INTERNATIONAL COSPAS-SARSAT PROGRAMME

COSPAS SARSAT

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INSIDE THIS ISSUE:

Bird Strike in Botswana: 406 MHz ELT Alert Received Within Minutes

The pilot of the small aircraft with his unexpected passenger – a large vulture!

On Thursday, 14 September 2006, a pilot with the Flying Mission Services of Gaborne, Botswana, took off from Nxabega with four passengers on what should have been a routine flight to Tsigaro. The Cessna 206 aircraft took off at 12:07 UTC, anticipating a short flight with an estimated time of arrival at Tsigaro at 13:25 UTC.

However, the flight was not destined to be as easy as anticipated. Mark Spicer, the Director of Operations of Flying Mission Services states that at 12:50 UTC, he received a phone call from the RCC in Cape Town, South Africa, reporting a signal from a 406 MHz Emergency Locator Transmitter (ELT). Decoding the beacon's digital message indicated that it was registered to the very same Flying Mission Services aircraft that had just departed from Nxabega. Mr. Spicer immediately tried to contact the pilot via cell phone, but no response was received. Further calls to the destination airport were unsuccessful in providing additional information, as no one was in radio contact with the aircraft. Meanwhile, several more phone calls

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International 406 MHz Beacon Registration Database (IBRD)

The IBRD has been operational and running smoothly for one full year, gaining new 406 MHz beacon registrations each month. The IBRD online user interface is provided in English, French, Russian and Spanish and is available free-of-charge at www.406registration.com. Cospas-Sarsat can only accept beacon registrations submitted via this online interface.

The IBRD is not intended to replace existing national beacon registration facilities. It is provided by Cospas-Sarsat to allow users to register their beacons and provide information that can be of great use to SAR Services in the event of beacon activation. This includes beacon owner contact information, emergency points of contact details, specific aircraft or vessel identification data, the make/model of aircraft or vessel in distress, communication equipment available,

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POINTS OF INTEREST:

- In 2005, Cospas-Sarsat alert data assisted in 435 distress incidents in which 1,666 persons were rescued.
- Since September 1982, the Cospas-Sarsat System has provided assistance in rescuing more than 20,500 persons in about 5,800 SAR events.
- The 406 MHz beacon population was estimated at 429,000 at the end of 2005, up 13.3% from 2004.

Bird Strike *(continued from p.1)*

were received from Cape Town Radio and the RCC, with reports of receipt of the ELT's signal.

The pilot later reconstructed the incident. About 15 minutes into the flight, he looked up to see a large bird, less than 20 meters away. He said, "I immediately turned left, trying to avoid the vulture, but the bird hit directly into the windscreen on the pilot side. There was a huge blast and I felt a strong hit into my face and my upper body." He further reported, "I tried to assess the situation. About three-fourths of the windscreen was ripped away. There was tremendous noise and wind in the cockpit. We were approximately five miles south of Stanley's airfield. We were continuing to lose altitude due to drag caused by air coming in through the windscreen. Two miles from Stanley's it was apparent that we wouldn't make it to the field. I saw a flat clear opening with shallow water just past a little lagoon. I cut the power to idle and we touched down with all three wheels. As soon as the airplane touched the water, the plane looped and water gushed into the cabin. When we stopped moving, we were hanging upside down in our seat belts. My head was in the water."

The pilot, after checking the injury level of the passengers, helped all evacuate the plane through the co-pilot side window. He states, "I climbed back into the airplane to see if I would be able to make a distress call. I could not get the radios to work but the Emergency Locator Transmitter (ELT) was beeping."

The Cape Town Cospas-Sarsat Mission Control Centre (ASMCC) received an unlocated alert from the UK's Geostationary satellite station (GEOLUT) at 12:32:21 UTC on 14 September. The beacon's identification was decoded and the registration data indicated that the aircraft was registered to the Botswana Flying Mission Services. The RCC operators were able to use this information to begin telephone liaison with the listed emergency contact, approximately 18 minutes after beacon activation.

The GEO detection was followed by LEOSAR detection at 13:15 UTC by Sarsat-10, tracked by the South African LUT. This detection provided an alert message which was sent to the RCC at 13:20:05 UTC indicating a Doppler A position of 19 38S / 023 17E with a 91 percent probability. A second LEOSAR overpass of the distress site by Sarsat-8 at 13:15 UTC on 14 September was tracked by the Saudi Arabian LEOLUT at Jeddah, and a resolved position of 19 38S / 023 17E was provided to South Africa at 13:28:44 UTC. A helicopter was sent to the coordinates and was able to reach the site at 14:45 UTC. Within two hours of the emergency landing, all passengers and the pilot were safely evacuated.

Mr. Derek Cooper of the South African Cospas-Sarsat MCC said, "The 406 MHz ELT carried by the Flying Mission Services aircraft provided the first and only alert in this distress incident. The fact that the beacon was properly registered allowed search and rescue to proceed quickly, with the first responders arriving on scene only one and a half hours after the emergency landing."

Phase-Out of 121.5 MHz Satellite Alerting Services

Switch to 406! Cospas-Sarsat Participants Campaign to Inform Beacon Users

The International Cospas-Sarsat System will cease satellite processing of 121.5/243 MHz beacon signals from 1 February 2009.

