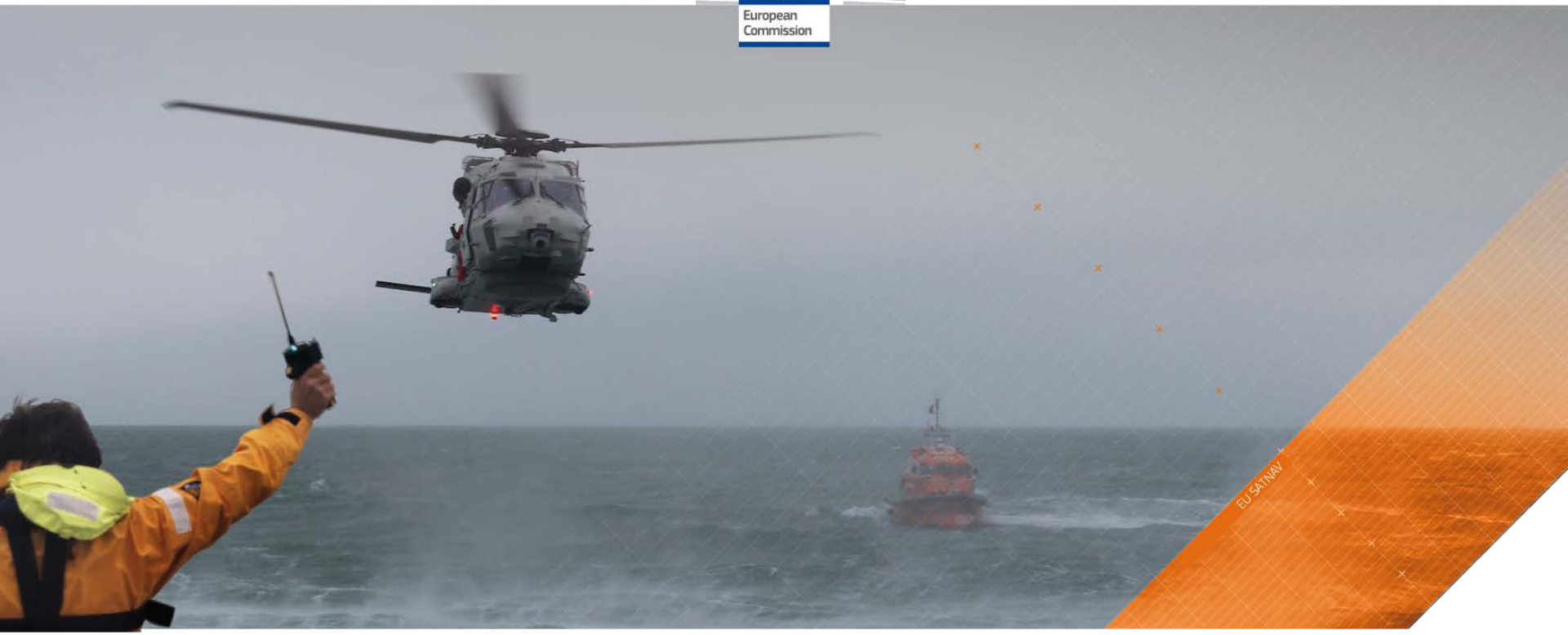


GALILEO SAR SERVICE

RETURN LINK SERVICE STATUS AND ROADMAP

RTCM 2017 ANNUAL ASSEMBLY MEETING • CLEARWATER BEACH, 10 MAY 2017

SAR GALILEO RETURN LINK SERVICE - AKNOWLEGMENTS

Acknowledgment Type 1

- The Galileo System is the only responsible for the transmission of the RLM to the beacon once the alert has been detected and located

Acknowledgment Type 2

- The Galileo System will send the RLM to the emitting beacon once it has received the instruction from the RCC

