Underway IFREMER projects

RV *Thalassa* refit, Seismic renewal and Polar Pod project

INMARTECH 2018

Mid life R/V Thalassa refit

RV Thalassa

- Built in 1996
- Length : 73,6m
- Width : 14,9m
- Disp. : 3022t

Modernization

- Project cost : 17 M€ - Britany region, ANR and FEDER
- Shipyard : PIRIOU NAVAL SERVICE – Concarneau, France
- Dry dock : June 3th – Sept 18th 2017
- Trials : until Oct 2th 2017

Discussions with shipyards (Autumn 2016) → *Choice of the Shipyard (December 2016)* → Studies (Jan-June 2017) → Works (June-Sept 2017) → Sea Trials (Sept 2017 and 2018)

Objectives

The R/V Thalassa is an oceanographic ship mainly dedicated to the missions of public service in the field of **fish stock assessment** and physical oceanography.

The aim of this modernization is to enlarge the capacity of the vessel in the fields of **marine geosciences** and deep sea environment.

The objectives of the modernization are:

- to ensure the remedial and curative maintenance at mid-life of the vessel,
- to modify vessel accommodation,
- to replace all obsolete scientific equipment by up-to-date ones,
- to provide a reliable and efficient platform appropriate to the coming 20 years of marine science.

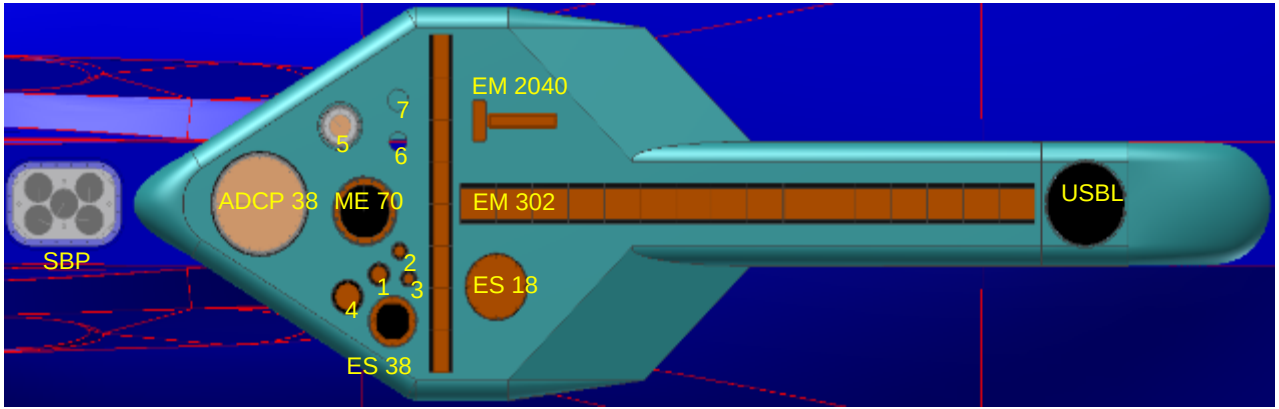
Scientific equipment up-grade

Fisheries:

- EK60 ➔ EK80 (18, 38, 70, 120, 200, 333 kHz)
- 120kHz horizontal ranging
- new ME70 transducer (12 years old)
- Trawl monitoring system (Marport): no changes (positioning, openings…)
- ADCP: no change
- Hydrophone reference monitoring system (sabrina): upgraded

Addings:

- MBES: EM304 0,5°x1°+ EM2040 0,4°*0,7°
- Sub-bottom profiler
- USBL for ROV/AUV + Acoustic release system (IXBLUE)
- DVL (many systems currently in testing)



