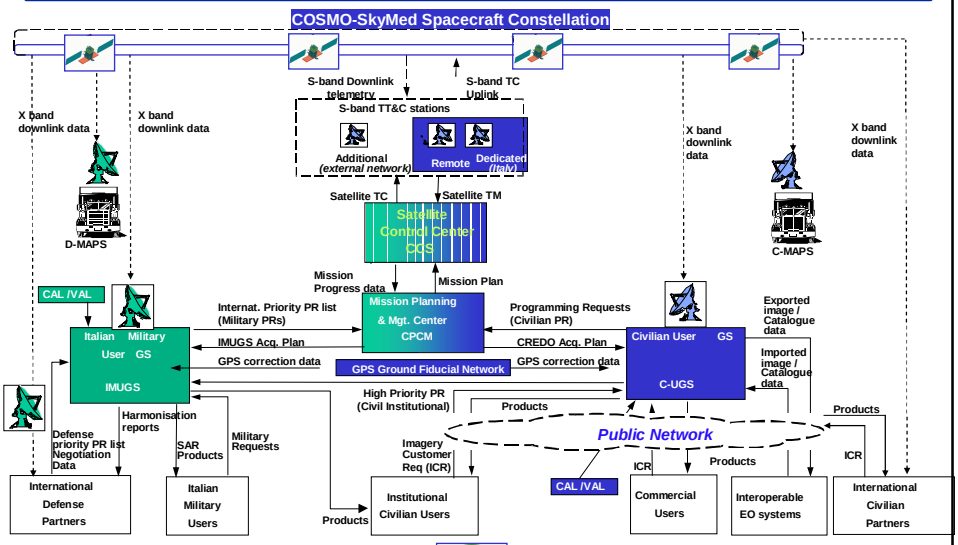
COSMO-SkyMed Ground Segment



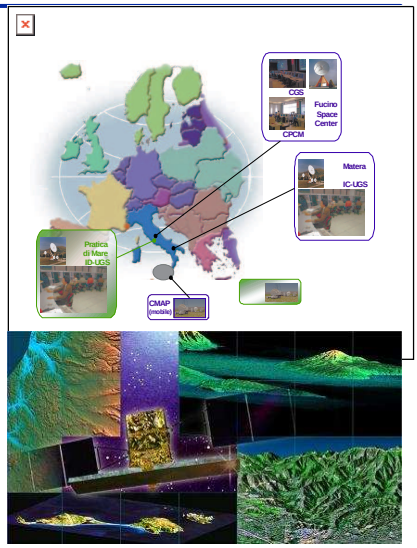
COSMO-SkyMed Ground Segment

- Ground Infrastructure geographically distributed and inter-connected (fixed / mobile stations and comm.network);
- Dual Use implementation:
  Security standards application, Integrity, Priority management, Plan Approval, Plan and data confidentiality;
- Reception/Elaboration/Distribution of the Observed data;
- GPS fiducial network;

Interoperability and Expandability with other Systems (optics, RADAR in other bands, on other platform, etc...);

Multisensor capabilities (common operational environment for various sensors);

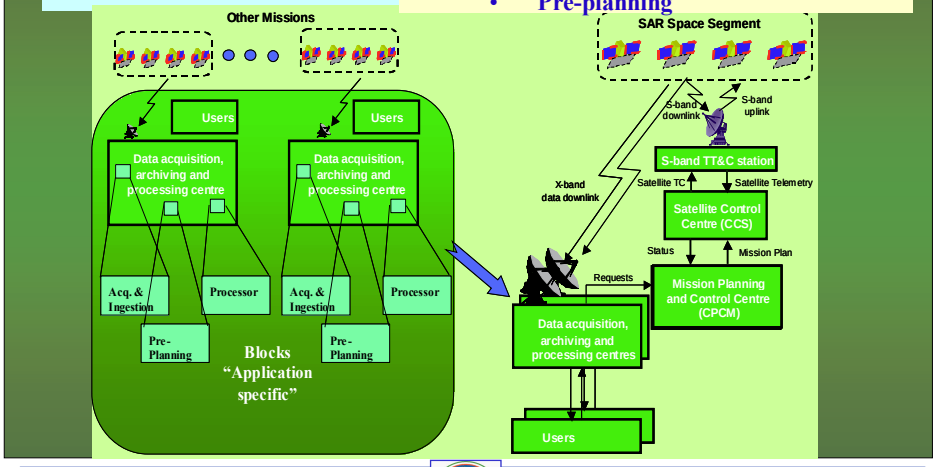
- ~~Functional and Physical Redundancy;~~
- Integrated Logistics and Operative Support.



