

COSPAS-SARSAT SYSTEM OVERVIEW



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Agenda

- Program History
- How the System Works
- Importance of Registration
- Benefits of 406 MHz Beacons
- False Alerts



Cospas-Sarsat

- Provides a true global satellite detection and location capability responsible for assisting in the rescue of over 30,000 people worldwide since 1982
- Alerts are provided using satellite and ground systems to detect, process, and relay the transmissions of emergency beacons operating on 406 MHz





Cospas-Sarsat History

- First beacons were 121.5/243 MHz Emergency Locator Transmitters (ELTs) designed for military aircraft in the 1950's.
- U.S. Congress mandated ELTs on all U.S. non-jet aircraft after Boggs-Begich tragedy in SE Alaska in early 1970's. Canada follows suit.
- Problems soon emerge:
 - ✓ No identification of aircraft/beacon
 - ✓ Designed for audible detection by over-flying aircraft
 - ✓ No means of accurately locating ELTs





International Cospas-Sarsat Program Organization

- Initially developed under interagency Memorandum of Understanding signed in 1979 (USSR, USA, Canada, France)
- First Satellite launched in 1982, first rescue that same year
- System declared operational in 1985
- 406 MHz beacons accepted by IMO for GMDSS in 1988
- International Cospas-Sarsat Programme Agreement (ICSPA) formally signed on July 1, 1988 among the governments of Canada, France, the former U.S.S.R and the United States
- ICSPA ensures continuity of the space system and availability to all States on a non-discriminatory basis

COSPAS-SARSAT System Overview





Emergency Beacons

121.5/243 MHz Beacons

- Not designed for satellite processing
- Does not have global coverage
- Analog signal only = no unique identification coding
- Less rigid standards – TSO-C91 and TSO-C91a
- Poor location accuracy = Usually no better than 20 km
- No registration process or information to assist rescue forces respond to an alert

**No longer detected by satellites
as of February 1, 2009**

406 MHz Beacons

- Designed for satellite processing
- Global coverage
- Digital signal and increased power (5 watt) provides greater detection
- Unique Identification helps identify specific user
- Rigid specifications TSO-C126
- More Accurate = 1-3 km location accuracy.