The Cospas-Sarsat Council, at its 37th Session in October 2006, reaffirmed that satellite processing of 121.5/243 MHz transmissions would be terminated on 1 February 2009. However, Administrations currently forecast that over 100,000 121.5 MHz beacons will still be in service in 2010, after the termination of 121.5 MHz satellite processing.

Cospas-Sarsat Participants have been working diligently to educate beacon users on the need to upgrade to 406 MHz models. Australia has one of the most active "Switch to 406" campaigns, following recommendations provided in document C/S R.010. Australian activities include direct mailings, advertising in news media, web-based information and provision of a new, free help and registration phone line.

Argentina announced a comprehensive media campaign to promote a change to 406 MHz technology through the web, by publishing related articles in specialist magazines and holding conferences for beacon owners. Chile has used air shows to disseminate information on the phase-out of 121.5/243 MHz satellite alerting services.

Why Switch to 406 before 1 February 2009? It just might save your life!

A number of countries, like the USA, have issued special regulations removing 121.5 MHz beacon licences and mandating a change to 406 MHz for certain user categories. Other countries, when no international requirement to switch to 406 MHz is applicable prefer to emphasize the advantages of a voluntary upgrade to 406 MHz beacons. The above table illustrates the definite advantages of 406 MHz beacons compared against the 121.5 MHz analog technology.

	406 MHz Beacon	121.5 MHz Beacon
Signal	Digital: unique identification, registration provides detailed owner information	Analog: no data encoded, higher false alarm rate
Signal power	5 Watts	0.1 Watts
Coverage	Global	Regional
Position accuracy	Within 5 km (Doppler), 100 m with GNSS (GPS)	Within 20 km (Doppler only)
Alert time	GEO alert within two minutes	LEO tracking in about 45 minutes
Ambiguity	Can be resolved at the first satellite pass	Two satellite passes usually required

Why Switch?

406 MHz beacons have proven superior performance capabilities. They transmit a much stronger signal, are more accurate, verifiable and traceable. 406 MHz distress signals can be accurately detected within a matter of minutes. Each 406 MHz beacon has a unique Identification encoded within its signal. As long as the beacon has been registered, rescue centres can quickly confirm that the distress is real, who they are looking for and where they should look. This means a search can be launched even before a final distress location has been determined. Position accuracy means the search area is less than 5 kilometres in radius, which decreases the amount of time SAR teams must search. This adds up to a significant time saving and a major advantage over the older 121.5 MHz technology.

For more information

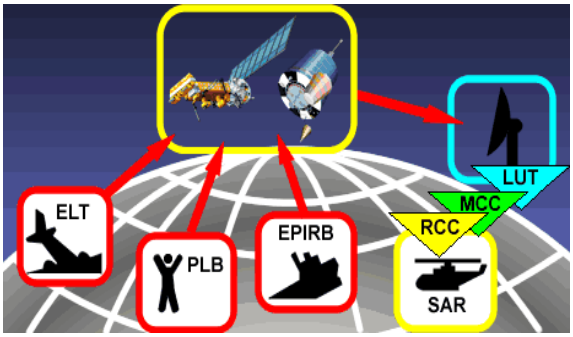
Document C/S R.010, the phase-out plan for 121.5 MHz processing, is available on the web at www.cospas-sarsat.int under the documentation - reports tab.

The Cospas-Sarsat System

The Cospas-Sarsat System provides distress alert and location information to search and rescue (SAR) services throughout the world for maritime, aviation and land users in distress. The System is comprised of:

- satellites in Low-altitude Earth orbit (LEOSAR) and Geostationary orbit (GEOSAR) that process and / or relay signals transmitted by distress beacons;
- ground receiving stations called local user terminals (LUTs) which process the satellite signals to locate the beacon; and
- mission control centres (MCCs) that provide the distress alert information to SAR Services.

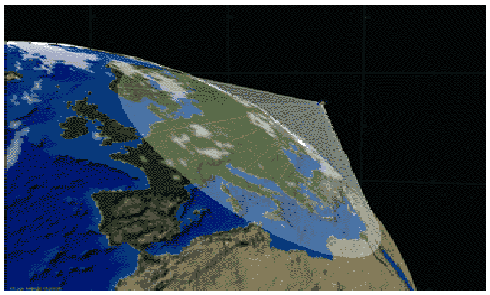
The Cospas-Sarsat System supports two types of distress beacons: old analogue technology beacons that transmit at 121.5 MHz and newer generation digital beacons that operate at 406 MHz.



ELT:	Emergency Locator Transmitter
PLB:	Personal Locator Beacon
EPIRB:	Emergency Position Indicating Radio Beacon
LUT:	Local User Terminal
MCC:	Mission Control Centre
SAR:	Search and Rescue
RCC:	Rescue Coordination Centre

Beacon Signal Processing

121.5 MHz beacon analogue signals are relayed by repeater instruments onboard LEOSAR satellites to Cospas-Sarsat LUTs, where the signals are processed to determine the beacon location. Because of the limitation of the analogue technology which does not allow for onboard storage of the beacon signals received by the satellites, both the beacon and the LUT must be simultaneously visible to the satellite in order for the beacon to be detected and located. This restriction limits detection to an area of about 6,000 km centred at each LUT. It is also important to note that because of the low-power, analogue transmission, the 121.5 MHz beacon signal cannot be relayed GEOSAR satellites.



