

# FIRST EXPERIENCE OF L'ASTROLABE



2018-03



## Polar Logistic Vessel

Arctic Passion Seminar  
Helsinki, March 15, 2018  
Jean-Luc PRIME



# AN INTERNATIONAL GROUP



# VESSELS

Over 420 vessels built for 26 countries



FISHING



SERVICES



EXPEDITION



DEFENCE

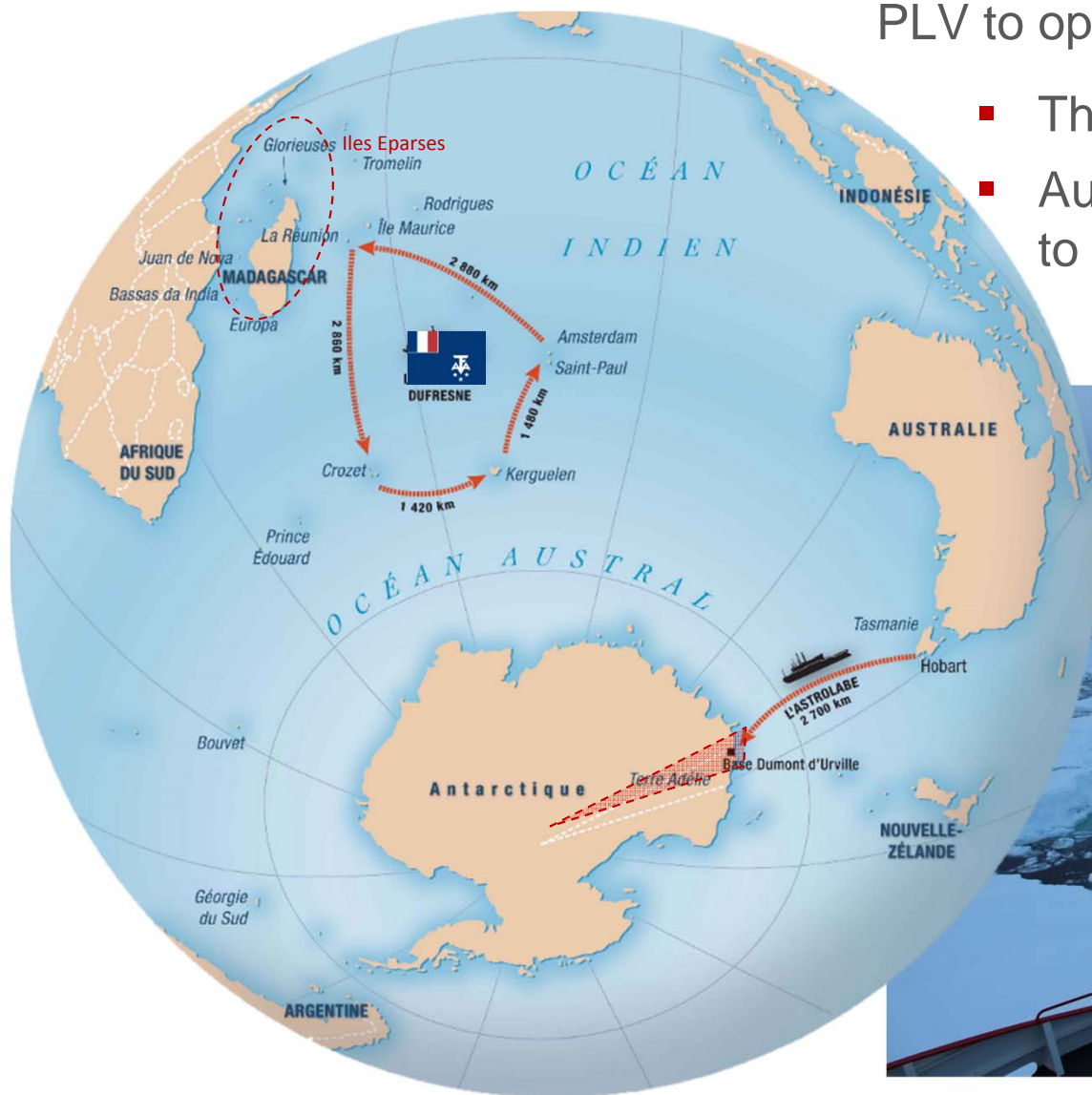


SPECIAL

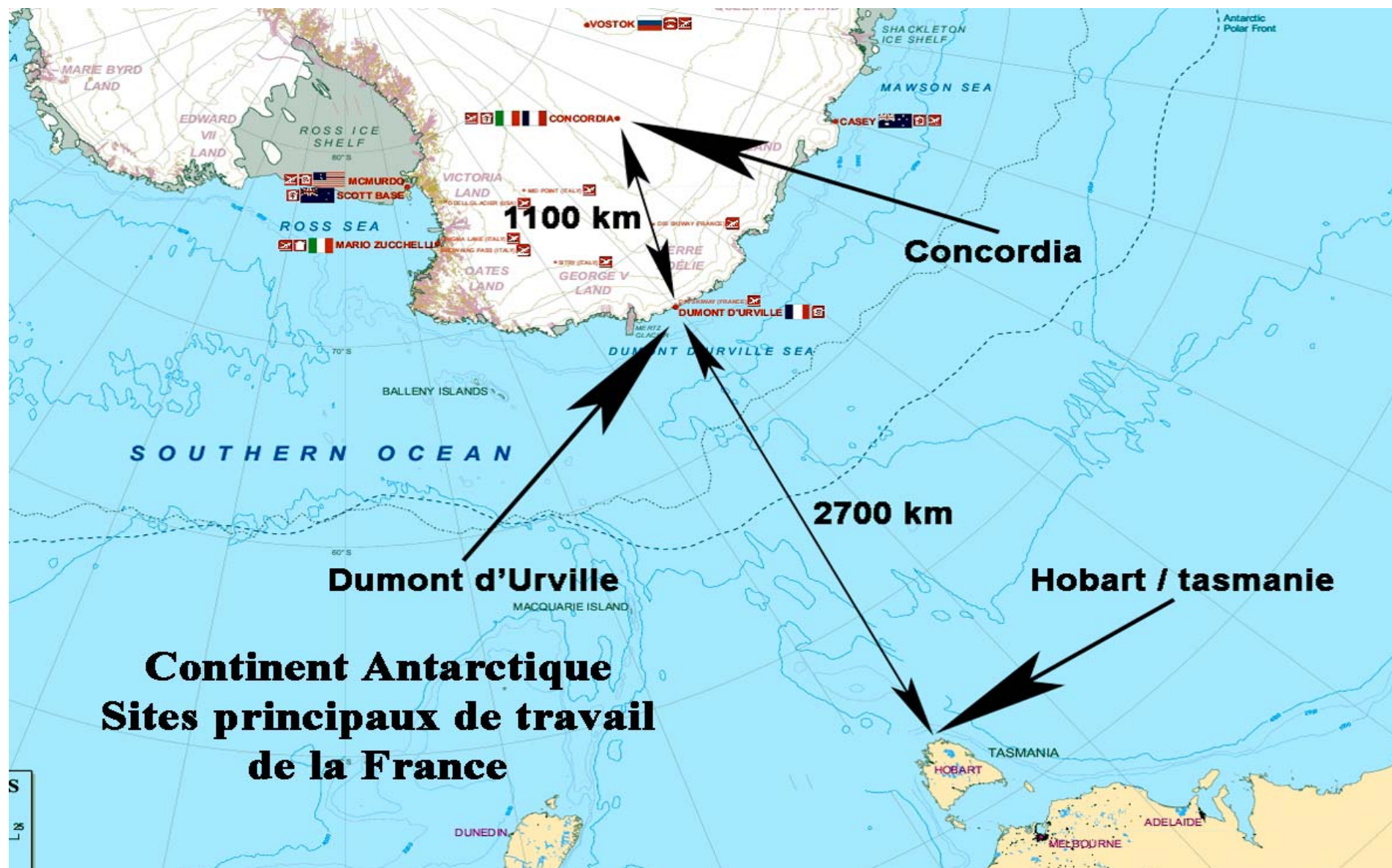


PLV to operate in:

- The Indian Ocean, subantarctic areas
- Austral ocean: from Tasmania (Hobart) to Terre Adelie

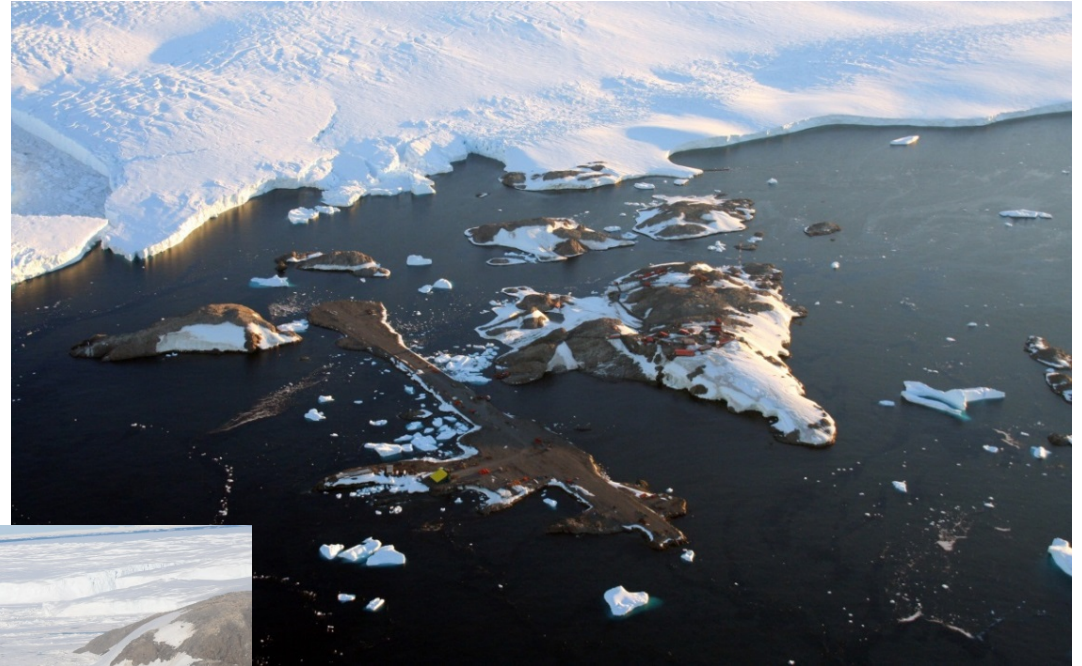








# DUMONT D'URVILLE BASE





# L'ASTROLABE

## Two different missions



- **Supply and logistic missions** to the Dumont d'Urville Antarctic Adelie land scientific base during the austral summer:
  - 5 months including mobilisation / demobilisation
  - 4/5 return trips from end of October to early March from Hobart
  - Transit time depending on sea ice coverage
- **EEZ (Exclusive Economic Zone) Patrol missions** (assistance and surveillance):
  - 7 other months from La Réunion, operations in the southern Indian Ocean