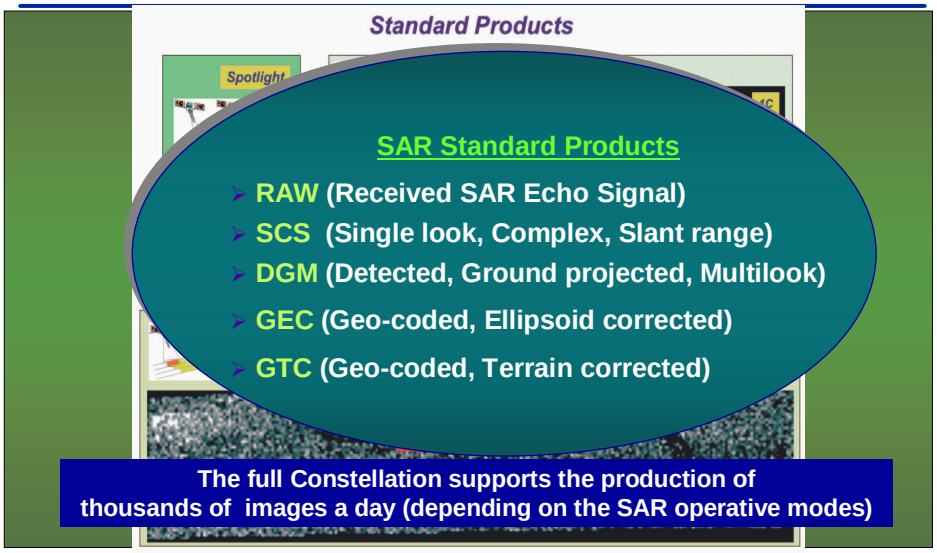
COSMO-SkyMed GS Interoperability & Expandability

Interoperability
- Adoption of international standards

Expandability, through plug-in of:
- Acquisition and ingestion chain
- Processors
- Pre-planning



COSMO-SkyMed Products



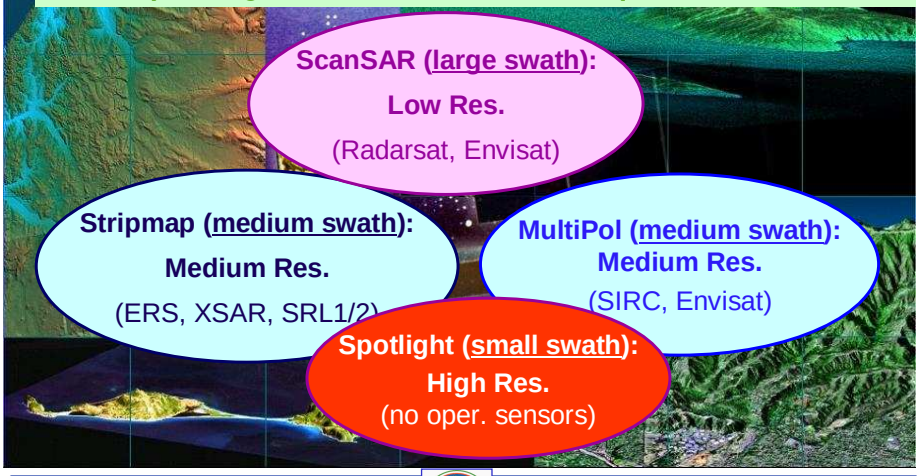
The full Constellation supports the production of thousands of images a day (depending on the SAR operative modes)

