

# EU **SATELLITE** NAVIGATION

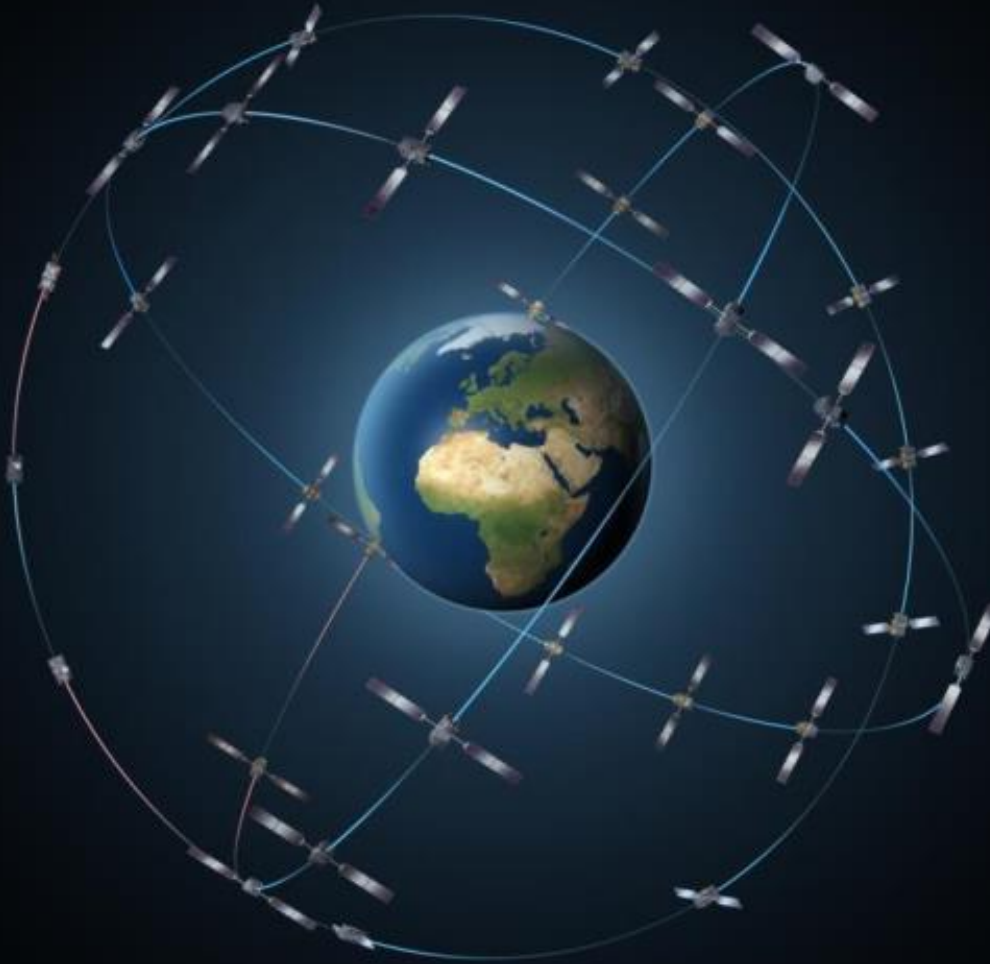
Galileo Emergency Warning Service

Search & Rescue Service

PSCE Conference, 4 December 2019, Paris



# GALILEO: THE EU GLOBAL SATELLITE NAVIGATION SYSTEM



Open Service (OS)	Ranging level : <2m Timing accuracy : <30 ns (Typ. positioning accuracy: 1.5-3m)
Public Regulated Service (PRS)	Encrypted signal reserved for governmental authorities
Search And Rescue Service (SAR)	Detection times (1-10min) Localisation accuracy (2-5km)