# L'ASTROLABE

## The PLV history



L'Astrolabe



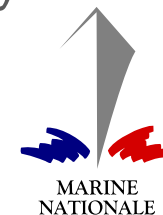
L'Albatros

The new 'L'Astrolabe' will replace two vessels:

- **L'Astrolabe** (1984), supply vessel for the Antarctic French Adelie land Dumont d'Urville base, chartered by TAAF and IPEV

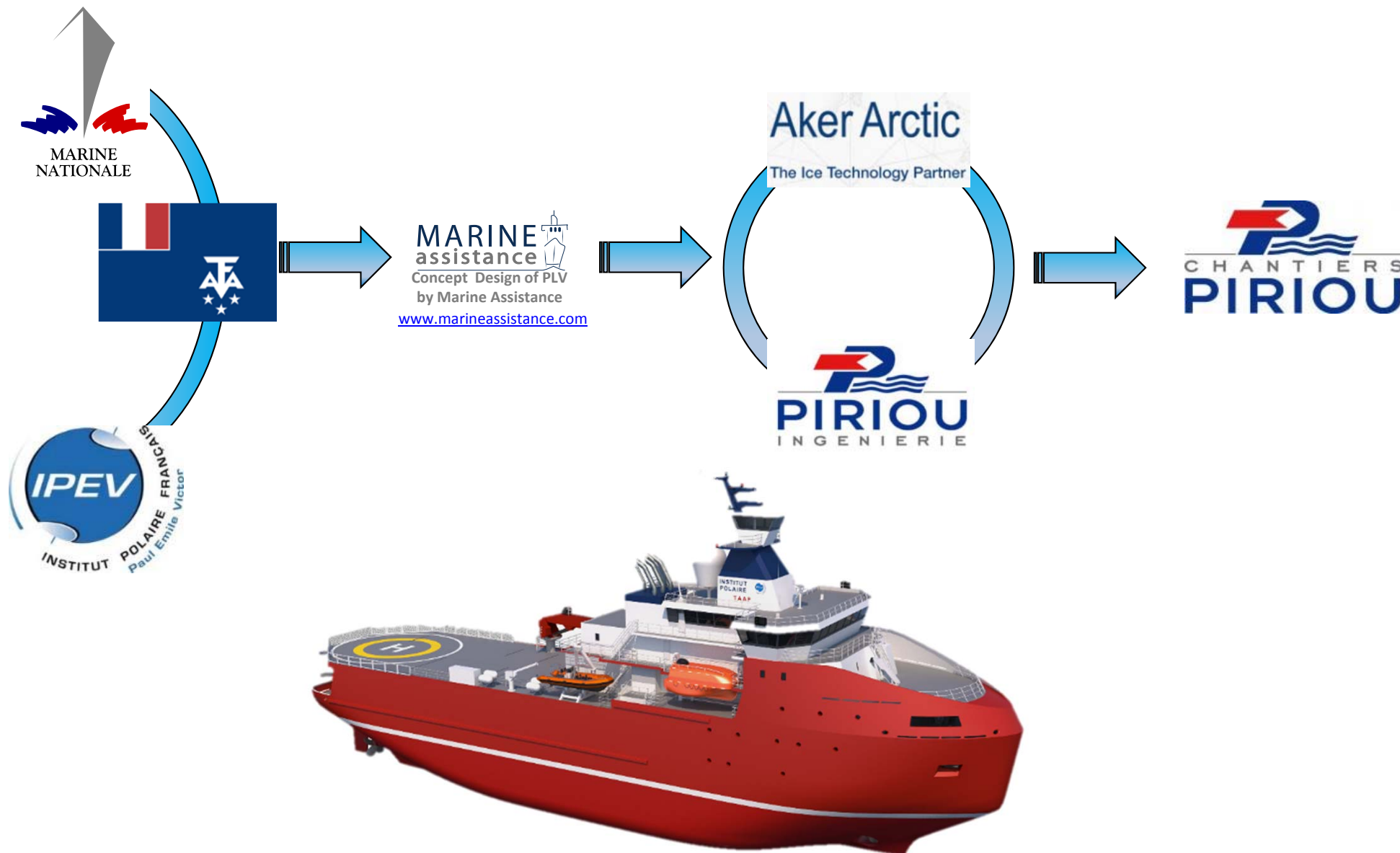


- **L'Albatros** (1967-2015), austral patrol vessel sustaining national sovereignty in the TAAF area, owned and operated by the French Navy

