

## RV Belgica: damage, repairs and refit



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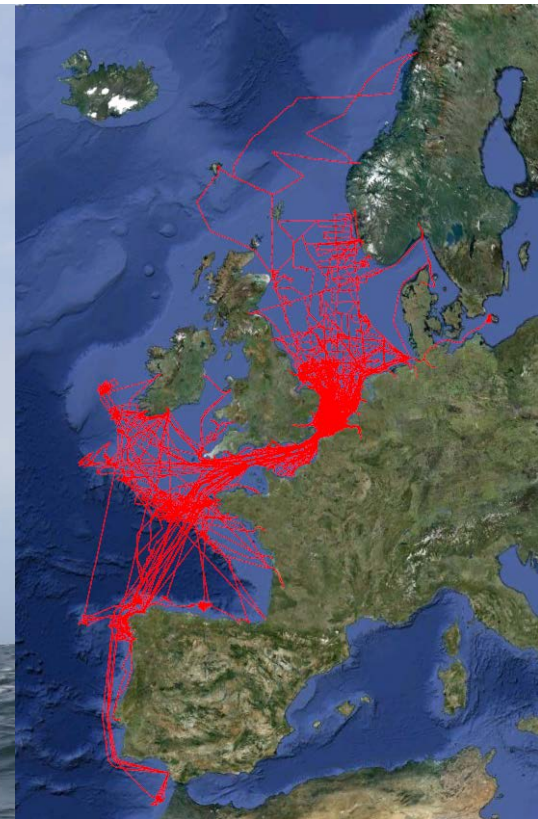


# Overview

1. Introduction
2. Obsolescence & refit
3. Flooding & damage
4. Replacement
5. Outlook



## Introduction

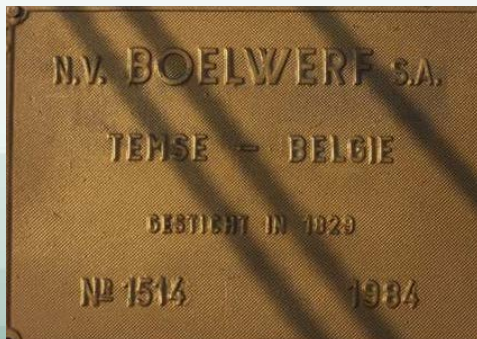




# Introduction

## Characteristics

Built:	1984 in Temse (B) – 31 years
Prize:	440 M BEF (11 M€)
Length:	51 m
Beam:	10 m
Draft:	4.6 m
Gross Tonnage:	765 t
Berths Crew + Scientists:	15 + 16
Operating cost:	2.8 M€/y incl. VAT



# Introduction

## Management

**Owned by the Belgian Federal State**  
**Responsibility of Belgian Science Policy**

**Convention Belgica**  
**Ministry of Science Policy – Ministry of Defence**

- **BELSPO – RBINS – OD Nature**
  - control of total budget (crew, maintenance, fuel etc.)
  - yearly scientific programming
  - detailed weekly campaign programming
  - scientific instrumentation
  - POC between scientists & crew
- **Defence – Marine component**
  - logistical and operational aspects
  - crew
  - maintenance contract
  - home port: Zeebrugge





# Introduction

## Activities

- **More than 31 years the Belgian research vessel**
  - Multidisciplinary vessel!

### Monitoring for (inter)national obligations (70% of ship time)

- Programs paid by dotation or contracts foreseen by law
  - MSFD, WFD, ICES, OSPAR, econ. activities, etc.

