International Civil Aviation Organization

Third Meeting of the Asia/Pacific Regional Search and Rescue Task Force (APSAR/TF/4)

Bangkok, Thailand, 06 – 10 July 2015

Agenda Item 3: Global update

STATUS AND DEVELOPMENTS IN COSPAS-SARSAT

(Presented by International Cospas-Sarsat Programme)

SUMMARY

This document provides a status report on the Cospas-Sarsat System, including System operations, System status (space and ground segments), and significant developments related to next-generation beacons and MEOSAR.

1. INTRODUCTION

1.1 This document provides a status report on the Cospas-Sarsat System, including System operations, System status (space and ground segments), and significant developments related to next-generation beacons and MEOSAR.

2. DISCUSSION

System Operation

2.1 In 2014 provisional statistics indicate that Cospas-Sarsat alert data assisted in 703 distress incidents (720 in 2013) and 2,104 persons were rescued (2,156 in 2013). Since September 1982, the Cospas-Sarsat System has provided assistance in rescuing at least 39,315 persons in 11,088 SAR events. The final statistics for 2014 still are being collected and compiled. For the most recent final statistics breakdown, please see document APSAR/TF/3-WP03.

2.2 It is worth a reminder that ELTs remain a significantly disproportionate contributor to false alerts. This appears to be due to training and information issues for cockpit crews and maintenance personnel, who activate beacons for testing without realizing that all transmitted alert signals are treated as real. The “Testing Your 406-MHz Beacon” page of the Cospas-Sarsat website has been updated to emphasize proper procedures. In part as a result of incidents where ELTs fail to transmit a burst before destruction in fire or submersion in water, the “wait” time for beacon first-burst transmission is being reduced from 50 seconds to 3 seconds in the next generation of beacons. Without proper training of cockpit crews and maintenance personnel, this could lead to an increase in false aviation-related alerts.

406-MHz Beacons

2.3 Based on information received from manufacturers on beacon production and a standard assumption made about beacons removed from the market at the end of an assumed ten-year service life, there were approximately 1.6 million 406-MHz beacons in use worldwide at the end of 2014, an approximate 9.5% increase from the prior year. ELTs represented approximately 25,000 units of new production in the year (13.3% of all 406-MHz beacon production), and approximately 9,000 of those were “Location Protocol” beacons with the ability to transmit location information from a local source (such as a built-in GNSS receiver).

2.4 It is a useful reminder that Cospas-Sarsat operates the International 406-MHz Beacon Registration Database (IBRD, www.406registration.com) which is freely available to users with no access to national registration facilities. By allowing their beacon users to register beacons in the IBRD, Administrations help to facilitate proper registration by beacon owners while avoiding administrative costs and inconvenience to their governments. Administrations may also avail themselves of the facility to upload their national beacon registration data to the IBRD to ensure that it is available 24/7 to other SAR services when they receive alerts from active beacons in their SAR area of responsibility. As at 1 December 2014, there were 48,341 beacons registered in the IBRD (38,991 at 1 August 2013) from 132 Administrations. On average 326 SAR users per month log into the IBRD to search for beacon registration information.

2.5 The Guidance on the Cospas-Sarsat International 406 MHz Beacon Registration Database (IBRD), adopted at the Ninety-fourth Session (17-21 November 2014) of the IMO's Maritime Safety Committee is again included for information as **Attachment 1** to this document, considering that it is largely applicable to ICAO and the aviation community.

The LEOSAR and GEOSAR Systems

2.6 As of 26 June 2015, five LEOSAR spacecraft were in operation: Sarsat-7, Sarsat-10, Sarsat-11, Sarsat-12 and Sarsat-13. Planned LEOSAR launches include the Russian Cospas-13 and Cospas-14 in 2016 and 2017 respectively, and the U.S. LEOSAR program in the process of planning and funding of a dedicated LEO satellite to be launched into an ascending early afternoon orbit, no earlier than 2019.

2.7 Seven satellites operating at full operational capability (FOC) comprise the GEOSAR space segment as at 26 June 2015: two Indian geostationary satellites, INSAT-3A at 93.5º E (presently not fully in service) and INSAT-3D at 82º E; two U.S. geostationary satellites, GOES-15 (West) at 135º W and GOES-13 (East) at 75º W; two Eumetsat geostationary satellites, MSG-2 (9.5° E) and MSG-3 (0°); and one Russian geostationary satellite Electro-L1 operated at 76º E. Russia's Louch-5A remains under test at position 167ºE, with New Zealand, the United States and Australia supporting Russia in evaluating the Louch GEOSAR performance, with an aim of commissioning the satellite into the GEOSAR constellation. On 28 April 2014 Russia launched another Louch-series geostationary satellite (Louch-5V), which remains under IOV test. The GEOSAR constellation will be further maintained with the anticipated launch of Electro-L2 (2015), MSG-4 (2015), and GOES-R, -S, -T, and -U (2016, 2017, 2019 and 2025, respectively).