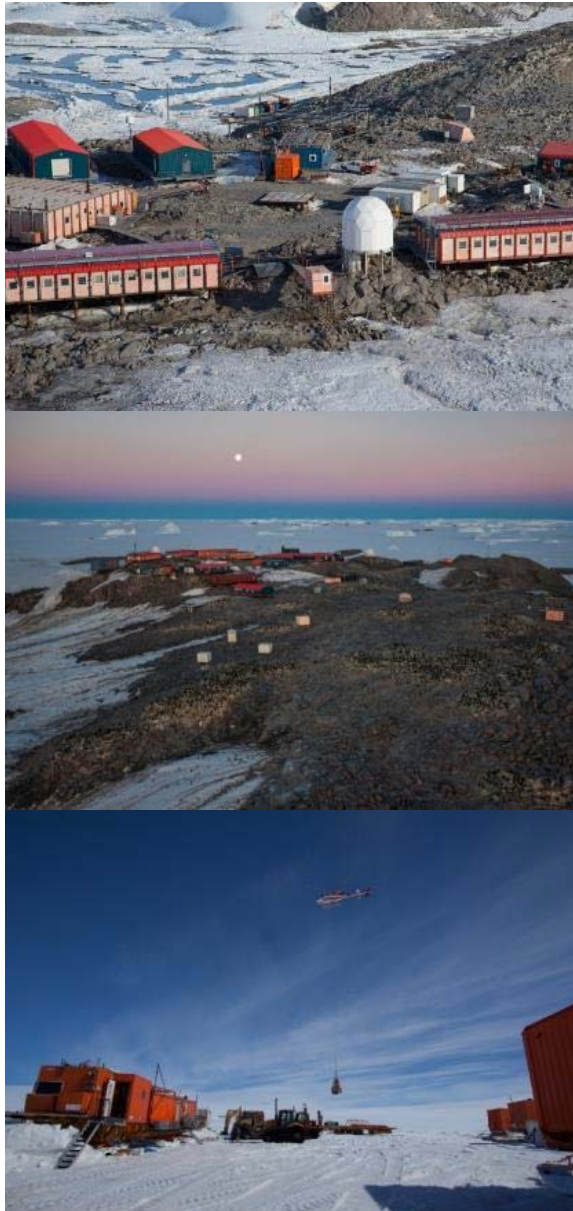


# L'ASTROLABE

## The Polar Logistic Vessel birth







### Typical austral summer mission :



- Duration : 5 to 6 days from Hobart to the pack, then from half a day up to 15 days in the ice to reach Dumont d'Urville base - 1500 NM (2700km). Potentially, navigation in ice area in continuous mode - Autonomy = 35 days



- Transportation of personnel (40 SPS)



- Transportation of MGO: Max. total freight = 900m<sup>3</sup> (550 m<sup>3</sup> delivered this year)



- Transportation of material in TEU container (or in 'big bags, pallets...): storage in the hold and on the deck (dangerous goods to be stored outside)



- Carrying of 2 helicopters (Ecureuil-type)



- Vessel being self-sufficient for loading and unloading

# L'ASTROLABE

## Main Characteristics

LENGTH OVERALL	72.00 m
BREATH MOULDED	16.00 m
DRAUGHT	5.20 m
MAX. SPEED	14.5 knots
CREW	20 p.
SPECIAL PERSONNEL	40 p.