### Science (28% of ship time)

- Programs paid by regional, federal or EC research funds

### Education (2% of ship time)

- sometimes related to the above programs

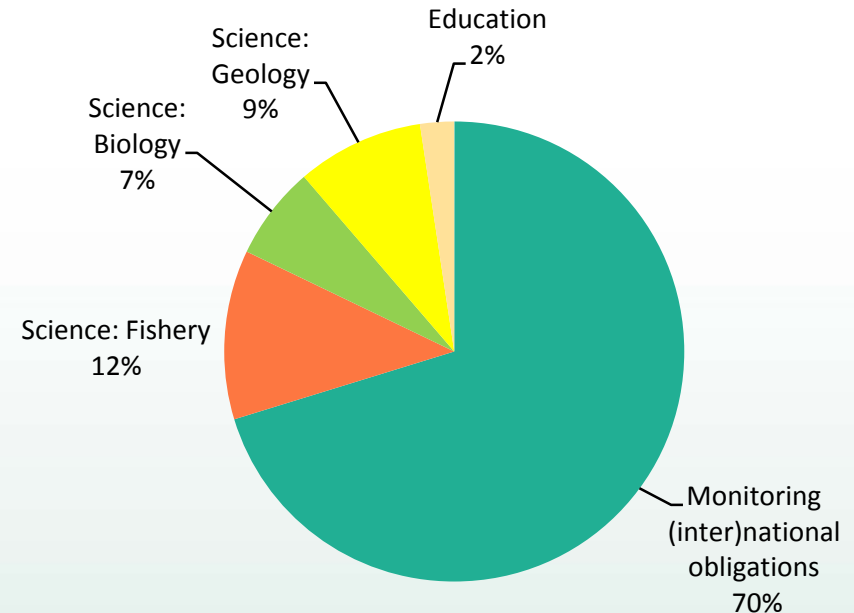
### Rapid Response activities (occasionally)

- Disaster relief

### European Infrastructure (occasionally)

- EC-FP 7 Eurofleets, ship-time exchange

### Ship time - distributed by financial control



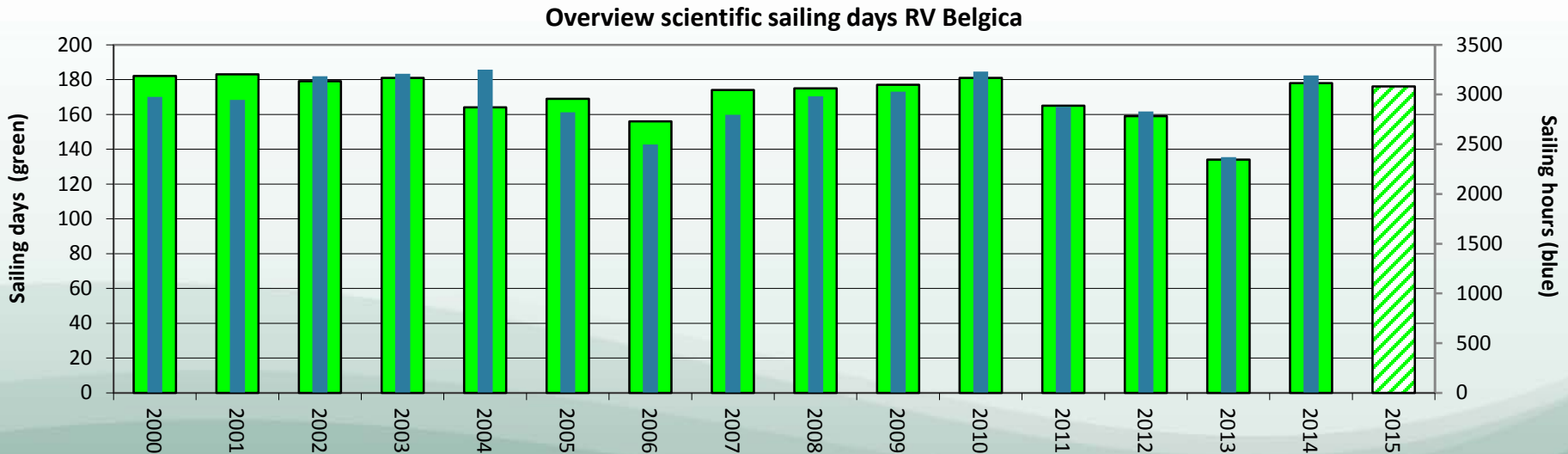
Ship time RV Belgica is provided for free to all Belgian institutes and universities by the Belgian Federal Government – Science Policy (BELSPO-RBINS-OD Nature).