2.8 As at 26 June 2015, 53 LEOLUTs, 23 GEOLUTs and 31 MCCs were in operation.

SPOC Communication Tests

2.9 Available results (see document APSAR/TF/3-WP03) clearly show that about 25% of all tested SPOCs remain insufficiently responsive or non-responsive. The majority of less responsive SPOCs are found in the African region.

2.10 For the Asia-Pacific region the good news is that the APSAR community has no Administrations on the list of non-responsive SPOCs. The bad news, however, is that the SAR Compatibility Matrix shows that, in their own judgments, many Administrations view themselves as deficient with respect to their implementation of Cospas-Sarsat alert facilities and procedures. Cospas-Sarsat is inviting Administrations to share copies of any SPOC agreements that might be in place, with a view towards developing a "model" Memorandum of Agreement between MCCs and supported SPOCs to, among other things, assist in improving communications between MCCs and SPOCs.

2.11 The ICAO Second High-level Safety Conference (HLSC, 2-5 February 2015, ICAO HQ, Montreal) was attended by 710 delegates from 155 delegations. The list of participants is at: http://www.icao.int/Meetings/HLSC2015/Documents/List_Delegates/HLSC2015_List%20of%20Delegates_No4.pdf. This meeting was very well attended and included a large presence from the press. Topics were discussed at a very high level for the benefit of the press and victims' rights groups in attendance.

2.12 Of interest from the Cospas-Sarsat perspective was a document from Sudan (HLSC/15-WP/53) encouraging ICAO to assist in development of regional SAR efforts and agreements. Sudan summarized their document as follows: "Notwithstanding the Convention on International Civil Aviation and Annex requirements and recommendations encouraging States to cooperate in search and rescue activities and to enter into agreements to facilitate search and rescue between neighbouring States and regions, many Contracting States were unable to effectively implement or undertake such a cooperative approach for several reasons. This paper proposes that ICAO play a leading role in the establishment of regional search and rescue organizations that would present an effective and efficient solution to resolve problems and obstacles." Sudan further invited the conference to:

- assess the benefits of establishing regional search and rescue organizations,
- recommend that ICAO actively support the establishment of such organizations, and
- encourage Contracting States to actively participate in regional search and rescue organizations to overcome the obstacles and problems that currently exist in this area.

2.13 The resulting recommendation, following strong support expressed by many conference attendees (Libya, Spain, South Africa, UAE, Saudi Arabia, Uganda, Mauritania, and Egypt), was: "The conference noted the challenges and suggestions to improve search and rescue activities through regional SAR organizations. The conference agreed that regional SAR training exercises related to abnormal flight behaviour can serve as a means to maintain proficiency on seldom-used emergency procedures and also provide feedback to further develop the GADSS in the future. This is particularly the case when cooperation amongst several stakeholders is essential." If undertaken, this effort could assist in the matter of non-responsive SPOCs, the majority of which, as noted above are located in the African region.

Developments in the work of the Cospas-Sarsat Programme

2.14 Since the APSAR/TF/3 meeting, Cospas-Sarsat has held the following meetings:

- A Task Group Meeting (TG-1/2015) on Second Generation 406 MHz Beacon Specifications, 23-27 February 2015 (which, among other things, recommended the preparation of a letter to ICAO, RTCA and the European Organisation for Civil Aviation Equipment inviting information, views and expert advice on the contents of distress message fields for ELTs activated in flight – see **Attachment 2**);
- A Task Group Meeting (TG-2/2015) on the MEOSAR Demonstration and Evaluation (D&E) Phase, 13-17 April 2015;
- The Fifty-Fourth Session of the Closed Council, 20-22 May 2015; and
- A Task Group Meeting (TG-3/2015) on the MEOSAR Demonstration and Evaluation (D&E) Phase Test Results, 8-12 June 2015.

2.15 Cospas-Sarsat has a full calendar of three additional meetings planned for 2015. In order to have sufficient time for completion and review of MEOSAR D&E work (see section 2.19, below) prior to declarations that the Cospas-Sarsat Council may make with respect to the operational availability of the MEOSAR system, the Council adopted an exceptional schedule for the Cospas-Sarsat Programme for the year 2015. This schedule is at **Attachment 3**.

System Enhancements

2.16 Future enhancements to System operations continued to focus primarily on development of technical specifications for second-generation beacons and the next-generation space system, MEOSAR. Highlights of developments of interest to SAR providers agreed at the Twenty-Eighth Meeting of the Cospas-Sarsat Joint Committee, which were reviewed and generally agreed at the Fifty-Third Session of the Open Council, were reported in document APSAR/TF/3-WP03.