### MDO CONSUMPTION

1.300 L/h @ 14 knots

710 L/h @ 12 knots



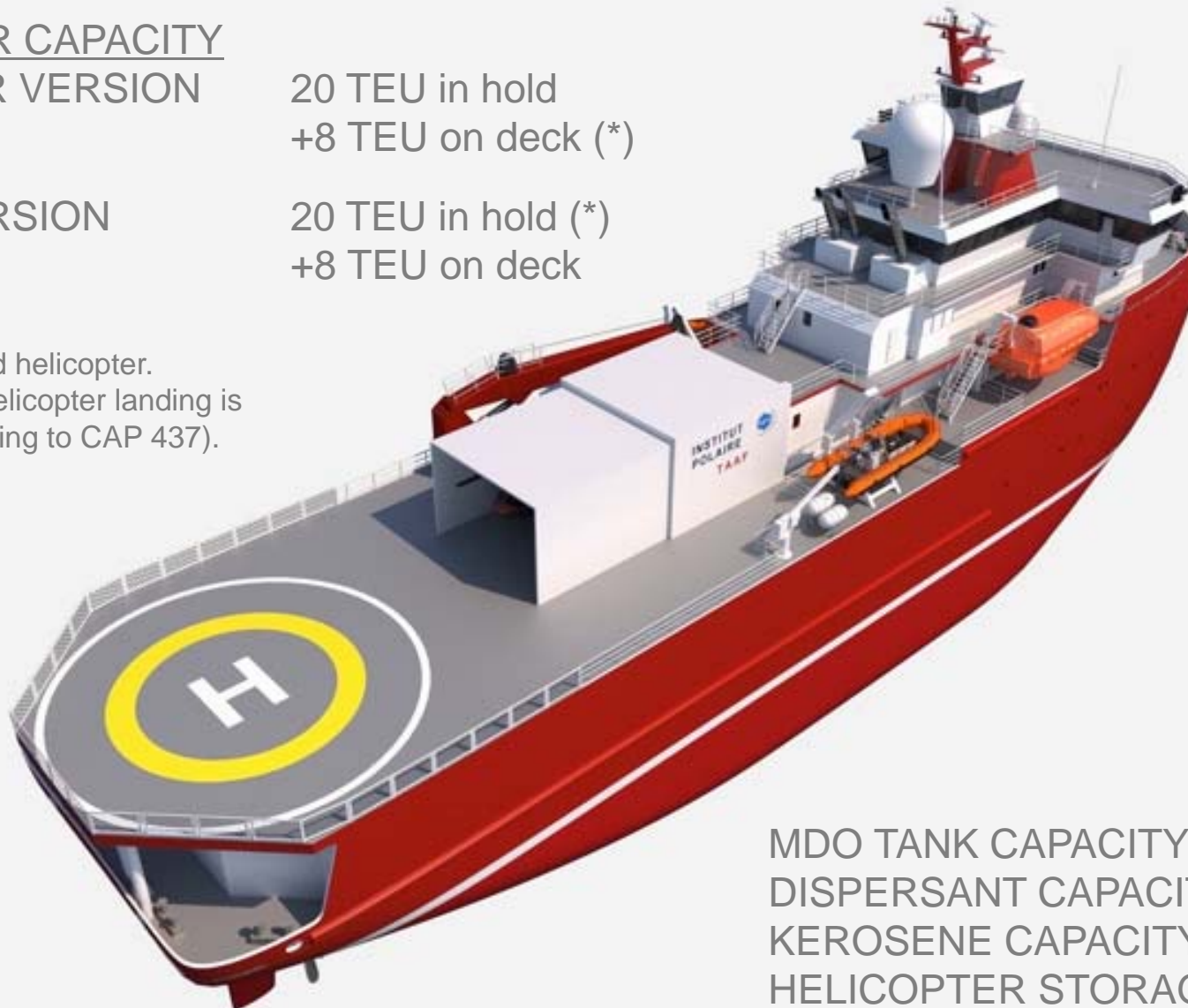
### CONTAINER CAPACITY HANGAR VERSION

20 TEU in hold  
+8 TEU on deck (\*)

### LIFT VERSION

20 TEU in hold (\*)  
+8 TEU on deck

(\*) without stored helicopter.  
In both cases, helicopter landing is possible (according to CAP 437).



MDO TANK CAPACITY	1.400 m <sup>3</sup>
DISPERSANT CAPACITY	16.00 m <sup>3</sup>
KEROSENE CAPACITY	16.00 m <sup>3</sup>
HELICOPTER STORAGE	2
(Ecureuil-type)	



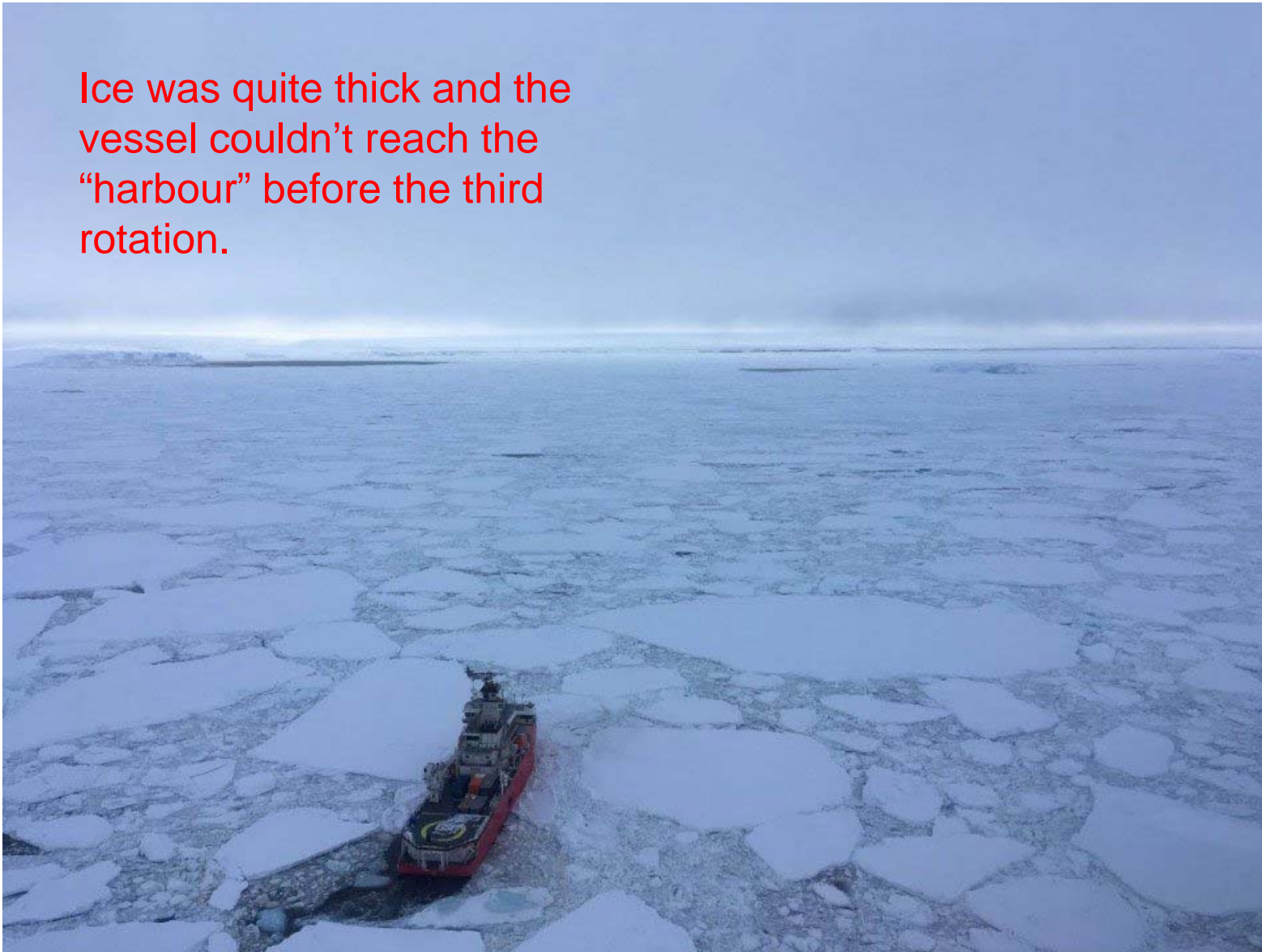
The vessel started first operations with 5 return trips to sustain Dumont D'Urville base in Antarctica.

