The European GNSS Programmes
- Status and Potential Use during Crisis -

Frédéric Bastide
European Commission
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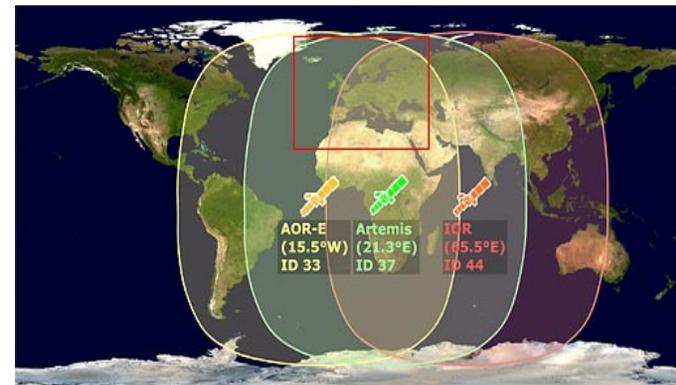Directorate-General for Enterprise and Industry

GALILEO EGNOS

Navigation solutions powered by Europe

EGNOS is Fully Operational

★ **EGNOS open service is operational** since October 2009

★ **EGNOS Safety of Life** service was declared operational in March 2011

★ Pau Pyrénées airport (France) became **Europe's first airport to use the EGNOS Safety of Life service** to guide in aircraft for landing in May 2011

★ Since December 2011, the EGNOS-based LPV procedures at Alderney airport (Channel Islands) are the first in Europe to be used for **commercial flights**

★ Over **100** EGNOS approach procedures for aircraft landings already published in Europe

AOR-E
(15.5°W)
ID 33

Artemis
(21.3°E)
ID 37

IOR
(65.5°E)
ID 44

LPV: Localizer Performance with Vertical guidance

Galileo is Taking Off

★ The first 2 **operational satellites** were launched on 21 October 2011 (in addition to the two test satellites launched in 2005 and 2008)

★ Further two Galileo satellites will be launched on the 28th of September 2012

★ All **industrial contracts** necessary to ensure early Galileo services in 2014 have been signed

★ To **accelerate Galileo's deployment** and to further contain costs, the following contracts were signed on 2 February 2012:

  - Additional order for 8 satellites

  - Adaptation of Ariane-5 for Galileo

  - Booking of one Ariane-5 launch

Galileo Services Provision Timeline

Early services will be provided from 2014 with a gradual transition towards full services as more satellites become available
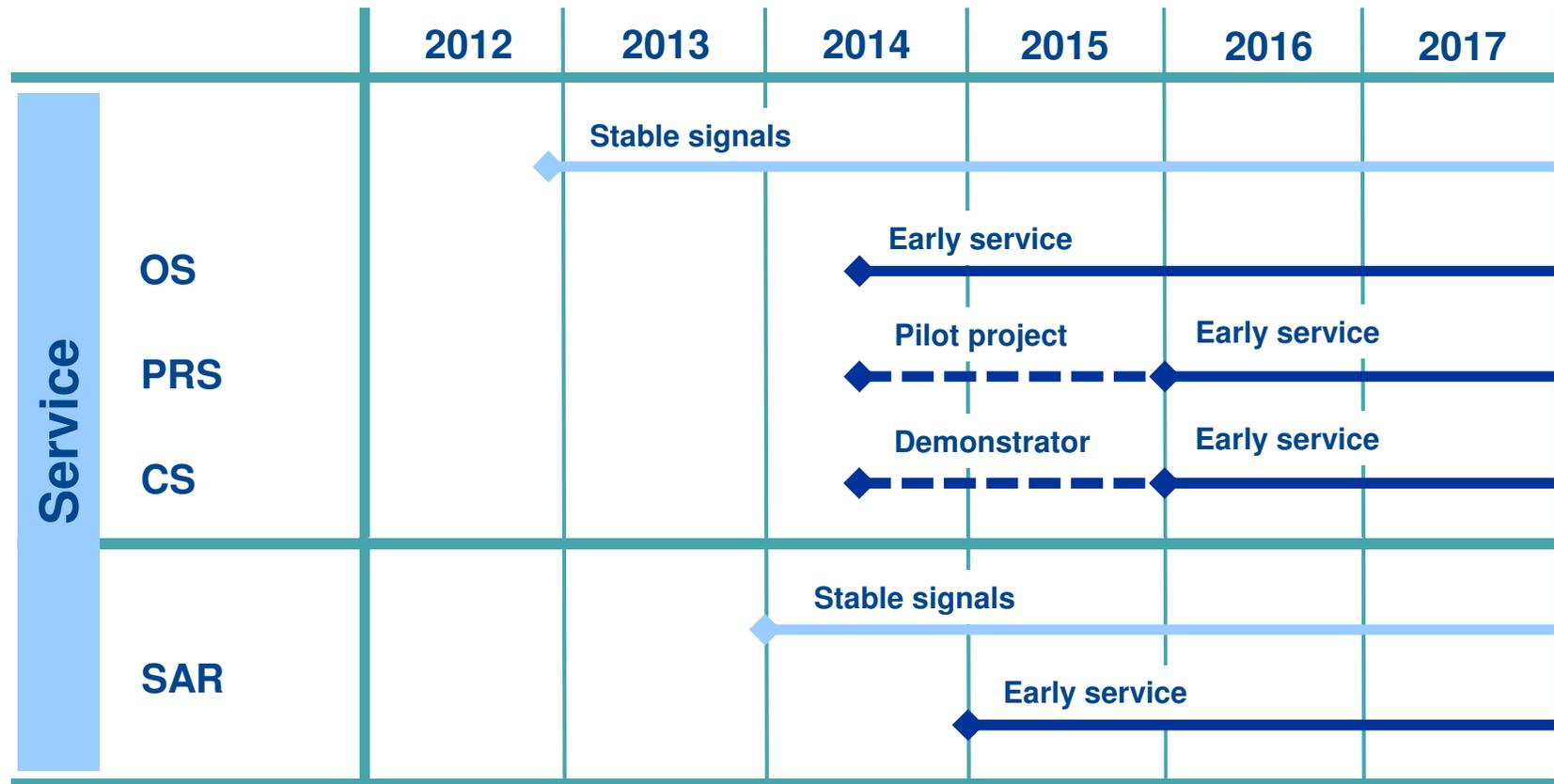
Characteristics

