

SAR/Galileo: A Contribution to Cospas-Sarsat MEOSAR

Galileo Workshop Status en Toepassingen

I. Stojkovic, principal SAR engineer, Galileo

Galileo Reference Centre, Noordwijk, 11/10/2019

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Galileo Services



Open Service (OS)

- Available world wide
- Interoperable with other satellite systems
- Free of charge



Public Regulated Service (PRS)

- Governmental users
- Robust and encrypted signals



Search and Rescue (SAR)

- European contribution to Cospas-Sarsat
- Free of charge
- Worldwide coverage



Start of the Initial Services provision



2016 DECEMBER						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31



Search and Rescue (SAR/Galileo)

- European Contribution to Cospas-Sarsat

Galileo Search and Rescue Service Definition Document

Version 1.0, December 2016



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SAR/Galileo Service – part of MEOSAR



Source: Cospas-Sarsat

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Cospas-Sarsat MEOSAR System Advantages



- MEOSAR : A major evolution of the Cospas-Sarsat system
 - Significant **performance improvement** with regards to LEO and GEO
 - Near-instantaneous worldwide **detection**
 - Improved **location accuracy**
 - Significantly reduced effect of terrain/wreckage or sea-state **obstructions**
 - Extensive **redundancy** both in Space and Ground Segments

MEOSAR Advantages for SAR Community



Better and **faster** ALERT
localization **accuracy**

=

Improved **effectiveness** of
rescue operations

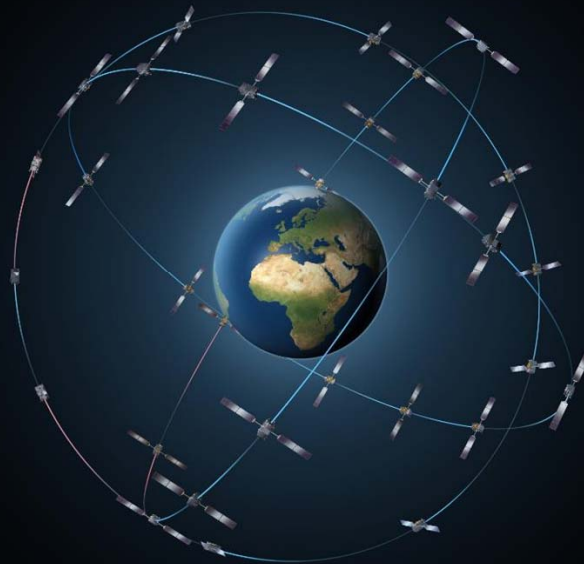
**WHAT'S THE GALILEO
CONTRIBUTION?**



SAR/Galileo Space Segment



23 payloads provided
by Galileo



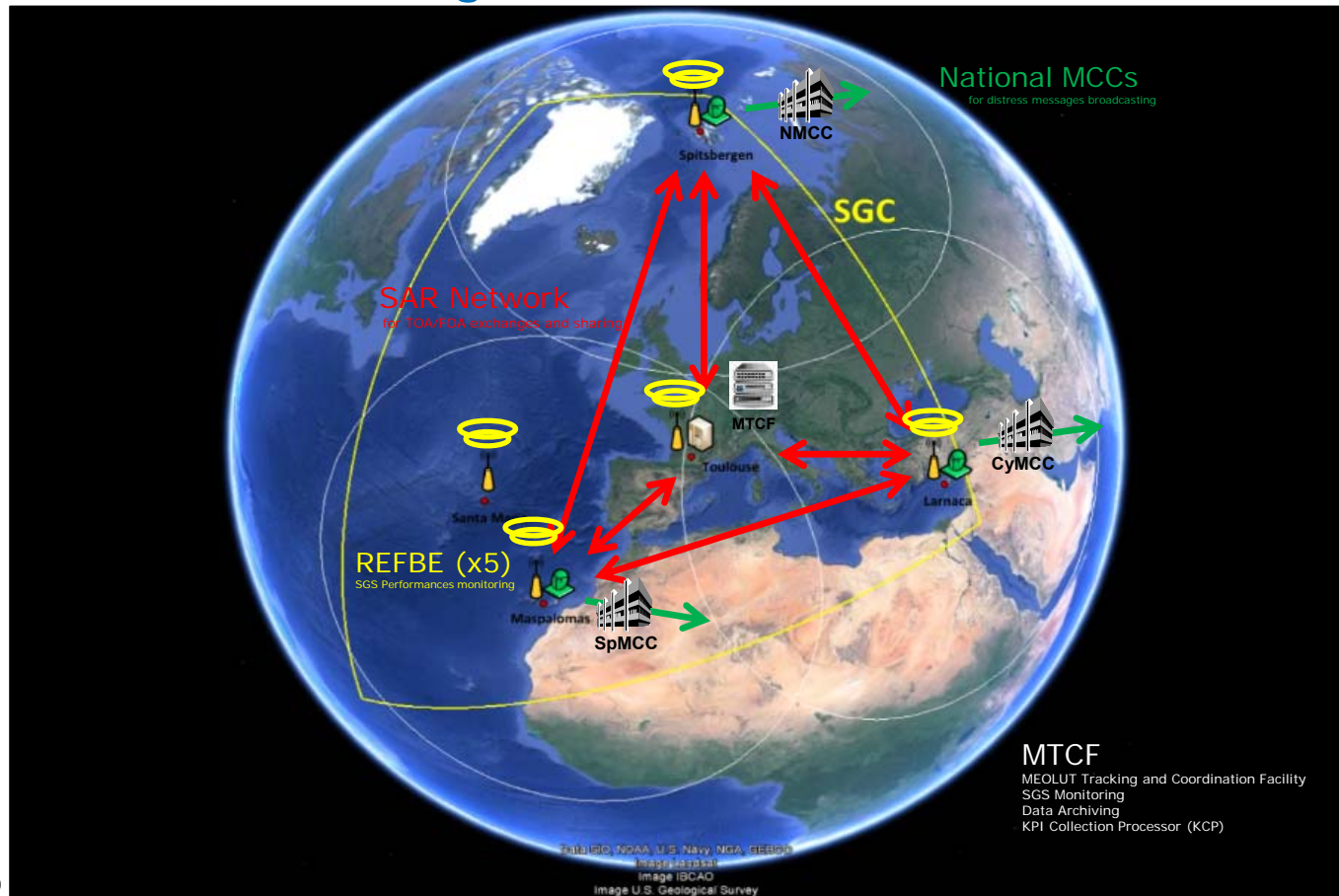
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SAR/Galileo Ground Segment



