>50t</td>
<td>20m</td>
<td>NA</td>
<td>Four</td>
<td>8 m/min</td>
<td>62 m</td>
<td></td>
</tr>
<tr>
<td>50t</td>
<td>10m</td>
<td>1</td>
<td>Four</td>
<td>8 m/min</td>
<td>62 m</td>
<td></td>
</tr>
<tr>
<td>50t</td>
<td>8.4m</td>
<td>2-3</td>
<td>Four</td>
<td>8 m/min</td>
<td>62 m</td>
<td></td>
</tr>
<tr>
<td>34t</td>
<td>8.4m</td>
<td>5-6</td>
<td>Four</td>
<td>8 m/min</td>
<td>62 m</td>
<td></td>
</tr>
<tr>
<td>25t</td>
<td>20m</td>
<td>-</td>
<td>Two</td>
<td>16 m/min</td>
<td>125 m</td>
<td></td>
</tr>
<tr>
<td>12.5t</td>
<td>21m</td>
<td>5-6</td>
<td>Single</td>
<td>32 m/min</td>
<td>250 m</td>
<td></td>
</tr>
<tr>
<td>Aux 5t</td>
<td>19m</td>
<td>NA</td>
<td>Single</td>
<td>60 m/min</td>
<td>40 m</td>
<td></td>
</tr>
</tbody>
</table>

**Work Crane**
- **Maker:** Norlift
- **Type:** GPFO 160 – 0510 folded jib crane
- **Design:** LRS, Ch. 3 Section 2

**Specification**

<table>
<thead>
<tr>
<th>Capacity</th>
<th>Outreach</th>
<th>Seastate</th>
<th>Hook speed</th>
<th>Hook speed</th>
<th>Hook travel</th>
</tr>
</thead>
<tbody>
<tr>
<td>5t</td>
<td>10m</td>
<td>6</td>
<td>90 m/m</td>
<td>37 m/min</td>
<td>35 m</td>
</tr>
</tbody>
</table>

**Helideck**
- **D-Value:** 19.5 m
  - Make take off and landing weight: Designed for Super Puma

** Provision crane**
- **Maker:** Norlift
- **Type:** GP
- **Specification:** 2 t / 7 m

**Aft deck crane**
- **Maker:** Norlift
- **Type:** Telescopic boom
- **Specification:** 10 t / 5 m
- **Winch capacity:** 2.75t
- **hook travel:** 15 m

**Hatches**
- **A-deck:** 14 x 6 m
- **B-deck:** 14 x 5.4 m (flush)
- **Helideck:** 7 x 6 m (flush)

**MANOEUVRING, NAVIGATION AND COMMUNICATION**

**Dynamic Position System:**

- Kongsberg K-Pos 21 + CJOY Remote Joystick
- Simrad LTW MK 8-155 Modified (500m)
- Seatex Seapath 200
- Seatex DPS 132
- STARFIX RTCM Correction Receiver
- MBX-4 IALA RTCM Correction Receiver
- MDL Fanbeam MK 4.2 Position Sensor
- HPR HiPAP 501
- HPR 410 Standard
- Interface to APos System
- Interface to DGPS NO.2
- 3 x Seatex MRU-5
- 3 x Anschütz Gyro
- Serial NMEA outputs Available
- Dief Wind Sensor Anemometer – 879
- 2 x Gill Sonic DP Wind Sensor
- Rudder, Thruster & Propulsion Control
- Propulsion Control
- Rudder Control
- Thruster Control
- ERN 99, 99, 96
### Navigation

**Integrated Bridge System – Kelvin Hughes IBS Paperless Bridge**

- Kelvin Hughes IBS
- Kelvin Hughes - X Band Manta Digital Radar
- Kelvin Hughes - S Band Sharpeye Radar
- Kelvin Hughes MDP-A2-ABAA ECDIS System (not certified)
- Bridge Watch Monitoring System
- 3 x Anschutz STD 20 Gyros
- Skipper GDS 101 Echo Sounder
- Kelvin Hughes MDP-A1 Slave radar
- Furuno Doppler Current indicator CI-600G
- Kelvin Hughes MDP-A2 Route Planning Station
- DGPS 1 - Furuno GPS90 GPS/ Seatex DPS 123
- DGPS 2 - Seatex Seapath 200
- Kelvin Hughes SEM 200 Autopilot
- Sperry Naviknot 350 E Speed Log
- Seatex HMS 100 Helicopter Motion and Weather
- Helicopter Transponding System
- Maneuvering Joystick System: Ulstein PosCon
- Navigation Information Network - ADB / LAN
- 1 X Becker Rudder Tenfjord Steering gear

**Scientific Bridge Equipment**

- Simrad EA 600 Hydrographic Echo Sounder
- AME 2006 Shipbourne Three Component Magnetometer
- Automatic Weather Reporting Station
- UK Meteorological Measuring Equipment

**Navigation Information Network**

- LAN: 4 access CISCO switch working at ISO/OSI level 2
- 1 CISCO switch level 3 + 1 Palo Alto Firewall
- WIFI: 6 access point - one for each bridge and in the dry lab.