1 : ES 120 2 : ES 200 3 : ES 333 4 : ES 70 5 : ADCP 150 6 and 7 : ship sounders

The new fairing

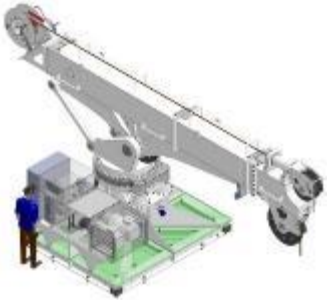
No gondola => same draft kept

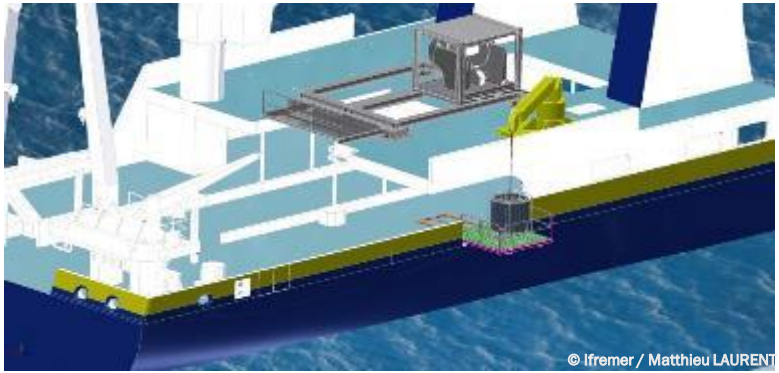
A fairing under the keel

Two new cranes

New oceanographic HEILA knuckle crane
180t.m – 2 winches (4t & 13t) – 20m at full extension

SWL offshore conditions
Dynamic 5t@8,5m
Static 10t@4,5m
Aux. winch 1t@8,5m

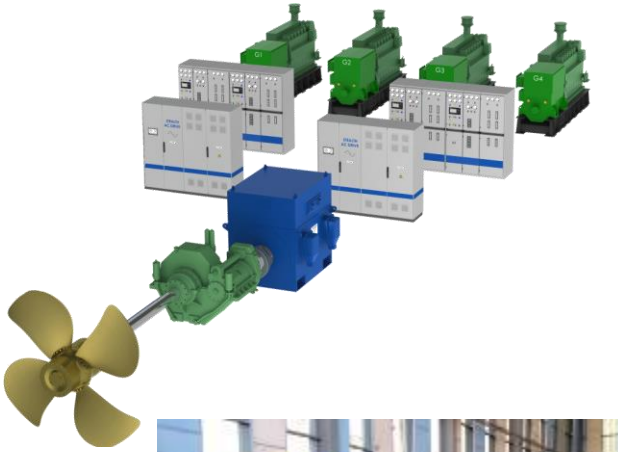




Custom design crane (KLEY FRANCE) for new CTD L/R and coring operations - Starboard shell plating opening and reinforcement

Large maintenance

- New gensets – Caterpilard 2 * 1500KVA & 2 * 1000KVA
- New main propulsion converters (Thyristors to IGBT),
- New Power Management System (PMS)

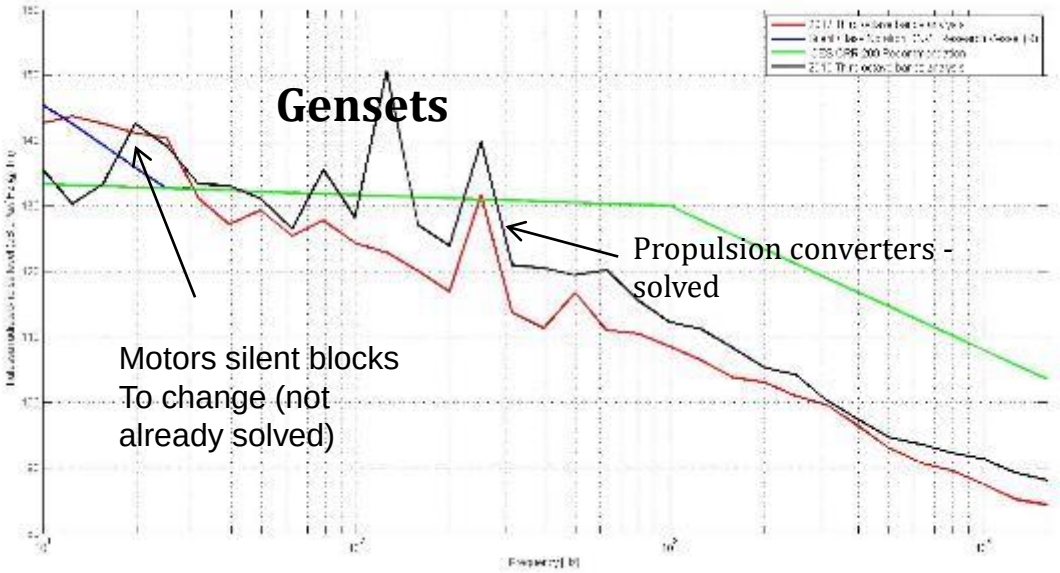


- Sheep steel central trawl track replace by a new one (10mm has reduced to 7mm)

