



# Jason-2: mission status DORIS data delivery

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# Mission summary

## Science Measurements

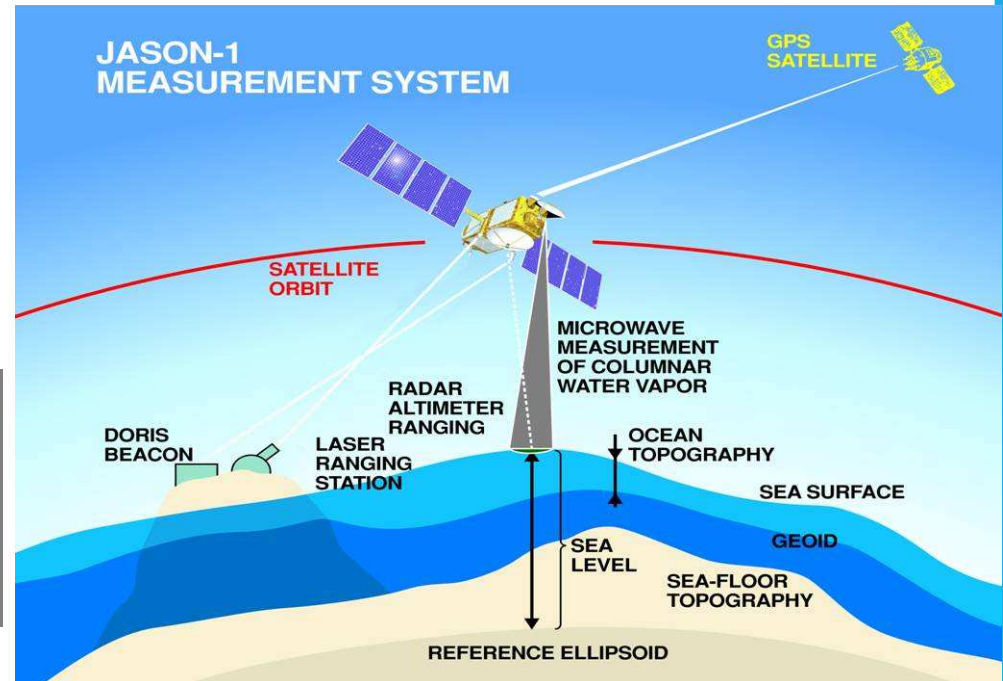
Global sea surface height to an accuracy of  $\leq 4$  cm every 10 days, for determining ocean circulation, climate change and sea level rise

## Mission Objectives

- Provide continuity of high precision ocean topography measurements beyond TOPEX/Poseidon and Jason-1
- Provide a bridge to an operational mission to enable the continuation of multi-decadal ocean topography measurements