### COMMUNICATION

**Communication and Radio Equipment including GMDSS for Area 4**

- Console N
- HF Radio 2
- Taiyo Auto RDF
- Watch Receiver
- Weather Fax
- Console Q1
- Sailor Inmarsat C - LRIT Compliant
- HF Radio 1
- Console Q2
- Console C
- VHF No. 1
- Console A
- Broadgate S-VDR
- Console G
- Kelvin Hughes UAIS
- Console R2
- VHF No. 2
- Console R3
- VHF No.3
- Helicopter Beacon
- Areonautical VHF
- Console M
- LP2 Domestic Supply
- EMP2 Emergency Switchboard Supply
- UPL1 Eaton 3KVA MKV
- UPL2 Eaton 3KVA MK
- Immarsat Fleet 77 Satellite Communications
- VSAT C-band Satellite Communications
- Iridium Certus Satellite Communications
- Immarsat FleetBB Satellite Communications (Optional)
### ACCOMODATION

High standard accommodation comprising facilities such as:
- Reception area, ships office, change room, recreation area, trim room, sauna, mess, TV/Crew dayroom, charterer's lounge, launderettes, laundry, client office
- Crew: 24 berths
- Available for charterers

- 2 single client rep. cabin = 2
- 4 cabins x 2 berths = 8
- 9 cabins x 3 berths = 27
- 6 cabins x 4 berths = 24
- Total 61 berths

All cabins with toilet and shower
- Hospital: 1 berth

### LIFESAVING AND RESCUE EQUIPMENT

Lifesaving and rescue equipment according to SOLAS

- Life boats: 2 x Harding MCB24CR - 40 persons
- Life boat davits: 2 x Vestdavit H-7000
- M.O.B. Boat: 1 x Norsafe Magnum 7.5
- M.O.B. Boat davit: 1 x Vest Davit P-3000, with shock damper.
- Life rafts: 8 x RFD (each 20 men).
- Survival suits: 80 off
- Lifejackets: 80 off
- EEBD's: 6 off
- Smoke Hoods: 38 off (2 per SPP Cabin)

### Fire Extinguishing:

<table>
<thead>
<tr>
<th>Location</th>
<th>Extinguisher Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accommodation</td>
<td>Flexifog Fixed Fire</td>
</tr>
<tr>
<td></td>
<td>Dampening System</td>
</tr>
<tr>
<td></td>
<td>CO2, Dry Powder and AFF Extinguishers</td>
</tr>
<tr>
<td>Galley, Paint store, and Sw Board</td>
<td>CO2</td>
</tr>
<tr>
<td>Cargo Holds</td>
<td>AFF Hi Ex Foam</td>
</tr>
<tr>
<td>Engine Room</td>
<td>AFF Hi Ex Foam</td>
</tr>
<tr>
<td>Helideck</td>
<td>AFF Low Ex Foam</td>
</tr>
</tbody>
</table>

Double berth cabin.

Fire extinguisher in the kitchen.
TV Lounge, B-Deck

Day room 2, B-Deck
Client office, 1st Bridge Deck

Party chief cabin, 1st Bridge Deck
Double berth cabin, A-Deck

Laundrette (on the left) and hospital (on the right), A-Deck
Bridge, 3rd Bridge Deck.

Control room, B-Deck.
Sediment trap recovering by means of the telescopic boom crane in the sheltered area, B-Deck.

CTD rosette deploying from the sheltered area, B-Deck.
Helicopter landing on the heli-deck, Terranova Bay (Ross Sea, Antarctica).

Telescopic boom crane and sheltered area.
The RV Laura Bassi from the stern. The main Crane is visible on the starboard side. The telescopic boom crane is also visible in the sheltered area.

Work crane, A-Deck.
Main crane (on the left) and main cargo hold from above (on the right).

Cargo operations in Terranova Bay (Ross Sea, Antarctica) to supply the PNRA Mario Zucchelli Station, February 2020.
Main Cargo Hold, C-Deck.

Lower cargo hold, Above Tank Top.
Table 2

Legend:
- Roll Reduction Tank
- Emergency / Hospital
- Cargo Areas
- Public and Service Areas
- Work Areas
- Accommodation

2nd Bridge Deck

3rd Bridge Deck

General Arrangements

RIVU LAURA BASSI
Table 8

<table>
<thead>
<tr>
<th>LEGEND</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roll Reduction Tank</td>
</tr>
<tr>
<td>Emergency Hospital</td>
</tr>
<tr>
<td>Cargo Areas</td>
</tr>
<tr>
<td>Public and Service Areas</td>
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<tr>
<td>Accommodation</td>
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Below: Tanktop

General Arrangements

Ribb Lautra Bassi