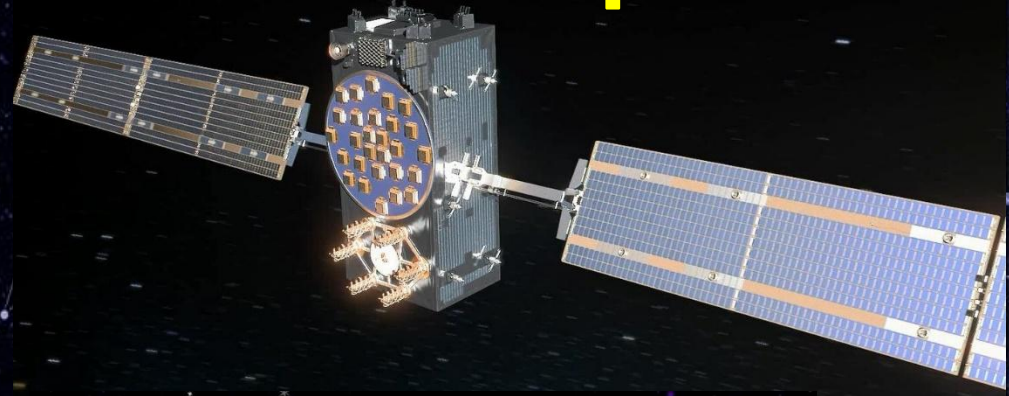


# Beacon Manufacturers Workshop

4-5 October 2021



Cospas-Sarsat updates and ELT(DT) related developments

Dany St-Pierre

Cospas-Sarsat Secretariat



# Cospas-Sarsat Programme

## Cospas-Sarsat Programme Status

- Overall Mission and Participants
- System segments status: Space segment, Ground Segment, Beacon population
- Assisted Saves distribution and evolution
- Upcoming developments

## ELT(DT) updates

- ELT(DT) deployment to market
- ICAO, EASA latest ELT(DT)-related developments

Type Approval/Test Laboratory Certification of new beacon types



# Cospas-Sarsat Mission

## Mission Statement

The International Cospas-Sarsat Programme provides accurate, timely and reliable distress alert and location data to help search and rescue authorities assist persons in distress.

## Objective

The objective of the Cospas-Sarsat system is to reduce, as far as possible, delays in the provision of distress alerts to SAR services, and the time required to locate a distress and provide assistance, which have a direct impact on the probability of survival of the person in distress at sea or on land.

## Strategy

Cospas-Sarsat Participants implement, maintain, co-ordinate and operate a satellite system capable of detecting distress alert transmission from radiobeacons and of determining their position anywhere on the globe. The distress alert and location data is provided by Cospas-Sarsat Participants to the responsible SAR services.

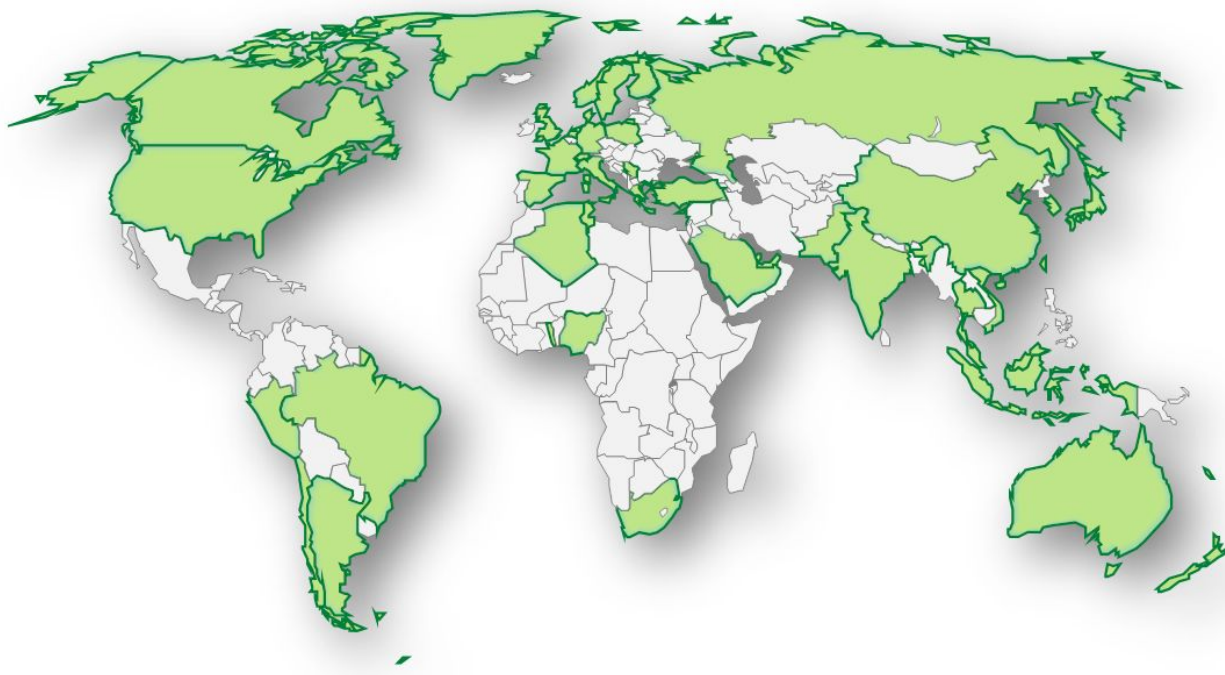
Services are provided worldwide and free of charge for the user in distress.