## Instruments

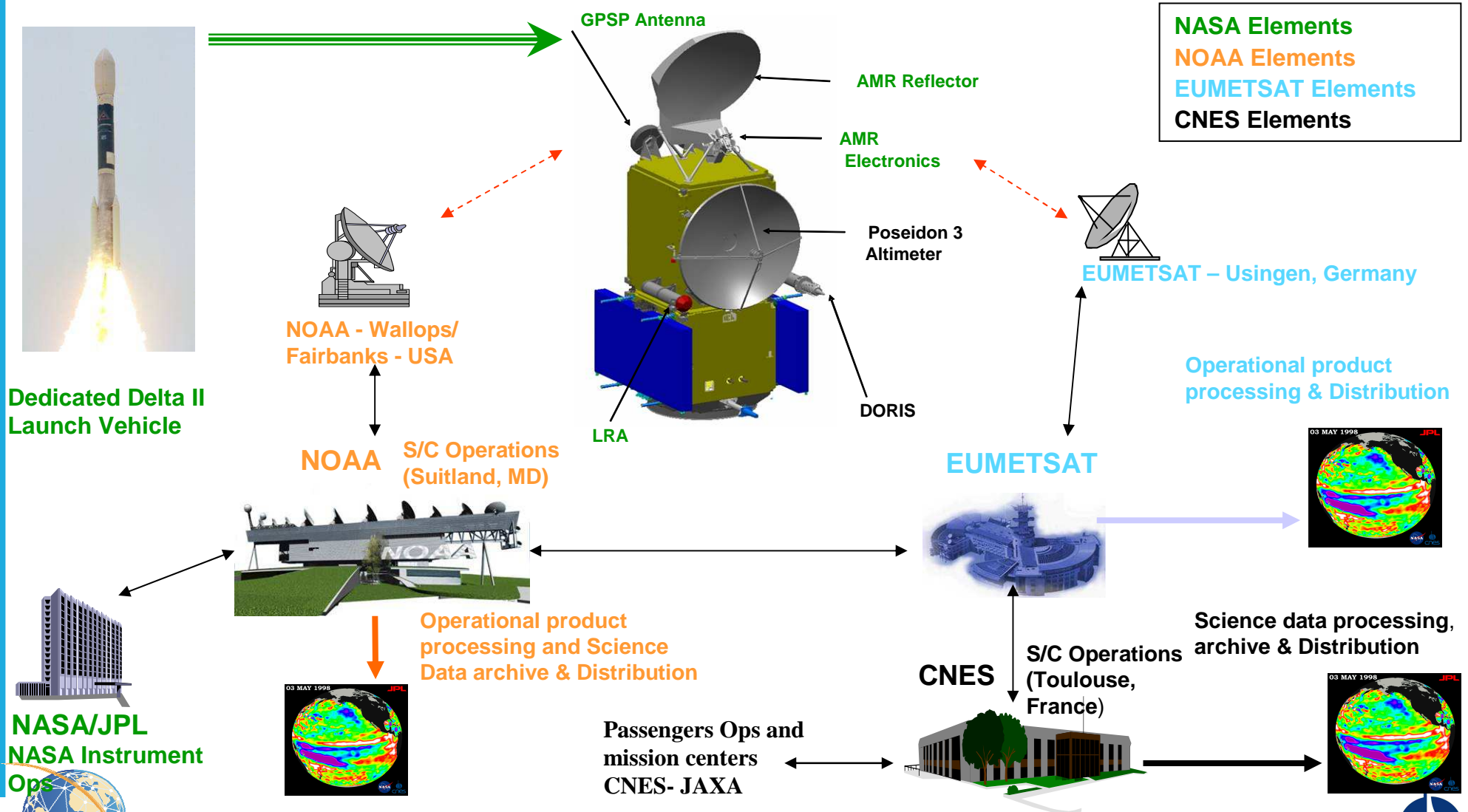
- Core Mission:
  - Poseidon-3 Altimeter
  - DORIS (Precise Orbit Determination System)
  - Advanced Microwave Radiometer (AMR)
  - GPS Payload (GPSP)
  - Laser Retro-reflector Array (LRA)
- Passengers:
  - T2L2
  - JRE (Carmen2 + LPT)



## Mission Overview

- Launch Date: 15 June 2008
- Launch Vehicle: Delta II 7320
- Proteus Spacecraft Bus provided by CNES
- Mission life of 3 years (goal of 5 years)
- 1336 km Orbit, 66° Inclination

# System elements



Dedicated Delta II Launch Vehicle

NOAA - Wallops/  
Fairbanks - USA

NOAA S/C Operations  
(Suitland, MD)

NASA/JPL  
NASA Instrument  
Ops

Operational product  
processing and Science  
Data archive & Distribution

Passengers Ops and  
mission centers  
CNES- JAXA

**NASA Elements**  
**NOAA Elements**  
**EUMETSAT Elements**  
**CNES Elements**

Operational product  
processing & Distribution

Operational product  
processing, archive & Distribution

# Program Status and Progress 1/2

## ➔ Mission/System:

### ● System reviews :

- ◆ System PDR (4-party review) held in December 2005 allowed to verify that overall architecture and design are compliant with system requirements
- ◆ Ground System Interface Review (4-party review) held in December 2006 allowed to verify that all the ground interfaces and the operations approach are compliant with system requirements
- ◆ Performances Key Point (4-party review) held in October 2007 allowed to verify that performances of the whole system are compliant with system requirements
- ◆ **Operational Readiness Review – ORR (4-party review) planned April 8-11, 2008**