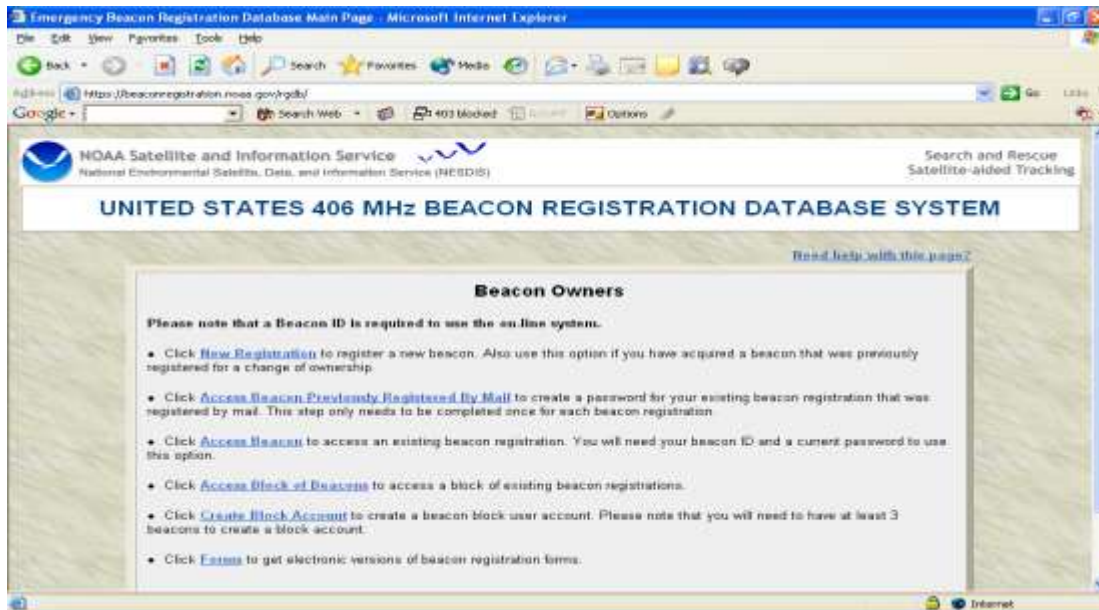
Allows integration of GPS

**Actively supported by
international Cospas-Sarsat
Organization**



What is Beacon Registration

- A collection of information to be used by rescue forces in response to a beacon activation
- There is no fee for registration and the information collected is protected and only shared with search and rescue forces during an activation.
- Registration with NOAA is required by FCC Regulations.
- Registration can be done online, by fax, or mail.



- Registration includes
 - Unique ID of the ELT
 - Name and address
 - Emergency contact #s
 - Home airport
 - Type of aircraft
 - Tail number
 - Other information useful in an emergency



Importance of Registration

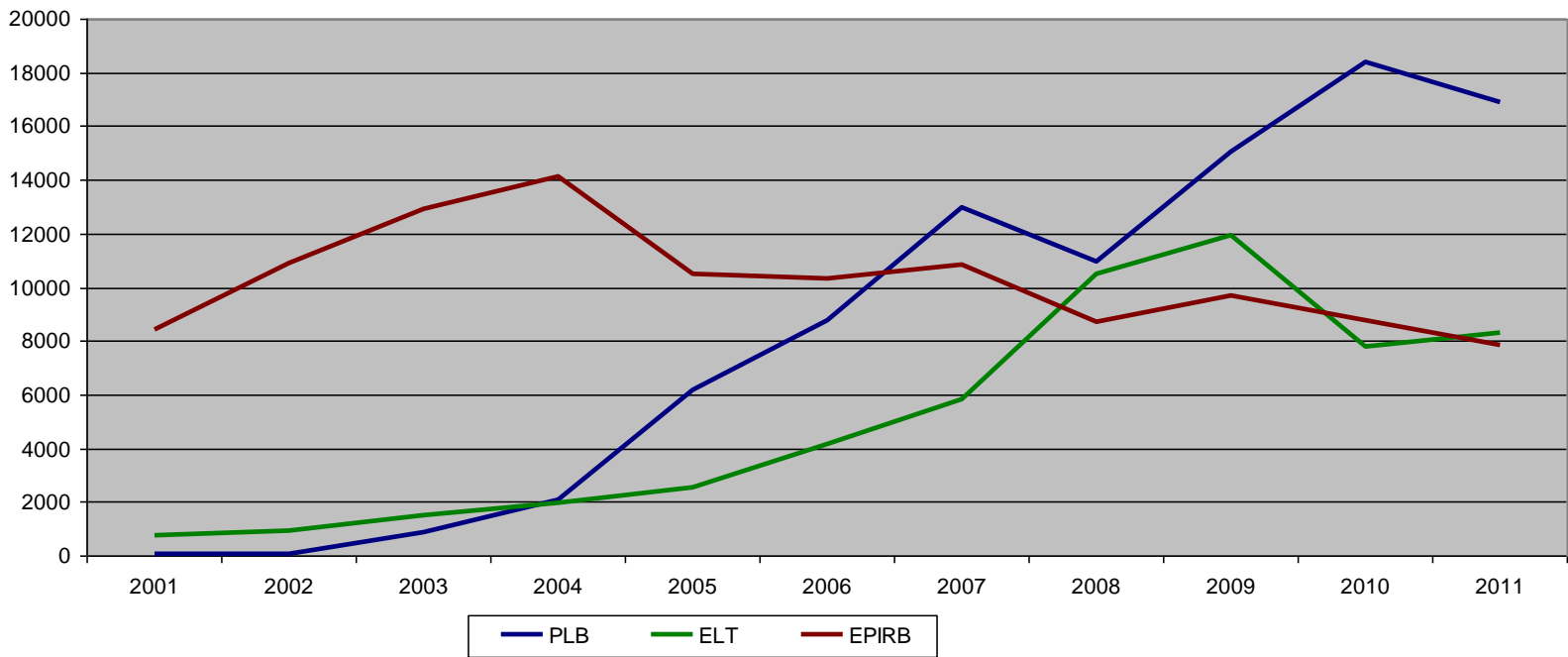
- Registration Database provides critical initial information such as owner/operator, emergency points of contact and can include specifics on aircraft or vessel type
- When a beacon alert is detected but a location can not be determined, registration information allows rescue forces to initiate a SAR response.
 - Without registration, rescue forces may not take action until a location is determined.
- In most cases, false alerts are resolved prior to launch of resources, saving taxpayer \$\$

