ERSDAC's Plans for PALSAR Data Application

03.27, 2001

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What is ERSDAC ?

- Non profit foundation affiliated by METI
- ERSDAC's Function
  - Research & Development of Remote Sensing Data Application
    - TO:
      - Natural resources exploration
      - Environmental geologic application
  - Development and Operation of Ground Data System (for METI's sensor data)
    - ERSDIS for JERS-1
    - IMGDIS for IMG/ADEOS
    - ASTER GDS for ASTER/Terra
    - PALSAR GDS for PALSAR/ALOS

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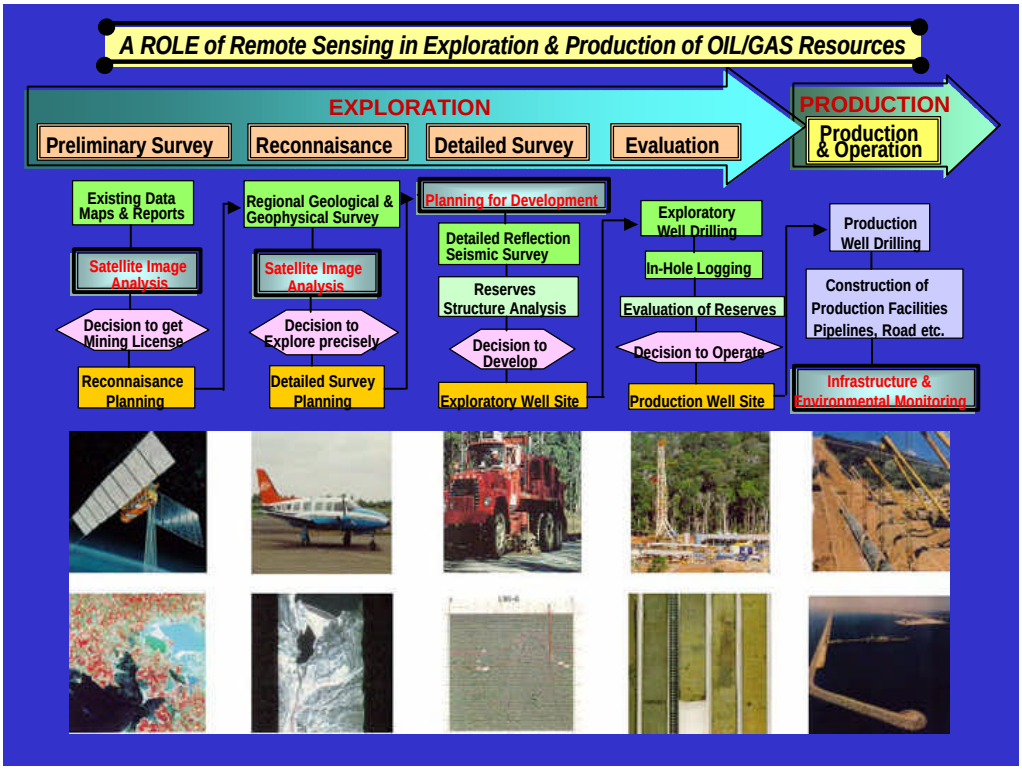
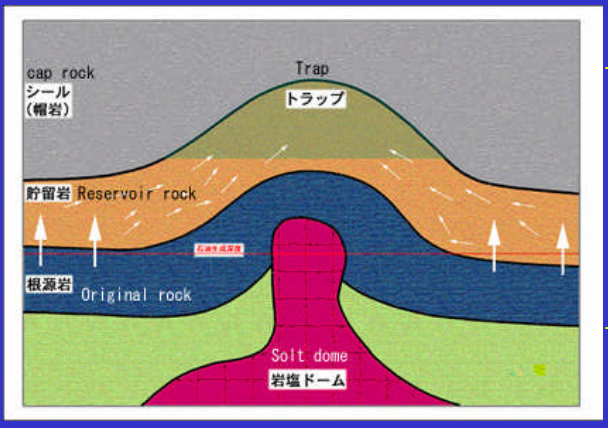


Examples of SAR Data Application to Petroleum Exploration

- Potential area evaluation on natural resources exploration
  - Geologic structure interpretation in a tropical rain forest area