The weather during the transit from and to Hobart was not too bad this year, without severe gales.





Ice was quite thick and the vessel couldn't reach the "harbour" before the third rotation.



- ✓ Sea conditions encountered during the voyages were :
  - ✓ Minimum swell of 4 m
  - ✓ Average of 5 to 6 m
  - ✓ Occasionally 8 to 9 m, with still a good seakeeping.
- ✓ Beam sea in general with not so long waves and cross swell.
- ✓ Max wind about 50 knots.

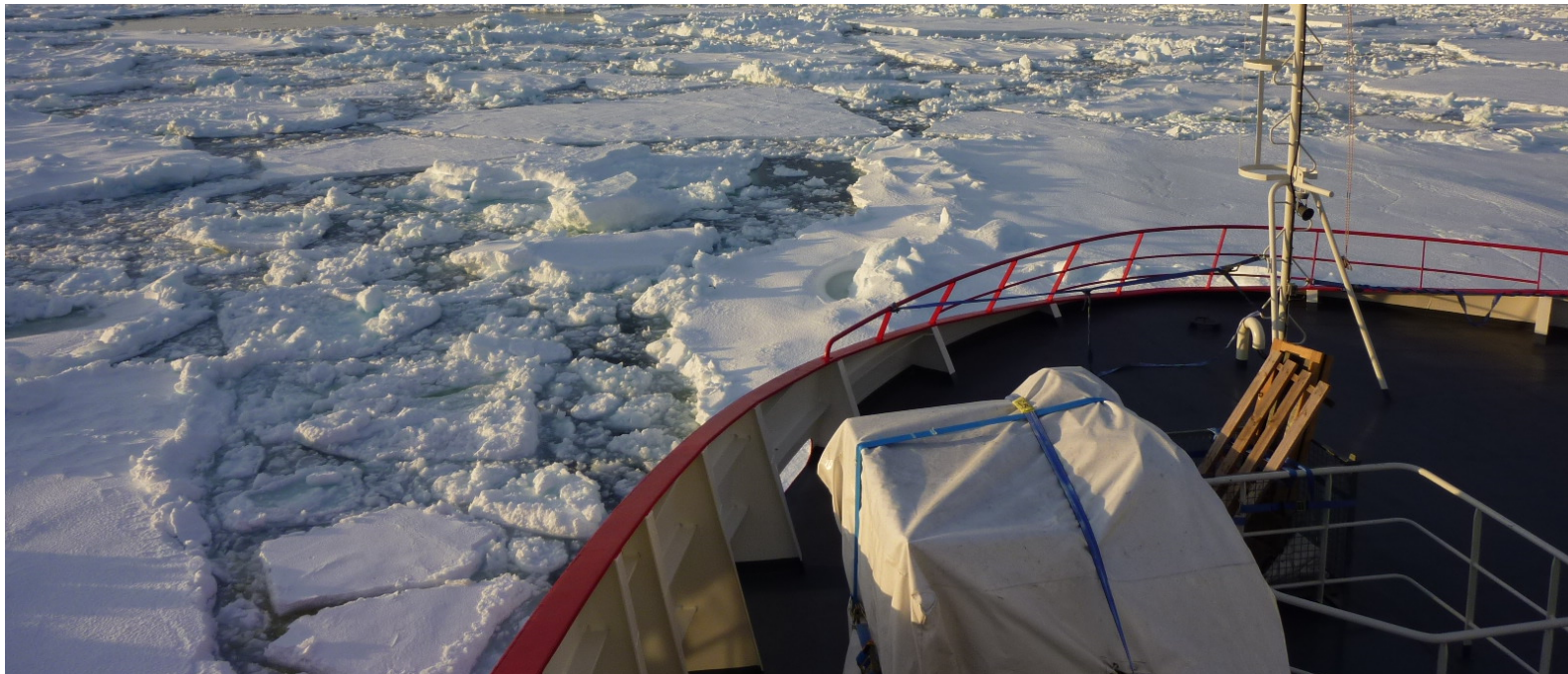


- ✓ Vessel seakeeping is satisfactory according crew comments.
- ✓ Roll is ample but smooth and slow. The use of stabilizer tank can be improved with more experience and filling adjustments. With beam swell, roll reached  $\pm 30^\circ$  .
- ✓ The pitch is normal for this kind of vessel, with a relatively short length for such voyages, and ice breaker bow shape.
- ✓ Passengers gave us also a good feed back, regarding comfort on board, despite the position of cabins in the fore part of the vessel and upper decks, due to cargo capacities of the vessel.
- ✓ Further than measurements values which were above the target CONF3 – NOISE 3, feelings from passengers and crew were good on this matter .

# L'ASTROLABE

## Ice performances / Requirements

- ✓ In polar areas, to be able to pass in continuous mode through a first year pack with thickness abt. 0.6 to 0.8 m with passages in ridges or 2nd-year ice (or more) inclusions in ramming mode.
- ✓ The ship will also need to pass through a coastal floe ice of 10/10 concentration up to at least 1 m thickness.
- ✓ The vessel will be compliant with class notation : ICEBREAKER 5.