2.17 It is useful to recall from document APSAR/TF/3-IP03 that the European Organisation for Civil Aviation Equipment (EUROCAE) created a working group (WG-98) to address specifications for a new class of automatically activated (prior to impact) next-generation ELTs, and definitions of ELT technical requirements, criteria for in-flight activation, criteria for termination of an ELT alert triggered in flight, and the frequency of transmission of data and applicable parameters. The Radio Technical Commission for Aeronautics (RTCA) created its SC 229 committee with similar objectives, and EUROCAE and RTCA decided to have their committees meet and work together in the interest of the best synergies. This important work continues.

2.18 Items of particular continuing interest to this meeting related to the ICAO/IMO Joint Working Group on SAR (JWG) may include:

- the 22nd meeting of the ICAO/IMO Joint Working Group on Search and Rescue is scheduled for 14-18 September 2015, in Trenton, Ontario, Canada;
- that the Cospas-Sarsat Secretariat transmitted a liaison statement to IMO regarding a modification to IMO Resolution A.810(19) that would allow the duty cycle of the 121.5 MHz homing signal to be reduced to 30 percent, as specified in ITU Recommendation ITU-R M.690-1, to enable the interleaving of other current- and emerging-technology signals and methodologies that offer the potential for a more capable and effective homing process, while concurrently preserving the 121.5-MHz legacy homing signal for those administrations that currently remain dependent on that signal for homing and on-scene locating;
- the decision of the IMO's Sub-Committee on Navigation, Communication and Search and Rescue (NCSR), at its second session, agreeing with the JWG that keeping the same level of performance of the 121.5 MHz final homing capability was the area of concern and that evidence was needed that the proposed modification of the current IMO requirement for a continuous 121.5 MHz homing signal would have no detrimental effect on 121.5 MHz homing capability, and that this should be demonstrated through appropriate testing, which should be documented and provided for review when the Sub-Committee would consider the revision of resolution A.810(19) at a future session" (note that it has been requested by Cospas-Sarsat that the results of such testing be provided to the 29th meeting of the Cospas-Sarsat Joint Committee (21-30 September, with a working paper deadline of 24 August), to enable the Joint Committee to review and forward relevant information to the 22nd meeting of the JWG);
- that the JWG had received a request from Cospas-Sarsat to indicate how long raw data received at earth stations should be kept available for the benefit of accident investigations in order for Cospas-Sarsat to plan for the storage of raw data for such an amount of time as might be needed, and the JWG's Recommendation 21/4 that ICAO and IMO provide the required period of time for storage of Cospas-Sarsat data related to accident investigations, and that the IMO's NCSR-2 had requested that the JWG further consider the matter and make recommendations back to NCSR-3.

Status of the MEOSAR System Development

2.19 MEOSAR development continues, following the January 2013 commencement of the technical tests of Phase I of the MEOSAR Demonstration and Evaluation (D&E). The JC-28 Meeting, EWG-1/2014 and the Fifty-Third Session of the Open Council discussed D&E test results available to date, including results from operational testing which commenced with Phase II of the D&E in April 2014. The Council decided to introduce into the MEOSAR implementation timeline a new, intermediate phase prior to the Initial Operational Capability (IOC), defined as the Early Operational Capability (EOC). The Council anticipates a decision at its next meeting in December 2015, or at its following meeting, on whether and when to enter MEOSAR EOC, with a decision whether to enter IOC anticipated for the last Council meetings in 2016, with an effective date potentially targeted for January 2017. The Council will formally advise stakeholders, such as ICAO, on transitions to operational configurations as the decisions are made.

2.20 The MEOSAR satellite constellation currently includes three operational L-band satellites (Glonass-K1, and Galileo IOV-3 and IOV-4 satellites) and 17 GPS II satellites carrying experimental DASS repeaters with an S-band downlink used by the Cospas-Sarsat Programme. It is reported that Galileo IOV-4 has been taken out of service following a problem that rendered it unable to use two frequencies (that may have been caused by a defective antenna) and an investigation is continuing, with the future disposition of this spacecraft uncertain. The first two Galileo FOC satellites (carrying L-band SAR payloads) were launched on 22 August, however a launch anomaly occurred and the operational capability of these satellites remains under review. In late November one of these satellites, FM-1, was successfully moved into a higher orbit with sufficient fuel to operate for 12 years. A similar orbital manoeuvre was executed for the second one, FM-2, and concluded in March 2015. Satellites FM-3 and FM-4 were launched successfully on 27 March 2015 from Guiana Space Centre. Four additional FOC satellites are expected to be launched in 2015. The USA plans to carry Canada-supplied L-band SAR repeaters on 24 GPS satellites beginning with the launch of the ninth GPS Block III satellite, anticipated for deployment as early as 2020.