### ● System Validation :

- ◆ driven by System tests requirements document
- ◆ System Tests tools : Satellite simulator (PRESTO) with payload simulation , TC generator, SDB use for instruments, ... (other PROTEUS generic tools available : RF suitcase, GENREC, ...)
- ◆ Qualification phase started in January 2007 (ground system compatibility tests)
- ◆ Technical qualification Phase (QT) from mid 2007 till end 2007
- ◆ **Operational qualification Phase (QO) from end 2007 till Launch**

### ● Some system tests : successful

- ◆ RF compatibility with stations
- ◆ Dry Rehearsal 0 (RG0)
- ◆ End to End tests Ground-Satellite from CNES and NOAA

### ● Operation preparation on-going :

- ◆ all the necessary documents according to the operation phases
- ◆ training through the System validation and specific tests



# Program Status and Progress 2/2

## ➔ CNES Ground System

- internal ORR held on Feb 15, 2008
- J2CCC (Command and Control Center) : all elements used for system tests and operations
- SSALTO ( mission center) : all elements accepted with a **last version of "product processing" mid May 2008**

## ➔ EUMETSAT ground system

- **internal ORR planned on March 31, 2008**
- Usingen Earth terminal accepted
- EUM Processing Center accepted. All elements used for system tests and operations

## ➔ NOAA ground system

- **internal ORR planned on March 12, 2008**
- Wallops and Fairbanks stations accepted
- J2TCCS (Command and Control Center) : all elements used for system tests and operations
- **NOAA Processing Center : acceptance end of March**

## ➔ JPL ground system

- **JPL Instruments and Data Center : acceptance end of March**

## ➔ Passengers ground system

- **Passengers Mission Center : acceptance end of March** . Some have participated to system tests (T2L2, LPT)

