International Civil Aviation Organization

Tenth Meeting of the ICAO Asia/Pacific Search and Rescue Workgroup (APSAR/WG/10)

Siem Reap, Cambodia, 27 – 30 May 2025

Agenda Item 3: Global Update

STATUS OF THE COSPAS-SARSAT PROGRAMME

(Presented by the Cospas-Sarsat Secretariat)

SUMMARY

This paper presents a status report on the Cospas-Sarsat System, including System operations, significant developments, Space and Ground Segments, beacons, false alerts, reporting by RCCs on use of the distress alert data provided, and results of MCC-SPOC communication tests, and seeks APSAR views on these matters.

1. INTRODUCTION

System Operation

1.1 In 2023, the latest year for which statistics have been compiled and reviewed, Cospas-Sarsat alert data assisted in 1,076 distress incidents (1,144 in 2022) and 3,109 persons were rescued (3,223 in 2022). Since September 1982, the Cospas-Sarsat System has provided assistance in rescuing at least 63,745 people in 19,883 SAR events (**Figure 1**).

1.2 The geographic distribution of all reported SAR events for which Cospas-Sarsat alert data was used in 2023 is presented in **Figure 2**, and the distribution of all SAR events is 20% for aviation, 44% for land and 36% for maritime. Participants often provide synopses of recent SAR cases supported by Cospas-Sarsat for publication on the Cospas-Sarsat webpage and Facebook page. APSAR working group participants are invited to monitor this page and contribute to it by sending stories to mail@406.org.

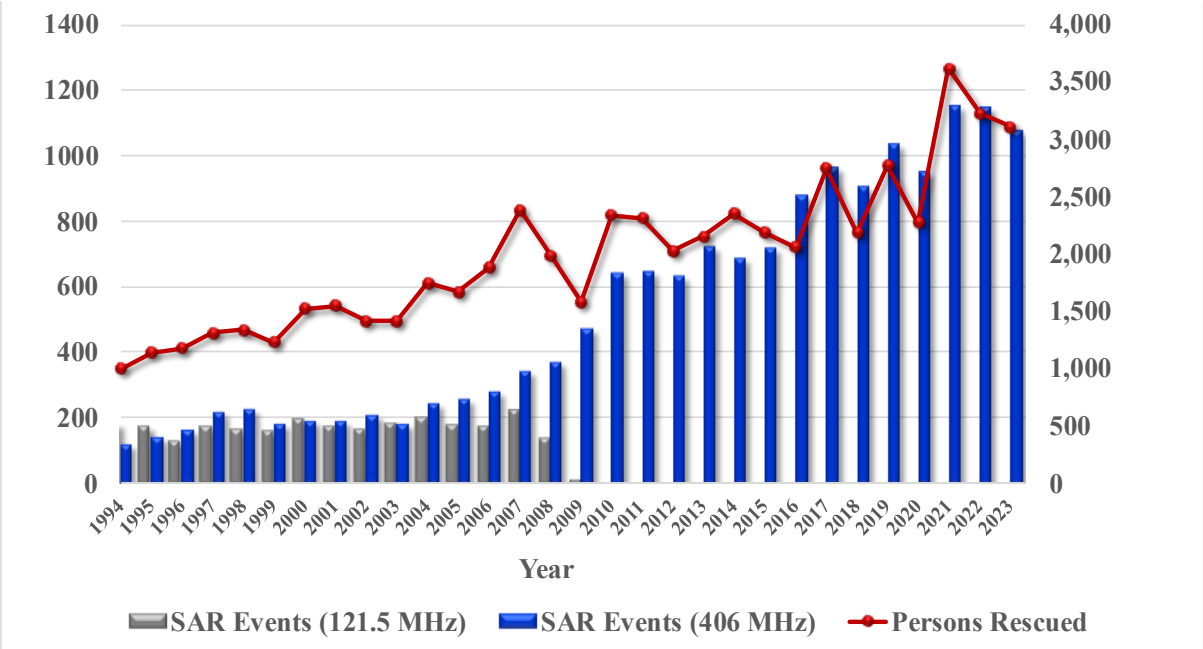

Figure 1: SAR Events with the Assistance of Cospas-Sarsat Data (Jan. 1994 - Dec. 2023)