– Detection & mapping
  • Anticline
  (Geological structure)
  • Reservoir rock
  (Limestone, Sandstone)
  • Original rock
  (Dolomite,Limestone)
– Detection of oil slick

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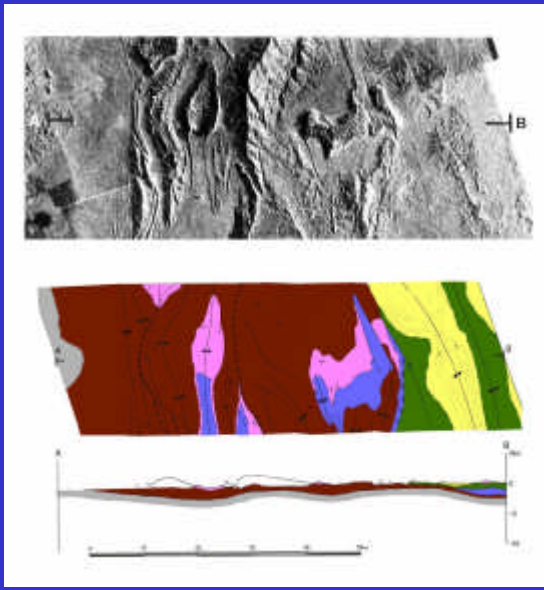
Kutei Basin, Kalimantan, Indonesia



- Tropical rain forest area
  - Difficult to obtain and interpret geological structure using optical data

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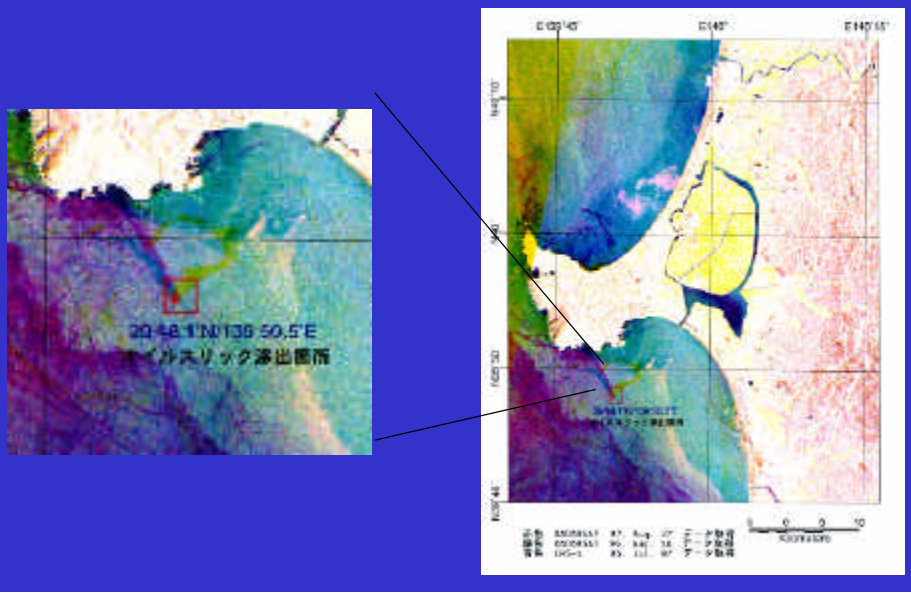
Oil Slick Detection, Offshore Akita



Examples of SAR Data Application to Environment Geology

- Earth surface deformation detection using interferometry technique
- Volcano monitoring & lahar classification
- Slope hazard and mass movement detection
- Flood monitoring in a tropical area