COSMO-SkyMed Products

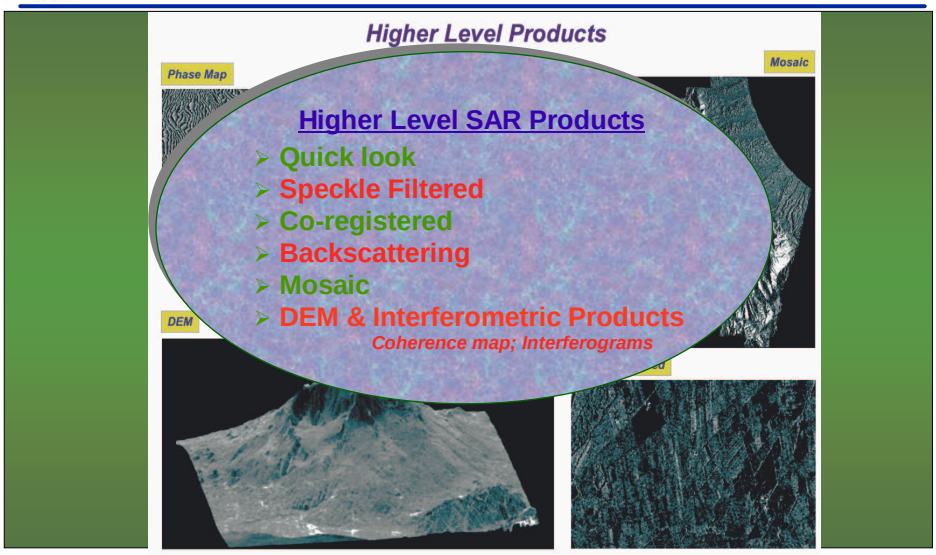
- RAW
  - Generation of higher level products (SCS)
  - SAR Technology Research
- SCS
  - It is a complex image whose modulus codes the scene reflectivity at the radar wavelength and the phase codes the satellite target distance (useful for interferometry)
  - The product is in radar geometry i.e. side looking (slant range) hence there are great geometric deformations
- DGM
  - is a image whose values code the scene reflectivity at the radar wavelength
  - the product is in radar geometry but projected on ground i.e. ground range-azimuth
- GEC & GTC
  - corresponds to classes of products rather a couple of products since the image contains the same input data physical quantity (is not restricted only to scene reflectivity)
  - geocoding processing requires that input data comes with ancillary data needed to geolocate pixel (e.g. timing, orbit)

COSMO-SkyMed Products

Each item corresponds to many possible product types depending on the different sensor acquisition modes:



COSMO-SkyMed Products



Achievements

S/L SDM

OBJECTIVES:

- Qualify the Primary/Secondary Structure and I/Fs
- Characterize S/C wrt external shock environments
- Validate the Structural Mathematical Models
- Determine physical properties (Mass, CoG and MoI)
- Demonstrate alignment stability
- Validate mechanical and test procedures
- Prove Facility/MGSE I/Fs

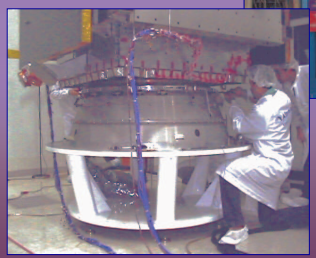
STATUS: QUALIFICATION ACHIEVED IN 2002 !!!

- Global & Local Static Test
- Sine Vibrations Test
- Launch Vehicle Separation Shock
- Launch Vehicle Fit Check
- Mass Properties Measurements
- Alignment Tests
- Mathematical Models fitting

Central Structure

Achievements

SDM - Static Test



SDM - Shock Test

SDM - Sine Test

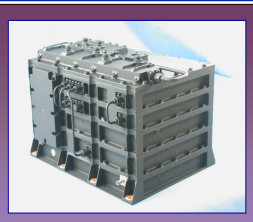
Achievements

Platform Avionic

- The Platform avionics development, carried out in the frame of PRIMA Program, has addressed all "key" functions:
  - S/L Management Unit (SMU)
  - STar Tracker (STT)
  - ICS On-board SW for AOC, DH and FDIR functions
  - Power Control Unit (PCU)
  - S-Band Transponder (SBT)
- Equipment have already been completed/tested satisfactorily
- Complete EM of ICS S/S has already been tested satisfactorily, using the developed EQM units and loaned AOC sensors/actuators
- **Avionics has now been integrated on EM S/L**
- Platform I/Fs and performances are steady
- **ALL UNITS HAVE BEEN DEVELOPED IN ITALIAN CONTEXT**