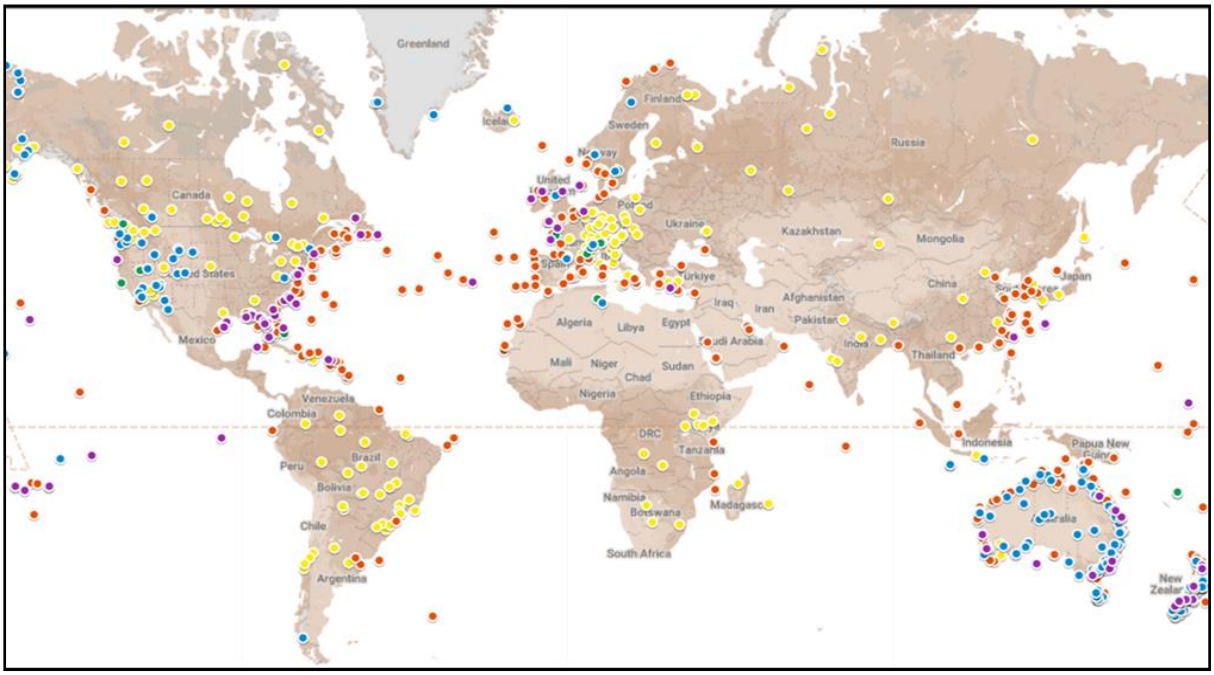

Figure 2: 2023 Geographic Distribution of SAR Events

2. DISCUSSION

406 MHz Beacons

2.1 Based on estimates made using beacon-registration data and the number of activated beacons that had been registered, there were about 3,170,000 Cospas-Sarsat beacons with the potential to activate worldwide at the end of 2023, an increase of about 2.2% over that reported in 2022 (3,100,000). We estimate that more than 75% of beacons deployed globally are equipped with global navigation satellite system (GNSS) receivers that allow the beacon location to be reported in the distress message (in addition to independent localization of the beacon by "trilateration" of the Cospas-Sarsat System).

2.2 The Cospas-Sarsat Secretariat maintains an International Beacon Registration Database (IBRD), an internet portal that is available for beacon registration for 167 Administrations (national and territorial) that allow its use in place of a national registration mechanism for at least one type of beacon. The IBRD also allows bulk upload and duplication of existing national databases as a means of making national records easily available on a 24/7 basis. As of 1 May 2025, there were 112,500 beacons registered in the IBRD (110,600 in March 2024). In 2022, Cospas-Sarsat deployed a new IBRD user interface to accommodate the registration of new beacon types, such as the ELT(DT)s and "second generation" beacons (SGBs) that use more modern "spread spectrum" transmission technology. The new IBRD, with a recently-available improved user-friendly interface, is available at www.406registration.com/.