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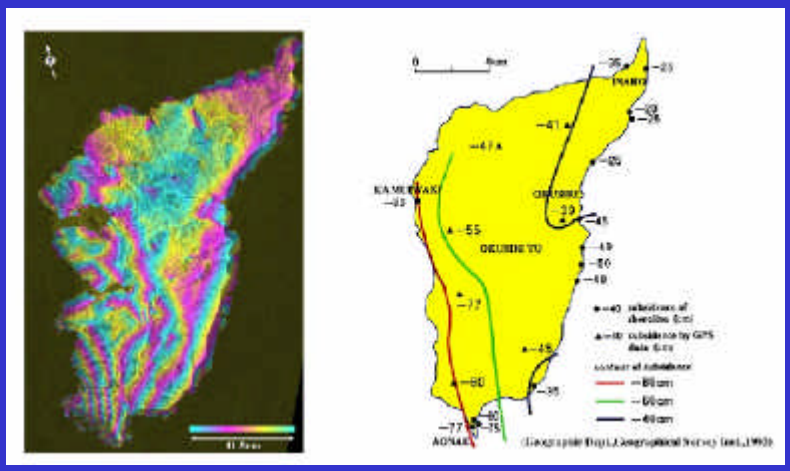
Earth surface deformation Okushiri, Japan



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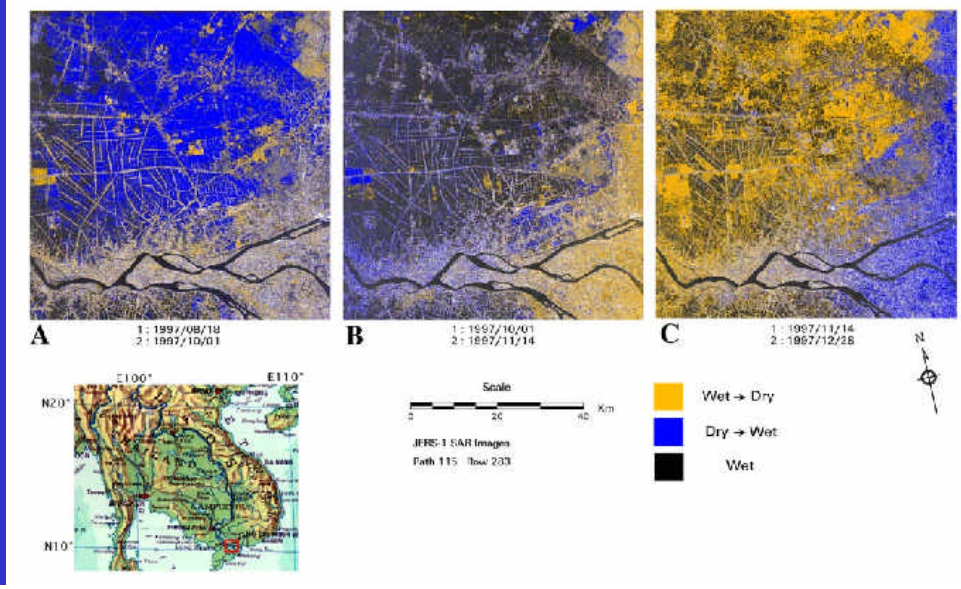
Flood monitoring
Mekong, Vietnam



PALSAR Mission Plan of ERSDAC / METI

- Natural resource exploration
  - Basin Mapping
- Environmental Geology
  - Regional Monitoring (South-East Asia)
- R&D of polarimetric SAR data application
- Urgent Observation

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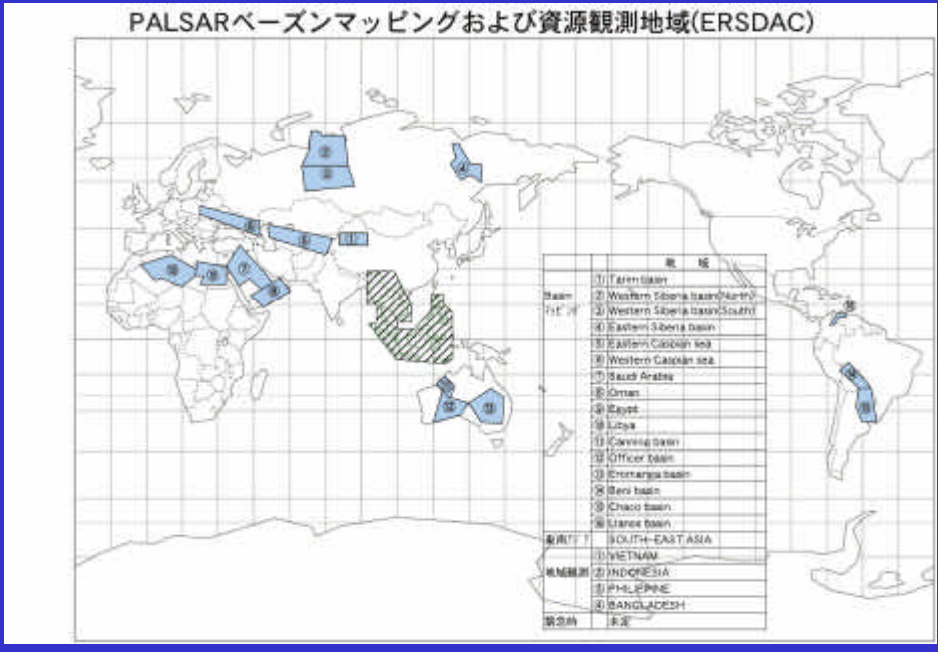
PALSAR Target Area for Basin Mapping and Regional Monitoring (ERSDAC)