# Cospas-Sarsat Participants

## Cospas-Sarsat Participants (45)



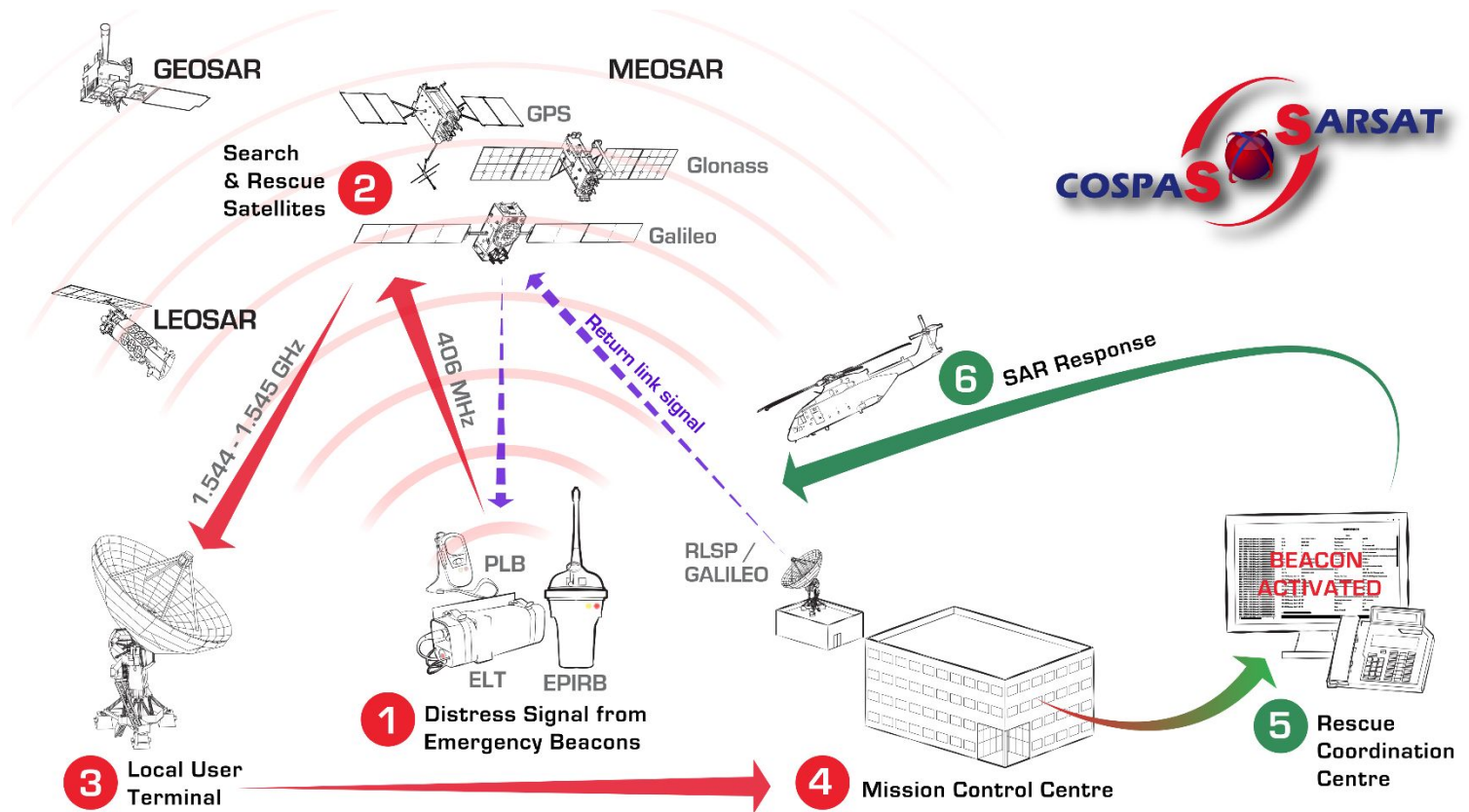
- |                      |                     |
|----------------------|---------------------|
| <b>Algeria</b>       | <b>New Zealand</b>  |
| <b>Argentina</b>     | <b>Nigeria</b>      |
| <b>Australia</b>     | <b>Norway</b>       |
| <b>Brazil</b>        | <b>Pakistan</b>     |
| <b>Canada</b>        | <b>Peru</b>         |
| <b>Chile</b>         | <b>Poland</b>       |
| <b>China (P.R.)</b>  | <b>Qatar</b>        |
| <b>Cyprus</b>        | <b>Russia</b>       |
| <b>Denmark</b>       | <b>Saudi Arabia</b> |
| <b>Finland</b>       | <b>Serbia</b>       |
| <b>France</b>        | <b>Singapore</b>    |
| <b>Germany</b>       | <b>South Africa</b> |
| <b>Greece</b>        | <b>Spain</b>        |
| <b>Hong Kong</b>     | <b>Sweden</b>       |
| <b>India</b>         | <b>Switzerland</b>  |
| <b>Indonesia</b>     | <b>Thailand</b>     |
| <b>Italy</b>         | <b>Togo</b>         |
| <b>ITDC</b>          | <b>Tunisia</b>      |
| <b>Japan</b>         | <b>Turkey</b>       |
| <b>Korea (R. of)</b> | <b>UAE</b>          |
| <b>Malaysia</b>      | <b>UK</b>           |
| <b>Netherlands</b>   | <b>USA</b>          |
|                      | <b>Vietnam</b>      |

**>75% of World  
Population  
>85% of World Wealth**





# Cospas-Sarsat System





# Cospas-Sarsat Satellite Systems

## 3 Types of Satellite Systems

- **LEOSAR: Legacy System** first payload deployed in 1982. Main operational system since the beginning of the Cospas-Sarsat Programme.
- **GEOSAR:** first payloads deployed in the mid-late 90s to provide early alerts and complement the LEOSAR system and in the future GEOSAR system.
- **Medium Earth Orbiting Search And Rescue (MEOSAR):** First payloads deployed in the early 2000s, first operational payload deployed in 2012 (Galileo), declared at Early Operational Capability in 2016. Initial Operational Capability anticipated in 2022.





# Cospas-Sarsat LEO-GEO Components

**Space Segment:** - Five LEO payloads in operation + one temporarily shutdown (S7) to avoid ground tracking interference. One LEO payload (S11) to be shut down permanently in mid-November 2021. Two additional Cospas payloads planned to be launched by the end of 2022.