Scientific equipment trials

Comparison before and after modernisation – ICES standard

Noise measurement



September 2017

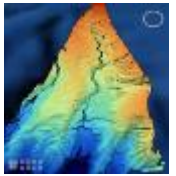
- ME 70
- EK80
- SBP
- Ferry box

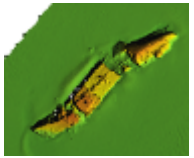
September 2018

- MBES EM 304
- MBES EM 2040

During 2019

- New Genset damping
- Coring gears





Seismic equipment renewal

Complete renewal of the seismic equipment :

- Increase of the capabilities of the old Ifremer seismic devices.
- Necessity to switch to solid streamer technology (SERCEL Sentinel RD + SEAL428).

Replacement of streamers, acquisition labs, navigation, new sources handling system

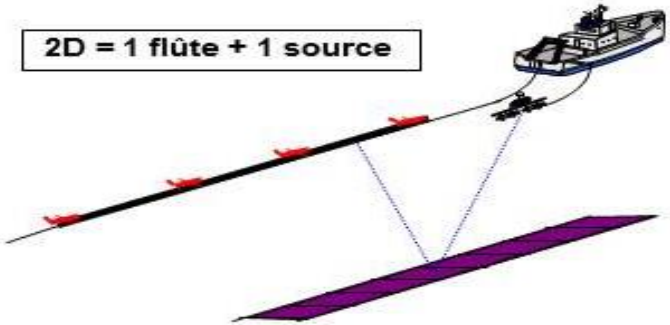
Start 2014 → 2015 → 2016 → 2017 → 2018 → End 2019

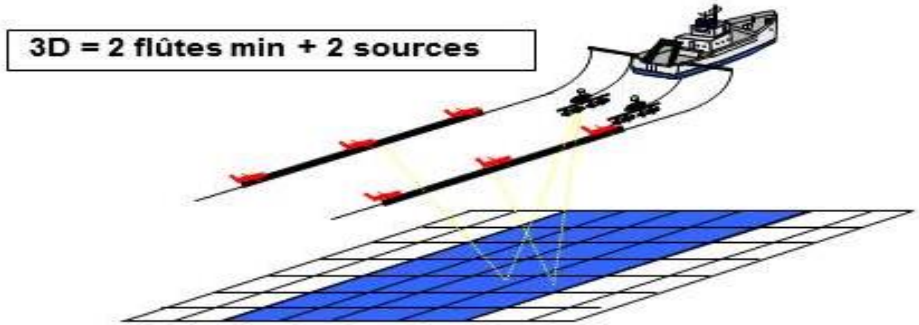
Seismic equipment renewal

SIS 1: 2D seismic device
1 x 6000m long seismic streamer.
Upgrade of the source handling system (improvement of the acoustic signal).
170 t, 14 containers, 1200 m3/h compressors, 10 technicians

SIS 2 : 2D or 3D seismic device (2 acquisition systems available).
2 x 600m long seismic streamers (distance between streamers: 25m).
Many available configurations (2D or 3D, streamer length from 150 to 1200m).
SIS 2 : 60 t, 7 * 10’ + 1 * 20’ containers, 300 m3/h compressors, 6 technicians

SIS 1 & SIS fully compatible (streamer section’s length 150m, distance between traces 6.25m, navigation system ECOS, streamer depth controller (ION), compressors.