2.21 The following have announced the planned implementation of an operational MEOSAR ground segment: Algeria, Argentina, Australia, Brazil1, Canada*, China, the European Commission* (Cyprus*, France (used for Galileo testing), Norway*, Spain*), France*, India, Japan*, New Zealand, Pakistan, Peru, Russia*, South Africa, Turkey*, UK*, UAE and USA*.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper;

b) review options to address problems with SPOC communications and false alerts;

c) review and highlight 406-MHz Beacon Registration issues;

d) discuss Cospas-Sarsat and MEOSAR developments and how they relate to the SAR Plan;

e) provide views and/or recommendations related to the letter to ICAO, RTCA and the European Organisation for Civil Aviation Equipment inviting information, views and expert advice on the contents of distress message fields for ELTs activated in flight;

f) provide views and/or recommendations about the how long raw data received at Cospas-Sarsat earth stations should be kept available for the benefit of accident investigations; and

g) discuss any relevant matters as appropriate.

[1] These Administrations are currently participating in the MEOSAR D&E Phase using MEOSAR experimental ground segment equipment (either a MEOLUT or a MEOSAR-ready MCC).

Attachment 1

The IMO Maritime Safety Committee approved *Guidance on the Cospas-Sarsat International 406 MHz Beacon Registration Database (IBRD)*, MSC.1/Circ.1210/Rev.1

GUIDANCE ON THE COSPAS-SARSAT INTERNATIONAL 406 MHz BEACON REGISTRATION DATABASE

Need for EPIRB Registration and Associated Databases

1 Emergency position-indicating radio beacons (EPIRBs) perform distress alerting and other functions to support search and rescue (SAR) services covered by the 1979 International Convention on Maritime Search and Rescue, as amended, for any person in distress at sea, and the 1974 International Convention on Safety of Life at Sea (SOLAS), as amended, requires EPIRB carriage (Chapter IV, regulation 7.6) and registration.

2 The provisions relevant to EPIRB registration in Chapter IV, regulation 5-1 apply to all ships on all voyages, and are as follows:

"Each Contracting Government undertakes to ensure that suitable arrangements are made for registering global maritime distress and safety system (GMDSS) identities and for making information on these identities available to rescue co-ordination centres on a 24-hour basis. Where appropriate, international organizations maintaining a registry of these identities shall be notified by the Contracting Government of these assignments."

3 It is crucial that 406 MHz EPIRBs be registered, and that the registration data be available to SAR authorities at all times. Experience has shown that EPIRB registration data is either critically important or otherwise often helpful in the majority of SAR cases involving an EPIRB alert.

4 406 MHz EPIRBs should be registered regardless of whether they are carried aboard ships or other marine craft, and registrations should be reinforced by national requirements.

5 It is essential that IMO Member States provide a readily-accessible mechanism (preferably one that is available by internet as well as other conventional means) to enable EPIRB owners to fulfill their obligation to register the beacons, and to make this data available for SAR authorities 24-hours-per-day, seven-days-per-week for use in an emergency. Such arrangements can be implemented nationally, on a regional basis in co-operation with other Administrations, or by other suitable means. The COSPAS-SARSAT International Beacon Registration Database is a facility available free of charge to enable beacon owners to directly register their beacons and/or to allow Administrations to upload their national registration data to ensure that it is available to SAR authorities worldwide on a 24-hours-per-day, seven-days-per-week basis.

International Beacon Registration Database

6 The International COSPAS-SARSAT Programme processes 406 MHz EPIRB alerts and routes them to the identified SAR authorities. It also operates the International Beacon Registration Database (IBRD) for 406 MHz beacons, operational since January 2006.

7 The IBRD is hosted on the Internet at www.406registration.com, with online help capabilities.

8 COSPAS-SARSAT provides the IBRD as a readily-available means for beacon owners to register their beacons unless an alternative method of registration is required by their national Administration. The registration information contained in the IBRD, whether directly entered by beacon owners or uploaded from national registration databases maintained by Administrations, is available 24-hours-per-day, seven-days-per-week for assisting SAR Services in SAR operations. The IBRD is available free of charge to individuals directly registering beacons and to Administrations uploading or retrieving registration data.

9 Administrations that maintain their own national registers are encouraged to upload their registration data to the IBRD to make their national beacon registration data available as quickly and easily as possible to SAR personnel on a 24-hour basis.

10 The IBRD can be used not only for registering 406 MHz EPIRBs, but also 406 MHz emergency locator transmitters (ELTs) carried on board aircraft, and personal locator beacons (PLBs) designed for personal use.

Background

11 The COSPAS-SARSAT 406 MHz System provides distress alerts that include the unique 15-character hexadecimal identification of the transmitting beacon. This beacon identification can be decoded to obtain information that includes:

.1 the type of beacon, i.e. ELT, EPIRB or PLB;
.2 the country code and identification data which form the unique beacon identification; and
.3 the type of auxiliary radio locating (homing) device, e.g., 121.5 MHz transmitter.