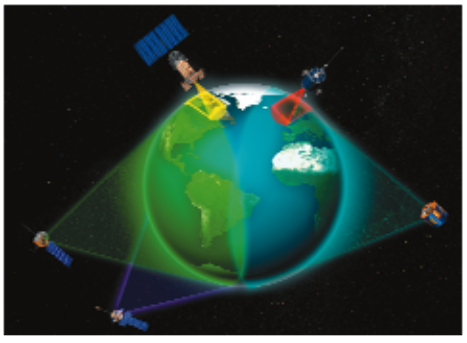
LEOSAR Instantaneous View of the Earth, a Circle of about 3000 km Radius

406 MHz Beacon processing

In contrast to older generation 121.5 MHz analogue beacons, 406 MHz digital beacons are supported by both LEOSAR and GEOSAR satellites. Additionally, each LEOSAR satellite includes a 406 MHz processor / memory module that stores the digital messages received from 406 MHz beacons. The contents of the satellite memory are continually transmitted to Earth, thereby eliminating the need for the satellite to have simultaneous visibility of the beacon and a LUT for detecting and locating the beacon. In effect, after the 406 MHz beacon signal has been received by a satellite, the signals stored in the satellite memory are made available to every LUT in the Cospas-Sarsat System, thereby providing complete global coverage.

However, users in distress may have to wait for a LEOSAR satellite to pass into view of their location. To address this limitation, in 1998 Cospas-Sarsat incorporated GEOSAR satellites to complement the service already provided by LEOSAR satellites. GEOSAR satellites are at a fixed position relative to the earth, thereby providing continuous coverage of a specific geographic region.

Since geostationary satellites do not move with respect to the Earth, the GEOSAR system cannot determine the beacon location unless this information is transmitted in the beacon's digital message. Many 406 MHz beacon models incorporate a satellite navigation receiver to determine their own position and transmit this information in the distress message.

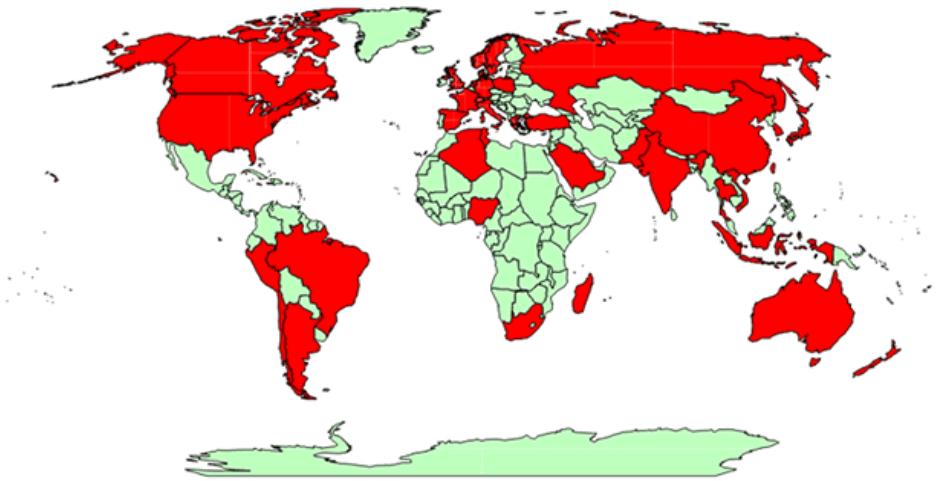


Cospas-Sarsat Combined LEOSAR and GEOSAR Operations

PARTICIPATING COUNTRIES AND ORGANISATIONS

The countries and organisations participating in the operation and management of the System are shown in red on the map to the right. The Participants include the four Parties to the International Cospas-Sarsat Programme Agreement (Canada, France, Russia and the USA), 25 Ground Segment Providers, 9 User States and 2 Organisations.

In 2006, Cyprus joined Cospas-Sarsat as a User State. Greece changed status from User State to Ground Segment Provider.



Cyprus joined Cospas-Sarsat in 2006 as a User State

Cospas-Sarsat Participants 2007

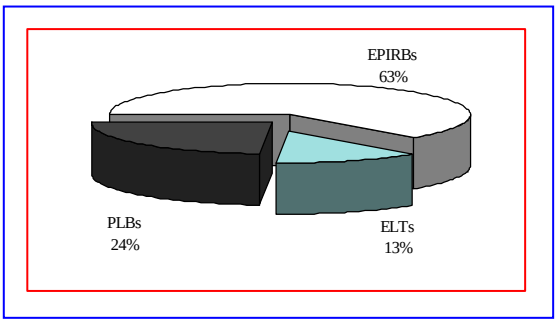
Algeria	Germany	Netherlands	South Africa
Argentina	Greece	New Zealand	Spain
Australia	Hong Kong	Nigeria	Sweden
Brazil	India	Norway	Switzerland
Canada	Indonesia	Pakistan	Thailand
Chile	Italy	Peru	Tunisia
China (P.R.)	ITDC	Poland	Turkey
Cyprus	Japan	Russia	UK
Denmark	Korea (R. of)	Saudi Arabia	USA
France	Madagascar	Singapore	Vietnam