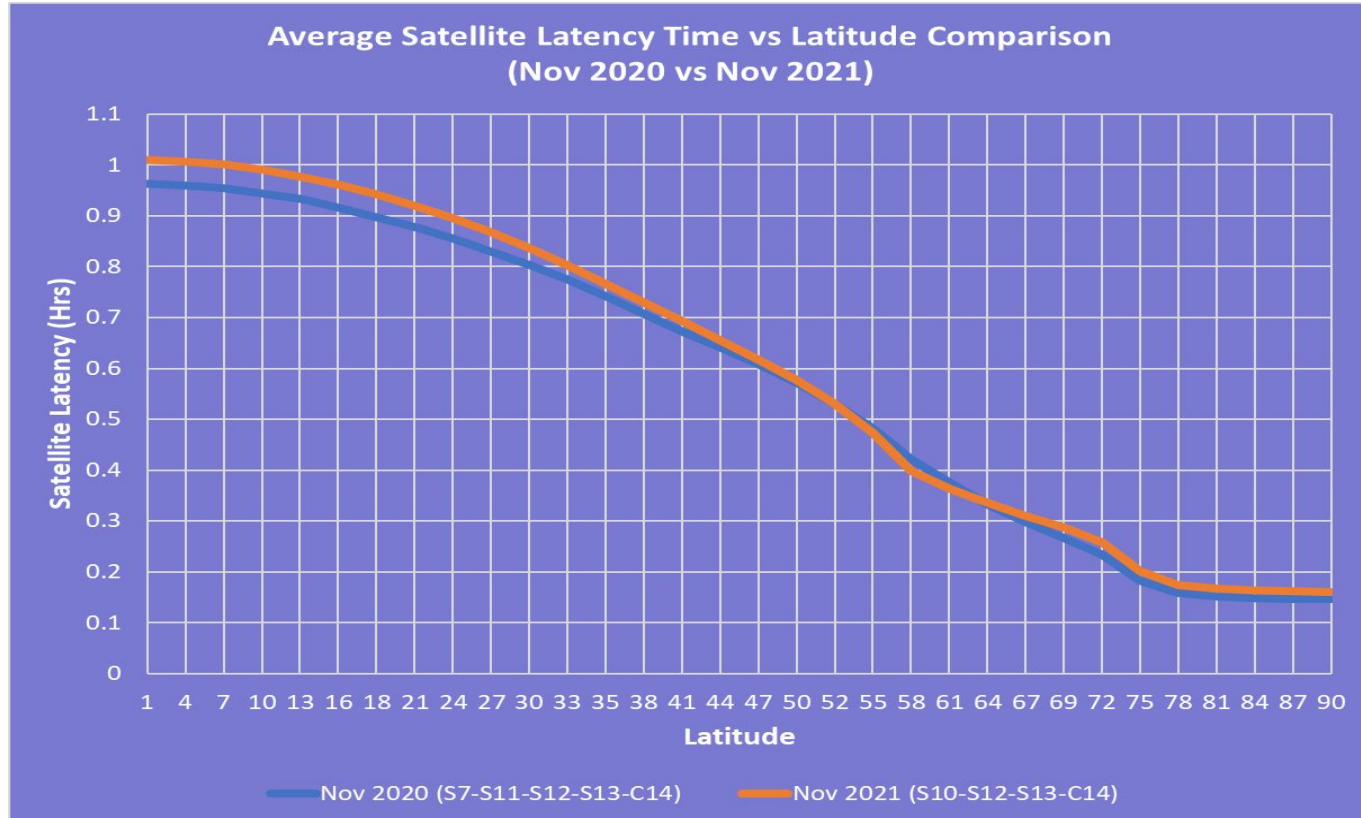
- Eight GEO payloads at FOC operation, Four additional GEOSAR at IOC status, + 4 additional in-orbit spares ( i.e., capable of being declared at FOC as needed).

**Ground Segment:** - 51 LEOLUTs at FOC + one Back-up facility.

- 27 Operational GEOLUTs +one Back-up facility
- 32 Operational Mission Control Centres in operation.



# Leosar performance (Nov 2020 versus Nov 2021)







# MEOSAR payload status

- Galileo: 24 SAR repeater operational. Two additional payloads are to be launched in November 2021, four more in 2022 and 6 more in the following years.

The EC is undertaking the procurement of new satellites that will make the transition between the Galileo First Generation and Second Generation. These transition satellites are planned to be launched from 2026.

- SAR/Glonass: Two experimental L-band SAR/Glonass payloads available to support the current MEOSAR testing activities (expected to be commissioned soon). Five additional Glonass payloads expected to be launched in the next few years.

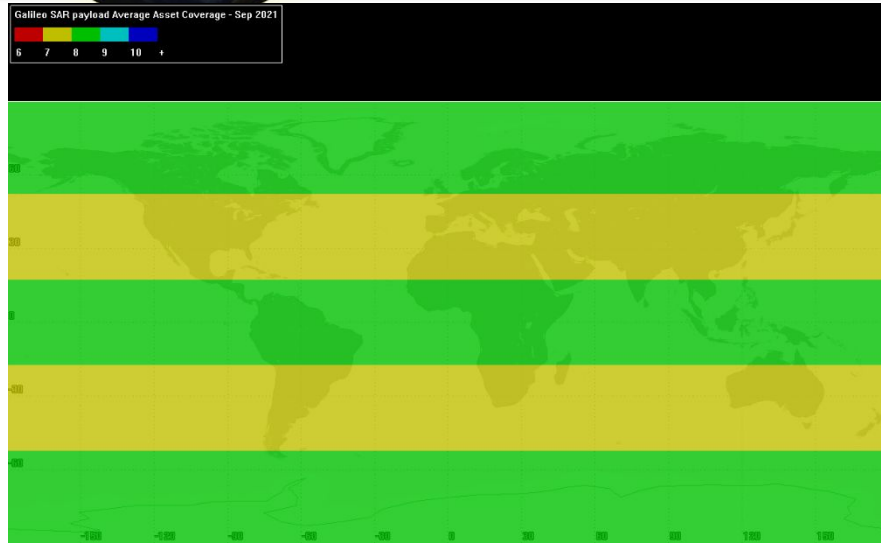


# MEOSAR payloads status

- **DASS/GPS II:** 18 DASS payloads used operationally with five more DASS payloads on GPS III satellites in orbit (under tests/ready to be commissioned). Three more planned to be deployed in the following years. First L-band payload on GPS III to be deployed no earlier than 2026.
- **Chinese BEIDOU:** Six BDS payloads commissioned in 2021. The integration of the BDS payloads into the Cospas-Sarsat MEOSAR Space segment is contingent upon a MOU being put in place between China and Cospas-Sarsat (in progress).
- **By the end of 2022, more than 55 MEOSAR payloads are expected to be made available for SAR operations.**