# Introduction

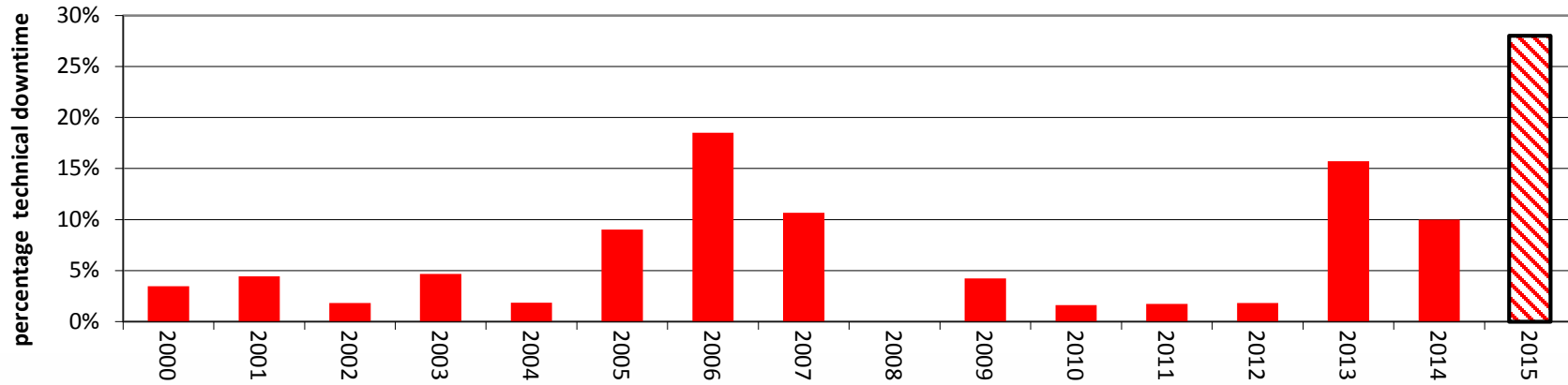
## Activities

- **More than 31 years the Belgian research vessel**
  - 175 scientific sailing days (105 nights) on average per year (ca. 92% available ship time is used)
  - 2850 scientific sailing hours on average per year
  - 910 scientific campaigns (ca. 30 per year)
  - > 30 scientific programs per year
  - > 300 different scientists come onboard yearly; 1800 scientific (wo)man days yearly
- **Request of ship time is stable, but the technical availability of the ship isn't!**