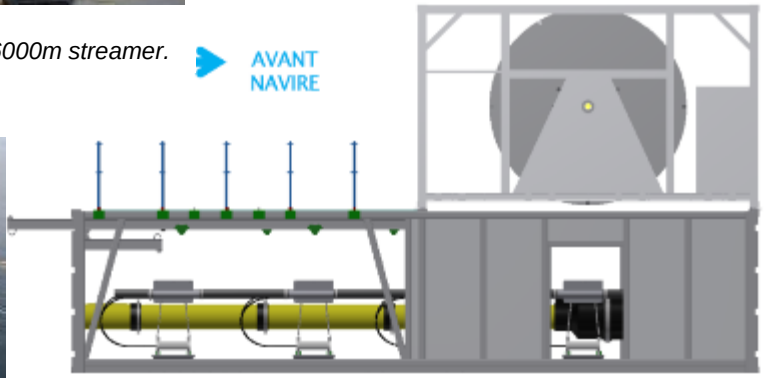


Seismic equipment renewal

Two new winches with the 6000m streamer.

Source handling equipment

- KAPPA system (flexible floats) integrated in 2 * 40’ containers
- 2 sub-arrays of 10 air guns max
- Guns depth adjustable 5, 10, 15m

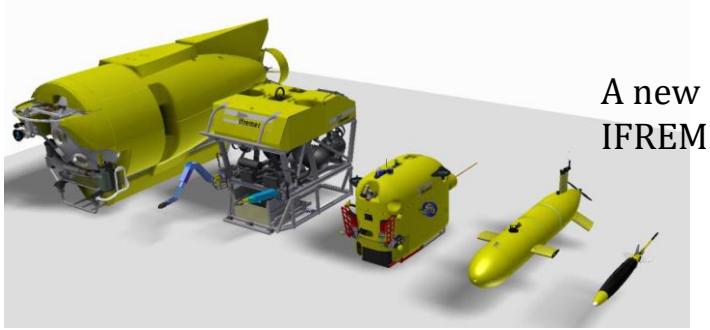


RV Pourquoi pas? in Brest (sea trials August 2018).

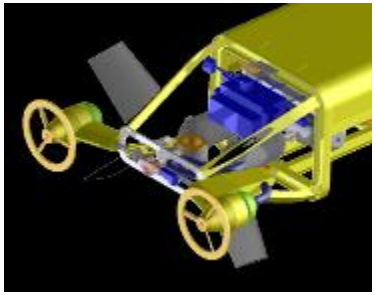
Source sub-array on-board recovery.

CORAL DEEP AUV

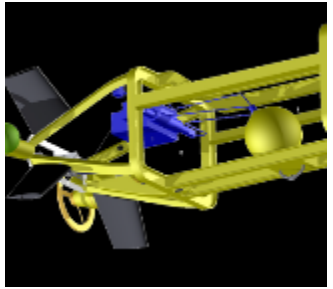
- Dimensions: 4.5m (L) 1.2m (l) 0.8m (h)
- Mass : 3 T
- Depth : 6000m
- Autonomy : 24 to 44h
- Energy : batteries 28 kWh Lithium



A new deep AUV inside the IFREMER UW vehicle panoply



Orientable propellors



Reversible ballast system

Scientific sensors payload

Permanent payload

Image acquisition payload:
16M pixel high quality image sensor
for 2D optical mapping, 3D reconstruction.

MBES Kongsberg Maritime EM2040

CTD Seabird SBE 49

Multi-parameter sensor suite:
Up to 6 small scale sensors including:
Magnetometer, Nephelometer, Eh; optional interfaces.

Modular payload: user configurable

Low frequency SBP IxBlue Echoes 5000

Sidescan sonar with optional SBP Edgetech 2205

RAMAN spectrometer
Detection, identification and in situ analysis of minerals or gas hydrates

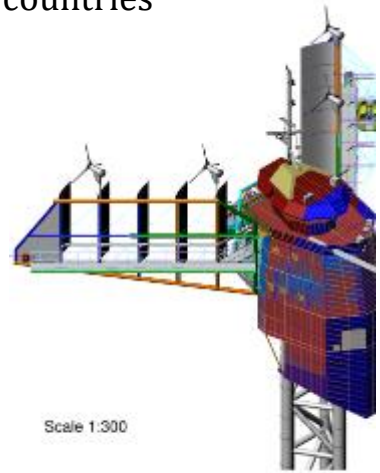
Sampling
in situ water sampling with separated circuits, 30 samples