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SAR/Galileo MEOLUT Local Facilities



SVALBARD (Norway)



MASPALOMAS (Spain)



LARNACA (Cyprus)

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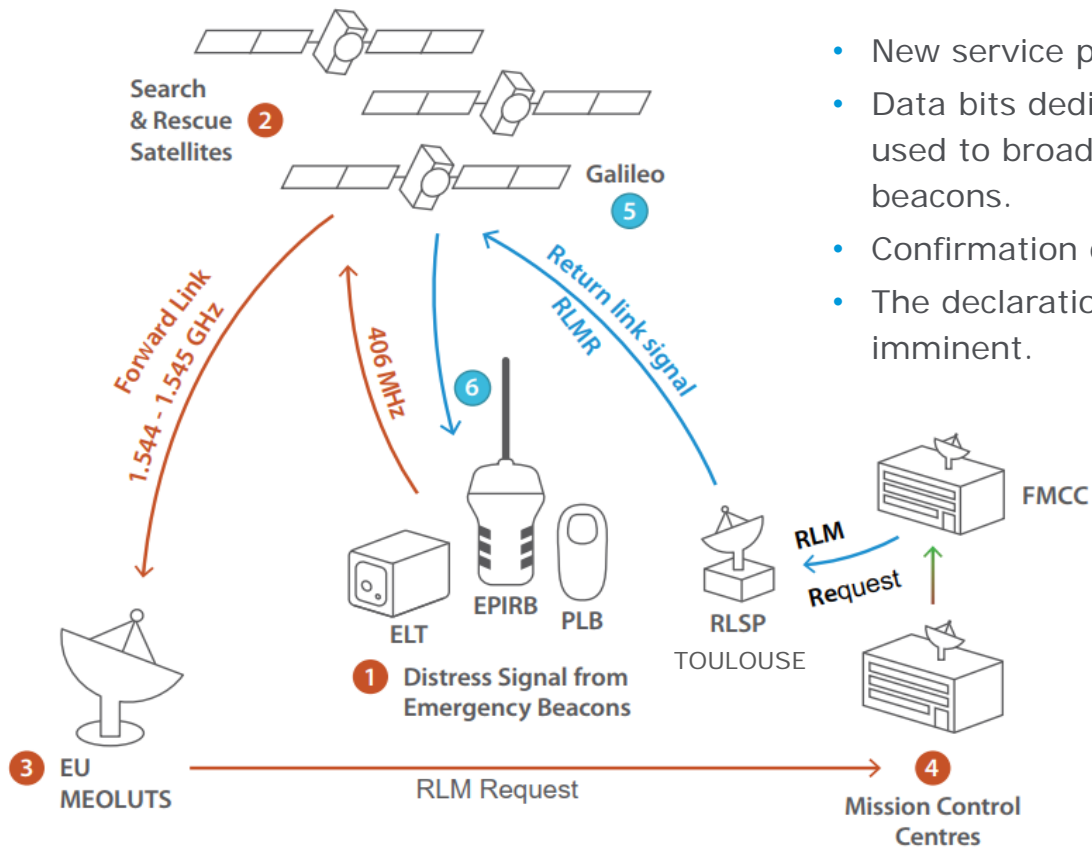
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SAR/Galileo Performance



Performance parameter	MPL	observed
% of transmitted bursts that are detected by at least one MEOLUT	>99%	99.9%
Location probability after 1 transmitted burst	>75%	99.8%
Location probability after 12 transmitted bursts ~10 min	>98%	100%
Location accuracy within 5km after 1 transmitted burst	>70%	98.9%
Location accuracy within 5 km after 12 transmitted bursts ~10 min	>95%	99.7%
Location accuracy within 2 km after 12 transmitted bursts ~10 min	>80%	96.3%

Return Link Service



- New service provided only by Galileo.
- Data bits dedicated to SAR/RLS on the Galileo E1 signal are used to broadcast Return Link Messages (RLM) to distress beacons.
- Confirmation of reception of the alert (Acknowledgment).
- The declaration of the SAR/Galileo Return Link Service is imminent.