Cospas-Sarsat System Status

As of February 2007 the Cospas-Sarsat System comprised:

- 7 LEOSAR satellites in low-altitude polar orbits (from 700 to 1,000 km);
- 5 GEOSAR satellites;
- 45 LUTs receiving signals transmitted by LEOSAR satellites;
- 18 LUTs receiving signals transmitted by GEOSAR satellites;
- 26 Mission Control Centres for distributing distress alerts to SAR services; and
- about 560,000 121.5 MHz beacons and about 430,000 406 MHz beacons.

Type of SAR Events Assisted by Cospas-Sarsat (January to December 2005)



The distribution of SAR events by category of events (maritime EPIRBs, aviation ELTs and PLBs) for the period January to December 2005 is presented above.

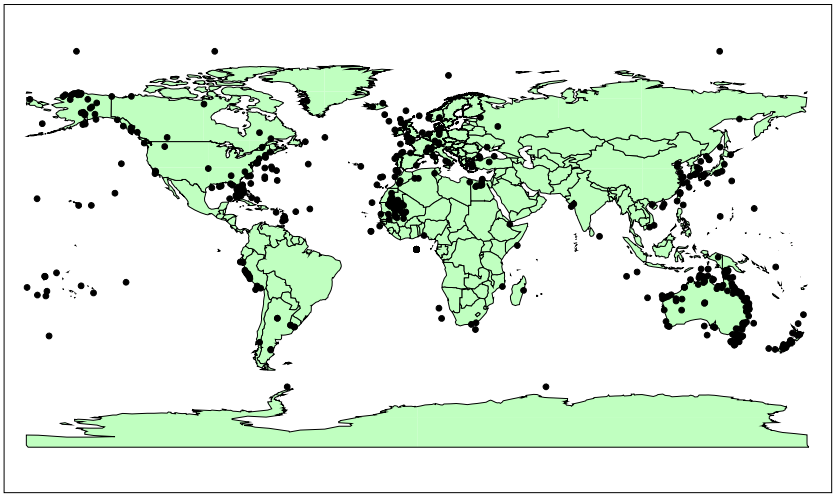
The detailed status of all components of the Cospas-Sarsat System and recent System use statistics are provided at www.cospas-sarsat.org.

Cospas-Sarsat Operations

The Cospas-Sarsat System assisted in the rescue of 1,666 persons in 435 SAR incidents during 2005. The geographical distribution of all reported 406 MHz and 121.5 MHz SAR events for which Cospas-Sarsat data was used is shown below. Of these SAR events, 274 were maritime incidents (1,408 persons rescued), 57 were aviation distresses (109 persons rescued) and 104 involved the use of PLBs (149 persons rescued).

The 406 MHz system was used in 258 of these events (1,262 persons rescued) and the 121.5 MHz system was used in the other 177 SAR events (404 persons rescued).

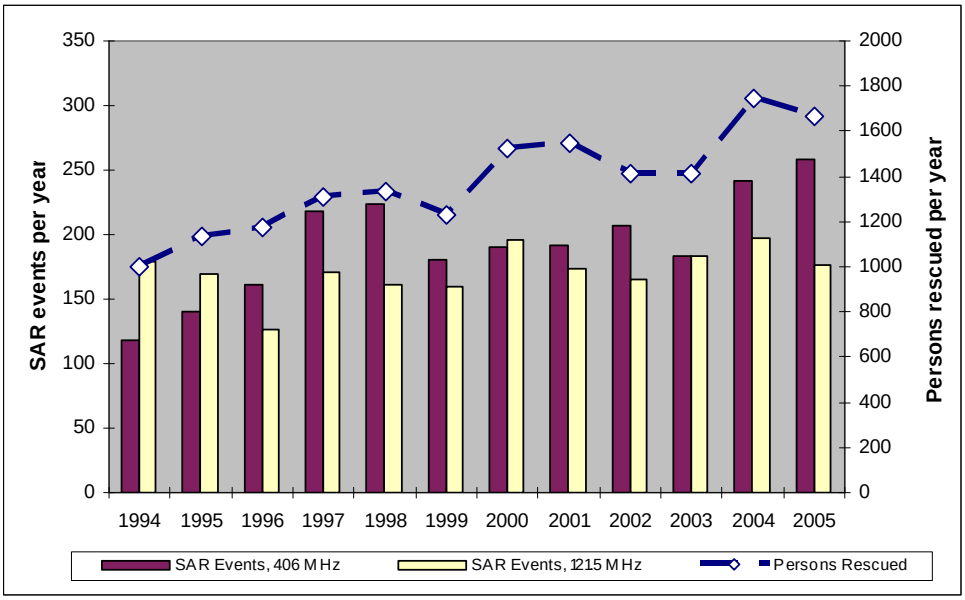
At its 37th Session in October 2006 the Cospas-Sarsat Council approved the commissioning into the Cospas-Sarsat System of the new LEOLUTs located at Nakhodka (Russia), Callao (Peru), Incheon (Korea), Lucknow (India), Greenbelt, Maryland (USA), as well as the GEOLUTs located at Wellington (New Zealand) and Greenbelt, Maryland (USA).



