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WORKING PAPER

ICAO/IMO JOINT WORKING GROUP ON HARMONIZATION OF AERONAUTICAL AND MARITIME SEARCH AND RESCUE (ICAO/IMO JWG-SAR)

FOURTEENTH MEETING

Saint Gilles les Bains, La Réunion, France, 10 to 14 September 2007

Agenda Item 7: SAR communications:
7.1: status of the GMDSS

REPORT ON COSPAS-SARSAT SYSTEM STATUS, OPERATIONS AND FUTURE DEVELOPMENTS

(Presented by Cospas-Sarsat)

SUMMARY

This document provides information on the status of the Cospas-Sarsat Programme as of 1 August 2007.

Action by the ICAO/IMO JWG is in paragraph 5.

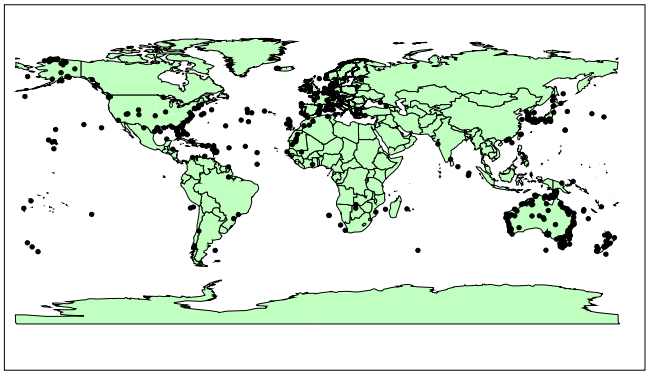
REFERENCES

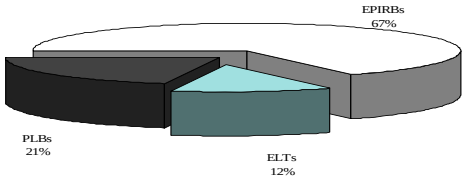
Related documents: None.

1. SYSTEM OPERATION

1.1 In 2006, based on preliminary information, Cospas-Sarsat alert data assisted in 415 distress incidents and 1,504 persons were rescued. Since September 1982, the Cospas-Sarsat System has provided assistance in rescuing at least 22,035 persons in 6,167 SAR events. In 2006, the 406 MHz system was used in 59.3 % of all events (1,146 persons rescued) and the 121.5 MHz system was used in 40.7 % of all events (358 persons rescued).

1.2 The geographical distribution of all reported 406 MHz and 121.5 MHz SAR events for which Cospas-Sarsat data was used in 2006 is presented below (left) and the distribution of all SAR events (maritime, aviation and PLB) for the period from January to December 2006 is shown below (right).





1.3 Table 1 shows statistics on 406 MHz beacon false alerts in 2006 by category (and origin of the false alert when known), for EPIRBs, ELTs and PLBs, as presented by Cospas-Sarsat Participants.

Category of False Alert	EPIRBs		ELTs		PLBs	
	Number Reported (23 Reports)	%	Number Reported (23 Reports)	%	Number Reported (23 Reports)	%
Beacon Mishandling	1,306	38.7	1,673	61.3	52	47.3
Beacon Malfunction	296	8.8	195	7.1	17	15.4
Mounting Failure	64	1.9	19	0.7	0	0.0
Environmental Conditions	245	7.2	30	1.1	1	0.9
Unknown	1,467	43.4	813	29.8	40	36.4
Total Number Reported	3,378	100	2,730	100	110	100

Table 1 : Statistics on 406 MHz False Alerts by Category

1.4 Based on the data provided by Participants, Cospas-Sarsat calculates two false alert rates, identified for convenience as the “SAR false alert rate” and the “beacon false alert rate”. The SAR false alert rate, which characterises the impact of false alerts on SAR services, is the percentage of false alerts plus undetermined alerts over the total number of alerts transmitted to SAR authorities. Table 2 below shows the evolution of the false alert rate computed from a SAR response perspective for 406 MHz and 121.5 MHz beacons. Table 3 below shows the evolution of the 406 MHz beacon false alert rate (ratio of false alerts over the beacon population) since 2000.