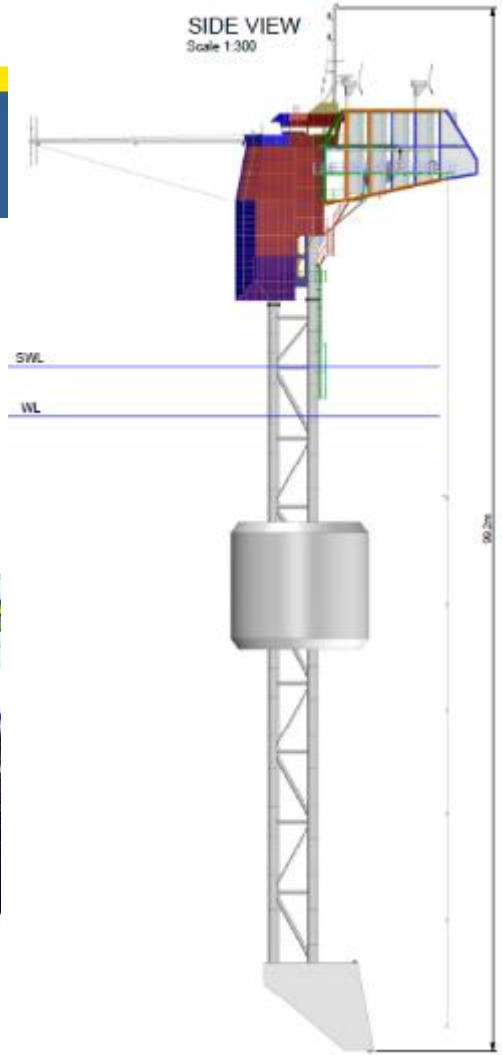
300 kHz ADCP: Teledyne RDI Pioneer

High accuracy positioning Beacon IxBlue RAMSES

POLAR POD

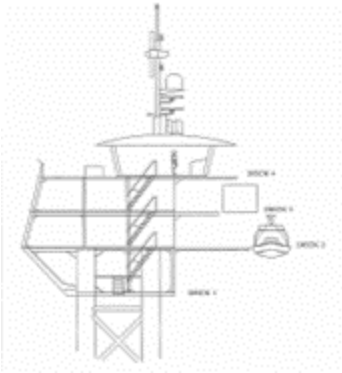
- Concept : « Vertical scientific ship based on US FLIP (Floating Instrument Platform)
- Expedition : 2 years circum-navigation around Southern Ocean
- > 100 researchers involved from 40 institutions and 10 countries





POLAR POD

- 22m * 40m length/width
- 80m draft
- 30m air draft
- 1000 t
- 7 persons
- <1,5 knts drift speed
- 6 wind turbines (2,5 kW)
- Emergency DA
- Emergency propeller