12 If a beacon is properly registered, the 15-character hexadecimal identification of the beacon can be used to access additional information. Beacon registration databases can provide information of great use to SAR personnel, including:

.1 specific owner identification information;
.2 the make/model and identification of aircraft or vessel in distress;
.3 communications equipment available;
.4 the total number of persons onboard; and
.5 emergency contact information.

13 To have this valuable information available to SAR authorities in an emergency, it must be available from either a national database available 24-hours-per-day, seven-days-per-week maintained by a national Administration and/or from the IBRD, provided that the national Administration allows direct registration in the IBRD by beacon owners or the Administration uploads its registration data to the IBRD for access by other SAR authorities.

14 Registration of 406 MHz beacons is required in accordance with international regulations on SAR established by the International Civil Aviation Organization (ICAO) and by the SOLAS Convention. In addition, some countries have made 406 MHz beacon registration mandatory.

IBRD Concept of Operations

15 The IBRD is designed to support:

.1 beacon owners who wish to directly register their beacons;
.2 Administrations to make their registration data easily available to other SAR authorities in an emergency by uploading that information to the IBRD; and
.3 SAR authorities that need to efficiently access beacon registration data to assist persons in distress.

16 COSPAS-SARSAT has configured the IBRD to accept by default beacon registrations from beacon owners, unless the Administration associated with the beacon's country code(s) has advised COSPAS-SARSAT that it:

.1 operates a national database with a 24-hour point of contact and does not want EPIRBs with its country code(s) included in the IBRD; or
.2 wishes to control the inclusion of beacons with its country code(s) in the IBRD.

Establishing an IBRD Point of Contact

17 Each Administration should provide COSPAS-SARSAT with a national IBRD Point of Contact for co-ordinating use of the IBRD. This Contact will decide the settings in the IBRD related to beacons with its country code and help to resolve problems arising with registration of beacons with that Administration's country code(s).

18 The national IBRD Point of Contact should be officially identified to the COSPAS-SARSAT Secretariat using a letter of the form that may be found at the Cospas-Sarsat website (www.cospas-sarsat.int – on the "Cospas-Sarsat Professionals" page choose the "Documents" tab, then "Document Templates, and select the "IBRD" tab). This letter must be signed by the Administration's IMO representative, or by its representative to COSPAS-SARSAT or to the International Civil Aviation Organization (ICAO), and sent to the COSPAS-SARSAT Secretariat. Based on the letter, the COSPAS-SARSAT Secretariat~~)~~ will allocate the requested user identifications and passwords to the Administration's national IBRD Point of Contact.

19 The request should specify whether user identification and passwords to be issued to the Administration's IBRD Point of Contact are required to:

.1 enable the Administration to upload registration data about its beacons to the IBRD;
.2 enable its SAR Services to access IBRD registration data in an emergency; and/or
.3 make IBRD registration data available to authorized shore-based service facilities and vessel inspectors.

20 Passwords and user identifications will be sent via post to the national IBRD Point of Contact. The national IBRD Point of Contact must then forward the user identifications and passwords to those entities authorized by its Administration to access the IBRD.

21 It is critical that, at a minimum, passwords be requested for SAR Services to access beacon registration information in the IBRD during an emergency.

Providing Details of Your National Beacon Registry

22 If an Administration maintains its own national beacon registry and decides not to allow beacons with its country code(s) to be registered in the IBRD, the Administration should review the information provided on the COSPAS-SARSAT website to the public (such as beacon owners) relating to its beacon-registration policies (please see the information contained on www.cospas-

sarsat.int on the "Cospas-Sarsat Professionals" page choose the "Contact Lists" tab and select "406 MHz Beacon Register"). Please provide the COSPAS-SARSAT Secretariat immediately with any updates, as appropriate. This is a source very commonly used by beacon owners to learn where to register their beacons and, therefore, it is critically important that accurate information is provided in order to keep these web pages up to date.

23 Based on the information that Administrations provide, a beacon owners who attempts to register a beacons on the IBRD will be advised through a "pop up" window on the IBRD website of how and/or where to register the beacon (based on the country code programmed into the beacon and the polices of that Administration reported to the Cospas-Sarsat Secretariat).

24 If no information is available regarding a national beacon registry for an Administration, COSPAS-SARSAT policy is to assume that no such registry exists and allow the direct registration in the IBRD by owners of beacons with that Administration's country code(s) (www.406registration.com).

National Administration Control of Beacon Registration in the IBRD

25 If an Administration has elected to prohibit direct registration by owners of their beacons in the IBRD, but wishes to upload to the IBRD some or all of its national beacon registration records, a national IBRD Point of Contact should be designated as described above so that the necessary arrangements can be made to enable the uploading of records.