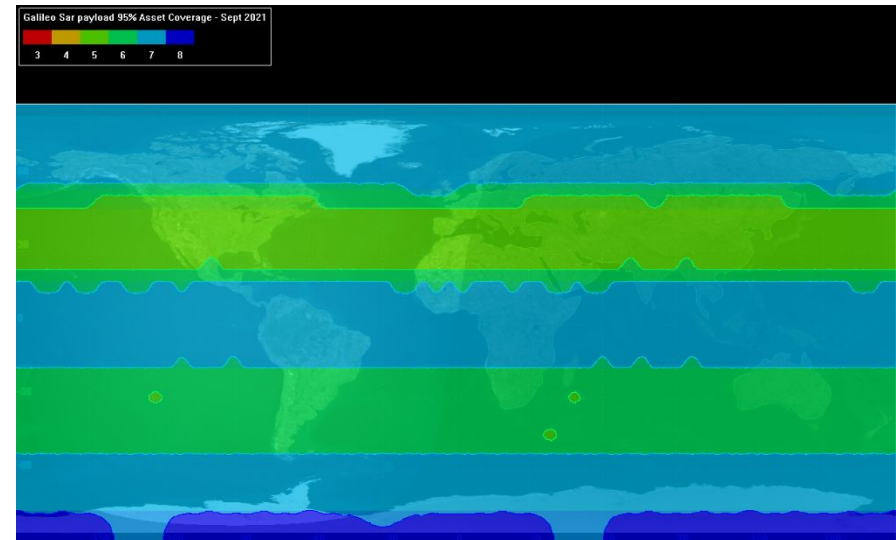


# Galileo SAR payload coverage (Sept 2021)



On average between 7 and 8 payloads in visibility worldwide

At least 5 payloads in visibility 95% of the time worldwide





# MEOSAR Ground Segment status

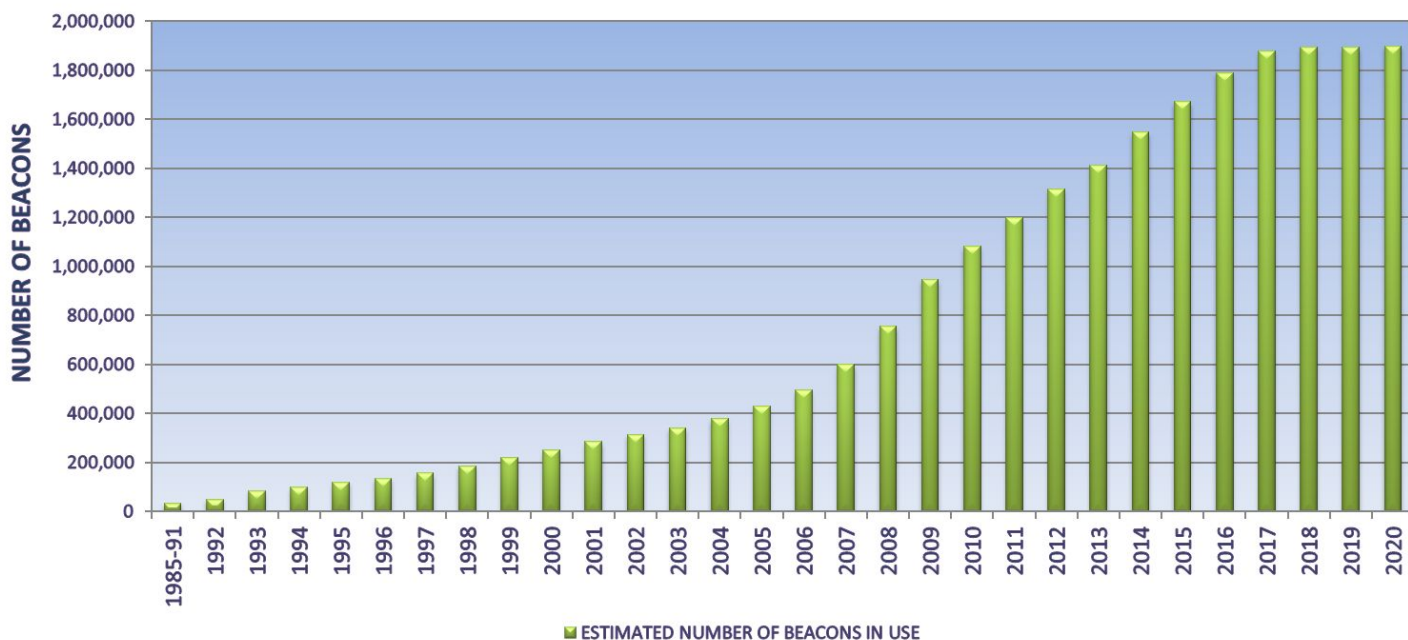
- 23 MEOLUTs Commissioned to EOC standards, four MEOLUTs commissioned to IOC/FOC standards
- Five MEOLUTs expected to be commissioned at IOC/FOC standards in the next six months (including three new MEOLUTs)
- At least eight new MEOLUTs expected to be operational at IOC/FOC between 2021 and 2025.
- 12 MCCs at FOC LGM level (Leosar, Geosar, Meosar (EOC))+ two MCCs at IOC LGM level. Four more MCCs planned to be commissioned at FOC LGM by Q1-2021.



# Beacon Population Evolution



## 406 MHz BEACON POPULATION





# Cospas-Sarsat SAR Events and Assisted Saves

2020 (preliminary)

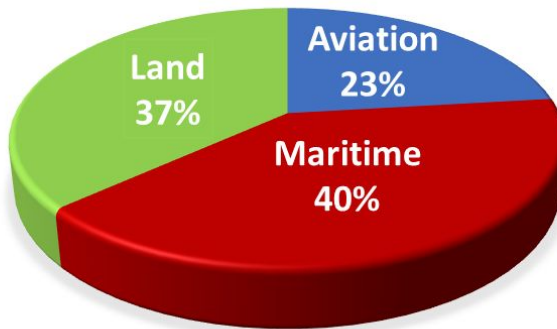
SAR Events: 951

P. Rescued: 2278

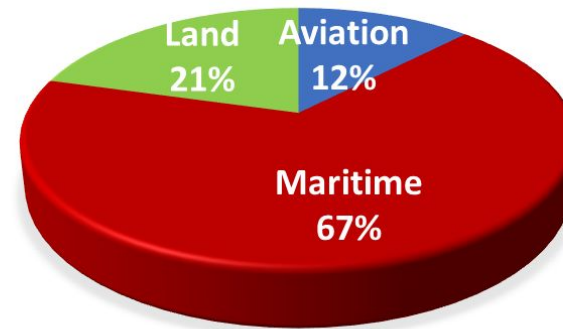
• SAR Events (1982 / 2020) : 16514 (TBC)