Registration is required by the Code of Federal Regulations, Title 47, Part 87.199 (f) (ELT)



New Beacon Registrations

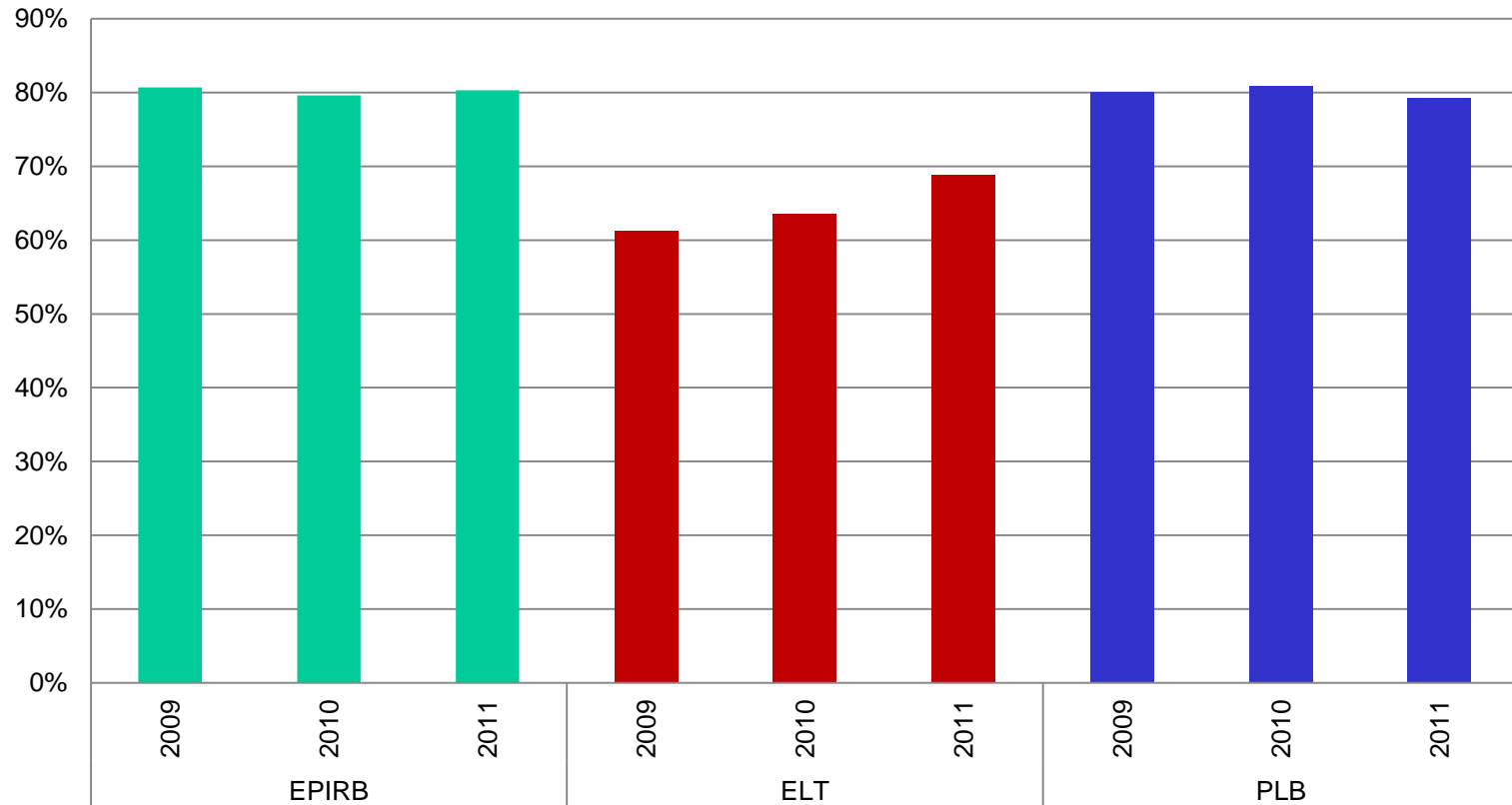
Beacon Registrations Entered 2001 to 2012