26 The Administration will be able to upload in bulk its beacon registration data or, if desired, keep sole control of individual record inputs or updates. In that case, beacon owners who attempt to register beacons with that Administration's country code(s) will be directed by the IBRD website to the Administration's national website or point of contact for beacon registration.

Means of Registration

27 Beacon registrations allowed on the IBRD only will be accepted via the online facilities of www.406registration.com and, under no circumstances can registrations be accepted in paper format nor by telephone, facsimile or any other communication facilities.

Other Supported Beacon Types

28 In addition to EPIRBs, the IBRD supports two other types of beacons:

.1 Emergency Locator Transmitters (ELTs), for use in aircraft; and

.2 Personal Locator Beacons (PLBs), small beacons for individuals to carry or wear; these beacons sometimes may be used for purposes similar to an EPIRB or ELT, as allowed by local regulations and, therefore, sometimes may be coded to transmit distress messages that have the same content as an EPIRB or ELT, and/or registered as an EPIRB or ELT in the IBRD.

Further Information

29 Further information can be found at www.cospas-sarsat.int, or by e-mail at dbadmin@406registration.com .

Attachment 2

International Satellite System for Search and Rescue
Système international de satellites pour les recherches et le sauvetage
Международная Спутниковая Система Поиска и Спасания

CS15/055/F450

Montréal, 17 April 2015

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Dear Sirs and Madam:

The International Cospas-Sarsat Programme continues to develop specifications for second-generation 406-MHz distress beacons that will be optimized for use within the MEOSAR system[1]. The intention is to introduce greater capabilities to better serve the 406-MHz distress-beacon user community and SAR authorities responding to 406-MHz distress signals. The International Cospas-Sarsat Programme could benefit from information, views and expert advice provided by your organizations related to emergency locator

[1] Medium-altitude Earth-Orbit Search-and-Rescue system. The MEOSAR system will provide an enhanced distress alerting capability and become the dominant component of the Cospas-Sarsat System in the years to come.

transmitters (ELTs) that may be activated during distress of an aircraft in flight.

One of the capabilities of second-generation beacons subject to continuing discussion is termed “rotating fields” where, with each beacon burst (distress message), part of the transmitted message will contain information that may differ from one burst to the next in order to increase the overall volume of information transmitted over time for use by rescue coordination centers.

Every beacon burst will include the beacon unique identification and certain other information considered essential in every message (such as vessel (MMSI)/aircraft ID and encoded location data). But variable or rotating fields would contain information that may not be essential in every message. A particular rotating field may be transmitted in every beacon burst, or only every second, third, fourth, etc. beacon burst, depending on predetermined priorities related to the beacon device or nature of the distress (as may be determined, for example, by the method of beacon activation). Generally, all fields will be transmitted at least once during each period of a few minutes.

Cospas-Sarsat anticipates that one block of rotating fields will be dedicated to the distress event described as “In-Flight Emergency”. This would be consistent with the objective operational requirements that have been established in section 4.4 of document C/S G.008, “Operational Requirements for Cospas-Sarsat Second-Generation 406-MHz Beacons,” to address ELTs activated in flight. That section says, in part: “Second generation fixed ELTs should have a capability to be triggered while the aircraft is still in-flight (prior to an anticipated accident). The ELT could be activated automatically (i.e. while in flight and separate from G-switch detection of a crash) and/or be manually activated. The automatic in-flight activation should be triggered by a signal originated by the aircraft avionics (or its equivalent) after detection of anomalous flight conditions that warrant ELT activation as determined by the triggering algorithm. ELTs with automatic activation capability should also transmit encoded location data in the beacon message.”

With the expectation that Cospas-Sarsat will include a rotating block of fields for “In-Flight Emergency”, Cospas-Sarsat invites your organizations to provide information, views and expert advice on the contents of such a block of fields, and the operational considerations that would be associated with it, including:

- the availability of the necessary interface/information for identifying the method of activation of the emergency (e.g., automatic, manually from cockpit, manually (remotely) from the ground) to be transmitted in the beacon message,

- what changes should occur in the ELT’s data transmissions in the event of the aircraft subsequently crashing,

- what entities the data from the in-flight activation should be forwarded to (e.g., air traffic management, aircraft owner/operator, SAR agency) and the extent to which any data should be withheld from certain entities, encrypted and/or archived for subsequent crash investigation,

- by what means the data should be forwarded to the appropriate entities,

- whether the necessary bus interfaces and data would be available to the ELT aboard typical commercial aircraft for the ELT to transmit any aircraft data that might be desirable (e.g., vertical speed and method of ELT activation),

- the amount of lead time required from when the in-flight activatable ELT specifications and interface requirements were finalized until an ELT could be certified and installed in a commercial airframe, and

- what agencies would initiate or be expected/allowed to initiate the manual activation request from the ground and the means by which this would be carried out.