P. Rescued (1982 / 2020) : 53790 (TBC)

2020 C/S EVENTS DISTRIBUTION

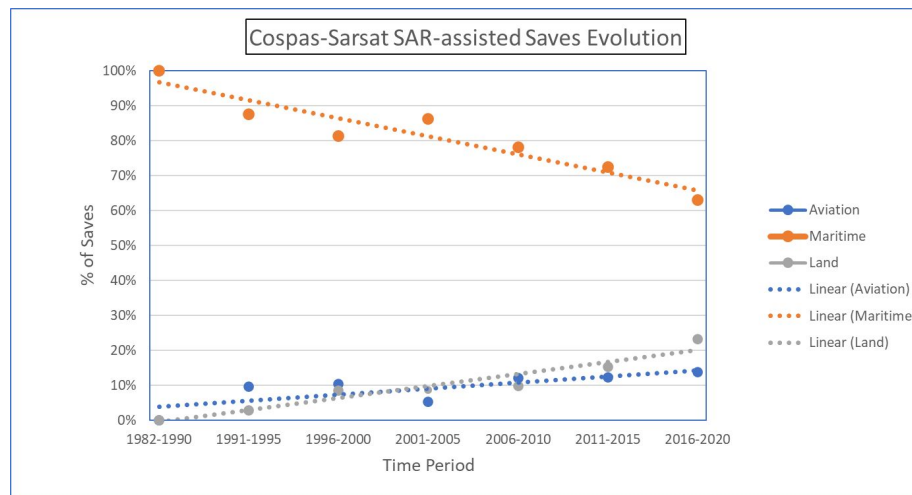
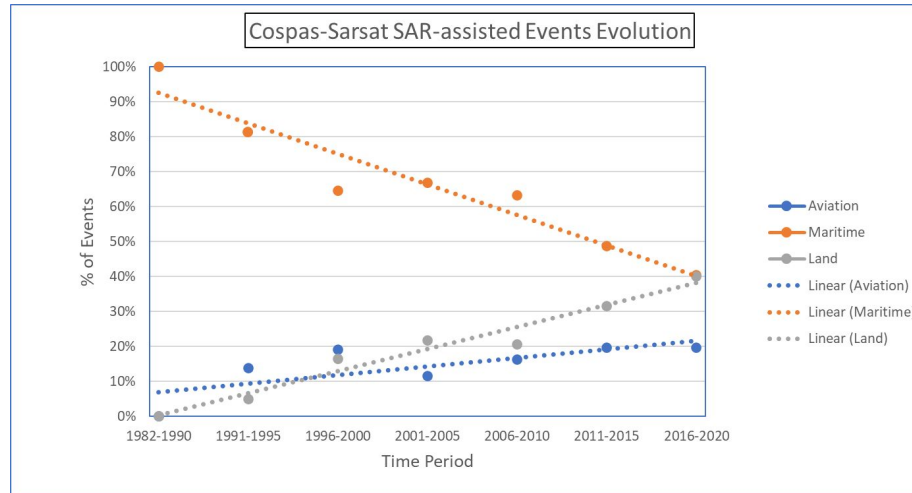