Beacon Registration Rates

406 MHz Beacon Registration Rates

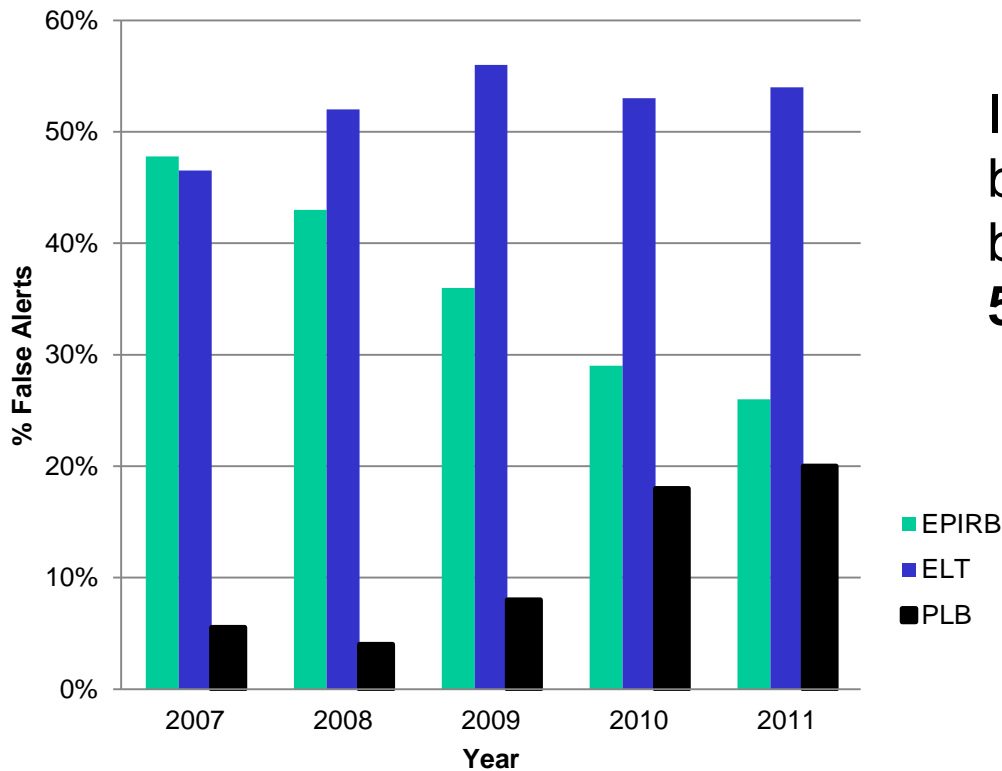


- ELTs have the lowest registration rate of all beacon types but account for the largest number of false alerts