# Emergency Warning Service

# BACKGROUND

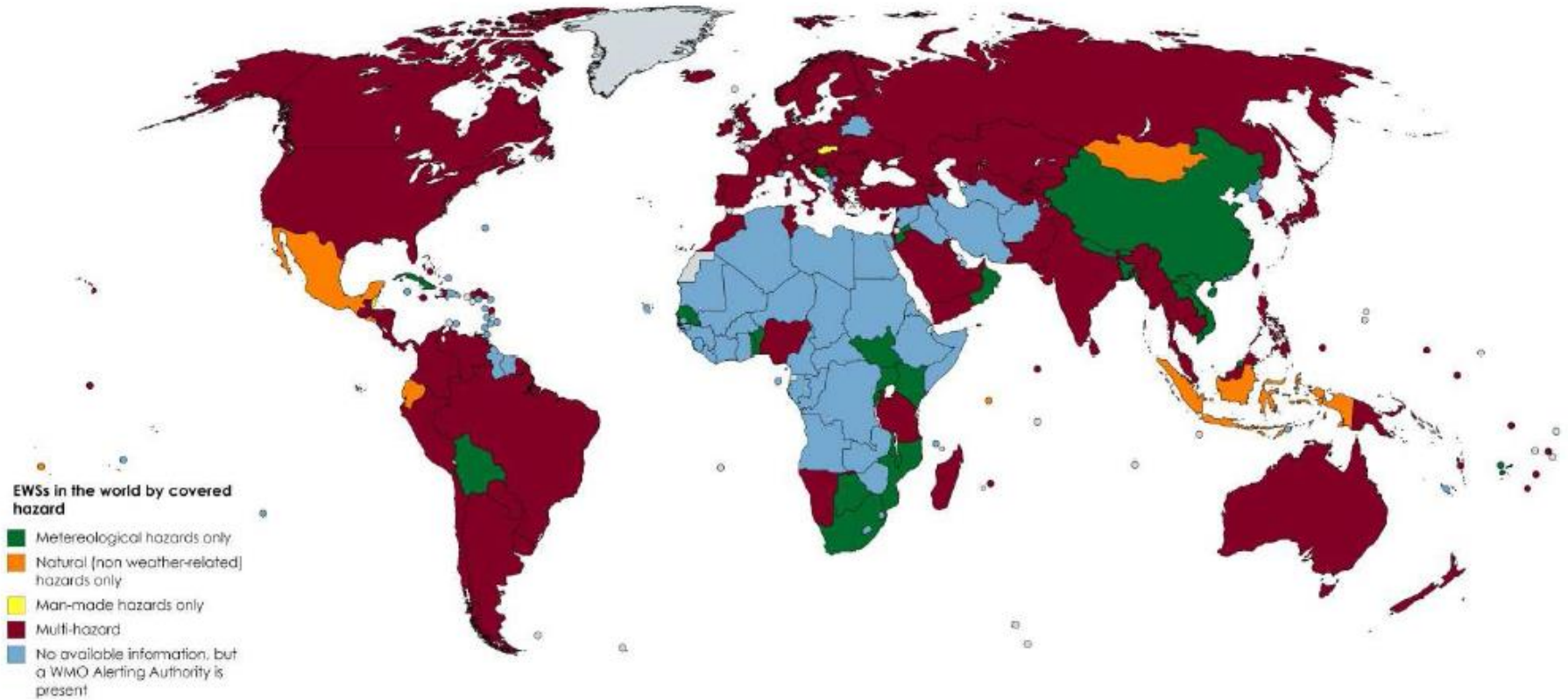


The European Commission will deploy a new Galileo service:

- NAME: Galileo Emergency Warning Service
- SERVICE PURPOSE: Alerting the population on case of a looming disaster
- DISASTER TYPE: (Any)
  - Terrorist attacks
  - Forest fires
  - Tsunamis
  - Industrial disasters
  - Nuclear Alerts
  - Floods
  - ...
- Included in the future Space Regulation and will be referenced in the Union Civil Protection Mechanism



# A WORLDWIDE STAKEHOLDER CONSULTATION



# FEEDBACK FROM OUR CIVIL PROTECTION STAKEHOLDERS



A GNSS-based Emergency Warning System is beneficial in case of alerts to the population

- Resilience to ground destruction
- From very large (10000km) to very small coverage area (100m)
- Multi-hazard (tornadoes, earthquakes, nuclear disaster or industrial disaster, terrorist attacks, ...)
- Complementary to existing systems

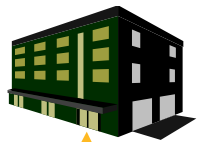
# WORKING WITH EU MS CIVIL PROTECTION AND GNSS

- ON-GOING: DEFINING EWS MISSION (MISSION REQUIREMENTS):
  - Initial study capturing feedback from CP stakeholders
  - Consolidation with EU Member States
    - DG ECHO EWS Expert group
    - DG GROW GNSS Working group
- NEXT: Service Consolidation with EU Member States (CP/GNSS):
  - EWS Service sizing/security/operations concept
  - EWS Message definition & coding:
    - Events
    - Guidance Library
    - Target Area Definition
    - ...