The System

2.3 Cospas-Sarsat relies on three satellite-constellation types: the original low-altitude Earth orbiting satellites (LEO); geostationary Earth orbiting satellites (GEO); and the newest-technology payloads aboard medium-altitude Earth orbiting satellites (MEO).

2.4 As of 1 May 2025, thirty-six MEO earth stations (local user terminals known as MEOLUTs), capable collectively of simultaneously tracking up to 400 satellites, were commissioned for MEO search-and-rescue satellite payloads (MEOSAR), and at least 11 more MEOLUTs (with multiple antennas/channels each) are planned between 2025 through 2026.

SPOC Communication

2.5 Since 2008, Cospas-Sarsat has conducted regular testing of communications links between Cospas-Sarsat mission control centers (MCCs) that distribute distress alerts to their supported SPOCs.

2.6 The information in **Table 1** provides a summary of MCC/SPOC communication test results for the period 2019-2024. Some MCCs do not support SPOCs outside of their country and therefore are not required to conduct these tests.

	2019	2020	2021	2022	2023	*2024**
Number of SPOCs tested by MCCs	161	166	171	171	161	*74*
Non-responsive SPOCs (no response to tests)	8.70%	7.23%	8.19%	5.26%	4.97%	*8*
Rarely responsive SPOCs (less than 20% successful tests)	5.59%	6.02%	3.51%	5.85%	4.97%	*0*
SPOCs with low success ratio (between 20 and 50% successful tests)	9.94%	7.23%	9.94%	8.19%	11.18%	*10*
Insufficiently responsive SPOCs	**24.23%**	**20.48%**	**21.64%**	**19.30%**	**21.12%**	***18***

Note (*) 2024 information yet to be reviewed by the Cospas-Sarsat Joint Committee in May-June 2025.

Table 1: SPOC Communication Test Results (2019 – 2024)

2.7 The statistics in **Table 1** and **Figure 3** are based on the proportion of successful tests between MCCs and their supported SPOCs. A successful test means that the requested positive feedback (not an automatic acknowledgement) was received from the SPOC. When available, several communications links (e.g., AFTN, Fax, Phone, E-mail, FTP, Telex, X.25) were tested each month. In many cases, each available link was tested separately and counted as a unique test.