Beacon Type	121.5 MHz	406 MHz
2000	98.3 %	94.2 %
2001	98.4 %	95.0 %
2002	98.2 %	94.9 %
2003	98.2 %	95.7 %
2004	97.8 %	95.8 %
2005	98.4 %	96.0 %
2006	98.5 %	97.1 %

Table 2 : SAR False Alert Rate

Beacon Type	EPIRBs	ELTs	PLBs	All Types
2000	2.6 %	11.2 %	0.8 %	2.8 %
2001	1.2 %	9.8 %	0.9 %	2.8 %
2002	3.0 %	11.0 %	1.2 %	2.7 %
2003	2.6 %	8.9 %	1.0 %	2.9 %
2004	2.2 %	9.2 %	2.1 %	2.1 %
2005	1.8 %	6.6 %	0.5 %	1.6 %
2006	1.8 %	10.1 %	0.7 %	2.7 %

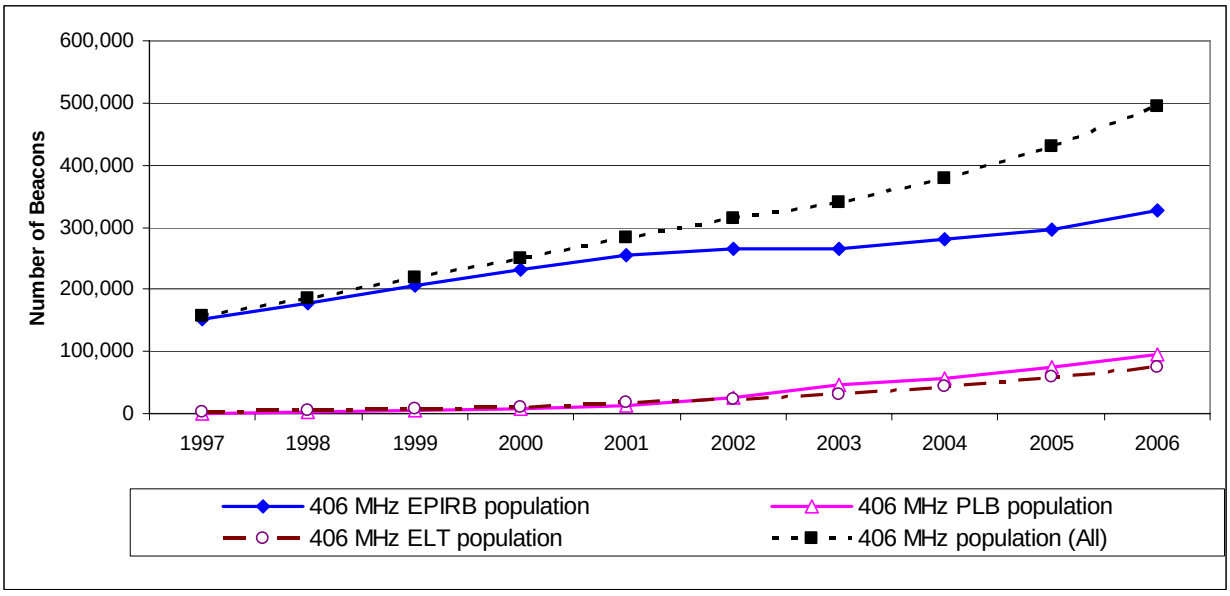
Table 3 : 406 MHz Beacon False Alert Rate

1.5 The slight increase of the SAR false alert rate for 406 MHz beacons is probably linked to the growth of the ELT population which is characterised by a higher beacon false alert rate. However, the general trend seems to be a decrease in the beacon false alert rate.

2. BEACONS

2.1 The current 121.5 MHz beacon population is estimated at 640,000 units. However, there are no established procedures to ascertain the reliability of this figure, which is entirely based on declarations by Administrations with varying degrees of currency.

2.2 Based on information received from manufacturers on beacon production, there were approximately 495,000 406 MHz beacons in use worldwide at the end of 2006, up 15.4 % from 2005. In 2006 beacon manufacturers produced 48,885 EPIRBs and SSAS beacons, 14,903 ELTs and 21,533 PLBs (respectively 57.3 %, 17.5 % and 25.2 % of all beacons produced). The chart below shows recent trends in the 406 MHz EPIRB, PLB and ELT populations.



2.3 Cospas-Sarsat operates the International 406 MHz Beacon Registration Database (IBRD) which is freely available to users with no access to national registration facilities and to Administrations who wish to avail themselves of the facility to make their national beacon registration data more available to SAR services (www.406registration.com). As at 1 August 2007, there were 4410 beacons registered in the IBRD.

2.4 The SOLAS Convention requires carriage of SSAS equipment aboard certain ships. Most Administrations have designated competent authorities to receive SSAS security alerts; however some Administrations have not established registration facilities for SSAS devices. The lack of registration databases could be detrimental to properly responding to security alerts. The Cospas-Sarsat Joint Committee (JC-21) met in June 2007 and agreed to invite Participants and the Secretariat to investigate the procedural and technical aspects of including SSAS beacons in the IBRD and alternative registries provided by IMO or ITU that might be suitable for the registration of SSAS beacons.

