

Basis for Terminating 121.5/243 MHz Satellite Distress Alerting

BACKGROUND AND SCOPE

The Cospas-Sarsat System, established pursuant to the International Cospas-Sarsat Program Agreement, provides for processing signals of two types of distress beacons that support distress alerting for search and rescue (SAR) operations:

406 MHz beacons specifically designed for use with the Cospas-Sarsat 406 MHz system, including the low Earth orbiting satellites of the LEOSAR system and the geostationary Earth-orbiting satellites of the GEOSAR system; and

121.5 MHz beacons suitable for use with the LEOSAR system only.

LEOSAR satellites process 243 MHz signals from beacons that operate on both 121.5 and 243 MHz in the same manner as they process 121.5 MHz signals. Discussion in this paper about 121.5 MHz processing also applies to processing 243 MHz alerts.

Due to inherent limitations of 121.5 MHz beacon signal characteristics, the 121.5 MHz system performance is limited. In particular, there are numerous false (non-distress) alerts generated that cannot be easily identified and eliminated.

This situation led to official requests to Cospas-Sarsat from the International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO) to establish a termination date for processing 121.5 MHz signals in 2008 or as soon as possible thereafter.

In October 1999 the Cospas-Sarsat Council decided to comply with these requests.

Cospas-Sarsat developed and is fully implementing a Plan to discontinue all System processes relating to 121.5 MHz satellite alerting. The Plan includes actions for Cospas-Sarsat and for responsible national administrations and international organizations to enable complete and coordinated termination.

TERMINATION DATE

The Cospas-Sarsat Council, supported by the Government of the United States and by ICAO and IMO, unanimously decided in October 2000 that a firm termination date should be established, which will result in discontinued use of any residual 121.5 MHz processing capability.

The announced date on which processing of 121.5 MHz alerts will be terminated by all components of the Cospas-Sarsat System is *February 1, 2009*.

Administrations and international organizations are continuing a coordinated global effort to prepare for the termination date on February 1, 2009.

HIGHLIGHTS OF TERMINATION RATIONALE AND ACTIONS

The following paragraphs discuss some of the justification for terminating 121.5 MHz services, and some efforts to ensure that it will happen smoothly:

System Capabilities

Based on limited availability of internationally-provided LEOSAR instruments, and finite design lives of satellites and onboard equipment, the space segment will be marginally capable of processing 121.5 MHz alerts until February 1, 2009, at which time the capability will be rapidly degrading. Services will end concurrently worldwide, regardless of any residual processing capability.

Space and ground elements and capacity are in place to process signals from all beacons that alert using the 406 MHz frequency band.

In addition to the U.S. 406 MHz beacon registration database, an international registration database (IBRD) enables registration of any beacon with a country code for which the associated Administration does not plan to exclusively handle registration.

Actions to be completed before February 1, 2009

Cospas-Sarsat will amend the following documents: Cospas-Sarsat Data Distribution Plan (C/S A.001); Description of Payloads used in the Cospas-Sarsat LEOSAR System (C/S T.003); Introduction to the Cospas-Sarsat System (G.003); and all other documents that provide for or describe space or ground processing of 121.5 MHz signals.

The U.S. and Russia will declare to the International Telecommunications Union (ITU) intent to not operate any satellites for 121.5/243 MHz alerts after February 1, 2009, and the ITU Radio Regulations will be reviewed for appropriate amendments.

More efficient data distribution plans will be developed for 406 MHz emergency locator transmitters (ELTs), emergency position-indicating radio beacons (EPIRBs), and personal locator transmitters (ELTs). Once the 121.5 MHz system (which requires less efficient generic data distribution) is eliminated; alerts can be routed more directly to the responsible SAR authorities.

All satellite and ground system operators will be instructed by Cospas-Sarsat to disable processing of 121.5 MHz signals effective February 1, 2009.

Beacons

Within the U.S., maritime distress beacons that alert on 121.5 MHz are no longer allowed to be manufactured or used. Beacons used in the land community have never been authorized to alert on 121.5 MHz. Use of 121.5 MHz aviation beacons is falling as the result of aggressive education on advantages of 406 MHz beacons, and about the termination date for processing 121.5 MHz alerts. Similar beacon phase-out efforts are underway in most countries.

Successful worldwide efforts have been ongoing to reduce the costs associated with 406 MHz beacons; costs are expected to continue to fall.

Information Campaign

The decision to terminate satellite processing of 121.5 MHz signals was announced in the Federal Register on July 2, 2001.

The termination date will continue to be publicized nationally and internationally to distress beacon users and SAR communities by all available means.

Cospas-Sarsat has provided clear guidance about the termination to administrations, rescue coordination centers (RCCs) and other SAR points of contact (SPOCs).

IMO and ICAO are supporting Cospas-Sarsat in informing administrations, beacon users, beacon manufacturers, and other international organizations about the termination.

Benefits

The termination will improve confidence in Cospas-Sarsat System capability, as the many 121.5 MHz system disadvantages will be eliminated.

Discontinuation of 121.5 MHz beacons will improve the quality of 121.5 MHz aeronautical voice distress and emergency communications by reducing noise and interference caused by distress beacons in the same frequency band.

A fixed date:

- Enables standard global implementation, consistent with IMO, ICAO and ITU requirements;

- Enables effective transition planning and management for international organizations, administrations, manufacturers, the public and associated entities;

- Encourages a shorter transition to 406 MHz beacons or equivalent systems, and helps beacon users prepare with the least possible confusion about the timeline; and

- Eases the burden on international RCCs which can simultaneously implement compatible and less difficult procedures for responding to alerts, and which will benefit from a large reduction in false alerts.

Termination will allow much more efficient and effective use of SAR resources, and improved services to beacon users in life-threatening situations.

121.5 MHz SAR operations are adversely impacted by unavoidable long delays inherent in the alerting process, and for resolution of ambiguity regarding the distress location. 406 MHz beacons have proven to be at least four times as effective for lifesaving.

Operating costs for Cospas-Sarsat Participants will substantially reduce due to simplified standard ground station functions and data distribution.

False alerts will be resolvable much more effectively with 406 MHz beacon identification and registration unavailable for 121.5 MHz.

Post-121.5 MHz operational capabilities will be much easier to explain in cases of inquiries or investigations, and much easier for beacon users and national authorities to understand.