Ice breaking capacity is conform to expectations and requirement.





# L'ASTROLABE

## Ice performances / Results



Generally the vessel was running on four engines  
According the Ice Pilot, 2 engines should be sufficient in loose pack.





# L'ASTROLABE

## Ice performances / Results



Through thick pack, the use of four engines without the shaft generators is preferable, but engines loads varies a lot.





# L'ASTROLABE

## Ice performance results

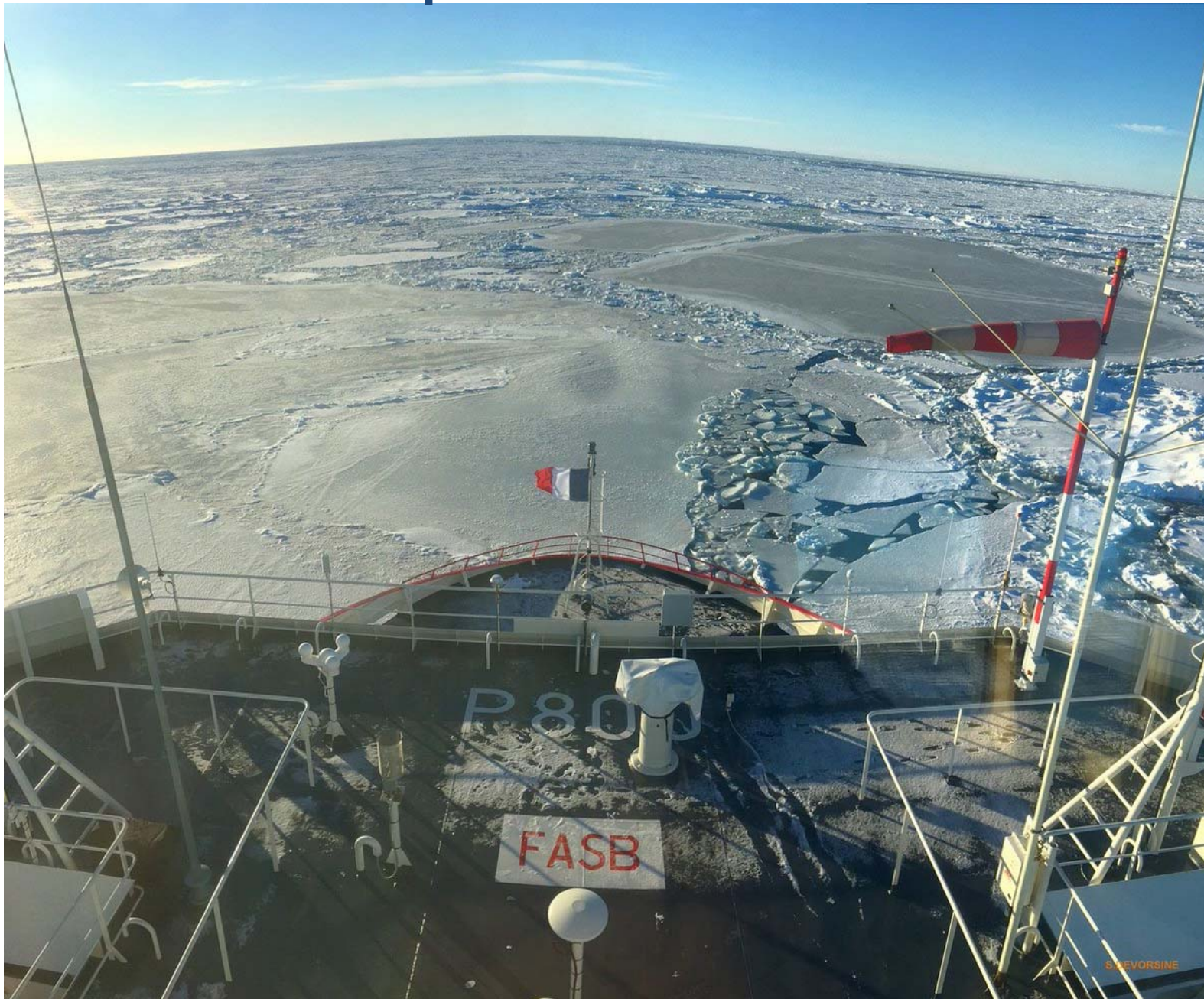
Alongside the hard floe.





# L'ASTROLABE

## Ice performances / Results





Loading deck and cargo hold are convenient, capacities match with requirements.