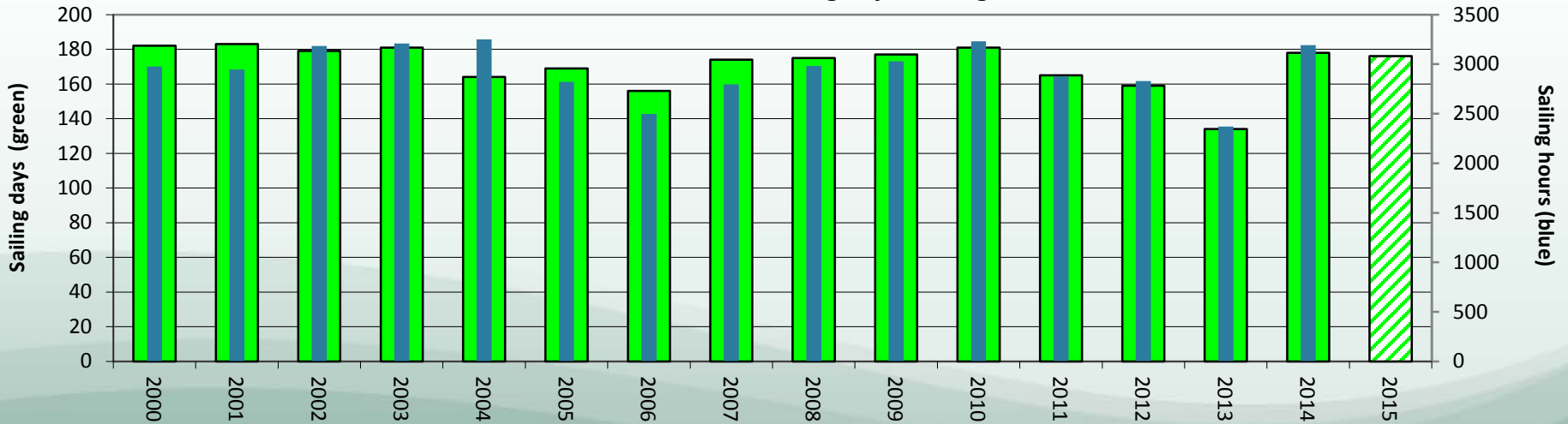


# Introduction Activities

## Technical downtime



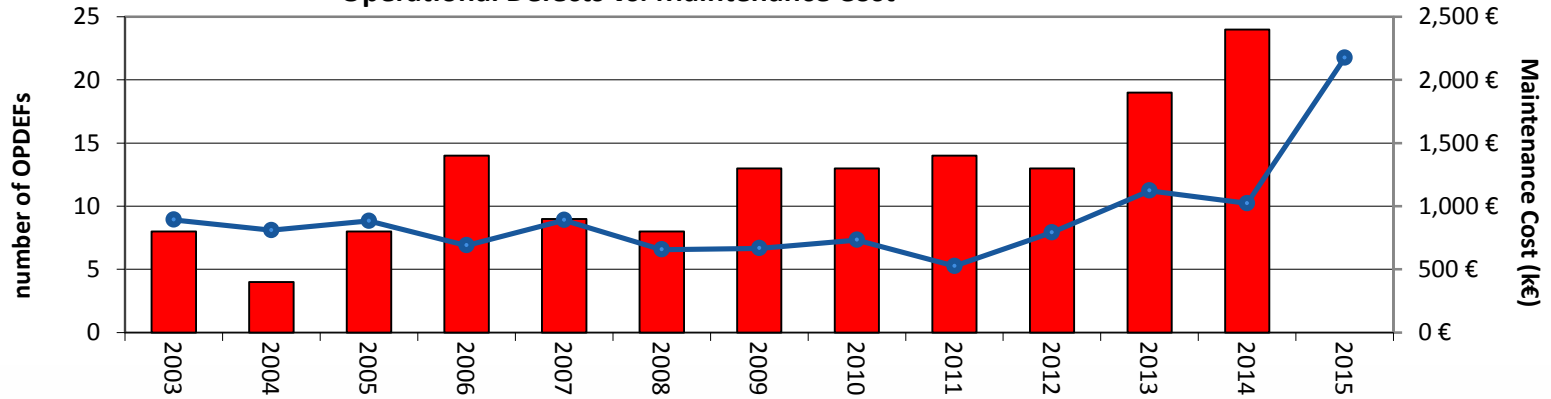
## Overview scientific sailing days RV Belgica