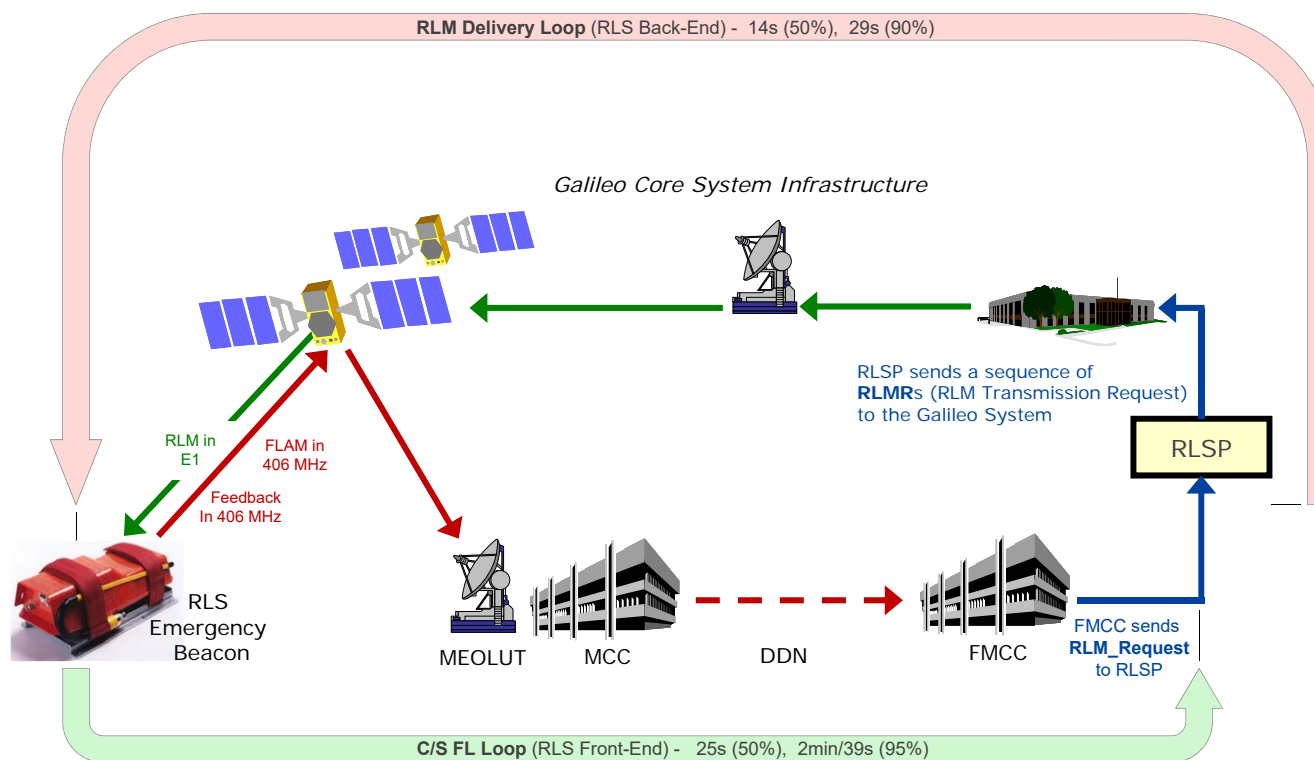
EUROCAE WG98-1 working on standard (MASPS) for **remote activation** of ELT-DT via the RETURN LINK of Galileo in cases of:

- Aircraft disappearance
- Un-responsive crew
- Hi-jacking

Access to authorized users (Airlines, ATC...)

WG98 SG-1 completion by DECEMBER 2019

RLM Delivery Latency



SAR/Galileo in Action demonstration



- Volunteer cast at sea in a liferaft
- 406 MHz PLB activated
- In 3 min / 32 sec :
 - Detected
 - Localized
 - Location confirmed independently
 - Oostende M-RCC informed



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S & R of SAR/Galileo



- SAR/Galileo MEOSAR Alert Service takes the “**search**” out of the **Search And Rescue** by reducing the time for detection and reliable location of the emergency down to minutes.
- SAR/Galileo Acknowledgement Return Link Service will give support to the “**rescue**” part of **Search And Rescue**, by providing reassurance to the persons in distress.



- Rescue:

- **Mr Henk Kok**

Senior International Advisor SAR

KNRM, Royal Netherlands Sea Rescue Institution