2020 C/S SAVES DISTRIBUTION



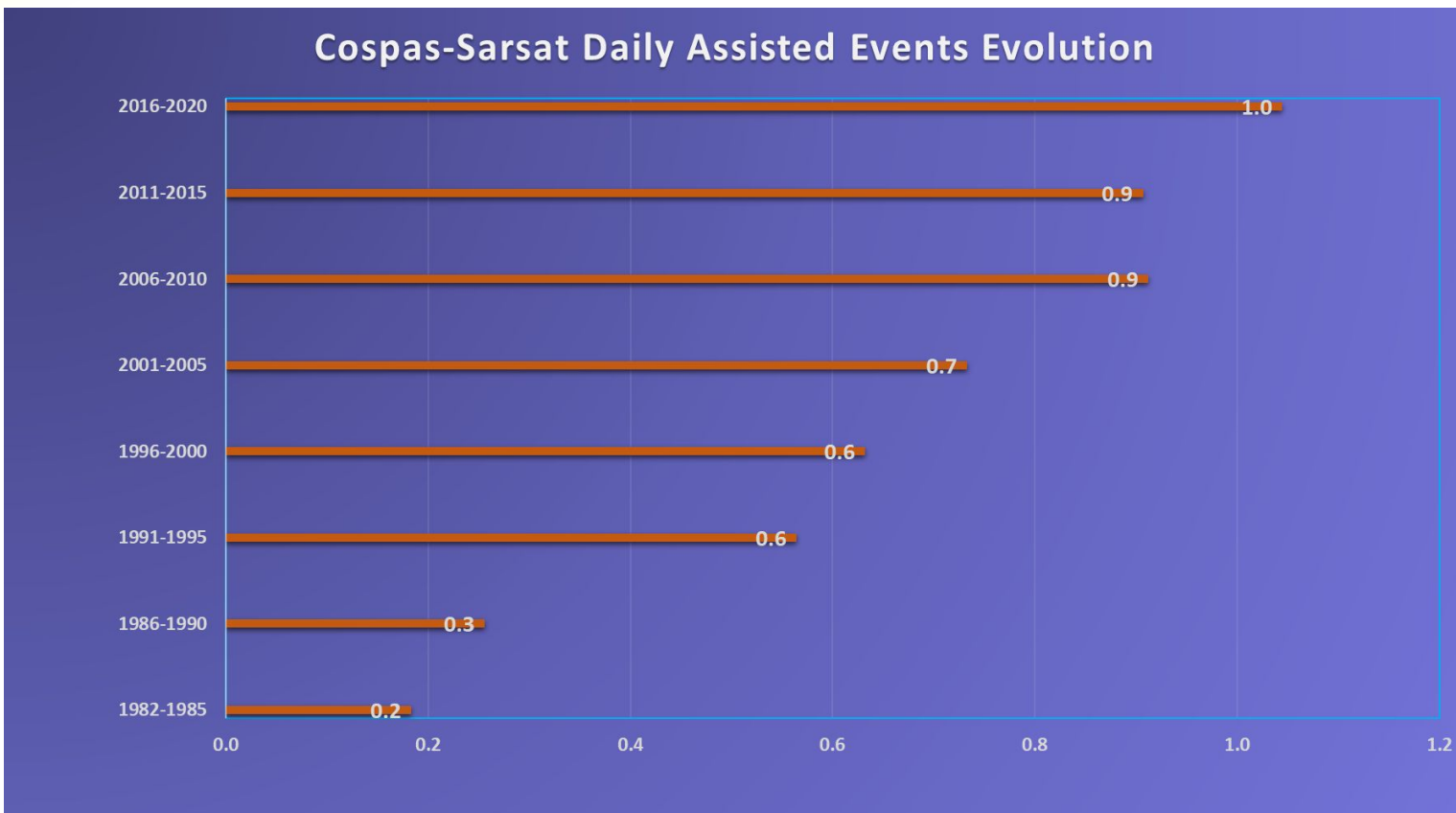


# Cospas-Sarsat SAR Event and Assisted Save Trends





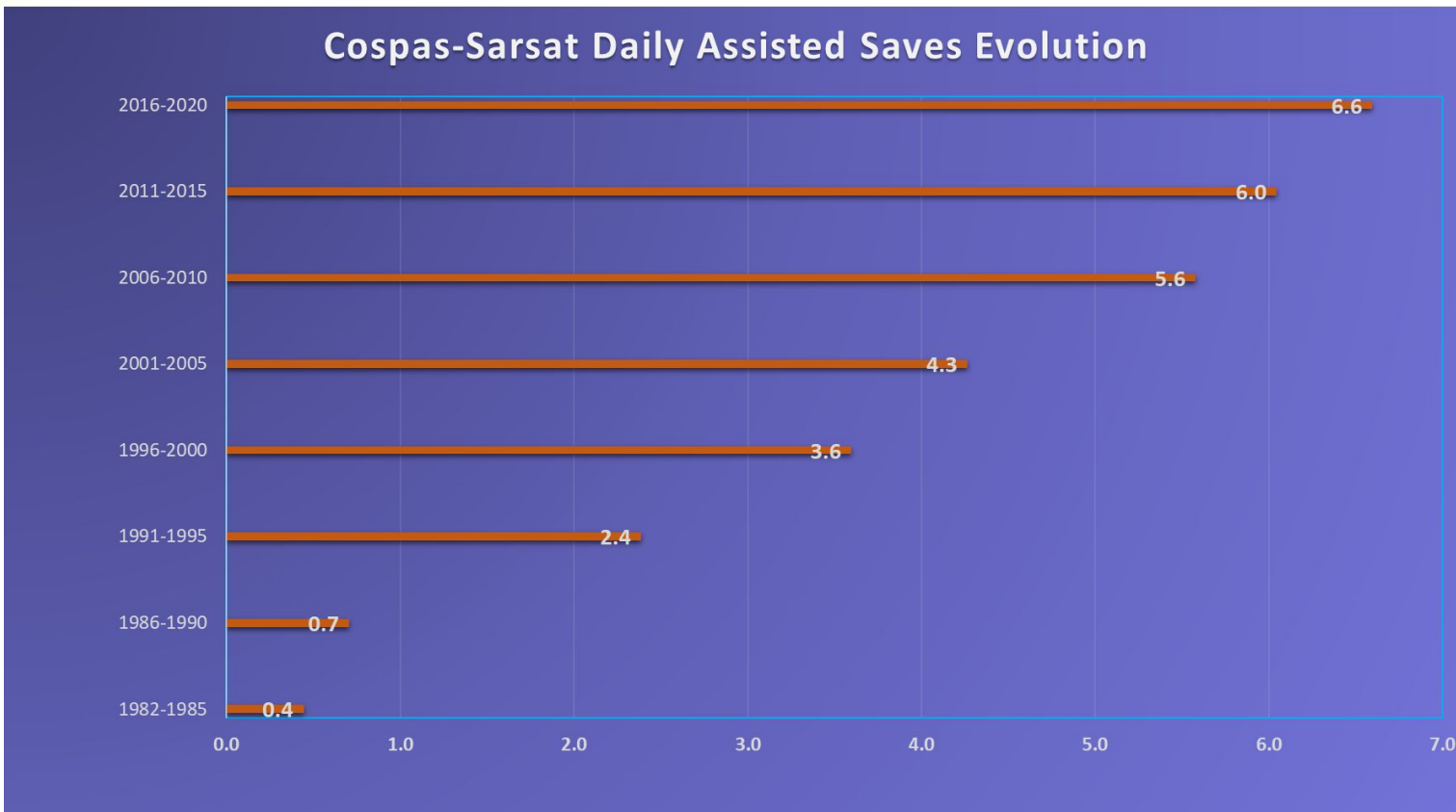
# Cospas-Sarsat-Assisted SAR Event Evolution







# Cospas-Sarsat-Assisted SAR Save Evolution





# Cospas-Sarsat main development goals and status

| Activity | Goals   | Progress since BMW 2020   |
|----------|---|---|
| MEOSAR   | <ul style="list-style-type: none"> <li>Reduced time to deliver distress alerts and positions</li> <li>Allow a better tracking of moving beacons</li> <li>More flexibility in beacon design and allowing more services to be provided (ELT(DT)s, SGBs)</li> </ul>                              | <ul style="list-style-type: none"> <li>New DASS payloads launched</li> <li>New MEOLUTs commissioned, including four at IOC/FOC level</li> <li>New MCCs commissioned at LGM FOC</li> </ul>   |
| ELT(DT)s | <ul style="list-style-type: none"> <li>Enhance the likelihood of locating an aircraft accident site</li> <li>Compliance with the new ICAO and EU regulations for large aircraft from 2023</li> </ul>  | <ul style="list-style-type: none"> <li>Improvement to beacon specifications and type approval procedures</li> <li>ELT(DT) System tests (completed)</li> <li>ELT(DT) Coverage Evaluation (initiated)</li> <li>New MEOLUT commissioned with ELT(DT) capability</li> <li>Significant progress on the acceptance of a test facility to undertake type approval of ELT(DT)s</li> </ul> |
| SGBs     | <ul style="list-style-type: none"> <li>Allow beacon positions to be more accurately determined (one order of magnitude compared with FGBs)</li> <li>More accurate encoded locations</li> <li>More information possibly conveyed to RCCs (longer and more flexible message content)</li> </ul> | <ul style="list-style-type: none"> <li>Improvement to beacon specification and type approval procedure</li> <li>SGS System tests (completed)</li> <li>ELT(DT) Coverage Evaluation (initiated)</li> <li>Significant progress on the acceptance of a test facility to undertake type approval of SGBs</li> </ul>  |
| RLS      | <ul style="list-style-type: none"> <li>New service aimed at enhancing the beacon user feedback</li> </ul>   | <ul style="list-style-type: none"> <li>RLS service declared at FOC (March 26 2021)</li> <li>New RLS-capable beacons typed approved</li> </ul>   |