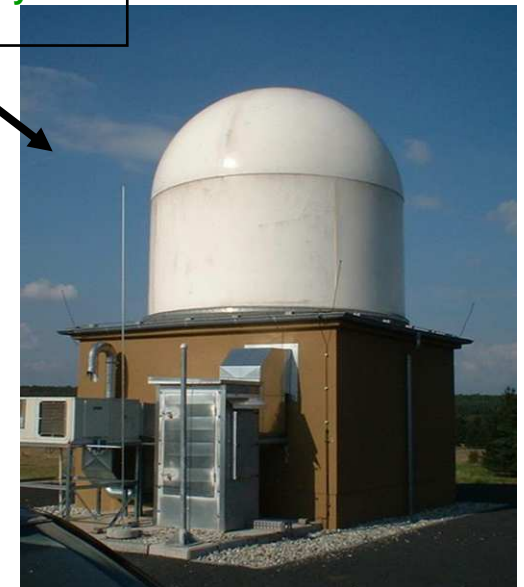
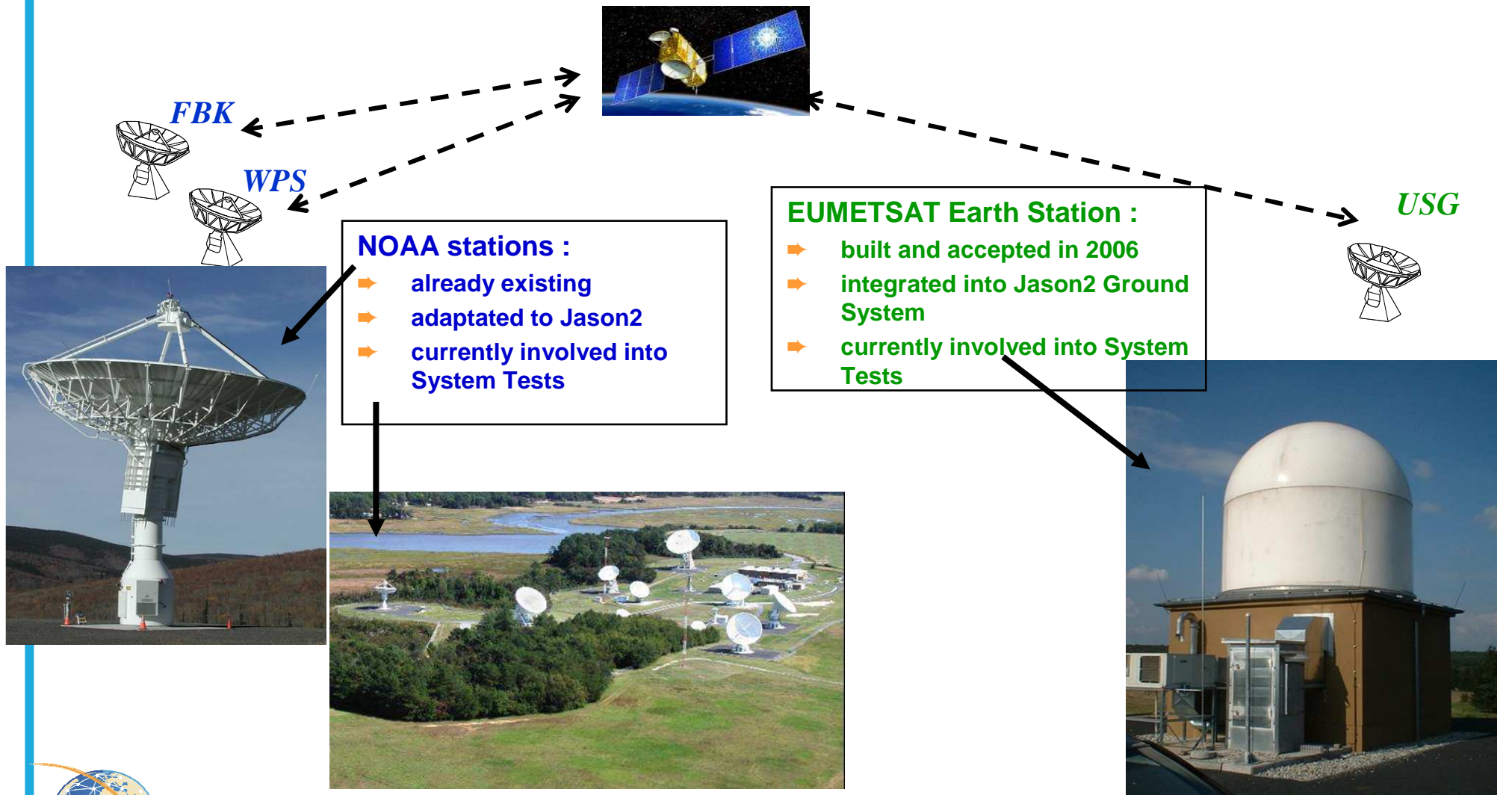
## ➔ Network : 4 partner network installed and operational

## ➔ Main System tests till the Launch

- **Dry Rehearsal 1 (RG1) : 17-21 April**
- **Long Term Routine 3 (LTR3) : end of April**
- **Network Dress rehearsals (RGR) : mid May and beginning of June**