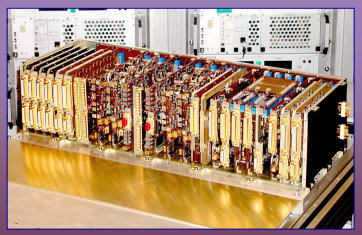
Achievements

Platform Avionics



S-Band Transponder

S/L Computer (SMU)



Power Control Unit (PCU)

Star Tracker

Achievements

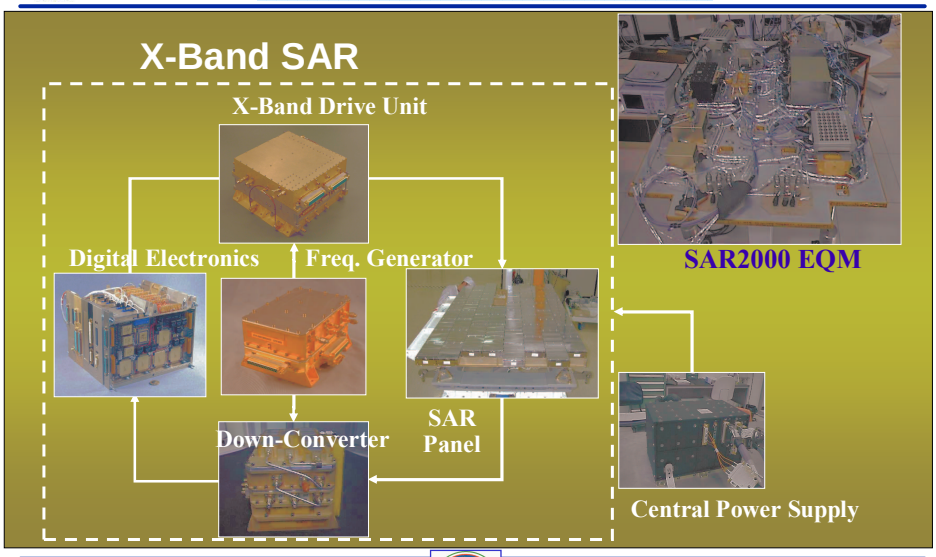
SAR P/L (EQM)

- Thanks to the activities exercised within SAR2000 Program, EQM verification campaign is running both at SAR Integrated Electronics (SIE) and at SAR Antenna Assembly level
- Basic equipment have already been completed satisfactorily
- "Stand-alone" EQM P/L Qualification achieved in 2004
- **EQM P/L has now been integrated on EM S/L**
- **All P/L interfaces and performances are at their steady value**
- **ALL UNITS HAVE BEEN DEVELOPED IN ITALIAN CONTEXT**

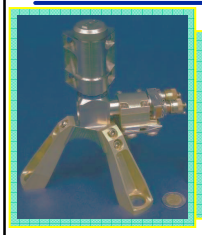
PDHT P/L (EM)

- All equipment have already been completed/tested satisfactorily
- "Stand-alone" EM P/L Qualification achieved in 2004
- **EM P/L has now been integrated on EM S/L**
- **All P/L interfaces and performances are at their steady value**
- **DSHA AND XBAA HAVE BEEN DEVELOPED IN ITALIAN CONTEXT**