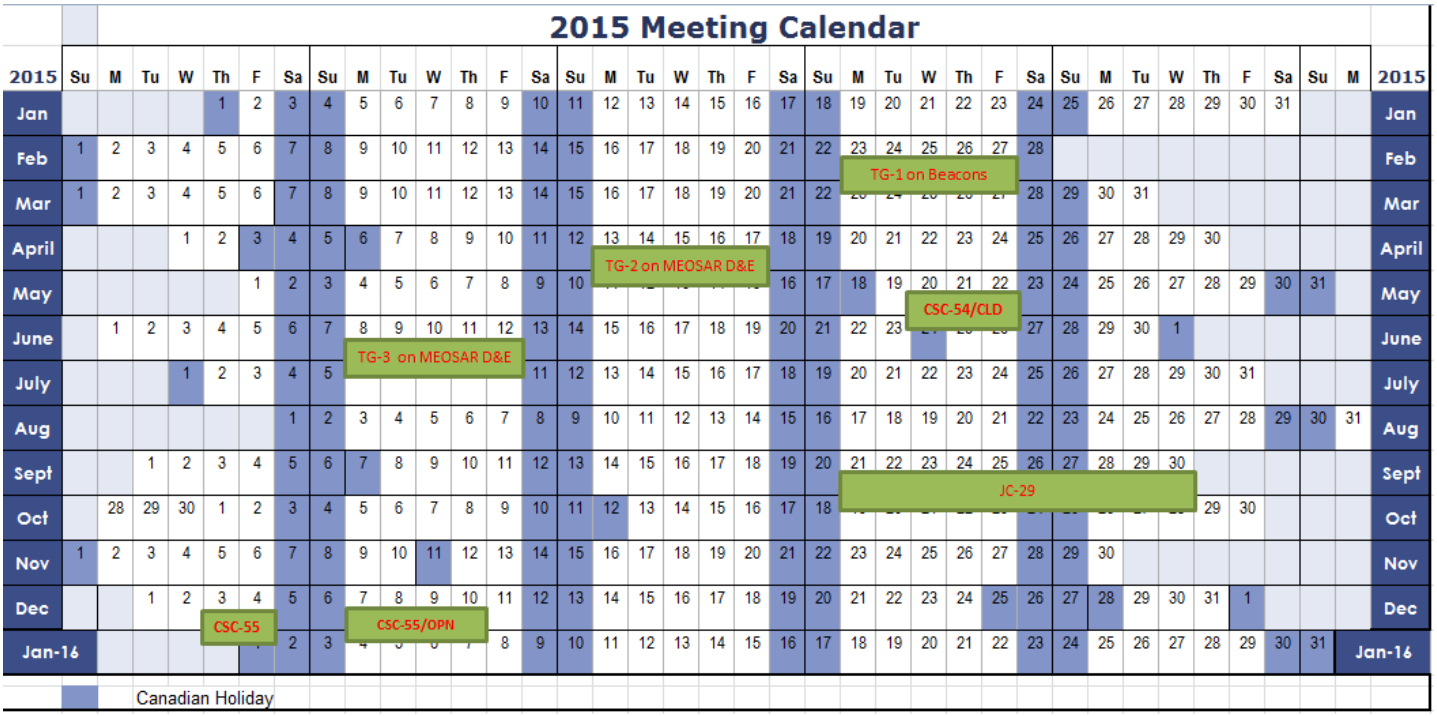
Recognizing that time is short, but that this also is a matter of urgency as several international organizations simultaneously are attempting to address issues of in-flight distress as rapidly as possible, any available information, views and expert advice that you may be able to provide, even of a preliminary nature, would be appreciated prior to 1 August 2015, to allow for its consideration by the 29th Meeting of the Cospas-Sarsat Joint Committee, where analyses of the matter and recommendations on the issue to the Cospas-Sarsat Council will be formulated.

Please accept the assurances of my highest consideration.

Yours sincerely,

Michael Donald
Council Chair

Attachment 3



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THE GOLD STANDARD FOR AVIATION SINCE 1935

June 25, 2015

Michael Donald, Council Chair
International Cospas-Sarsat Programme
700 rue de la Gauchetiere West Suite 2450
Montréal (Québec) H3B 5M2
Canada

Subject: Your letter (CS15/055/F450)

Dear Mr. Donald,

Thank you for your letter dated 17 April 2015 regarding your request for information on RTCA and EUROCAE activities in the area of Emergency Locator Transmitters that may be activated during distress of an aircraft in flight.