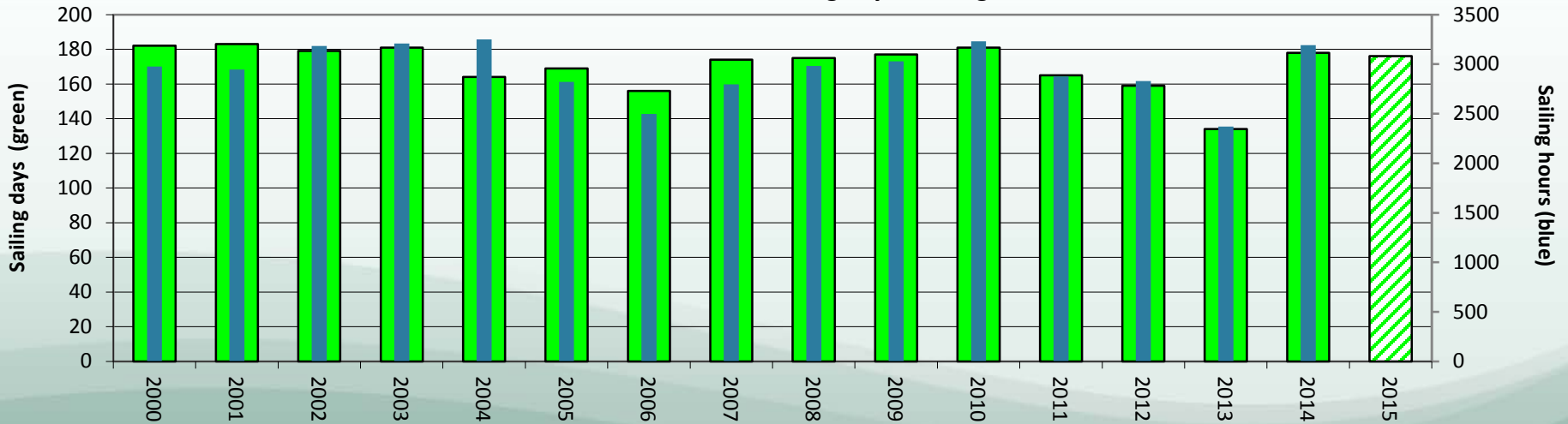


# Introduction Activities

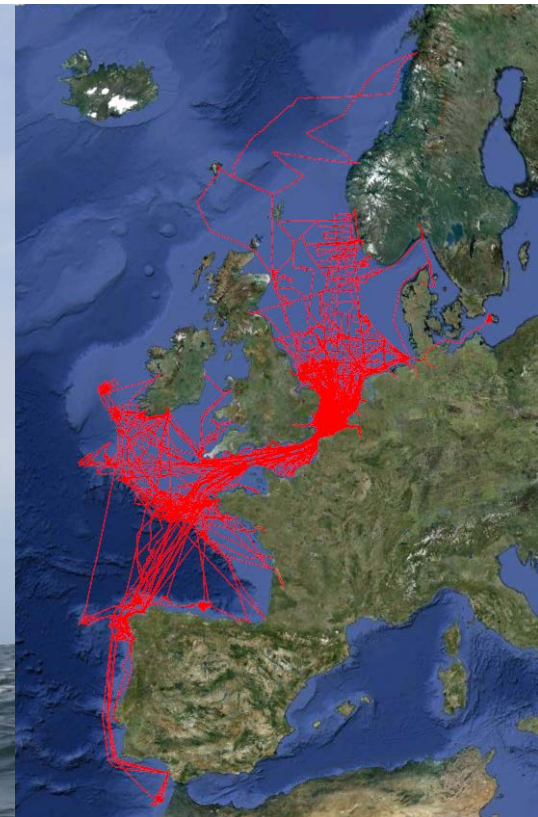
**Operational Defects vs. Maintenance Cost**



**Overview scientific sailing days RV Belgica**



## Obsolescence & refit



## Obsolescence & refit

- **More than 31 years the Belgian research vessel**
  - RV Belgica was built for 25 years and didn't receive a mid-life refit
- **Obsolescence is a major problem!**
  - Systems are old, not trustworthy and even dangerous
  - System parts are no longer available or the provider/factory just doesn't exist anymore
  - System replacement is the only possible solution (= expensive)
  - After the 6 weeks/25 days of ship time lost in 2013, Defence introduced an obsolescence maintenance approach