3. THE LEOSAR AND GEOSAR SYSTEMS

3.1 The Cospas-Sarsat LEOSAR (Low Earth Orbit satellite system for SAR) and GEOSAR (Geostationary satellite system for SAR) space segments continued to provide global coverage at both 121.5 and 406 MHz.

3.2 As at mid-2007, six LEOSAR spacecraft were in operation. The LEOSAR constellation will be maintained with the anticipated launch of Sarsat payloads on NOAA-N' (Sarsat-12, 2009), METOP-B (Sarsat-13, 2011) and NPOESS-C1 (Sarsat-14, 2013). Cospas-11 and Cospas-12 are planned for launch in 2008.

3.3 The USA operated the geostationary satellites GOES-11 (West) at 135° W and GOES-12 (East) at 75° W. The Indian communication satellite INSAT-3A was operational at 93.5° E longitude. Eumetsat's MSG-2 was operational at 0°. The GEOSAR constellation will be maintained with the anticipated launch of INSAT-3D (2007), GOES-O (2008), Electro-L (2008), GOES-P (2009), Luch-M-1 (2009), GOES-R (2012) and GOES-S (2014).

3.4 Cospas-Sarsat will cease satellite processing of 121.5/243 MHz beacons from February 2009. Administrations should encourage all beacon owners and users to replace their 121.5/243 MHz beacons with 406 MHz beacons as soon as possible.

3.5 As at mid-2007 44 LEOLUTs, 20 GEOLUTs and 26 MCCs comprised the Cospas-Sarsat Ground Segment.

4. STATUS OF THE MEOSAR SYSTEM DEVELOPMENT

4.1 A formal Declaration of Intent for Co-operation on the Medium Earth Orbit Search and Rescue (MEOSAR) Satellite System between the Cooperating Agencies of the International Cospas-Sarsat Programme and the Galileo Joint Undertaking (GJU) was signed in December 2006. The purpose of the Declaration is to establish on a formal basis the cooperation between the European SAR/Galileo system provider and the Cospas-Sarsat Programme for the demonstration and evaluation phase of the MEOSAR system.

4.2 The US operated Distress Alerting Satellite System (DASS) constellation deployment will be spread over a number of years, as satellites would be launched to replenish the current GPS constellation. The DASS ground segment would eventually consist of multiple networked ground stations. Two operational MEOLUTs are planned, the first to be installed during 2008-2009 in Hawaii and the second in the eastern United States during 2011 - 2012. Canada is continuing the development of a prototype MEOLUT installed in Ottawa.

4.3 The European GNSS Supervisory Authority (GSA), with the support of ESA and industry, are jointly developing a MEOLUT prototype for proof-of-concept activities and the demonstration of the future MEOSAR system. GSA/ESA and industry were also developing a Return Link Service Provider (RLSP) prototype for the SAR/Galileo return link service. The European MEOLUT is also under development.

4.4 The Russian GLONASS constellation is expected to consist of 18 satellites by the end of 2007 and 24 satellites by 2009. A complete constellation of SAR/GLONASS satellites is expected to be launched by 2017. Russia is developing an experimental MEOLUT.

4.5 Subject to Cospas-Sarsat Council approval in October 2007, Demonstration and Evaluation (D & E) of the MEOSAR System will be addressed at a 2008 Cospas-Sarsat Task Group (TG) meeting. The TG terms of reference include:

a) Assessing the current and planned status of 406 MHz MEOSAR space and ground segment component implementation;

b) Reviewing the planned implementation of the SAR/Galileo Return Link Service (RLS) to determine the applicable concept of operation for conducting an evaluation of the SAR/Galileo RLS during the MEOSAR D&E;

c) Defining an initial configuration of the system to be evaluated during the D&E, in terms of constellation, space segment, beacons, ground segment, data distribution, communication, and documentation;

d) Developing a draft Cospas-Sarsat 406 MHz MEOSAR D&E Plan to include test descriptions, procedures, data collection, analysis, and reporting for the technical and operational objectives of the MEOSAR demonstration and evaluation phase;

e) Developing a possible timeline for the conduct of 406 MHz MEOSAR D&E activities; and

f) Preparing a draft MEOSAR D&E Plan for review by the JC 22 Meeting in July 2008.

5. ACTION REQUIRED BY THE ICAO/IMO JWG-SAR

5.1 The ICAO/IMO JWG-SAR is invited to note the information provided on the status of the Cospas-Sarsat Programme.

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