SAR GALILEO RETURN LINK SERVICE – IMO PERSPECTIVE

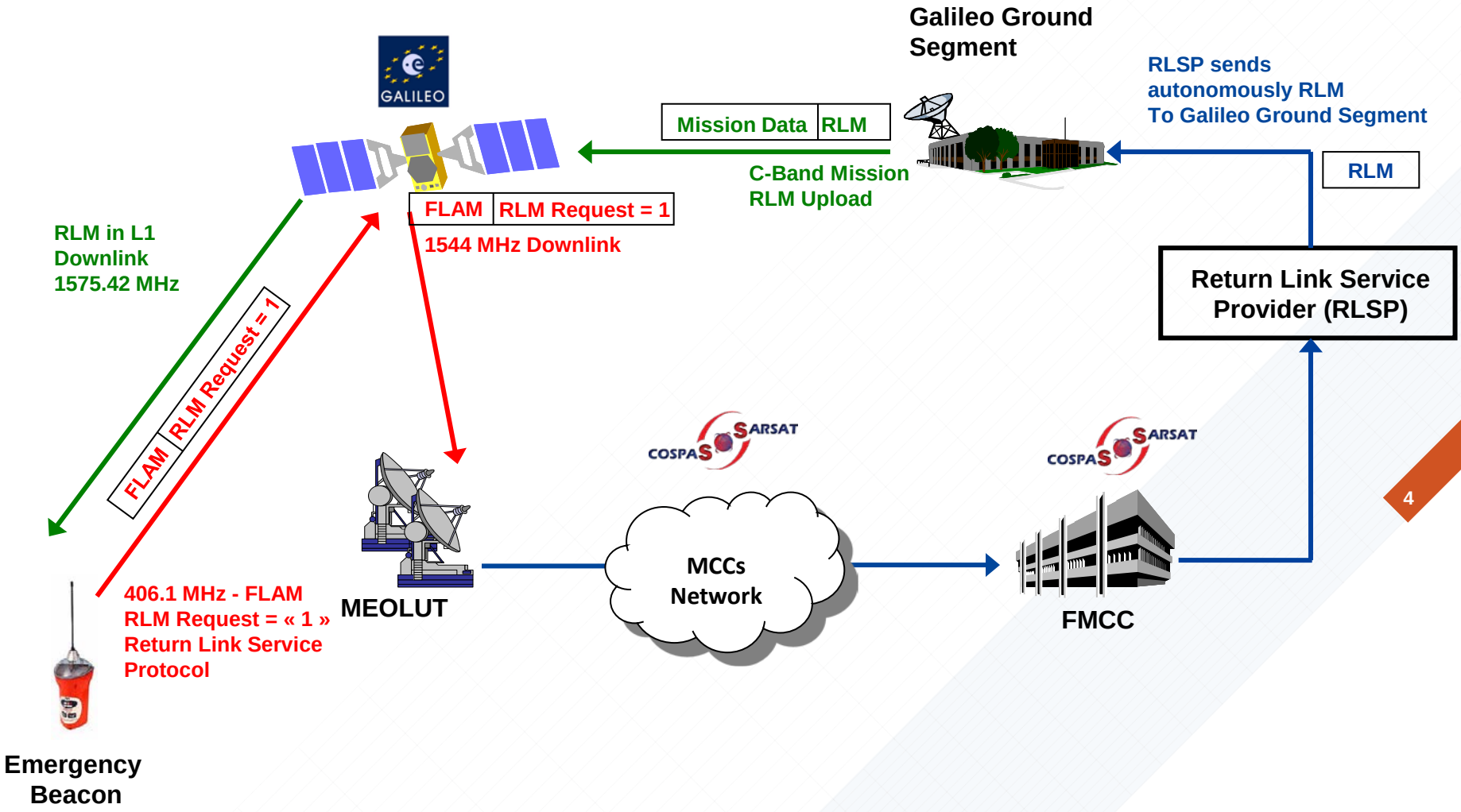
In March 2012, the European Commission participated to the COMSAR 16 and presented a paper on the Return Link Service

- **Outcome of COMSAR 16:**

> ***6.22 The Sub-Committee endorsed:***
>
> *…*
>
> *.4 the acceptability of the Return Link Message (RLM) Type-1 including the optional inclusion of this particular functionality within distress beacons; and*
>
> *.5 the further consideration of the complex matter of RLM Type-2 messages by the ICAO/IMO Joint Working Group.*

The EC retains the possibility to offer the RLS Type-2 service to interested RCCs and offer it as an additional service

SAR GALILEO RETURN LINK SERVICE



SAR GALILEO RETURN LINK SERVICE PRE-OPERATIONAL FACILITY

- **Pre-Operational Facility deployed in FMCC:**
  - **Cospas-Sarsat Test Campaign (test O-5) scheduled end of 2017**
    - **Between October 2017 and December 2017**
    - **Participation of several MCC with test beacons: SPMCC, BRMCC, NMCC, USMCC, FMCC, ITMCC**
  - **Participation of a number of beacon manufacturers planning to tests the RLM capability in their new beacons: Mobit, Orolia**

- **Reference Standards:**
  - **T.001 / T.007: Return Link Service Protocol and GNSS Receiver operations for RLS (published)**
    - **<u>but without the RLM acknowledgment mechanism</u> on the pre-operational RLSP: transmission of RLM continues until timeout**
  - **Galileo Signal in Space ICD: Definition of RLM Message (published)**