Geographical Distribution of all Reported Cospas-Sarsat SAR Events (2005)

The new Nakhodka (Russia) LEOLUT was commissioned in 2006

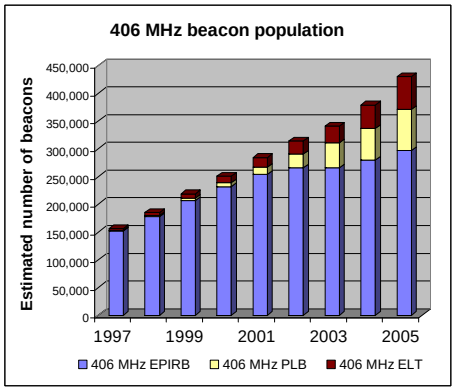
System Use Statistics



The figure at left shows the evolution of use of the System since 1994. Since the beginning of its operation in September 1982 through the end of 2005, Cospas-Sarsat provided alerts that assisted in the rescue of more than 20,500 persons in about 5,800 SAR events.

406 MHz Beacon Population: A Steady Growth

Every year the Cospas-Sarsat Secretariat undertakes a survey of 406 MHz beacon manufacturers to determine the number of beacons that were produced in the previous year. The results are used to predict trends in the beacon market, forecast the beacon population growth, estimate future distress message traffic and manage the 406 MHz frequency band.



Based on the results of the 2006 survey, the Secretariat estimated that at the end of 2005, over 429,000 beacons operating at 406 MHz were in use globally, an increase of 13.3 % over the previous year. A closer review of the data shows that the growths varied widely for each beacon type. While the population of beacons used in a maritime environment (EPIRB) has shown a modest increase of 6%, aviation type beacons (ELT) and personal beacons (PLB) have reached population growths of 30% and 38% respectively in 2005. Beacons with GPS capabilities (i.e. capable of directly broadcasting their position as part of the beacon message) are also gaining in popularity. More than 35% of the beacon built in 2005 had a GPS capability, compared with 27% in 2004.

In 2005, over 70 thousand 406 MHz beacons were produced by 32 beacon manufacturers distributed around the world.

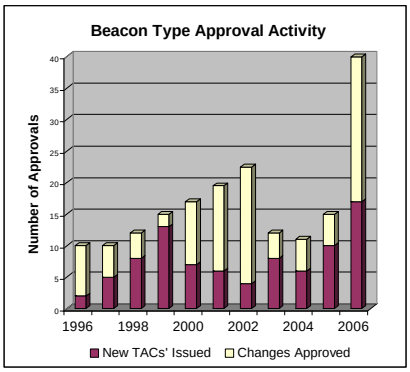
New beacon models to operate at 406.037 MHz

When two or more beacon distress signals are emitted at the same frequency in the same geographical area, they may collide with each other resulting in a loss of information. In order to maintain a low probability of repeated collisions, Cospas-Sarsat requires that beacons transmit 406 MHz bursts with a variable repetition period. However, this process has limitations. Eventually an expanding beacon population reaches the channel capacity limit requiring the use of a new frequency channel to maintain adequate system performance.

On the basis of information provided by manufacturers and the Secretariat beacon population forecast, Cospas-Sarsat decided to close the 406.028 MHz channel for new beacon models from 1 January 2007. New beacon models submitted to Cospas-Sarsat for type approval after 1 January 2007 shall be designed to operate at 406.037 MHz.

2006 : A record year for beacon approval activity

The Cospas-Sarsat Secretariat has responsibility for reviewing the results of analysis and tests submitted by beacon manufacturers for type approval by the Cospas-Sarsat Parties. Beacon manufacturers seeking approval by Cospas-Sarsat are required to test new beacon models or modifications to approved models that may affect electrical performance. Beacon models that successfully demonstrate compliance to Cospas-Sarsat requirements are granted a Type Approval Certificates (TAC). When previously approved beacons are modified by manufacturers, change notices must be submitted. Approval is granted after demonstrating that changes do not affect compliance with requirements. Since 1989, over 175 new beacon models and 140 beacon modifications have been approved by Cospas-Sarsat.



In 2006 beacon approval activities reached a record level, due to increased customer demand, price reductions, regulatory changes (ICAO requirements, termination of satellite processing of 121.5 MHz, new environmental regulations for manufacturing printed circuits) and the introduction of new technologies (batteries, GPS receivers, oscillators). Nearly 55% of all beacon manufacturers have developed new 406 MHz beacons or introduced changes to existing models during 2006. This led to an unprecedented number of new Type Approval Certificates issued (18) and Change Notices approved (23). Early indications are that the trend will continue in 2007.