Basin Mapping using PALSAR

- Objectives:
  - Basic geological structure information in basin area
  - Data base for petroleum resources potential area
- PALSAR Observation Mode:
  - Off nadir angle = 45 degree in principle
    - Wide off nadir angle is useful for geological interpretation
  - Observation each basin twice per year
  - Total observation scenes over 10,000

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Target Area for Basin Mapping

- **East Asia**
  - Tarim Basin
  - Western Siberia Basin (North)
  - Western Siberia Basin (South)
  - Eastern Siberia Basin
- **Central Asia**
  - Eastern Caspian sea
  - Western Caspian sea
- **Far East**
  - Saudi Arabia
  - Oman
- **North Africa**
  - Egypt
  - Libya
- **Australia**
  - Canning Basin
  - Officer Basin
  - Eromanga Basin
- **South America**
  - Beni Basin
  - Chaco Basin
  - Llanos Basin

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Regional Monitoring

- **Objectives:**
  - Monitoring Geological Hazard
  - International Cooperation
- **PALSAR Observation Mode**
  - Off Nadir = 35 °
  - Interferometric Interpretation
- **Target Area**
  - Southeast Asia
    - VIETNAM
    - INDONESIA
    - PHILIPPINE
    - BANGLADESH

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R&D of Polarimetric SAR Data Application

- Objectives:
  - Mapping, classification and estimation of forest type & biomass etc., for monitoring forest as carbon sink source.
  - Basic information for the early exploration stage [logistics]
- PALSAR Observation Mode:
  - Full polarimetry
- Target area:
  - Typical basin in Southeast Asia
    - Mahakamu Delta, Bangladesh
  - Australia

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Data Fusion

- Data fusion using optical (spectral) data and radar (backscattering) data
  - ASTER & PALSAR
- ASTER (Advanced Spaceborne Thermal Emission and Reflection Radiometer)
  - VNIR (3band+stereo), SWIR (6 bands) and TIR (5 bands)
  - VNIR : regional tectonic information
  - SWIR : detection alteration area (mineralogy)
  - TIR : mapping rock type using deference of silica contents
- PALSAR
  - Geological structure mapping in a tropical rain forest area, boreal area, etc.,

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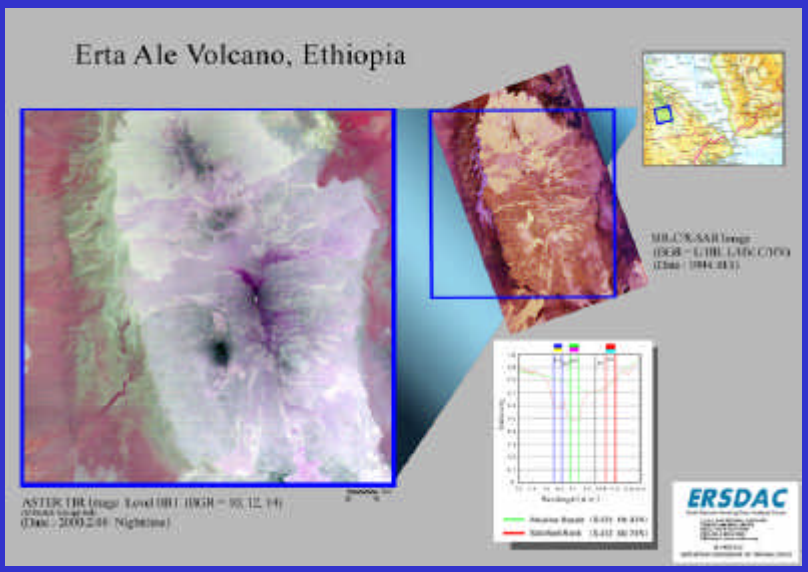
Comparison of ASTER data and polarimetric SAR data (SIR-C/X-SAR)