# CONCEPT OF OPERATIONS



National Emergency Centre  
**DECISION**



CAP / XML

Galileo Emergency Service  
Interface



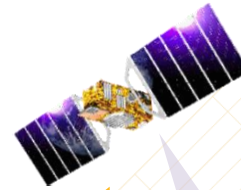
EWS Message  
Bit level



Civil protection



Galileo Ground Segment



Population





# SIGNAL IN SPACE

- E1B: One word, 128 bits available, Emergency Message based on 122 Bits
- E5B: More bandwidth available
- Authentication feature of Galileo
- Ideally targeting mobile phones but will work with any GNSS RX compatible with Galileo

1 124 484 112

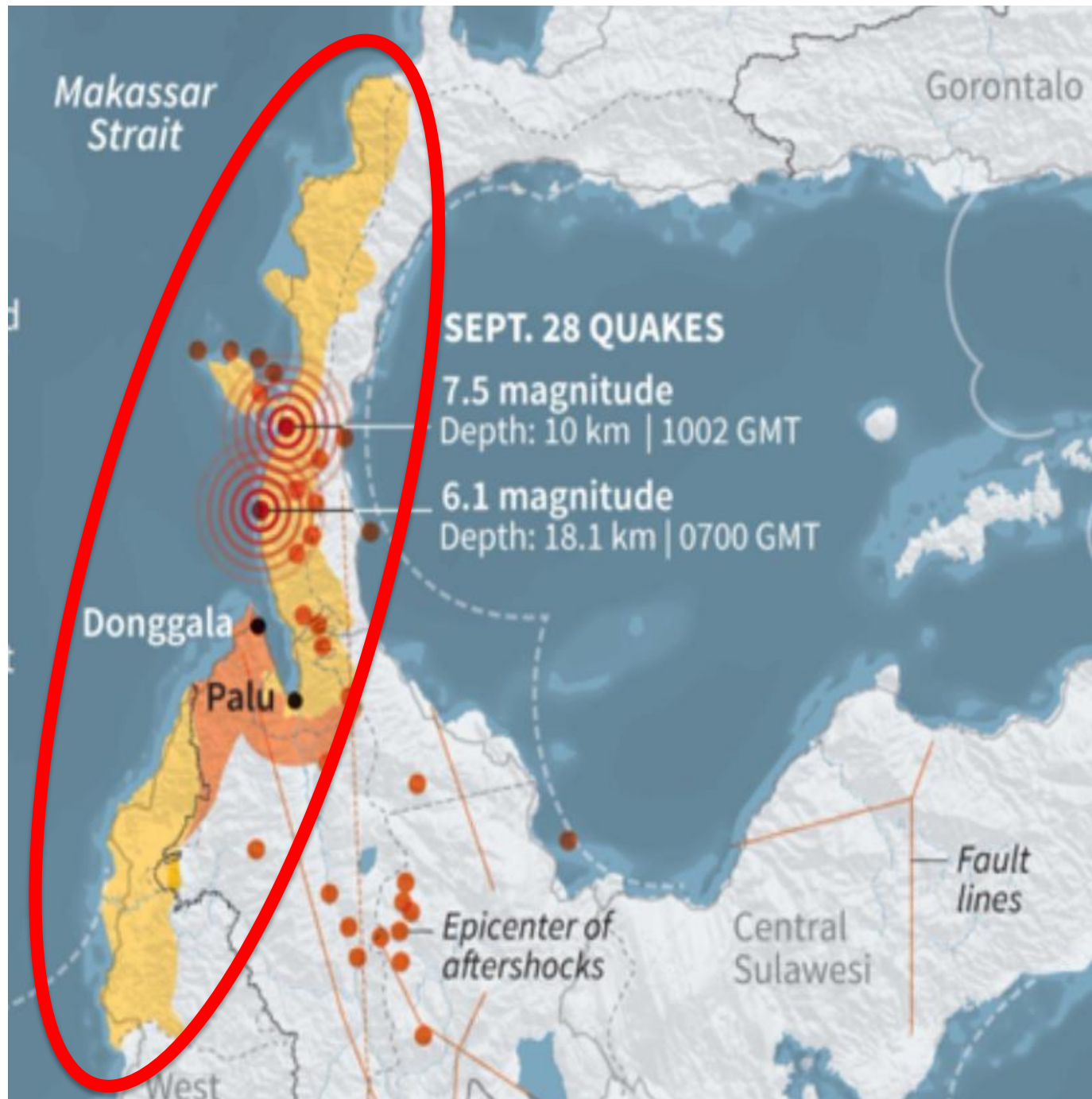
Estimated number of  
Galileo-enabled  
smartphones today