# Obsolescence & refit

- **More than 31 years the Belgian research vessel**
  - RV Belgica was built for 25 years and didn't receive a mid-life refit: **Obsolescence is a major problem!**
- Obsolescence maintenance:
  - Requiring extra funds and extra long maintenance period: **no obsolescence budget in 2014 (-2015)**
  - No obsolescence maintenance & budget would have lead to a **sailing prohibition from 2016** (cfr. Navy)
  - In **2015** Cabinet Science Policy agreed on the needed **extra funds (1019 k€)**; added to current contract.
  - In **2016** an extra long **maintenance period of 5 months** is foreseen
    - In 2016 the planned ship time is limited to 115 days (+15R), instead of 175 days (+10R)

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
January	Zeebrugge	MT	RESERVE/MT	Zeebrugge	RESERVE/MT	AOE	Zeebrugge	OD Nature	INBO	Zeebrugge	ILVO	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge
February	CSS	DGMR	Zeebrugge	RCMG	Zeebrugge	OD Nature	INBO	MT	Zeebrugge	CSS	OD Nature	DGS	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	
March	ILVO	Zeebrugge	OD Nature	CSS	Zeebrugge	OD Nature	INBO	UB	Zeebrugge	RESERVE/MT	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	
April	OBsolescence MAINTENANCE																														
May	OBsolescence MAINTENANCE																														
June	OBsolescence MAINTENANCE																														
July	OBsolescence MAINTENANCE																														
August	OBsolescence MAINTENANCE																														
September	RBINS	Zeebrugge	ILVO	OD Nature	Great	Yarmouth	ILVO	Zeebrugge	MT	ILVO	Zeebrugge	ILVO	CSS	OD Nature	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	
October	Zeebrugge	MT	ILVO	OD Nature	Zeebrugge	SMB/VLIZ	OD Nature	Zeebrugge	OD Nature	CSS	DGMR	Zeebrugge	SMB	OD Nature	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	
November	VACATION	Zeebrugge	ILVO	EV	VACATION	Zeebrugge	VACATION	INBO	ULg	MT	Zeebrugge	OD Nature	Zeebrugge	ILVO	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	
December	ILVO	Zeebrugge	RESERVE/MT	Zeebrugge	Zeebrugge	VACATION	INBO	ULg	MT	Zeebrugge	OD Nature	INBO	Zeebrugge	VACATION	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	Zeebrugge	

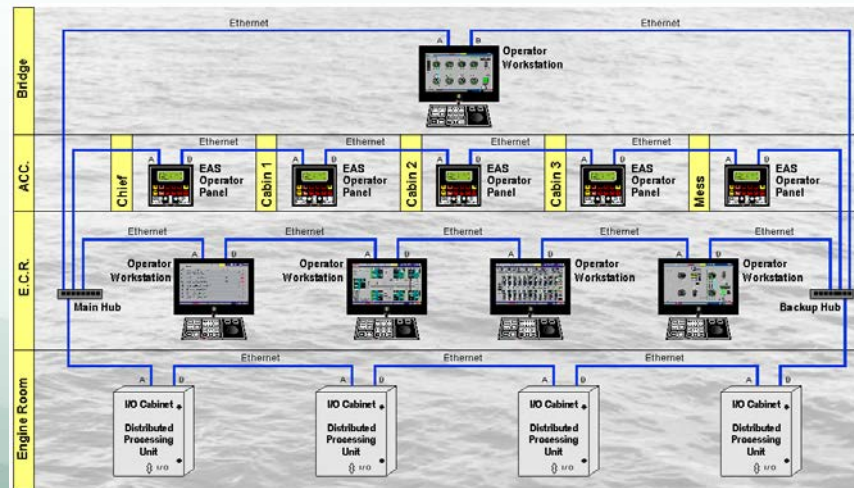




# Obsolescence & refit

- **More than 31 years the Belgian research vessel**
  - RV Belgica was built for 25 years and didn't receive a mid-life refit: **Obsolescence is a major problem!**
  - Obsolescence maintenance:
    - Will foresee in a new platform management system (alarm systems, propulsion management & sync., etc.)
    - Will address (hidden) corrosion of pipes & vents, etc.
    - Already addressed hydraulic systems 1 & 2, purifiers, trawling winch, ship's crane within standard maintenance budgets & periods