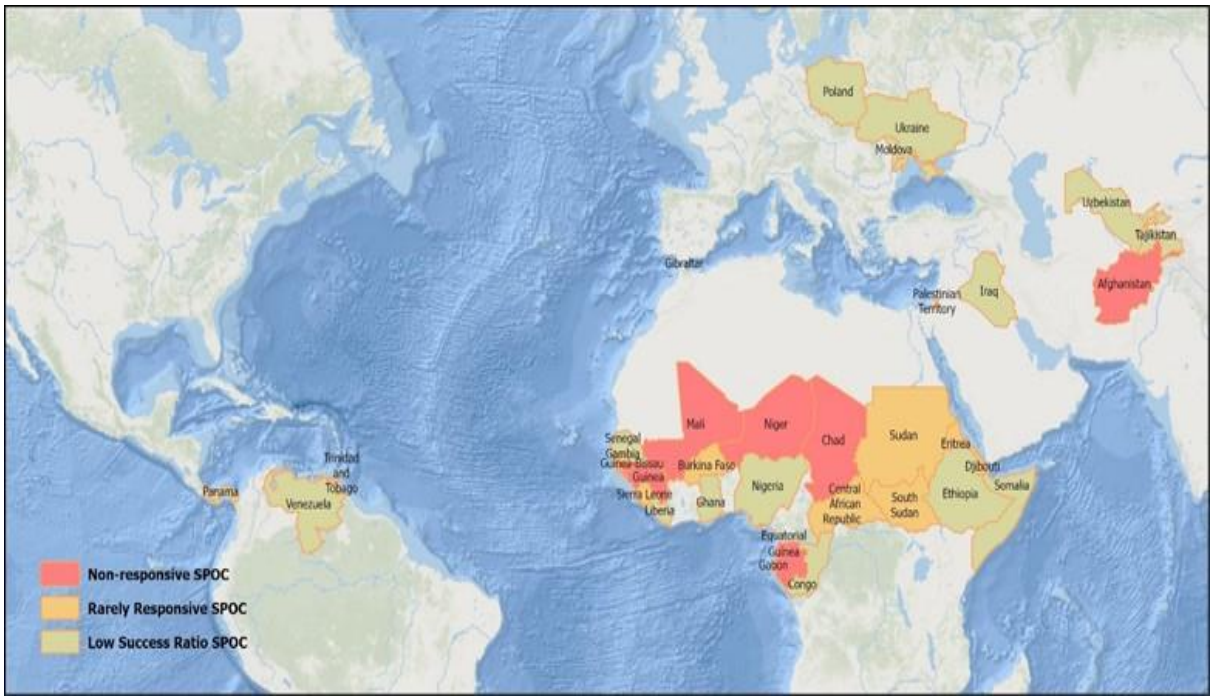

Figure 3: Map of Non-Responsive and Poorly Responsive SPOCs (2023-2024)

2.8 With the assistance of members of the ICAO/IMO Joint Working Group on Harmonization of Aeronautical and Maritime Search and Rescue (ICAO/IMO JWG-SAR), ICAO and Cospas-Sarsat have hosted a series of seminars aimed at improving the ability of rescue coordination centres (RCCs) to effectively respond to distress alerts sent by Cospas-Sarsat and to reduce the poor response rate to test messages sent to SPOCs.

2.9 The first such workshop was hosted by the ICAO Western and Central African (WACAF) Regional Office, Dakar, Senegal, in September 2021 using a virtual meeting platform. A follow-on seminar was conducted (virtual platform) in October 2022. An ICAO Africa – Indian Ocean Regional GADSS Workshop held (virtual platform) in August 2022 and in addition to GADSS, also addressed SPOC communication matters. In November 2023, a regional IMO meeting held in Cape Town, South Africa, and two regional SPOC meetings held in Doha, Qatar in March 2024 and in Jeddah, Saudi Arabia in February 2025 addressed this important topic.

2.10 The Secretariat currently holds copies of agreements/arrangements between:

- Algerian MCC – Niger (2022)
- South African MCC – Angola (2023)
- South African MCC – Botswana (2023)
- South African MCC – Congo (2023)
- South African MCC – Eswatini (2023)
- South African MCC – Lesotho (2023)
- South African MCC – Malawi (2023)
- South African MCC – Namibia (2023)
- South African MCC – St Helena (2023)
- South African MCC – Zambia (2023)
- South African MCC - Zimbabwe (2023)
- South African MCC – Uganda (2023)
- South African MCC – Mozambique, (2023)
- South African MCC – Bahrain (2020)
- Saudi Arabian MCC – Lebanon (2018)
- Spanish MCC – Togo (2024)
- Spanish MCC – Benin (2022)
- Spanish MCC – Cameroon (2022)
- Spanish MCC – Gambia (2022)
- Spanish MCC – Ghana (2021)
- Chilean MCC – Paraguay (2018)
- French MCC – La Réunion (2019)
- French MCC –Tahiti (2020)
- French MCC – Tunisia (2021)
- French MCC– Austria (2021)
- French MCC –Antilles-Guyana (2020)
- French MCC – Germany (2020)
- French MCC – Morocco (2021)
- French MCC – Switzerland (2021)
- Indian MCC –Nepal (2015) *unsigned*
- Indian MCC – Maldives (2023)
- Italian MCC – San Marino (2023)
- Italian MCC – Albania (2023)
- Italian MCC – Kenya C (2022)
- Italian MCC – North Macedonia (2018)
- Italian MCC – Serbia (2020)
- Italian MCC – Somalia (2021)
- Italian MCC – Sudan (2018)
- Norwegian MCC – Sweden (2015)
- United Kingdom MCC – Ireland (2018)
- US MCC – Bermuda (2025)
- US MCC – COCESNA (2025)
- US MCC – Dominican Republic (2025)
- US MCC – Dutch Caribbean (2018)
- US MCC – Ecuador (2025)
- US MCC – Haiti (2018)
- US MCC – Panama (2018)
- US MCC – Trinadad and Tobago (2025)
- Viet Nam MCC – Cambodia (2013)
- Viet Nam MCC – Laos (2013

Providing Feedback on Actions Taken by an RCC

2.11 At its 30th meeting in 2024, the ICAO/IMO Joint Working Group (JWG) on the Harmonization of Aeronautical and Maritime Search and Rescue approved the draft amendments to the IAMSAR Manual, Volume II, appendix B, to provide sample ELT(DT) alerts and cancellation messages to be published in its 2025 edition.