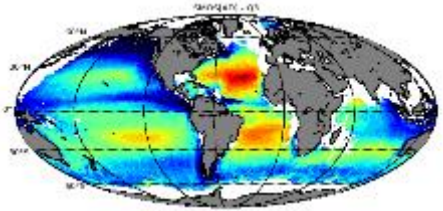


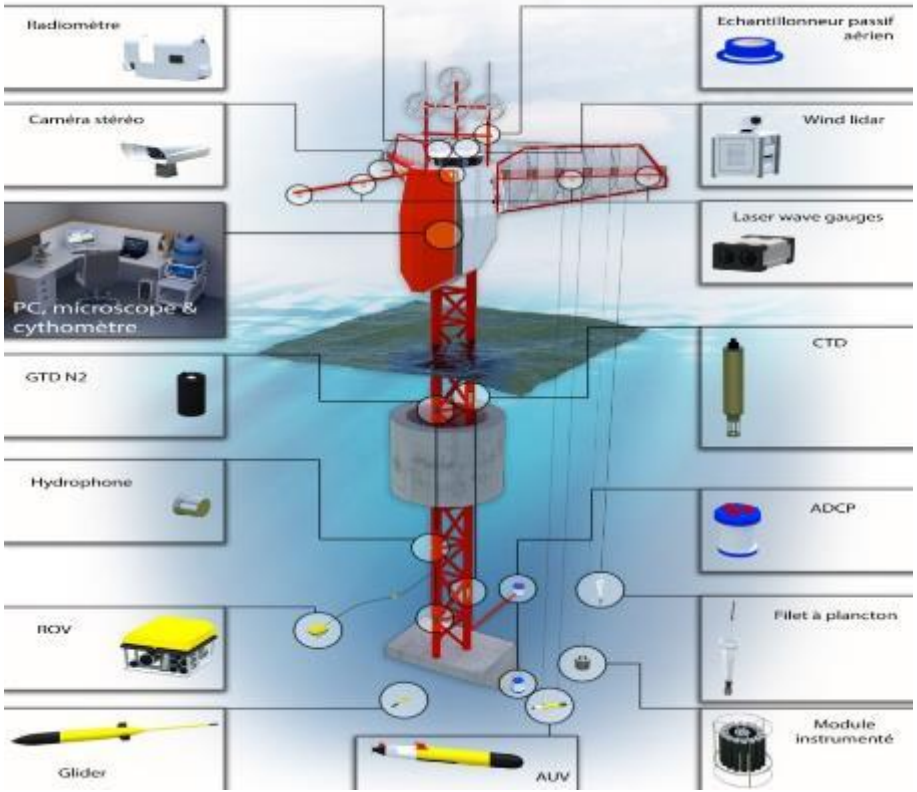
Towed horizontally to the gyre

POLAR POD Scientific equipment

A large panoply of scientific equipment

- SBES
- Hydrophones
- ADCP
- CTD, CO2, N2, O2,..
- Lidars
- Samplers for contaminants
- Radiometers
- ROV
- …

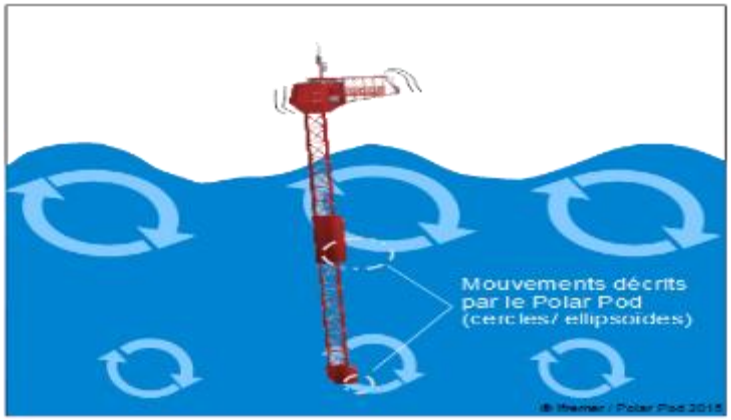


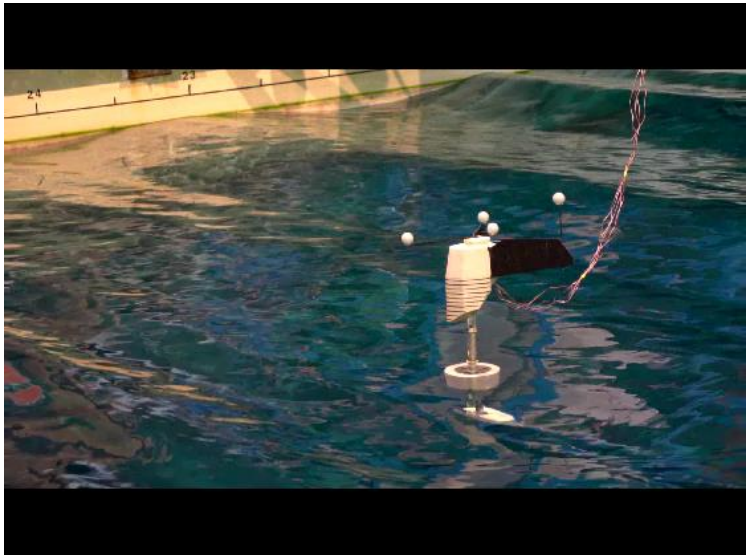


POLAR POD concept

Design

- ✓ 20.6m H1/3, 76 knts wind speed
- ✓ Complete waves absorbtion for Hs<3m
- ✓ Heave absorption of 80% in heavy seas
- ✓ Surge of +-4m in Hs 5m





Ifremer

The End

Thanks…