# SOME EXAMPLES





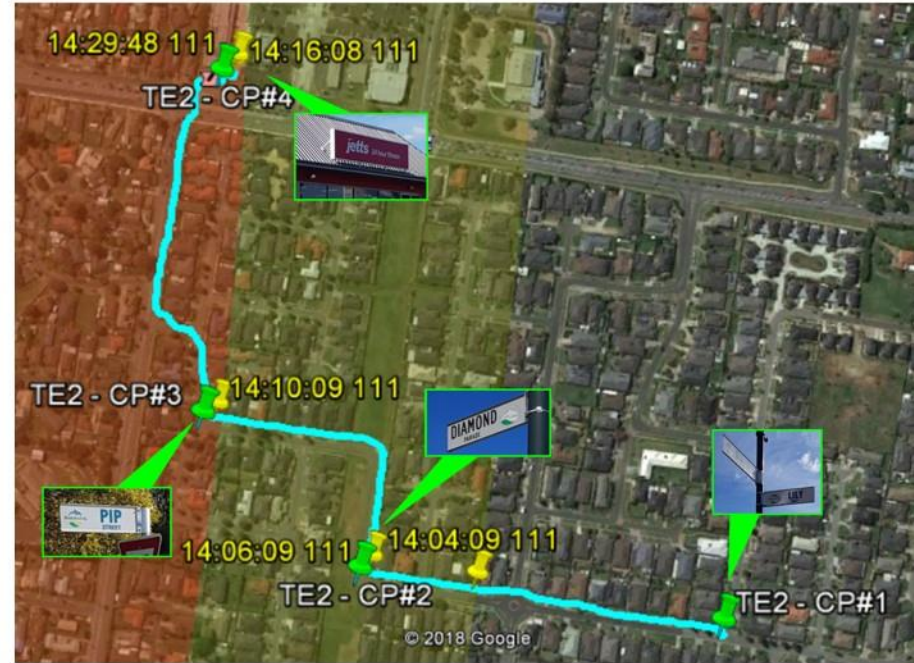




# Test Trial 3

« Stay inside »

« Evacuate to reach meeting point... »





# SIGNAL IN SPACE EWS MESSAGE



- Embedded in the OS Navigation Message
- Will contain all necessary information to warn the population:
  - Target Area
  - Disaster Type
  - Event Onset
  - Event Duration
  - Guidance / Instructions to follow
  - Additional information (Earthquake magnitude, Tsunami wave height...)
- The EWS message is under construction and requires interfacing with the EU Member States Civil Protection authorities

