Using Victor 6000 on board
R/V Sarmiento de Gamboa

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ABSTRACT

The R/V Sarmiento de Gamboa was designed with the capacity to operate the deep-ocean ROV from Ifremer Victor 6000.

Design of several devices and gears, together with ship’s design requirements, were applied for load and operation of Victor 6000: as maximum deck load of 120 Tons for ROV equipment.

Adaptation of R/V Sarmiento de Gamboa deck for ROV installation and operation, as well as the design of stern “A” frame.

Specification of power lines and navigation aids (USBL, DP).

The shipyard (C.N.P. Freire) and other companies (Industrias Ferri) participated on these design and development.

The vessel was finished on July 2007. In January 2008, a test cruise at depth 2000 m, was carried on in french waters, close to Toulon Ifremer base.

Three test dives were done: fixed point survey, line survey and a recovery operation.

The cruise was a complete success and today R/V Sarmiento de Gamboa and its crew is prepared for using this ROV in scientific cruises.
Ship Characteristics

Main Particulars

Length O.a.: 70,50 m
Length p.p.: 62,0 m
Max Breadth: 15,50 m
Depth to main deck: 5,00 m
Design Draught: 4,60 m
Scantling Draught: 4,90 m
Dead weight: 850 tpm
Gross Tonnage: 2630 GT
Prop. power: 2400 kW
Endurance: 40 days
Accommodation (crew, research) 16,26
Fuel Oil 573 m3
Fresh Water 101 m3
Ballast 239 m3
Lub. Oil 10 m3
Call sign: E A K F  IMO Nº: 9.335.238
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Victor 6000

Concept with depressor
- No heave compensator on ship
- Main subsets
  - Vehicle + trolley + rails
  - Depressor + support
  - Five containers
  - Deep sea winch
    - Weight: 31t
    - Length: 4.5m
    - Width: 4.2 m
    - Height: 2.3 m
    - Direct driven winch equipped with 8500m of electro-optical cable

- Total package weight: ≠ 100t
- Power: ≠ 135 kVA, 320 kVA, 400V
**Victor 6000**

**ROV**
- Depth: **6000 m**
- Length: **3.1 m**
- Width: **2.2 m**
- Height: **2.7 m**
- Dry weight: **4.6 t**
- Propellers: **6**
- Cameras: **7**
- Manipulators: **2**
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Victor 6000

Five Containers

- Power Plant
- Hidraulic Plant
- Control
- Mecanic Workshop
- Hold
Ship equipment

- Electrical and Control Connectivity
- Water and Air services for containers and winches
- Tent
- “Tie down” for rails and accessories installation
- Acoustic positioning
- Dynamic Positioning
Adapting the vessel

“A” Frame
Lift Line winch
Deep cable puley
Adapting the vessel

“A” Frame (*Industrias Ferri*)

- $Q_R$: 5 000 daN (sea state 5)
- Velocity: 45 m/min
- $Q_C$ (all out): 12 000 daN (s.s. 1)
- $Q_L$ (depressor): 15 000 daN (s.s. 5)
- $Q_V$: 2 000 daN
- Basc. Angle: 120º
- Basc. Time: 50 s
- Weight: 12 000 Kg
Adapting the vessel
Using Victor 6000 on board R/V Sarmiento de Gamboa

Adapting the stern “A” frame

On A frame:
- Lift line winch
- Deep sea pulley
- Docking head on tilting beam
Adapting the stern “A” frame

On A frame:
- Lift line winch
- Deep sea pulley
- Docking head on tilting beam
Adapting the stern “A” frame

On A frame:
- Lift line winch
- Deep sea pulley
- Docking head on tilting beam
Adapting the vessel deck

On deck

- Guide lines winch
- Fairlead
Adapting the vessel deck

On deck
- Depressor bed adaptor
- Tether winch
Adapting the vessel deck

On deck
- Deep sea cable winch
Adapting the vessel deck

On deck
■ Trolley and rails
Adapting the vessel deck

On deck
- Five containers
Adapting the vessel deck

On deck
- Five containers
Adapting the vessel deck

On deck

- Five containers

  i. Electrical plant container (R08)
  380 v | 5% 50 Hz | 1%
  45 kVA
  3 phases

  ii. Electrical powering for hydraulic container (R05)
  400 v 50 Hz
  2 x 160 kW
  3 phases
Adapting the vessel deck

On deck
■ Five containers
USBL and Navigation

- Posidonia (Ixsea) installed on Drop Keel
  - Transponders on Vehicle and Depressor
  - Tracking with EIVA + Hypack
  - Sending Telegram (Ifremer) to Control Room

- POS-MV attitude and DGPS

- Dynamic Pos. (DP I)
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Navigation Control

- Data Output (Telegram) from Posidonia to Control Container

Data Output/User Defined Output
On UDP Port: 10100 255.255.255.255

$PIFM,GBGEN,ddmmyy,hh:mm:sss,LAT (DDD°MMM.MMMMMM N/S),LON (DDD°MMM.MMMMMM E/W),Gyro (%2lf),SMG (%2lf),CMG (%2lf),Depth (%2lf),<CR><LF>
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Test Cruise

January 8th, 2008, Toulon