# Jason2 Ground System : Earth stations



# Jason2 Ground System & Operations

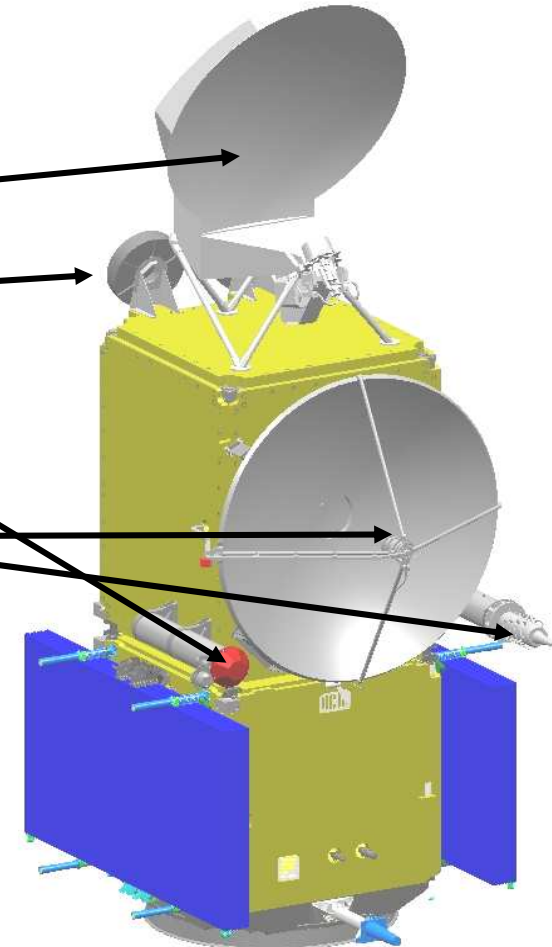
- ➔ **CNES Control Center: for LEOP & Assessment phases**
  - adaptation and integration to Jason2 Ground System: completed
  - currently involved in the system tests and the Operational System qualification
  
- ➔ **NOAA Control Center: for satellite operational phase**
  - adapted to Jason2 Ground System
  - integrated into Jason2 Ground System in summer 2007
  - currently involved in the system tests and the Operational System qualification
  
- ➔ **EUMETSAT Near Real Time Product Center**
  - integrated into Jason2 Ground System: summer 2007
  - currently involved in the system tests and the Operational System qualification
  
- ➔ **CNES Off line Product Center (SSALTO)**
  - adapted to Jason2 ground system, new development accepted
  - integrated into Jason2 Ground System: summer 2007
  - currently involved in the system tests and the Operational System qualification

# Jason-2 satellite

## ➔ 8-instrument Payload

- AMR (NASA/JPL)
- GPSP (NASA/JPL)
- LRA (NASA/JPL)
- DORIS receiver (CNES)
- POSEIDON 3 altimeter (CNES)
- 3 passengers : Carmen 2 (CNES), T2L2 (CNES), LPT (JAXA)