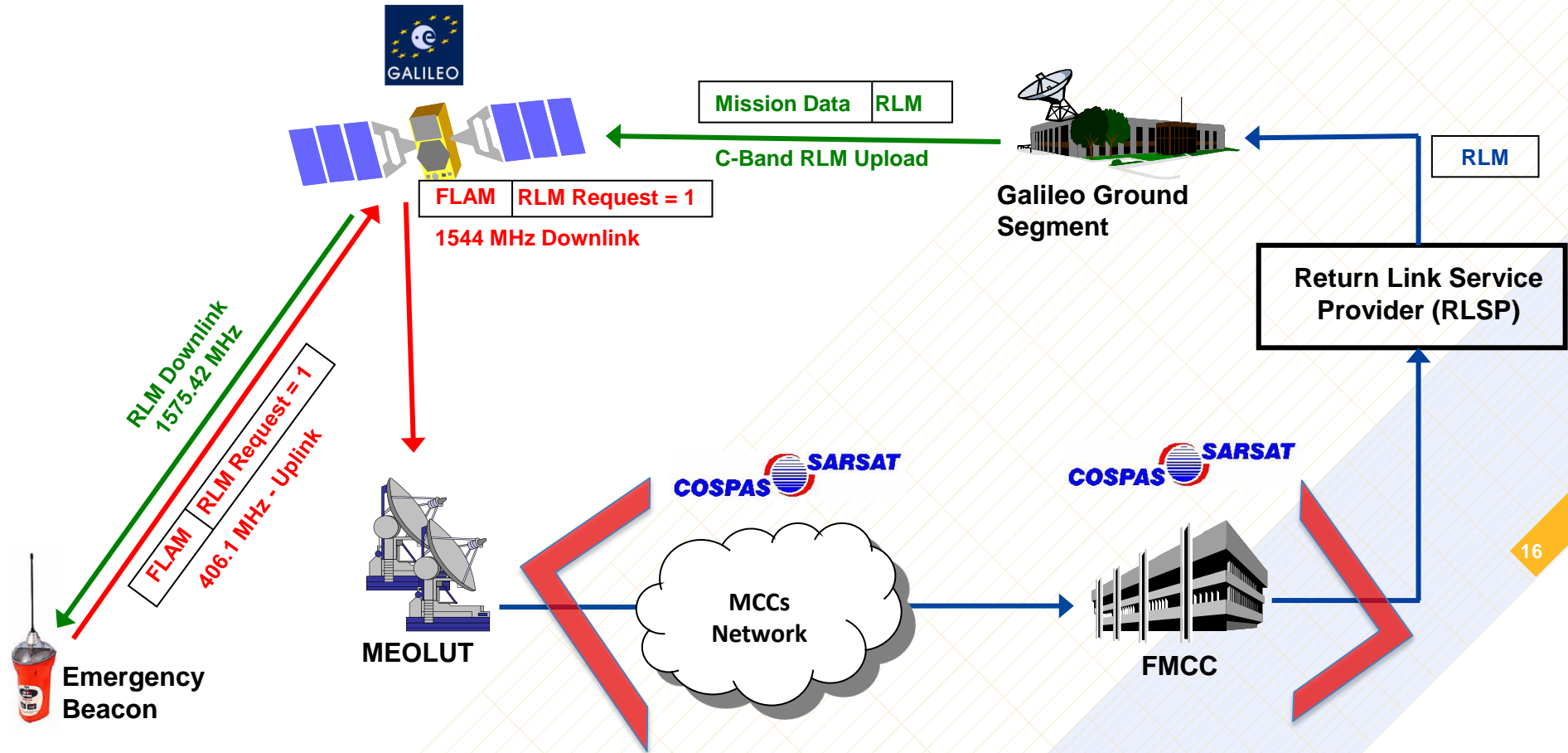
# HOW TO GET THERE



- Policy level:
  - Space Regulation & UCPM need to go through the legislative process
- Technical level:
  - Converge on EWS data formats and standards (CAP/XML/...)
  - Development of an operational EWS network and operational interfaces between the Civil Protection Centres and GNSS Operations
  - Receiver and/or mobile phone industry needs to be involved
    - Ideally EWS capacity embedded within any mobile phone
  - Procurement of Galileo infrastructure and operations (GSA/ESA/Industry)
- Possibility to build an international standard:
  - Working with other GNSS providers in the frame of United Nations International Committee on GNSS (UN ICG)
  - Considering interoperability with other GNSS systems (QZSS)

# Search and Rescue Service

# SAR GALILEO RETURN LINK SERVICE (RLS)



RETURN LINK SERVICE DECLARATION UNDER PREPARATION



**THANK YOU**

<http://ec.europa.eu/galileo>