2.12 Full details of the new SIT 185 message format, including samples, explanation and guidance, can also be found in the Cospas-Sarsat RCC Handbook, document C/S G.007, available free of charge at https://www.cospas-sarsat.int/images/stories/SystemDocs/Current/G007-OCT-27-2023.pdf. A video describing the new SIT 185 format is available at https://www.cospas-sarsat.int/en/search-and-rescue/training-resources.

System Enhancements

2.13 The MEOSAR system transitioned to initial operational capability in April 2023, and full operational capability (FOC) of the system is anticipated to be declared in 2025. Future enhancements are focused primarily on advancing the MEOSAR system to its next operational phase. This work principally involves commissioning of new or upgraded ground segment equipment within Cospas-Sarsat Participant States and territories to augment global coverage, and the implementation of a quality management system (QMS) for MEOSAR.

2.14 Cospas-Sarsat announced full operational capability (FOC) for FGB ELT(DT)s from January 2023 and for SGB ELT(DT) from January 2024. In some cases, the ELT(DT) replaces the ELT(AF), which may initially result in the loss of the 121.5 MHz homing signal; however, an update of the ICAO regulations is expected to ensure that at least one automatic ELT (including ELT(DT) onboard commercial aircraft shall include a 406 MHz distress beacon transmitting on 121.5 MHz as well. Cospas-Sarsat has developed guidance for use by RCCs when in receipt of an alert from an ELT(DT), available on the Cospas-Sarsat website.

2.15 Cospas-Sarsat also focused on developments necessary to begin operational phases for second-generation beacons (SGBs) (that will transmit more information in their distress message and have greater location accuracy). This work principally involves commissioning of new or upgraded Ground Segment equipment within Cospas-Sarsat Participant states and territories to ensure global coverage.

2.16 Cospas-Sarsat has continued the design of 406 MHz distress beacons allowing two-way communication. Two-Way Communication (TWC) for distress beacons will provide a number of benefits in emergency situations, including:

- providing confirmation of receipt of the distress signal by SAR services (RCCs);
- improving situational awareness by allowing the person in distress to provide additional information, allowing rescue teams to better understand the nature of the emergency and respond appropriately;
- providing important safety benefits by allowing the SAR services to communicate with the person in distress, possibly providing guidance on how to stay safe, and to monitor their circumstances until help arrives; and
- reducing false alarms.

2.17 Consistency in the TWC system is part of the design, as TWC is envisaged for implementation on several different MEOSAR satellites systems. Based on the RLS technology, this TWC service can be seen as an enhancement of the current RLS - Type 1. Cospas-Sarsat held dedicated experts working groups in February 2024, and more recently in March 2025, and has established a correspondence working group led by the European Commission to further consider matters related to TWC. Interested participants are invited to join the correspondence working group on Two-Way Communications to monitor and contribute to the work being done and to assist in the further development of the planned two-way communication capability for RLS second generation beacons.

Training Material and Public Relations

2.18 Development of video material continued with the creation of a series of video FAQs. All videos are available free-of-charge in English on YouTube (406.org/en/search-and-rescue/programme-videos-en) and at https://moodle.406.org/ with subtitles in the French and Russian languages available. Videos on new SIT 185 format message and the use of the new IBRD were released recently, and production of videos addressing ELT(DT)s and SGBs is in progress.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information provided on the status of the Cospas-Sarsat Programme;

b) provide feedback on notifications about Cospas-Sarsat System developments;

c) provide details of any existing MCC-SPOC agreements/arrangements, and proposals for improving MCC-SPOC communications during tests and real alerts;

d) note that Cospas-Sarsat declared the ELT(DT) operational in January 2023 (for FGBs) and January 2024 (for SGBs), and consider making available to RCCs in their national/regional documentation advice on management of distress alerts emanating from an aircraft which might still be in flight;

e) encourage APSAR WG Member States to join the Cospas-Sarsat Correspondence Working Group on Two-Way Communications to assist in the further development of the planned two-way communication capability for RLS second-generation beacons; and

f) provide feedback on the video library made available publicly for use by SAR professionals, including the possible need to address any new topics.

– END –