## ➔ 505kg/ 472W satellite

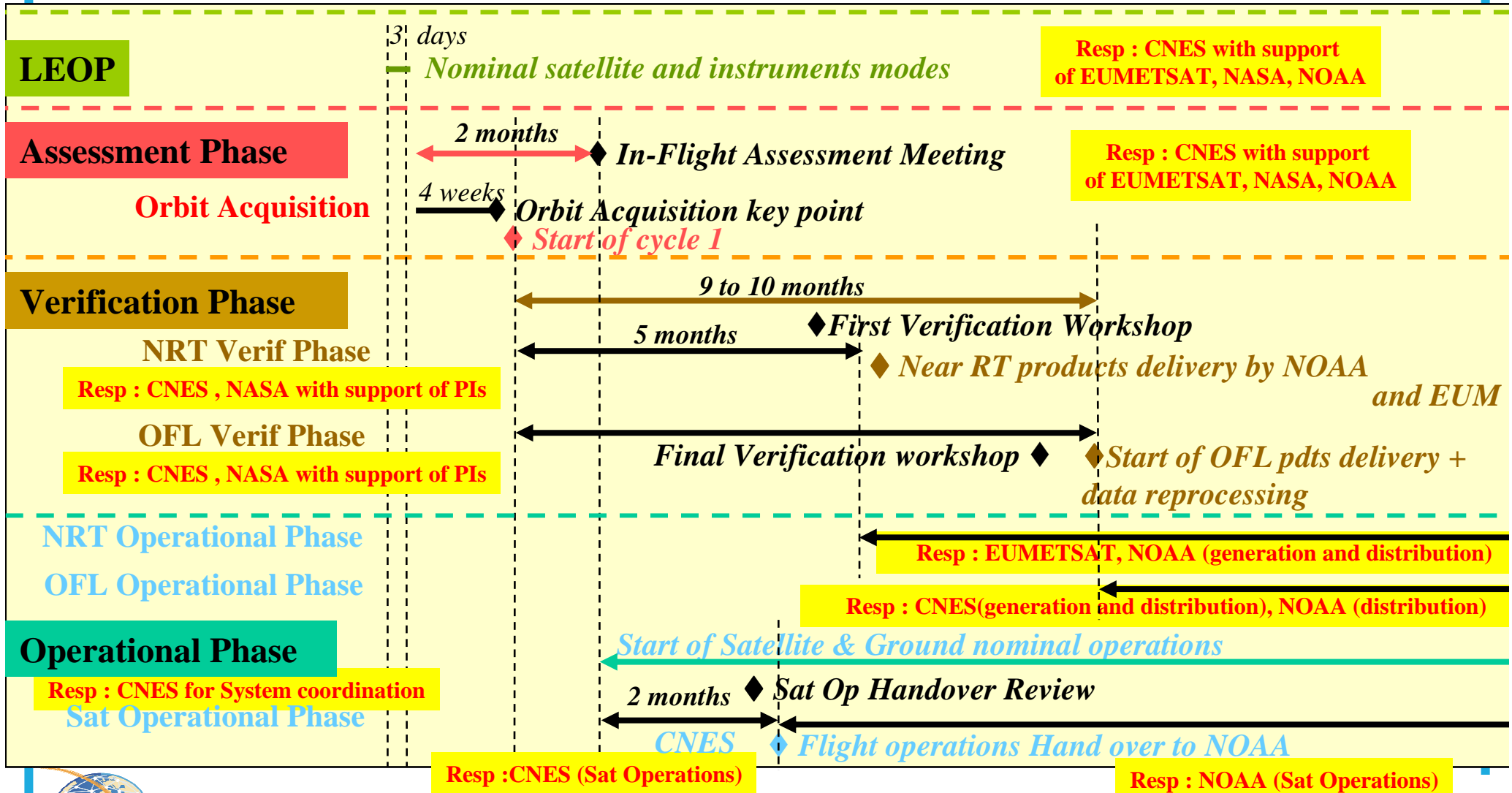




# Satellite status

- All payload instruments delivered
- Payload instruments integration and test: completed (Dec '06 to June '07)
- Current measured payload and satellite performance meets all requirements
- Satellite Assembly, Integration and Test: from June '07 to February '08
  - Initial performance tests, mechanical tests, radiated EMC and conducted EMC tests performed
  - Thermal Vacuum, Mission Profile performed
- Next main milestones:
  - Satellite Qualification Review : beginning March 08
  - **Operation Readiness Review : April 08**
- **Launch: mid June 2008**
  - ~ 1 month schedule margin for satellite