**Obsolescence maintenance is not a major refit and it is designed to keep the RV Belgica in a safe and good working order for a maximum period of 4 years, but...**





## Flooding & damage



## Flooding & damages

- Sunday 190715: Flooding of engine room (0.8-1.2 m): affecting main engine, generators, pumps, electrical cabling, etc.
- Intervention by Navy services on Sun & Mon prevented the ship of sinking (during weekend & vacation), but...



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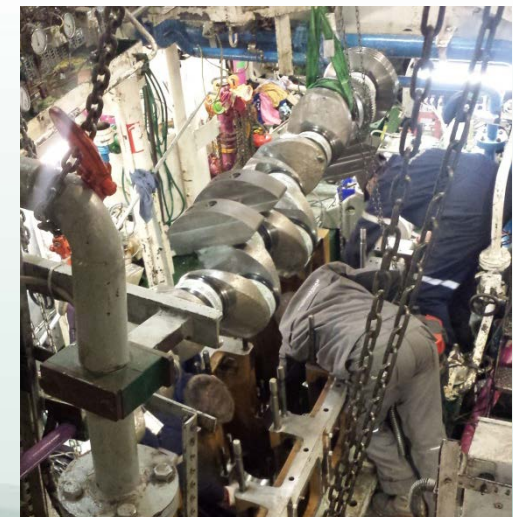
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- Ship needed to be dead towed to dry dock and back for the repair of the ship's hull
- Preliminary analyses show that the hole is a result of galvanic corrosion
- Preliminary cost estimated by expert CASCO insurance: 2.3 M€ incl. VAT and ship yard fee
- CASCO insurers paid an advance of 900 k€
  - CASCO insurers are investigating the VAT obligation of RV Belgica; renewal CASCO insurance 2016 unsure...



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- Maintenance is advancing rather well
  - Replacement of all cabling, compressors, electric motors & major maintenance of main engine, GenSets, etc.
  - Preservation measures didn't really help, but were costly!







# Flooding & damages

- 48 planned scientific days lost; 17 programs affected (mainly seasonal monitoring – no recuperation)
  - Makeshift solutions using other vessels were problematic (cfr. cost, availability, capabilities, berths, etc.)
  - restart planned campaigns from the 9<sup>th</sup> Nov