Cospas-Sarsat is striving to facilitate the approval of improved products meeting the evolving needs of beacon buyers. Beacon specifications are reviewed annually to ensure that clarity and pertinence are retained. Cospas-Sarsat also maintains close coordination with other national and international organisations (RTCM, RTCA, Eurocae, IEC, ETSI, etc.) to ensure consistency and avoid unnecessary duplications in certification and approval procedures. However, given the current level of type ap-

(continued on p. 8)

2006 : A record year for beacon approval activity *(continued from p.7)*

proval activities, manufacturers need to coordinate with the test laboratories and the Secretariat with sufficient advance notice during the development of new products or the introduction of design changes to type approved beacons, especially when individually tailored testing procedures are required.

Avoid False Alerts! How to test your beacon...

Never test a 406 MHz beacon in its operational mode. Activating a 406 MHz beacon, even for a few seconds, will likely generate a Cospas-Sarsat distress alert message that will be relayed to Search and Rescue Services for their immediate action.

How should I test my 406 MHz beacon?
Beacons should only be tested using the self-test feature. Even though this self-test will not generate a Cospas-Sarsat alert, it will consume some of the beacon's limited battery power, and therefore, should only be used in accordance with the beacon manufacturer's guidance. Questions relating to the beacon self-test mode should be referred to the manufacturer. The contact details for 406 MHz beacon manufacturers are published to the Cospas-Sarsat website.

If you inadvertently activate your beacon in its operational mode, report the details to the nearest search and rescue service as soon as possible.

METOP-A Launched Carrying Sarsat-11

Pictures provided courtesy of the European Space Agency

MetOp-2, the first of three satellites of the EUMETSAT Polar System (EPS), was launched at 16:28 UTC on 19 October 2006 from the Baikonur Cosmodrome in Kazakhstan. Once in orbit, the satellite took the name MetOp-A.

As for the NOAA LEO satellites of the USA that have been carrying all previous Sarsat payloads, the primary mission of the MetOp satellites is to collect meteorological data. In addition, MetOp-A carries 121.5/243/406 MHz Cospas-Sarsat search and rescue payloads provided by France and Canada and is also referred to as Sarsat-11 by Cospas-Sarsat Participants. The SAR repeaters and processors on Sarsat-11 were declared operational within the Cospas-Sarsat System on 5 December 2006.

INSAT GEOSAR Understanding

The Indian Space Research Organization (ISRO) has been providing a geostationary complement to the Cospas-Sarsat polar orbiting system for many years, initially with the INSAT-2A (1992) satellite and since 2003 with the SAR payload on INSAT-3A. Until recently, this welcome contribution to the Cospas-Sarsat GEOSAR system was not fully acknowledged, as no formal document recognised the specific status of India as a contributor to the Cospas-Sarsat Space Segment. This is about to change as the text of a formal Understanding between the four Cospas-Sarsat Parties and India on the integration of the INSAT GEOSAR system into the Cospas-Sarsat System is expected to be signed shortly by all five parties. Although the absence of a formal document did not impact the distribution of distress alerts provided by the INSAT GEOSAR system into the Cospas-Sarsat network, this development should allow for a closer cooperation with India. INSAT 3-D scheduled for launch in 2007 will also carry a SAR payload.

International Beacon Registry *(continued from p.1)*

and the maximum number of persons that might be onboard.

Administrations are able to either control the registration of beacons with their country code in the IBRD or authorise users to register their beacons directly over the Internet. The IBRD is particularly useful when no established national database is available, or when Administrations cannot provide 24-hour per day, 7-day per week access to their national database. SAR Services are able to query the IBRD directly over the Internet.

The IBRD is configured to accept, by default, beacon registrations from beacon owners unless the Administration associated with the beacon's country code has advised Cospas-Sarsat that they operate a national database with a 24-hour point of contact, or that they wish to control the registration of beacons with their country code.

To acquire an IBRD user account, National Administrations should designate a National IBRD Point of Contact and request that the Cospas-Sarsat Secretariat allocate user identification and passwords to their National IBRD Point of Contact. The request must be provided in writing to the Database Administrator using the format provided on the Cospas-Sarsat website (www.cospas-sarsat.org).

As at January 1, 2007, the IBRD held almost 4000 beacon records from 34 countries: Argentina, Armenia, Brunei, British Virgin Islands, Cayman Island, Comoros, Dominica, Hong Kong, Hungary, India, Israel, Japan, Jordan, Kazakhstan, Kenya, Latvia, Libya, Moldova, Mongolia, Nepal, Nicaragua, Nigeria, Oman, Panama, San Marino, Sao Tome and Principe, Sierra Leone, Sri Lanka, Tanzania, Trinidad and Tobago, Turkey, United Arab Emirates, Venezuela and Vietnam.

The IBRD manager, Ms. Melanie Roberge, is available to answer all questions concerning beacon registration (contact Dbadmin@406registration.com).

Support Search and Rescue : Register your beacon!

United Nations and South Africa Host Cospas-Sarsat Workshop

The fourth in a series of satellite-aided search and rescue training courses jointly sponsored by the United Nations and a host country was held from 20 to 24 November 2006 in Cape Town, South Africa. The first such workshop was organised by India in Bangalore in 2002, and was followed by a 2004 US-hosted session in Miami and a 2005 session in Canberra, Australia.