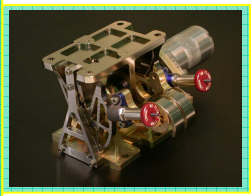
Achievements



Achievements



Antenna Pyro

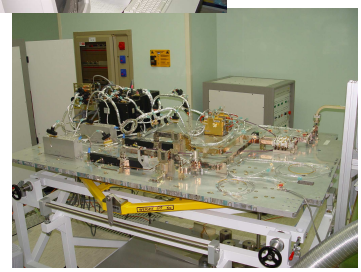


Antenna
Deployment Motor

EM P/L
under test

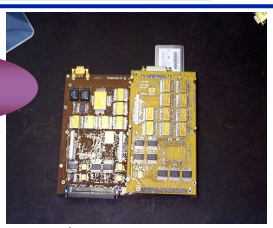
X-Band Antenna

PDHT
EM & PFM



Achievements

PDHT

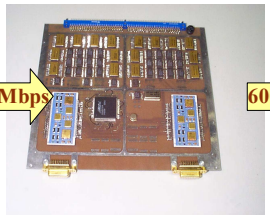


Supervisor
Module

SAR Interface

Memory Modules

Downlink Formatter



600 Mbps

600 Mbps

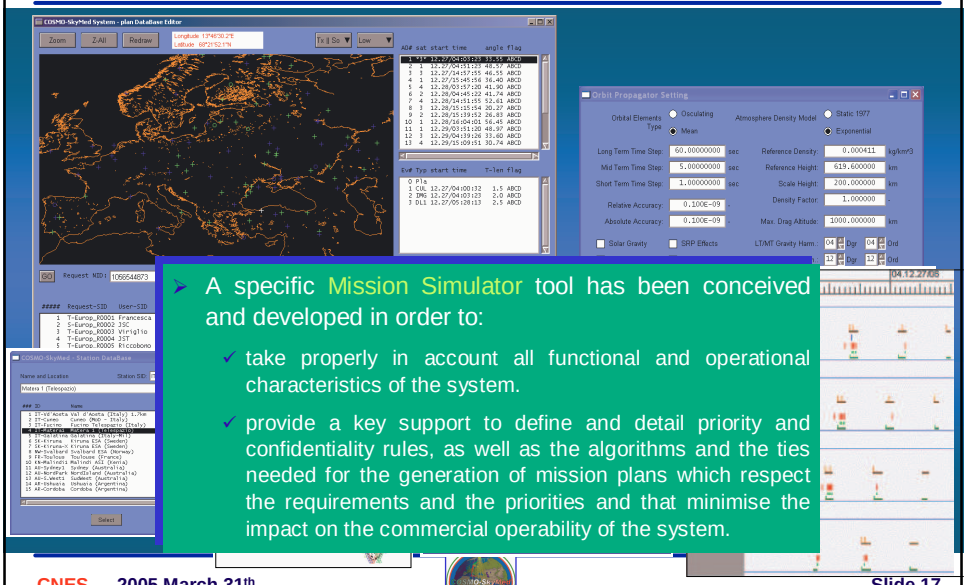
155 Mbps

155 Mbps

155 Mbps

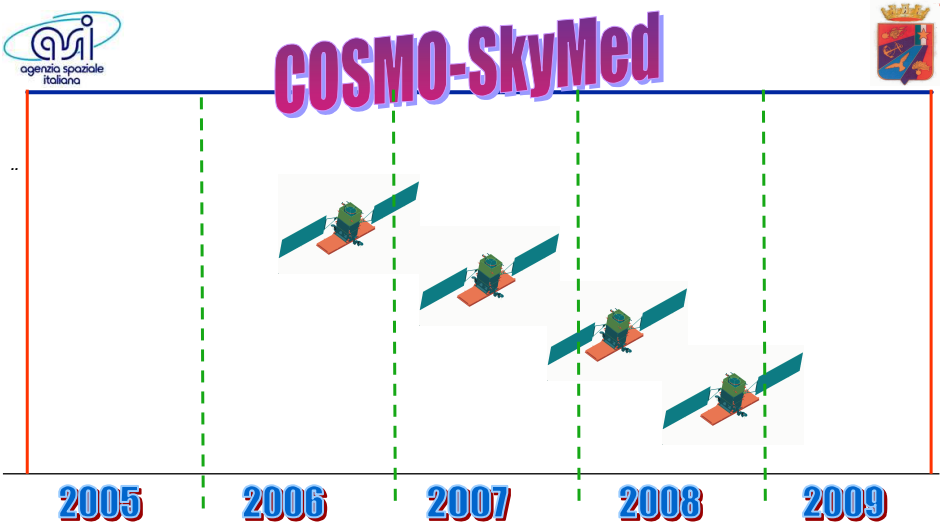
155 Mbps

MISSION SIMULATOR



- A specific Mission Simulator tool has been conceived and developed in order to:
  - ✓ take properly in account all functional and operational characteristics of the system.
  - ✓ provide a key support to define and detail priority and confidentiality rules, as well as the algorithms and the ties needed for the generation of mission plans which respect the requirements and the priorities and that minimise the impact on the commercial operability of the system.

COSMO-SkyMed



LAUNCH SCHEDULE

CONCLUSIONS