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Urgent Observation

- Objectives
  - Observation in case of geological Hazard
  - Volcanic eruption, Landslide,Flood, etc.,
  - Cooperated with GSJ and other related laboratories
- PALSAR Observation Mode:
  - Case by case (normal, scan-sar,etc.,)

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Functions of PALSAR GDS

- Receives Observation & Products Requests from Users.
- Sends Observation Requests to NASDA.
- Acquires Raw Data (Level-0 Data) from NASDA via EDB.
- Implements SAR Data Processing to Generate SAR Images .
- Archives Original and Processed Data.
- Distributes SAR Data and Products to Users.

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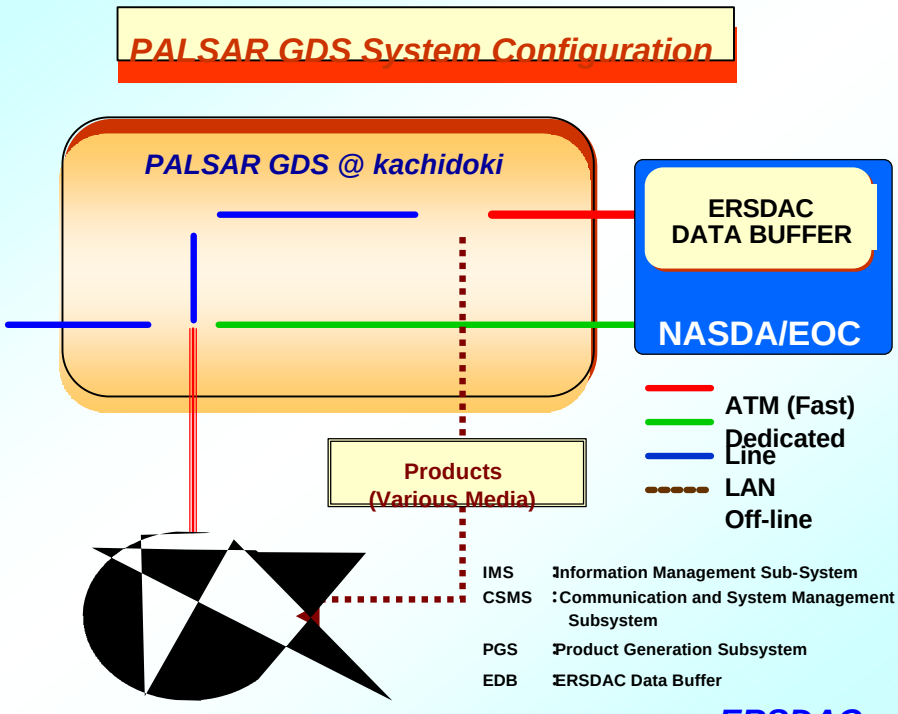
PALSAR GDS System Configuration