Twelve countries in the southern part of Africa attended the Cospas-Sarsat workshop in Cape Town

The UN/South Africa training was supported by the Department of Transport - South Africa and the United Nations Office for Outer Space Affairs and attracted delegates from Botswana, Democratic Republic of the Congo, Kenya, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe.

Delegates learned the details of the operation of the Cospas-Sarsat System and toured the South Africa MCC (ASMCC). Another highlight included an afternoon aboard the vessel *Smit Amandla*, which is frequently involved in search and rescue in the Cape Town area.

System Development: MEOSAR

The USA, Russia and the European Commission / European Space Agency (EC/ESA) have announced plans to include 406 MHz search and rescue repeater instruments on their respective constellations of medium-altitude Earth orbit (MEO) global navigation satellites (GPS, GLONASS and Galileo).

> MEOSAR will provide robust beacon-to-satellite communication links and a high level of satellite redundancy and availability

A Cospas-Sarsat MEOSAR system based upon these constellations would provide near instantaneous global coverage, an accurate independent beacon locating capability (i.e. no reliance on a navigation receiver in the beacon to determine location), and robust beacon-to-satellite communication links. Furthermore, because of the number of satellites planned and the characteristics of their medium altitude earth orbits, the MEOSAR system would provide high levels of redundancy and resistance against beacon-to-satellite blockages.

The MEOSAR constellation will include GPS, Galileo and GLONASS satellites

Preliminary testing using 6 prototype payloads on GPS satellites and MEOLUTs in Canada and the USA commenced in early 2006. Plans are in place for additional proof of concept payloads to be launched and for prototype MEOLUTs to be installed in Europe and Russia.

The first Glonass and Galileo satellites with 406 MHz SAR payloads are scheduled to be launched in 2008.

A detailed description of the plans and schedule for the development of an operational Cospas-Sarsat MEOSAR system is provided in the Cospas-Sarsat MEOSAR Implementation Plan (document C/S R.012), which can be downloaded free of charge at www.cospas-sarsat.org.

MEOSAR Declaration of Intent

In December 2006, a formal Declaration of Intent for Co-operation on the Development and Evaluation of the MEOSAR Satellite System was signed by the Galileo Joint Undertaking and the Cooperating Agencies of the Parties to the International Cospas-Sarsat Programme Agreement (ICSPA), i.e. Canada, France, Russia and the USA.

The co-operation between Cospas-Sarsat and the providers of global navigation satellite systems in the USA, Russia and Europe who will host the MEOSAR satellite payloads has been effective for several years. The providers have been working towards a common goal of ensuring the compatibility of the future MEOSAR system with the Cospas-Sarsat 406 MHz system, i.e. existing 406 MHz beacons, and the "interoperability" of various MEOSAR components, i.e. the capability for a ground receiving station (MEOLUT) to process signals relayed by any MEO satellite, independently of the constellation to which it belongs.

These efforts have been fruitful and resulted in the development of the Cospas-Sarsat 406 MHz MEOSAR Implementation Plan (MIP), approved by the Council in 2004. However, to move to the next phase of the plan, namely the joint Demonstration and Evaluation (D&E) of the MEOSAR system with a variety of space and ground segment components, it became clear that some form of official co-operation had to be established. With Russia and the USA already Parties to the ICSPA, Cospas-Sarsat was the natural vehicle of the cooperation with DASS and SAR/Glonass. For SAR/Galileo, the relationship between Cospas-Sarsat and the European authority representing Galileo required official recognition in a new instrument. The MEOSAR Declaration of Intent will serve this purpose, at least for the D&E phase of the MEOSAR system.

The D&E phase will be open to all countries that participate in the Cospas-Sarsat Programme. However, D&E activities must be coordinated with the expected deployment of the MEOSAR space segment. At the present time, only a limited number of DASS proof-of-concept satellites are available. They provide for the early exploration of the performance characteristics of the MEOSAR concept and a more precise definition of basic requirements for the ground segment. The D&E will require a much larger number of satellites equipped with SAR payloads and a number of MEOLUTs spread around the world. The current target period for the MEOSAR D&E is 2009-2012. To achieve this, D&E planning will become a major activity for Cospas-Sarsat in forthcoming years.

Status of SAR/Glonass system

In Russia, the development of a MEOLUT capable of processing S-band signals from DASS proof-of-concept satellites, as well as L-band signals from SAR/Glonass and SAR/Galileo satellites has begun. Prototypes of 406 MHz and L-band antennas for the Glonass-K satellites have been successfully tested. A full constellation of the Glonass satellites for the Russian global navigation system is expected to be in place by 2009 and by 2017, the operational constellation will consist of 24 Glonass-K satellites. The Russian Federation is currently investigating the number of transponders in the Glonass constellation required to satisfy the MEOSAR mission.