# OSTM/Jason-2 Mission Phases



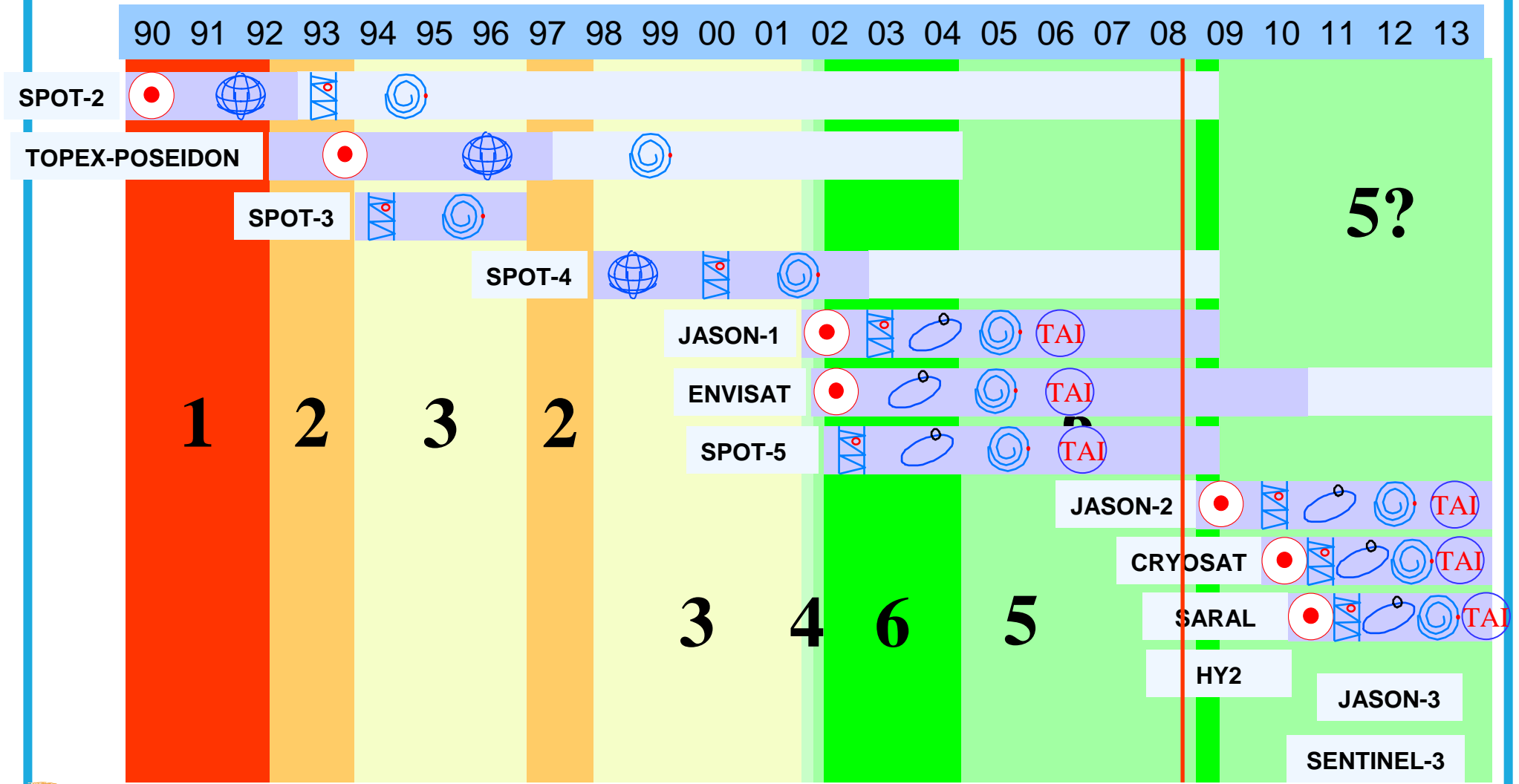
# DORIS Data delivery schedule

- ➔ **Launch: June 15, 2008**
- ➔ **Start of cycle 1: 5 to 6 weeks**
- ➔ **Flight acceptance: 2 months**
- ➔ **DORIS Data delivery**
  - **RINEX**
    - ◆ Daily files
  - **POD 1b (DORIS Data Exchange Format Version 2.2)**
    - ◆ 10-day files

# Future Missions

- ➔ **CryoSat (ESA)**
  - May 2009
  
- ➔ **SARAL/Alti-KA (CNES/ISRO)**
  - 2010
  
- ➔ **Hy2 (CNSA/CNES)**
  - THALES to supply DORIS receiver
  - CNSA/CNES MOU
  - June 2010
  
- ➔ **SENTINEL 3 (ESA)**
  - November 2012
  
- ➔ **Jason-3 (NOAA/EUMETSAT/CNES/NASA)**
  - End 2012?

# IDS tomorrow: Satellites



## Possible Missions

- ➔ **SEOSAT (SPAIN)**
  - 2011?
  
- ➔ **CEMIT (NASA Small Explorer program)**
  - Dallas and Colorado universities proposal: spatial environment (iono)
  - Possible CNES proposal for DORIS + accelerometers: thermosphere
  - Accelerometers beyond CHAMP and GRACE: 2012?
  
- ➔ **EarthCARE (ESA)**
  - DORIS + GPS - 2013? 3+ years
  
- ➔ **GRASP (Y. Bar Sever - JPL)**
  - On-board colocation (SLR + DORIS + GPS + VLBI)
  
- ➔ **GFOFO (US Navy) RFI → THALES/CNES**