False Alerts by Beacon Type

406 MHz beacons have reduced the number of false alerts by a factor of 10 compared to 121.5 MHz beacons.

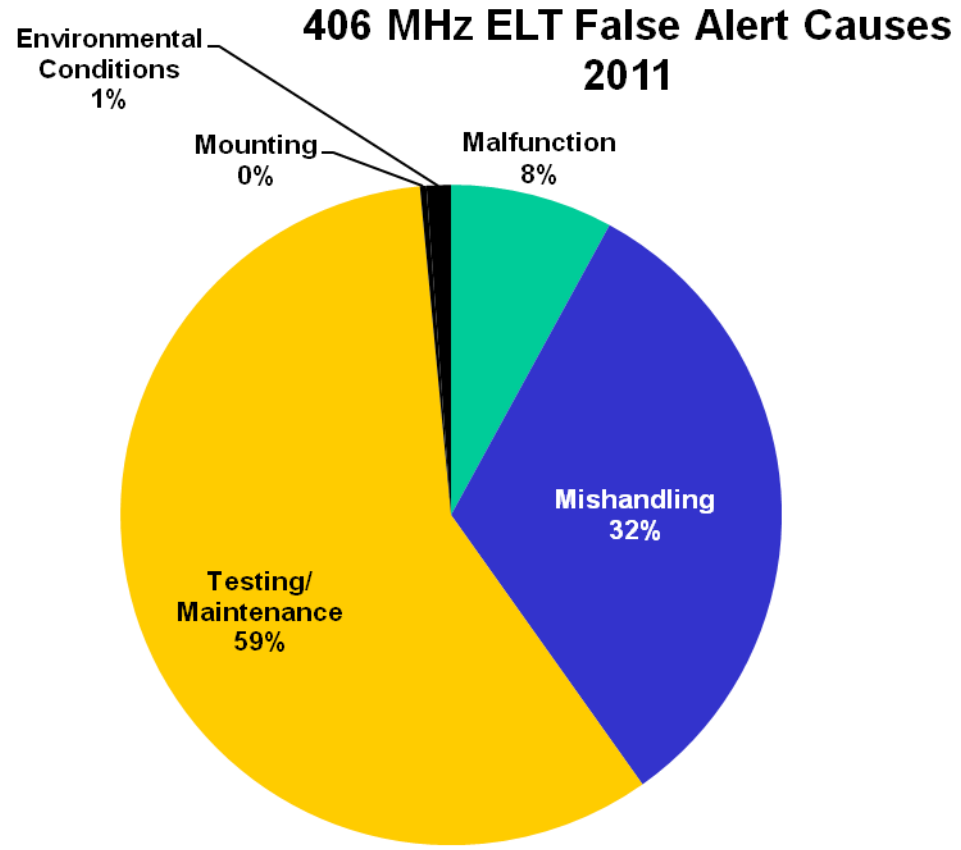


In 2011, **18%** of all registered US beacons were 406 MHz ELTs, but they were responsible for **54%** of all false alerts



Reasons for False Alerts

- **Testing/maintenance**
 - Failure to follow proper testing procedures
 - Activation during battery change
- **Beacon mishandling**
 - Installation
 - Usage/testing by owner
 - Improper disposal
- **Beacon malfunction**
 - Faulty activation switch, hard landing, water intrusion, electronics malfunction
- **Mounting**
 - Faulty mounting magnet for externally mounted ELT
- **Environmental conditions**
 - Extreme weather conditions, aircraft overturned, ice build-up





406 MHz ELT Testing During Maintenance

- The FAA advises maintenance personnel conduct 406 MHz ELT tests in accordance with manufacturer instructions
- Manufacturers instructions include the following caution:

"DO NOT ALLOW THE DURATION OF THIS TEST TO EXCEED 5 SECONDS. THE ELT WILL TRANSMIT A 406 MHZ SIGNAL AFTER THE ELT IS ACTIVATED FOR APPROXIMATELY 47 SECONDS. THE COSPAS-SARSAT SATELLITE SYSTEM WILL CONSIDER THE 406 MHZ TRANSMISSION TO BE A VALID DISTRESS SIGNAL."



Summary

- 406 MHz ELTs represent a significant improvement over 121.5 MHz ELTs
- ELT registration is critical for ensuring the fastest possible rescue response
- The majority ELT false alerts can be avoided by following proper maintenance and test procedures.



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