A Note from the 2006 Council Chairman

As we reflect on the events of the past year and begin contemplating our work for the upcoming year I'm reminded of the constant state of change that Cospas-Sarsat is in. It seems there are always new challenges before us and new paths for us to forge. In 2006 we saw our membership expand to 38 countries and 2 organizations. We also concluded instruments of cooperation with the European Galileo Joint Undertaking and India to help build and sustain our space segment. While the organization continues to grow it is also evolving. During the past six years – a short time in the life of an international organization – we have:

- decided to phase out satellite processing of 121.5 MHz emergency beacons;
- modified our specifications to allow for lower cost beacons;
- expanded our user base to allow for ship security alerting system beacons;
- taken significant strides to protect our frequency spectrum;
- moved our organization to Montreal, Canada and established a legal status for our Secretariat; and
- implemented an international registration beacon database to assist States in meeting their ICAO/IMO obligations.

Still, we're not done. We are now in the process of developing a quality management system to ensure that our critical services continue to meet the expectations of the search and rescue community, and we are preparing for the introduction of the MEOSAR system that will dramatically improve the critical service we provide. The British naturalist, Charles Darwin, once said "It is not the strongest of the species that survives, nor the most intelligent, but the one most responsive to change." This is germane to Cospas-Sarsat, which should count among its strengths its ability to respond to external factors and adapt and transform itself to meet its mission and the needs of its customers and stakeholders.

While some of the credit for this agility belongs to the organization and the Agreements under which we operate, most of it belongs to the individuals from the National Administrations and the Secretariat who are involved in the management and operation of the program. Without their dedication and hard work it would not have been possible to accomplish all that Cospas-Sarsat has. It is this commitment, flexibility, and vision, and the fact that we all share a common goal - to save lives - that will help ensure that Cospas-Sarsat will continue to meet challenges and stay relevant in the future. I look forward to the upcoming year, especially celebrating the 25 years of success that Cospas-Sarsat has enjoyed.

Ajay Mehta, United States
Cospas-Sarsat Representative

A Note from the Head of Secretariat

Daniel Levesque
Head, Cospas-Sarsat Secretariat

The first satellite carrying a SAR instrument, Cospas-1, was launched in June 1982 and the first SAR operation assisted by Cospas-Sarsat alert data followed shortly thereafter on 10 September 1982. This operation resulted in the rescue of three persons whose Cessna 172 aircraft had crashed in British Columbia, Canada. The Cessna had been privately chartered by the father of the pilot of another aircraft which had disappeared two months earlier. Despite lengthy searches, the first crashed aircraft was never located. The second aircraft's 121.5 MHz ELT signal, relayed by Cospas-1, was located by the Canadian ground station in Ottawa only hours after the crash, demonstrating the considerable potential of the Cospas-Sarsat satellite system.

Twenty five years later, a new beacon technology at 406 MHz is the international standard for satellite distress alerting. A decision has been made to terminate on 1 February 2009 the satellite processing of 121.5 MHz beacons (see feature on page 3) and users are invited to switch to 406 MHz beacons, which exhibit enhanced performance characteristics.

Because of the large number of 121.5 MHz beacons still in use, there is a sense of urgency in Cospas-Sarsat's invitation to Administrations and users to "Switch to 406".

However, Cospas-Sarsat is also preparing for future system evolution. A small but significant milestone was reached at the end of 2006, with the signing of a formal Declaration of Intent to cooperate on the development of the 406 MHz MEOSAR system by the Cooperating Agencies of the Cospas-Sarsat Parties and the Galileo Joint Undertaking. Preliminary trials of the MEOSAR concept are very encouraging, as illustrated on page 10, but further efforts will be required by all Participants in Cospas-Sarsat to continue with the development of the MEOSAR system and perform a complete demonstration and evaluation of its performance.

The celebration in 2007 of 25 years of successful operation of the Cospas-Sarsat system should also be an incentive to prepare for the forthcoming transitions, with a view to continuing the provision of effective and timely distress alerting to SAR authorities worldwide.

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International Satellite System for Search and Rescue

Mission Statement:

The Cospas-Sarsat Programme assists search and rescue (SAR) activities on a worldwide basis by providing accurate, timely, and reliable distress alert and location data to the international community on a non-discriminatory basis.

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:

To achieve this objective, Cospas-Sarsat Participants implement, maintain, co-ordinate and operate a satellite system capable of detecting distress alert transmissions from radiobeacons that comply with Cospas-Sarsat specifications and performance standards, 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.

Cospas-Sarsat co-operates with the International Civil Aviation Organization, the International Maritime Organization, the International Telecommunication Union and other international organisations to ensure the compatibility of the Cospas-Sarsat distress alerting services with the needs, the standards and the applicable recommendations of the international community.

The Cospas-Sarsat satellite system was initially developed under a 1979 Memorandum of Understanding among Agencies of the former USSR, USA, Canada and France. The Cospas-Sarsat Low-altitude Earth Orbit (LEO) satellite system for search and rescue (LEOSAR) has been in operation since 1982 and was complemented in 1998 with geostationary satellites (GEOSAR).

Cospas-Sarsat provides global distress alerting free of charge to the user in distress. Participants include the four Parties to the Cospas-Sarsat International Programme Agreement (Canada, France, Russia and the USA), 25 Ground Segment Providers, 9 User States and 2 Organisations.

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