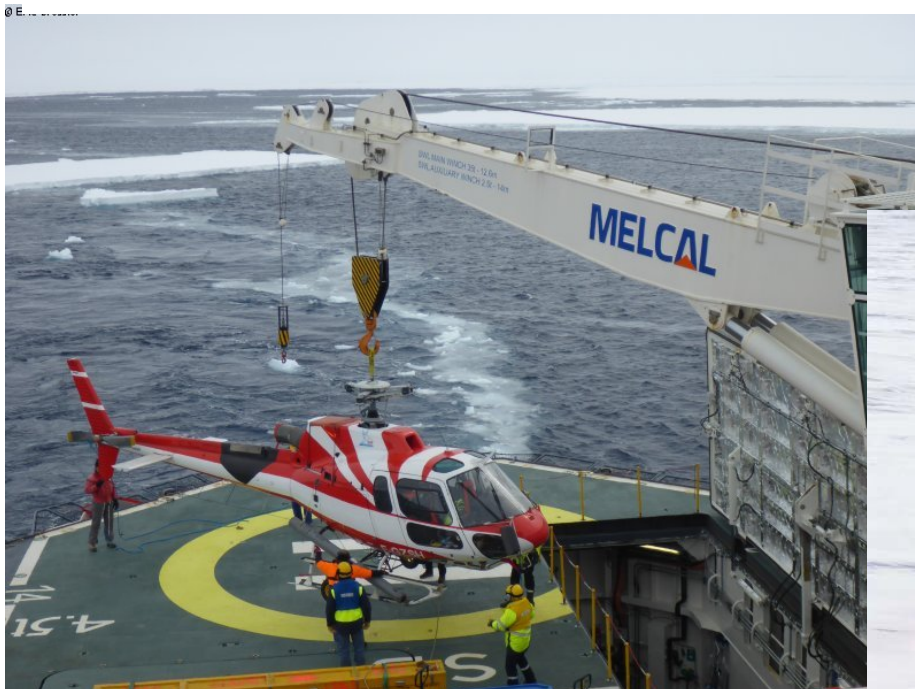








Expected flexibility to arrange the cargo onboard, and to manage the sequenced unloading is achieved.

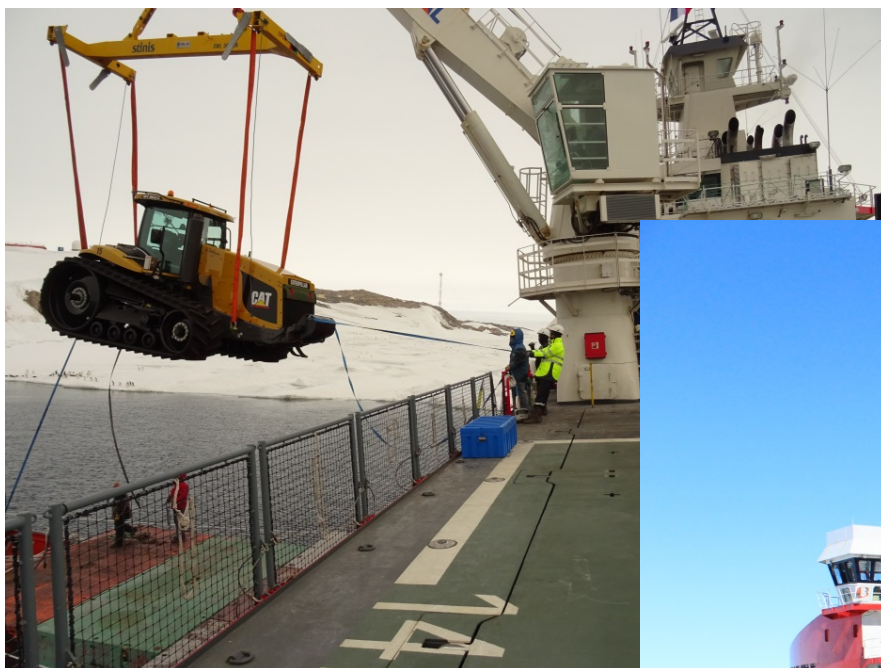






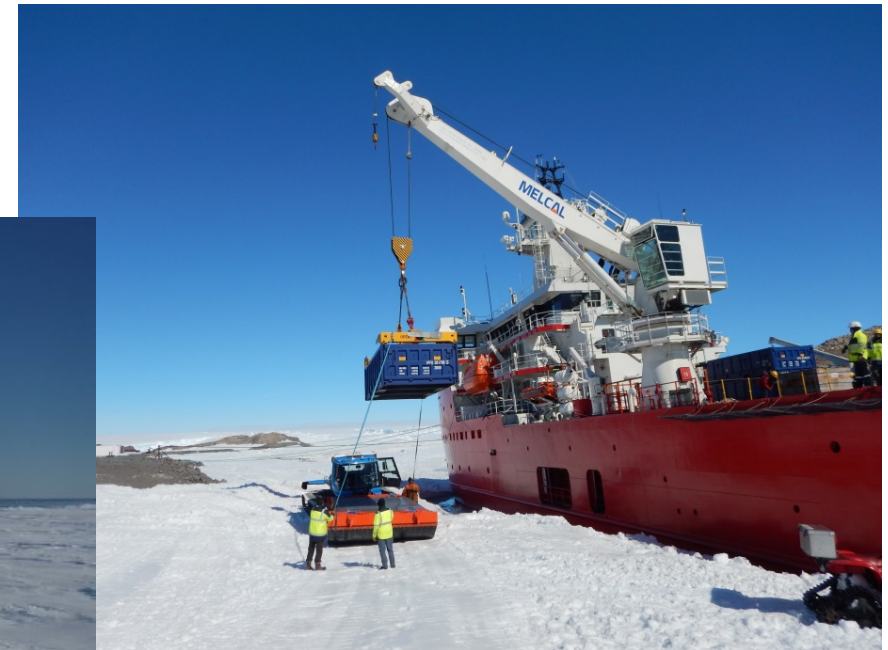


Unloading operation of containers and materials were efficient, both at “quay”...





alongside the ice floe...



and by helicopter...





FO unloading with vessel cargo pump was efficient at the quay, and along side the floe, with floppy tanks.