D&E operational TEST O-5

- **Objective of test O-5:**
  - Evaluate the global performances of the SAR/Galileo Return Link Service
    - in terms of latency, interface and acknowledgment detection probability
    - in respect of the COSPAS/SARSAT specifications

- CNES, as SAR/GALILEO Data Service Provider (SGDSP), is in charge of the coordination of the test 0-5

- 3 mains criterions targeted:
  - RL-1: Validation of the different interfaces between the entities involved in the RLS,
  - RL-2: Measurement of the RLM time transfert for assessing the system latency (from MCC* to the RLS beacon),
  - RL-3: Determine the RLM detection probability within 15 minutes from the RLM transmission by the RLSP to the GMS.

D&E Test O-5: KEY Actors and METHODOLOGY

Current list of participants :

- MCCs: FMCC, NMCC, SPMCC, ITMCC, USMCC and BRMCC.
  - LGM or D&E compliant with the C/S A.001 document of Dec. 2016
- RLS Beacons operators: one RLS Enabled Beacon (REB) at each MCCs location and one at ESA (The Netherlands)
- 2 additional RLS Prototypes: Mobit (Israel) and McMurdo (France)

Methodology :

- RLS Test Beacons deployed (one per MCCs and one at ESTEC) according to several scenarios (cf. next slide).
- Each RLS Test Beacons will follow a script in order to transmit 20 beacons IDs with a 50s rate and 10s interleaved.
- Each participant will collect data at RLS and MCC level to support the evaluation of the RLM request distribution procedures, then SGDSP will consolidate results.

D&E Test O-5: Test Running

- **The test will follow 4 strategic scenarios:**
  - **#1 FMCC = MCC*: beacon activation in FMCC and ESTEC.**
  - **#2 One MCC of the Central DDR** = MCC*: beacon activation in NMCC, ITMCC and Tel-Aviv (ISR: Mobit).**
  - **#3 One MCC of another DDR = MCC*: beacon activation in SPMCC, USMCC.**
  - **#4 Finally, one MCC of another DDR but not directly connected to the FMCC = MCC*: beacon activation in BRMCC.**

MCC: MCC responsible of the area where the alert is located*
*DDR**: Data Distribution Region (Service Area)*

SAR GALILEO RETURN LINK SERVICE OPERATIONAL FACILITY

- **Operational Facility in Development:**
  - **Deployment by end of 2017**
  - **Qualification by May 2018**
  - **Entry into service in end of 2018**

- **Possibility for the beacon manufacturers to test their RLS Beacon from mid-2018**
  - **Implements the full loop of the RLS (including the acknowledgment of the RLM reception at the beacon)**
  - **Use of RLS Test Protocol**
  - **Operational RLSP will allow parallel testing of beacons and RLS operations**

- **Reference Standards:**
  - **T.001 / T.007: Return Link Service Protocol and GNSS Receiver operations for RLS (published)**
  - **Galileo Signal in Space ICD: Definition of RLM Message (published)**
  - **Amendment to NMEA0183 adding a new NMEA0183/ IEC61162-1 sentence for RLM (published)**

SAR GALILEO RETURN LINK SERVICE – EVOLUTION PREPARATION

- **Introduction of new RLS Services (Type-2, remote activation…)**
  - **The operational RLSP deployed in 2018 will already have the capability to implement these services**
  - **Will be tested with SAR community before actual service operations**
- **Preparation of specifications for RLS in Second Generation Beacons (T.018)**
- **Interoperability with future RLS providers (e.g. GLONASS) is being coordinated between EC and Russia**

SAR GALILEO SERVICE DECLARATION MILESTONES

- **End 2018: SAR/GALILEO ENHANCED SERVICES MILESTONE**
  - **Increased performances and coverage with additional SAR Transponders**
  - **Upgraded ground segment to meet Cospas-Sarsat IOC Standard (including ELT-DT processing)**
  - **Start of the Return Link Service**

- **End 2020: SAR/GALILEO FULL OPERATIONAL CAPABILITY MILESTONE**
  - **Fully deployed Galileo constellation with SAR transponders**
  - **SAR/Galileo Ground Segment extension in South Indian Ocean area**
  - **SAR/Galileo MEOLUTs upgrade to meet Cospas-Sarsat FOC standard, including Second Generation of Beacons**
  - **New Return Link Service capabilities (e.g. RCC activation)**

THANK YOU

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http://ec.europa.eu/galileo-sar