- Free of charge positioning, navigation and timing information
- Galileo Open Service is fully interoperable with GPS

Users

- Mass-market applications (i.e. smartphones, in-car navigation)

Next steps

- Provide early Galileo Open Service from 2014
- Autonomous and continuous service available when the full constellation is deployed

Open Service (OS)	Freely accessible service for positioning and timing	

Galileo PRS will be an encrypted, robust and continuous service

Characteristics

- Signals resistant to involuntary interference, malicious jamming, spoofing and meaconing
- Continuous service even in crisis conditions
- PRS will function independently of GPS

Users

- Authorised users requiring a high continuity of service, with controlled access (i.e. governmental bodies)

Next steps

- Involve pilot Member States (MS) that will start using PRS from 2014
- Provide early Galileo PRS service from 2016

Public Regulated Service (PRS)	Encrypted service designed for greater robustness and higher availability	

PRS Access Rules – General Principles

★ Decision 1104/2011 ("PRS Access Rules") adopted by the European Parliament and the Council on 25 of October 2011

★ The MS, the Council, the European Commission and the EEAS have the right to unlimited and uninterrupted access to the PRS worldwide
  - MS will decide independently who the authorised PRS users will be
  - The Council, the European Commission and the EEAS will decide which categories of agents are authorised to be PRS users

★ Union agencies may become PRS participants to fulfil their tasks and if relevant administrative agreement is concluded with the European Commission

★ Non EU states or international organisations could become PRS participants if:
  - A security Agreement exists between the EU and that state/organisation
  - A specific Agreement defining the access modalities is concluded with the EU

Galileo SAR will efficiently contribute to international search and rescue operations

Characteristics

★ Provides a "forward link" for the detection of distress signals

★ Introduces a unique "return link" feature to send detection acknowledgement message from the SAR operator to the distress emitting beacon

★ Europe's contribution to the MEOSAR system of COSPAS-SARSAT

Users

★ Used by national Rescue Coordination Centres in the detection and localisation of distress events from owners of COSPAS-SARSAT beacons

★ COSPAS-SARSAT contributes to saving 1300 lives per year on average

Next steps

★ Sign contract with SAR operator in April 2012

★ Provide early Galileo SAR service from 2014

Search and Rescue Service (SAR)	Assists locating people in distress and confirms that help is on the way	

MEOSAR: Medium Earth Orbit Search And Rescue System

Potential Use of GNSS during Crisis

★ GNSS can contribute in every phase of the disaster management cycle above

★ Large-scale disaster often affect transport, communication and energy distribution on a wide-area (regional/global)

- local ground-based infrastructure can be unavailable therefore satellite technology which cover wide area can be useful

Pre-Disaster Phase

★ For risk assessment/prevention

- Monitoring of ground profile (eg for landslides and earthquakes), sea level (eg for tsunamis), infrastructure monitoring (eg nuclear plant)

★ Preparedness

- Alert broadcasting (potential GNSS service)