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
January	Vacation	Vacation	Zeebrugge	MAINTENANCE				Zeebrugge	MAINTENANCE				Zeebrugge	MAINTENANCE		MT	Zeebrugge	OD Nature		INBO		Zeebrugge									
February	Zeebrugge	5 CSS DGMR MSC	2 KD OL SP YVP	MT	Zeebrugge	3 OD Nature AOE DG5	3 DVDE MP RM	MT	Zeebrugge	4 ILVO	Zeebrugge	5 INBO OD Nature	5 ES KP JH	4	MT	MT	Zeebrugge	1 KP <sup>1</sup> MF VVL JH	ES												
March	Zeebrugge	6a ILVO	CSS	Zeebrugge	6b KH <sup>1,2</sup>	KP	(KD)	Zeebrugge	7 VVLF MF Stud JH	Zeebrugge	8 RCMG	Zeebrugge	9	UB																	
April	AOE INBO	MP ES	Zeebrugge	VACATION				Zeebrugge	OD Nature				Zeebrugge	ILVO		Zeebrugge	DGMR MSC														
May	Vacation	Zeebrugge	MT	13 CSS OD Nature	13 KD MF KP JH	Zeebrugge	MT	14 VUB (LabMET)	14 FD (AS)	15 La Coruna	15 DVR																				
June	RCMG (LabMET)				Brest			16 CSS OD Nature	DGMR MSC	*1	MT	Zeebrugge	17 CSS OD Nature	DGMR MSC	Zeebrugge	18 AN/sd															
July	OD Nature <sup>6</sup>	MT	NAVY DAYS	MT	19 OD Nature <sup>6</sup>	KR	Zeebrugge	20 OD Nature <sup>6</sup>	KR MF KP <sup>1</sup> JH	Zeebrugge	Vacation	Vacation	MAINTENANCE	Zeebrugge	MAINTENANCE																
August	Zeebrugge	MAINTENANCE				Zeebrugge	MAINTENANCE				MT	Zeebrugge	21 OD Nature <sup>6</sup>	INBO TW	Zeebrugge	22a ILVO	Great Yarmouth	22b													
September	ILVO	Zeebrugge	SMB OD Nature <sup>6</sup>	23 JR <sup>1</sup> IDM MF KP	Transit	Temse		24 ILVO	Zeebrugge	25a ILVO	Zeebrugge	25b KH <sup>1,2</sup>	ILVO																		
October	CSS	Zeebrugge	MT *3,4	25c KH <sup>1,2</sup> KP <sup>1</sup> JH	Zeebrugge	26 DGMR MSC OD Nature	Zeebrugge	27 SMB OD Nature	Zeebrugge	28 INBO	MT	Zeebrugge																			
November	Zeebrugge	VACATION				Zeebrugge	29 Stud	MT	Vacation	30 ILVO	Zeebrugge	31 CSS OD Nature	INBO	Zeebrugge																	
December	MOST + DCC				Zeebrugge	32 OD Nature	INBO	Zeebrugge	RESERVE	Zeebrugge	VACATION		Zeebrugge	VACATION																	



# Replacement





# Replacement

**2005** Concept note replacement

**2006** Questionnaire scientific teams

**2007** Initiation feasibility study

**2008** Scientific working groups – scientific needs

**2009** Finalizing feasibility study (= only option RV Belgica needs to be replaced by a new ship)

- Preliminary design and specification were created

**2010** No Federal Government

**2011** No Federal Government

**2012** Initiation preliminary design study (Preparation note Council of Ministers)



# Replacement

## 2013-2014 Finance study

- Best solution: build new ship and exploitation cfr. current RV Belgica
- chartering/rent of other ships is 17-36% more expensive over 10 year; ship availability not guaranteed
- Build: 54.5 M€ incl. VAT/ 4.3 M€ per year (300d)
- No or limited financial input from private sector/foreign partners/FPS's for build of new ship
- Foreign or private cooperation possible cfr. ship time exchange and use (new ship needed)
- Support letters Belgian universities, scientific institutes and private companies

## 2014 Set up of **technical part tender document**

## 2014-2015 Update **Scientific needs**

## 2015 **Working group** RV Belgica replacement (cfr. new government)

## **ASAP** New ship: **agreement** by Council of Ministers! **Delivery of new ship will take 3.5-4 years!**

## 2016 – 2019 Tendering for preliminary design & final design & build; build of new ship

**The flooding of 190715 didn't change this process, it only emphasized the need for the replacement!**

## Replacement

Built:	201? In ???
Prize:	54, 5 M€ incl. VAT
Length:	ca. 65 m
Beam:	ca. 15 m
Draft:	Max. 4.8 m
Berths Crew + Scientists:	15 + 24
Days (24h) at sea:	300/y
Operating cost:	4,3 M€/y incl. VAT







## Outlook



# Outlook

## RV Belgica & replacement

- Return of the ship to sea in November 2015
- Successful obsolescence maintenance in 2016; to have a reliable and safe ship for the coming 3-4 years
- Get a final agreement on the build of a new ship (2015-2016)
- Delivery of the new ship (2019)



# Thank you!



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