As you know from COSPAS SARSAT's involvement in the groups, RTCA SC-229 '406 MHz Emergency Locator Transmitters (ELTs)' and EUROCAE WG-98 'Aircraft Emergency Locator Transmitters', have been working together since 2014 to update DO-204 / ED-62 'MOPS for aircraft emergency locator transmitters (406 MHz and 121.5 MHz – optional 243 MHz)'. The revised draft is expected to be submitted to the RTCA FRAC (Final Review and Comment) and EUROCAE Open Consultation in Q3/2016. Final approval and publication are expected in early 2017. Please note that any responses we provide you now are subject to change during that review process. We trust that your representatives on the RTCA and EUROCAE groups will keep you apprised of the activities and final approved documents.

In addition to the MOPS mentioned above, EUROCAE WG-98 alone is working on a new EUROCAE Document: ED-237 'Minimum Aviation System Performance Specification for in-flight event detection and triggering criteria'. RTCA has no parallel activity at this date.
The EUROCAE draft is expected to be submitted to the EUROCAE Open Consultation in September 2015, and finalized before the end of the year. EUROCAE Council approval and publication are expected in January/February 2016.

We are pleased to provide in attachment to this letter initial responses to the questions raised in your letter. These responses were developed by SC-229 and WG-98 at their recent joint plenary meeting. The responses pertain only to the MOPS, which we are developing jointly with EUROCAE, and not the MASPS for in-flight triggering, which EUROCAE is developing alone. Again, our responses are subject to change as the groups move through the final review process and the documents are presented to the governing bodies at RTCA and EUROCAE for final publication.

If you have any questions, please contact Sophie Bousquet, Program Director for SC-229 is our contact; her email is sbousquet@rtca.org and phone number is (202) 330-0663.

Sincerely,

Margaret T. Jenny
President

cc: Mr Philippe Plantin de Hugues, BEA, EUROCAE WG-98 Chairman
Mr Tom Pack, ACR Electronics, RTCA SC-229 Chairman
Mr Stuart Taylor, HR Smith, WG-98 / SC-229 Secretary
Ms. Charisse Green, FAA, SC-229, Designated Federal Officer

RTCA SC-229 / EUROCAE WG-98 answers to COSPAS-SARSAT letter

The joint working group EUROCAE RTCA SC-229 / WG-98 is developing specifications for second generation of ELT and EUROCAE WG-98 is developing a MASPS for in-flight triggering criteria. The responses to the questions raised in your letter were developed during the SC-229/WG-98 meeting in Hamburg on April 2015.

Question: Necessary interface/information for identifying the method of activation (e.g., automatic, manually from cockpit, manually (remotely) from the ground) to be transmitted in the beacon message?

- *Answer: The group is assuming that when a signal is received from a second-generation ELT it will be necessary to have at least the information indicating whether the aircraft is still in-flight or crashed on ground. It is desirable for the ELT to transmit the method of activation (i.e, inflight or after accident has occurred) for a better analysis of actions to be performed by Mission Control Centre (MCC) or Rescue Coordination Centre (RCC).*

Question: What changes should occur in the ELT's data transmissions in the event of the aircraft subsequently crashing?

- *Answer: The joint SC/WG agreed that in the message sent to COSPAS-SARSAT sufficient information shall be provided to indicate a change on the status of the aircraft. The frequency of transmission shall be evaluated as well.*

Question: What entities the data from the in-flight activation should be forwarded to (e.g., air traffic management, aircraft owner/operator, SAR agency) and the extent to which any data should be withheld from certain entities, encrypted and/or archived for subsequent crash investigation?

- *Answer: This question couldn't be answered by the joint SC/WG. The State Letter that was issued on 15 May 2015 by ICAO on the location of an aircraft in distress provided an answer to the question.*

Question: By what means the data should be forwarded to the appropriate entities?

- *Answer: This question couldn't be answered by the joint SC/WG. It is a procedural matter, not normally addressed in a MOPS. The ICAO GADSS document has already identified this issue as an important item to resolve.*

Question: Whether the necessary bus interfaces and data would be available to the ELT aboard typical commercial aircraft for the ELT to transmit any aircraft data that might be desirable (e.g., vertical speed and method of ELT activation)?

- *Answer: The joint WG considered this question outside its scope.*

Question: The amount of lead time required from when the in-flight activable ELT specifications and interface requirements were finalized until an ELT could be certified and installed in a commercial airframe?

- *Answer: This question was deferred to aircraft manufacturers. Nevertheless, from preliminary discussions during the meeting a potential answer is that it typically takes two years after issuance of (TSO/ETSO) until an ELT could be certified and installed. The related and equally important question is to know how long after the publication of the MOPS until the TSO and ETSO will be released.*

Question: What agencies would initiate or be expected/allowed to initiate the manual activation request from the ground and the means by which this would be carried out?

- *Answer: The joint WG considered this question outside its scope. This question is deferred to ICAO.*