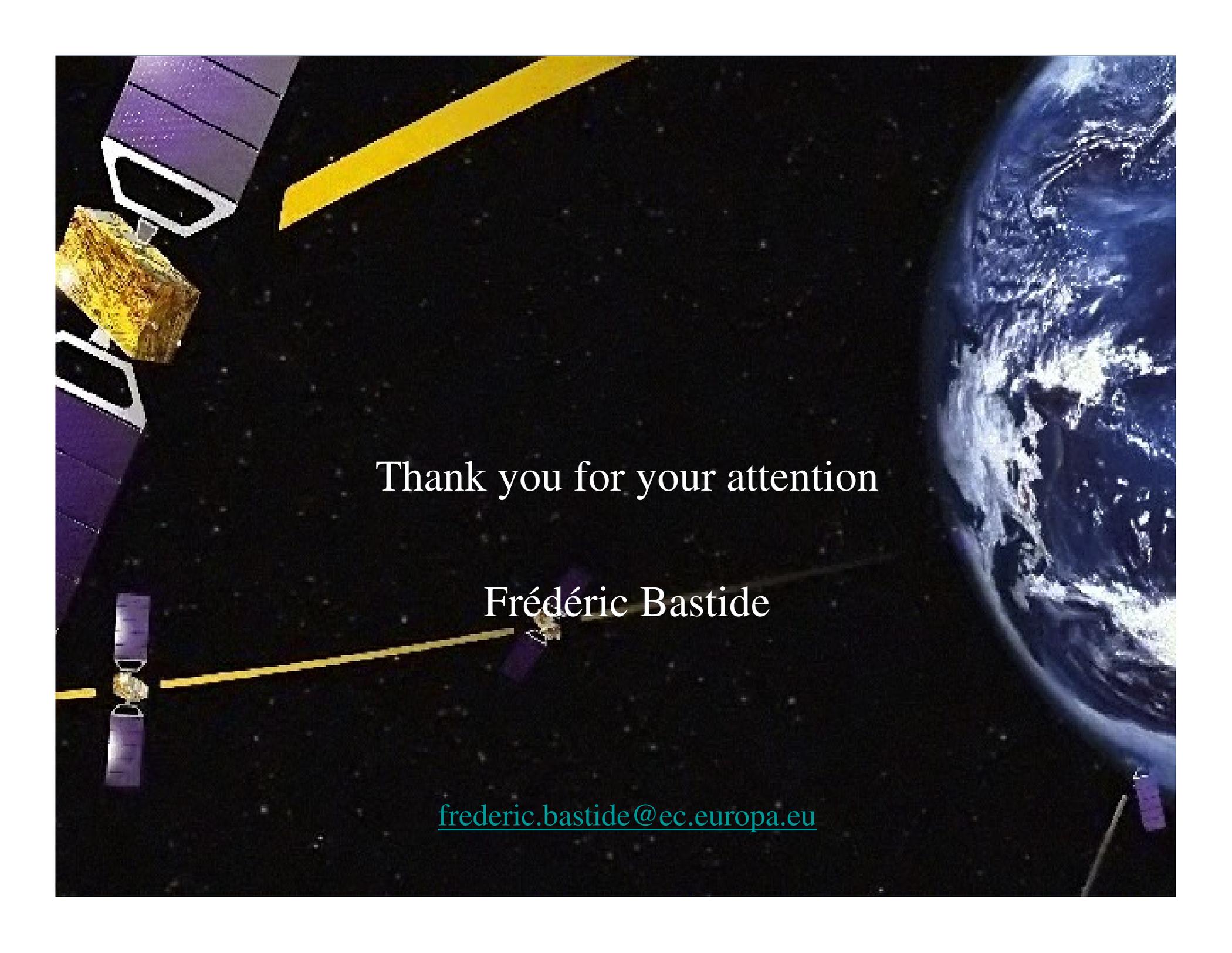★ When a disaster occurs, very fast and efficient response must be provided

★ GNSS can be instrumental by supporting:
  - an efficient management of the rescuers and fleets (in difficult environment)
  - an increase of the safety of the rescuers
  - the coordination and logistic support to the operations (e.g. unmanned delivery of goods (parafoil))
  - aid to navigation in difficult environment (eg destruction of local aids to navigation, bad weather, scarce visibility (fire))

★ Assessing damage
  - Rapid mapping / Support to the delivery of reference damage maps

★ Restoration of the infrastructure (eg telecom) and buildings

- As during the immediate disaster response phase, reconstruction crews and materials can be better coordinated using GNSS

- GNSS data used in combination with data from aerial and space based Earth observation systems for optimized processes

★ Analysis of GNSS data gathered before and during the disaster to better model the causes of a disaster and better predict their occurrence (eg earthquakes or volcanic activity)

★ Analysis of the ways GNSS data are used in rescue operations can assist in developing improved procedures for future events (e.g. by preventing bottlenecks in crowd movements)

Thank you for your attention

Frédéric Bastide

frederic.bastide@ec.europa.eu