SARSAT MEOSAR/MCC and Ground System Updates

SARSAT Beacon Manufacturers Workshop 2022

Apurve Mather

ERT, Inc.
US SARSAT Ground Segment

Alaska
NOAA Command and Data Acquisition Station (FCDAS)
Fairbanks, Alaska
2 LEO/MEOLUTs

Guam
Andersen AFB
2 LEO/MEOLUTs to be replaced by 2 LEO/MEOLUTs in 2022

Hawaii
2 LEO/MEOLUTs & 6-antenna MEOLUT

Florida
2 LEO/MEOLUTs & 6-antenna MEOLUT

New Mexico
SUSA MEOLUT planned for 2022

Maryland
US Mission Control Center
2 GEOLUTs
&
1 Test GEOLUT
1 Test LEO/MEOLUT(FL9)
1 Planned Test Phased-Array MEOLUT (TPAM)
USA LEO/MEOLUT Plans

• Hybrid LEO/MEO LUTs bridge the transition from LEOSAR to MEOSAR
  – 2 more LEO/MEO planned (Guam)
    • The 4th Generation LEOLUTs track MEOSAR when no LEOSAR satellites are in view
    • The MEO data provided will be used as additional channels to existing MEOLUTs
    • Guam will feed MEO data to HI MEOLUT

• MEOLUTs
  – FL and HI MEOLUTs to be commissioned at IOC in 2022
  – New Mexico - Phased-Array MEOLUT planned (SUSA)
  – Maryland - Test Phased-Array MEOLUT planned (L-band only) (TPAM)

Currently Operational:

LEO/MEO Channels:
• Alaska (2)
• Florida (2)
• Hawaii (2)
• Maryland (1)

Guam LEO/MEO Channels (2) • Phased Array MEOLUT In NM- SUSA • Phased Array MEOLUT In MD- TPAM
June 2022 August 2022 Oct 2022
USA LGM MCC
Commissioning Schedule

• Commissioned
  – 2021 CHMCC declared FOC October 2021

• 2022 Planned Commissionings
  – LGM CMCC commissioning in progress, on hold until CMCC is ready
  – ARMCC still selecting an LGM vendor
  – BRMCC support contract pending
  – PEMCC expected to be ready for commissioning in late 2022
  – ELT(DT) / SGB capability - USMCC / FMCC cross commissioning started in Feb 2022
  – ELT(DT) / SGB capability - AUMCC commissioning planned to start in Sep 2022
MEOSAR Initial Operational Capability (IOC)

Florida MEOLUT – IOC commissioning March 2022
Hawaii MEOLUT – IOC commissioning Mid 2022

Challenges from the US perspective:
- Expected Horizontal Error (EHE)
- Slow-moving beacon location accuracy
- Uncorroborated (previously Suspect) alerts
Return Link Service - Type 1

The USA SARSAT Program approved EPIRBs and PLB RLS Type 1 beacons for sale in the USA once both the updated EPIRB and PLB RTCM standards are published.

- EPIRB Standards have been published
- PLB Standards expected to be out for Committee Draft for Vote (CDV)
Moving Beacons

• The Florida MEOLUT is capable of handling slow moving beacons as of 25 March 2022
• The Hawaii MEOLUT will be capable of handling slow moving beacons later 2022
C/S System Test - ELT(DT)s and SGBs

- In June of 2021, C/S participants conducted an System Test focused on the new beacon technologies, ELT(DT)s (FGB and SGB) and SGBs in general
- This testing encompassed 6 days and demonstrated the end-to-end performance of the System to:
  - Validate the associated specifications
  - Assess the readiness of the C/S System to process and distribute alert data generated by these beacons
- Operational MCCs and LUTs were employed with key participants including Canada, France/EC, Spain, Russia, Turkey and the USA
- LUTs and MCCs received alert data from simulators as well as actual beacon prototypes, and distributed it throughout the C/S global network
C/S System Test - ELT(DT)s and SGBs

• The test campaign uncovered issues at both the national and global system levels, the most notable being the increased data load caused by ELT(DT)s:
  – ELT(DT)s transmit as many as 12 bursts per minute
  – Sending all this data throughout the system, in particular when in human readable form, proved overwhelming
  – MCC Specifications were changed to reduce this impact
• A mini retest was run in January of 2022 and successfully demonstrated improvements in managing the data load
• This end-to-end testing was a success, significantly advancing C/S readiness for operational use of these new beacons
• Internationally coordinated testing continues, now focused on the secondary matter of verifying the System’s capacity to handle a large number of simultaneously active SGBs
SGB Status

• The Florida and Hawaii MEOLUTs are capable of detecting Second Generation Beacons (SGBs), making SGB solutions, and sending those SGB solutions to the USMCC

• The USMCC is not yet using or distributing SGB alert data operationally
QUESTIONS?

Eric Foster
eric.foster@noaa.gov