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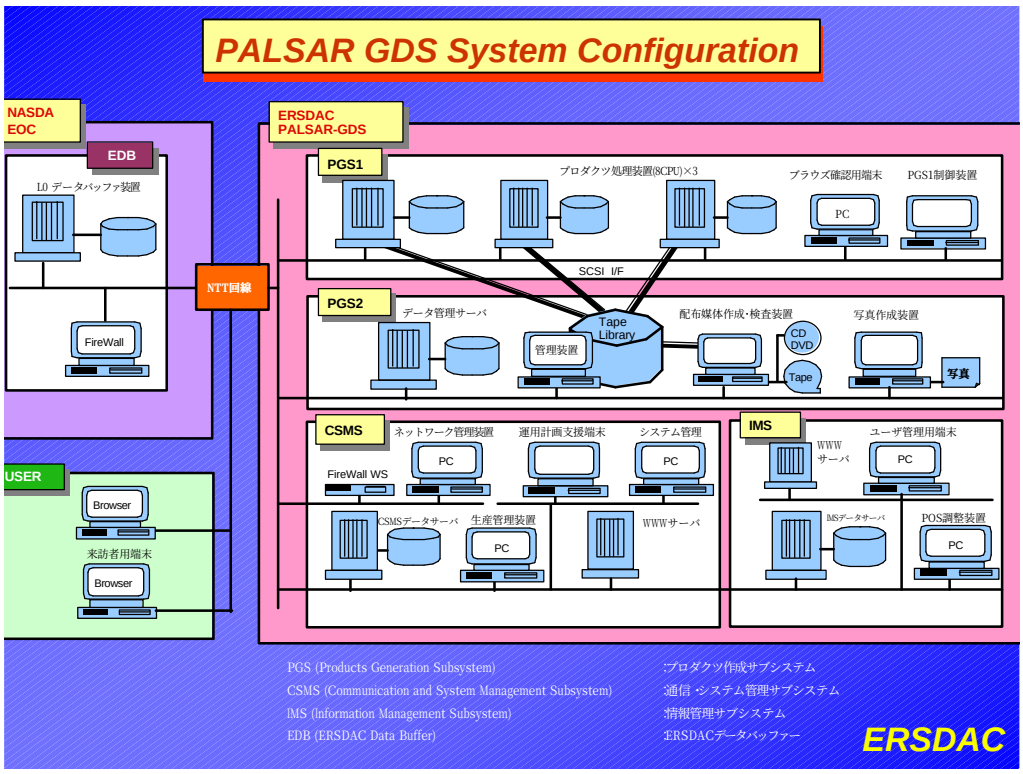

PALSAR GDS System Configuration

EDB (ERSDAC Data Buffer)

Temporary Storage of Level-0 Data (at maximum 1,400 scenes /day from NASDA@EOC)

PGS (Products Generation Subsystem)

- PGS-1 : Data Retrievals、SAR Data Processing
- PGS-2 : Data Archive & Products Distribution (Tape, CD/DVD-ROM, Film, etc.)

Data Transfer (Max) : Level-0 Data 500 scenes/day from EDB to GDS
Data Processing (Max) : Level-1 500 scenes/day , Level-1.5 100 scenes/day ,
ScanSAR : 10 scenes/day , Multi-Polarimetry data 10 scenes/day .

CSMS (Communication & System Management Subsystem)

- CSMS-1 : System & Network Management, Operation Scheduling, etc.
- CSMS-2 : Production Management

IMS (Information Management Subsystem

- IMS-1 : Management of Observation and Products Requests, User Registration, etc.
- IMS-2 : Planning of Observation Request to NASDA and Communication Control.

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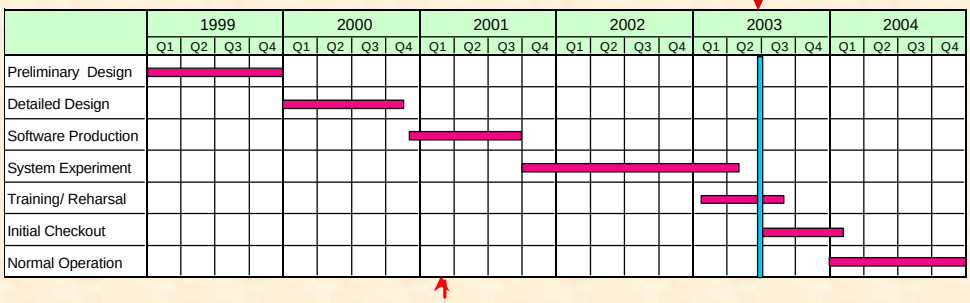
Oct., 2000

PALSAR GDS Master Schedule

ALOS Launch
(June, 2003)



Today
(2001.03.27)

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