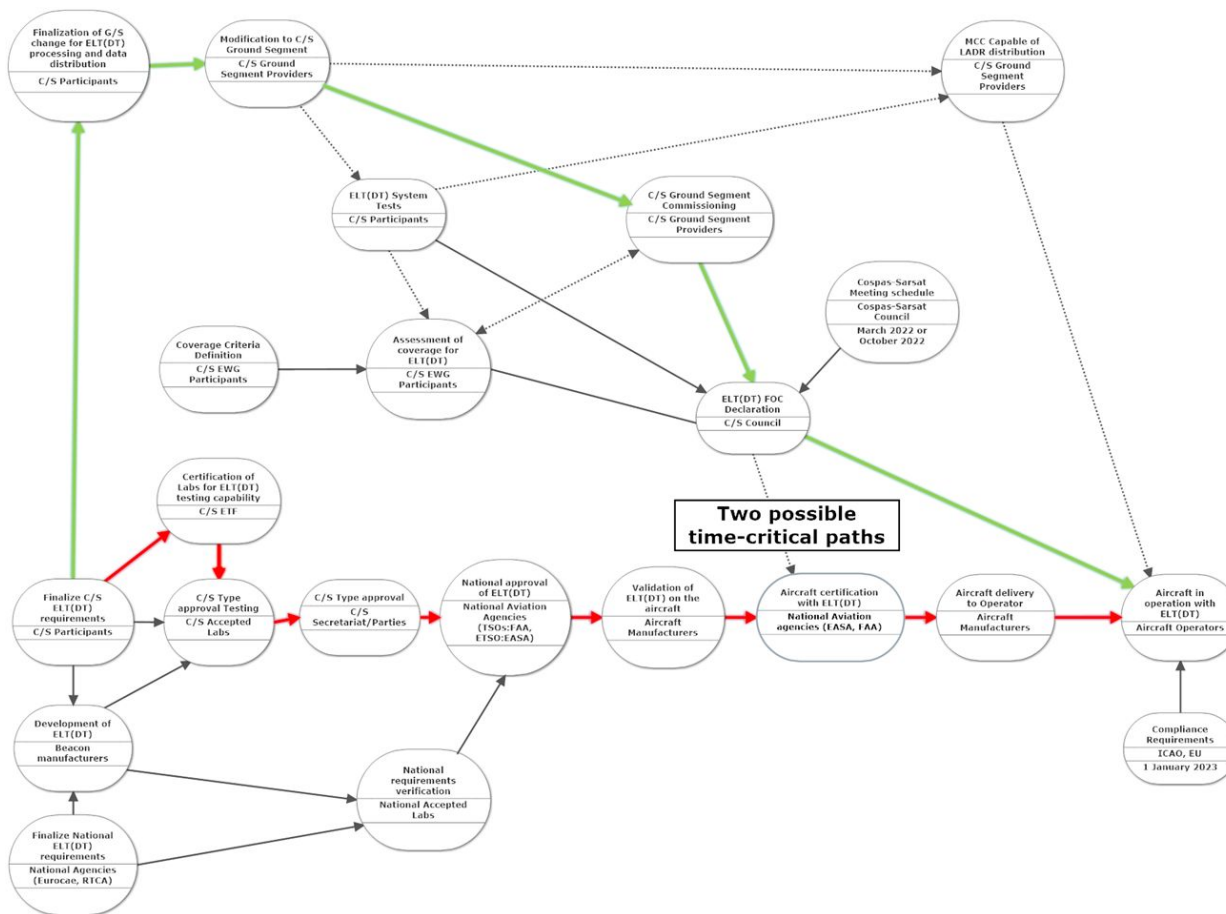


# Cospas-Sarsat “Expert” Working Groups in 2021

- Experts Working Group Meeting on Second-Generation Beacons (SGBs) and FGB/SGB ELT(DT)s
- Experts Working Group Meeting on Evaluation of MEOSAR Global Coverage
- Experts Working Group Meeting on Commissioning of MCCs
- Experts Working Group Meeting on Commissioning of LUTs
- Experts Working Group Meeting on Commissioning of Space Segment Assets
- Experts Working Group Meeting on FGB and SGB ELT(DT) and SGS System Test
- Technical Team on Extended Test Facility Capabilities and approval of new beacon types



# ELT(DT) Development (from a Cospas-Sarsat Perspective)





# Main elements for ELT(DT) deployment to market

- ELT(DT)-related Cospas-Sarsat beacon specifications and type approval procedure.
- National regulations to complement Cospas-Sarsat ELT(DT) specifications and testing and allow/regulate the use of ELT(DT)s.
- Modifications to Cospas-Sarsat ground segments to adequately process and distribute ELT(DT) alerts to appropriate stakeholders.
- International regulations and infrastructure to allow the use of ELT(DT)s.
- Cospas-Sarsat Certified Test Facilities for type approval of ELT(DT)s.



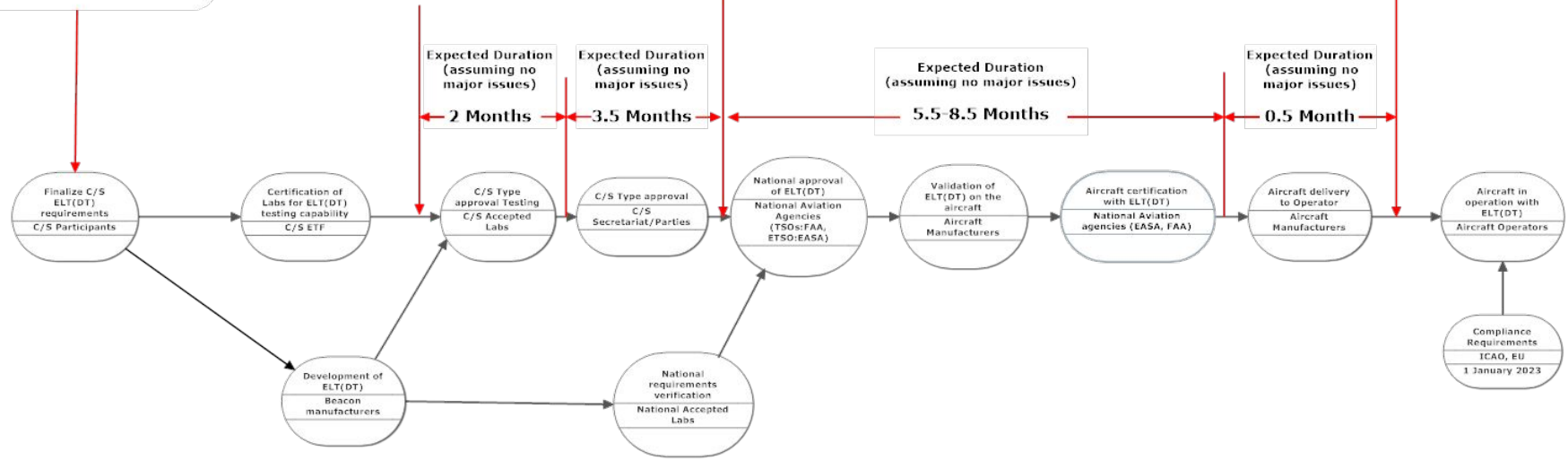
# ELT(DT) Development (ELT-DTs approval path)

Assuming no more changes impacting beacon design, or ELT(DT) testing

Latest time for Lab declared capable of ELT(DT) Testing & ELT(DT) sent to Labs T/A Mid Q3 to Mid Q4 2021

Latest time for ELT(DT) Type Approval Beg. of Q1 to Beg. of Q2 2022

Earliest expected delivery date Beginning Q4 2022





# EU/EASA latest ELT(DT)-related developments

- CAT.GEN.MPA.210 'Location of an aircraft in distress – Aeroplanes' was introduced by Commission Regulation (EU) 2015/2338 into Annex IV (Part-CAT) of Regulation (EU) 965/2012 (Air OPS regulation) in order to enhance the localisation of accidents occurring in oceanic and remote areas. In 2019, the EU adopted EASA Regulation (EU) 2019/1384 postponing the applicability date of CAT.GEN.MPA.210 to 1 January 2023.
- Given that this new rule only defines the applicability criteria and the general concept, related acceptable means of compliance (AMC) and guidance material (GM) were needed.
- On May 31 2021, EASA Executive Director adopted decision 2021/008/R amending document CS-ACNS which provides EASA Certification Specifications and Acceptable Means of Compliance for Airborne Communications, Navigation and Surveillance . The objective of this decision was to facilitate the implementation of CAT.GEN.MPA.210 'Location of an aircraft in distress – Aeroplanes' of Annex IV (Part-CAT) to Regulation (EU) No 965/2012 ('Air OPS Regulation').

**COSPAS** The revised CN-ACNS introduces ELT(DT)s as one of the three possible means of compliance to CAT.GEN.MPA.210 and provides the requirements associated with the use of ELT(DT)s.



# ICAO LADR-related developments

- *ICAO continues to develop the Global Aeronautical Distress and Safety System (GADSS) and, in particular, with respect to the location of an aircraft in distress repository (LADR, formerly known as the distress tracking repository, or DTR).*
- Efforts to secure the funding of the production model were underway in Q1 2021.
- A State Letter seeking potential host State(s) or organizations for the LADR production model was forwarded to Administrations in Q2 2021 with answers expected by June 25.
- A LADR development Information session was held by ICAO in May 2021 to describe how the LADR would be hosted and financed.
- Responses to ICAO's State Letter has allowed for a sufficient number of qualified organisations to provide their proposal for the provision and operation of the LADR production model. The final selection of the organization(s) that will be awarded the contract is expected to be announced in the upcoming weeks.
- ICAO is planning for the full production LADR model to be made available in Q4 2021 and for the LADR point of contacts to be populated (e.g. Aircraft Operators) throughout 2022 in order to have a functional LADR by 1 January 2023.





# Type Approval/Test Laboratory Certification of new beacon types

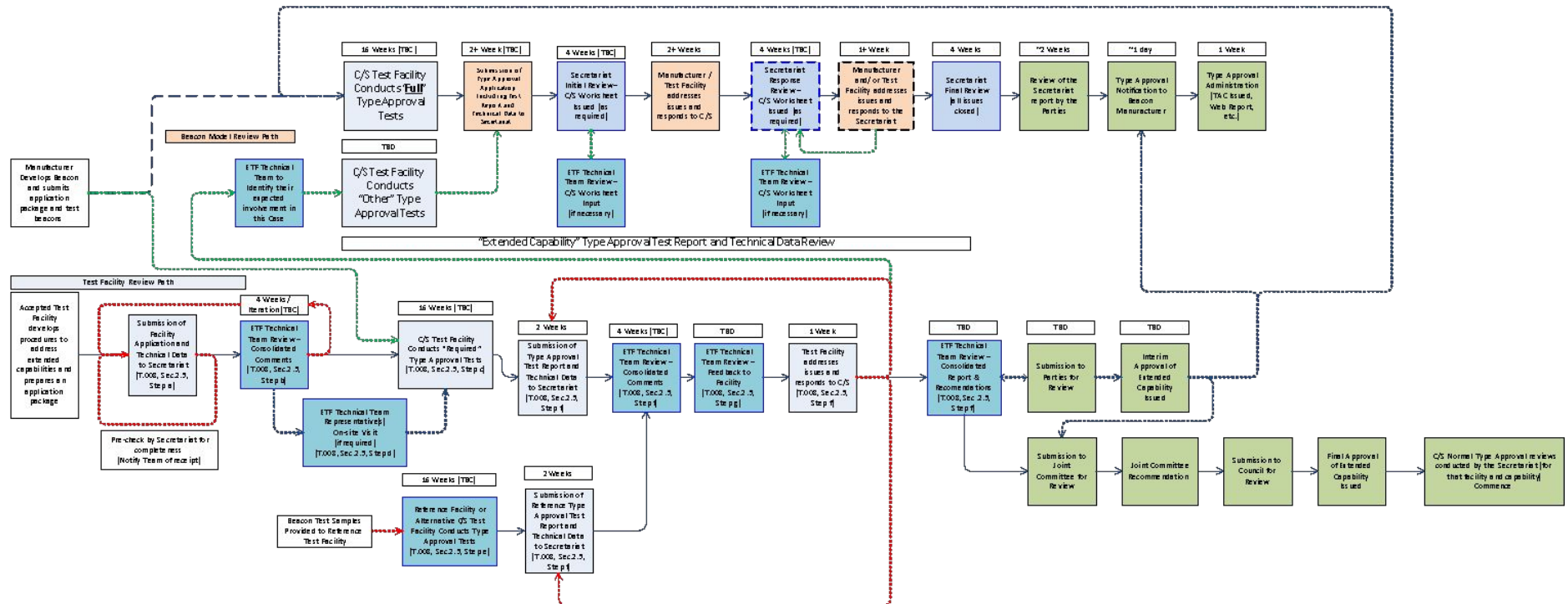
## Progress made in 2021

- *A first application package for SGB certification was received from a test lab in May 2019, followed by a first ELT(DT) application package from a different laboratory in October 2019.*
- In 2020 and in the first half of 2021, the progress on the recertification of these two laboratories was partly impaired by a number of issues ( COVID-19, conflict with other commercial endeavours, funding, etc.). In recent months the situation has considerably improved, and significant progress has been made with the two laboratories that submitted their application.
- In March 2021, CSC-64 decided to agree on a revised process for the certification of test facilities for new beacon types allowing for an interim approval to be granted to a test facility prior to a formal review by the C/S Joint Committee.
- It is now expected that in the upcoming weeks the ETF panel will be in a position to ask the Cospas-Sarsat Council to grant an interim acceptance for a first facility to undertake C/S type approval tests for FGB ELT(DT)s and an interim acceptance for a first facility to undertake C/S type approval tests for SGBs (excluding SGB ELT(DT)s).
- As of Oct 2021, the C/S Secretariat has not received any additional application packages from the remaining laboratories for recertification for ELT(DT)s and SGBs.



# Test Facility Certification Process Flowchart (CSC-64)

Anticipated Cospas-Sarsat Type Approval Process for First Article Extended Capability Beacon (EWG-1 2021)





# For More Information

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