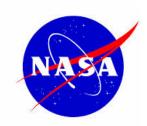# Beacon Use, Issues, and the 406 MHz Beacon Registration Database

Beacon Manufacturers Workshop

May 2017

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ERT, Inc.

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NOAA'S
BEACON REGISTRATION DATABASE
(RGDB)

National Use Beacons

- When a US Government agency orders beacons, ask the buyer to contact NOAA to ensure that:
  - Special coding and processing are considered
  - They understand the C-S system and how alerts from their beacons will be distributed
  - They understand beacon operation and do not generate false alerts
  - They are aware of **and** follow proper test policies
  - The beacons are properly registered
  - Proper procedures are followed for replacements of beacons/batteries

NOAA's Checksum Implementation

- The registration form (approved by OMB) contains a 5-digit checksum field, which is used to verify the 15-hexadecimal beacon ID.

- The checksum is currently provided by a few manufacturers.

- Currently, a new registration is accepted regardless of whether the checksum value is correct, incorrect, or absent. The fact that the checksum field is not required in the RGDB minimizes owner confusion and frustration, hopefully ensuring the owner will complete registration.

- NOAA has enhanced the RGDB's real-time checks via online entry to validate the beacon ID using the checksum value.

- NOAA contacts owners where this validation fails, resulting in uncovering and correcting registrations with incorrect beacon IDs.

Beacon Manufacturers' Checksum Implementation

- NOAA has started the Code of Federal Regulations (CFR) process for mandating that checksum be used for most new beacons.

- In preparation, NOAA requests that manufacturers start generating checksum values for their new beacons.

- Refer questions on implementing the checksum to:
  Jesse Reich, SARSAT Ground System Engineer
  jesse.reich@noaa.gov
  301-817-4509

- Contact NOAA immediately when an issue arises that has a direct impact on beacon owners, such as:
    - Duplicate beacon IDs encoded into beacons
    - Mislabeling of beacon IDs on forms or beacons
    - Recalls of beacons you have manufactured
- Ensure that the UIN label is legible and affixed to the blank registration form.
- Consider using a font type (such as Consolas, which is what RGDB currently uses) where the zero and the number 8 stand out. Owners often confuse 0 with the letter "O" and 8 with letter "B."

- Consider how to make your manufacturer UIN stand out on both the beacon and the registration form.

- Consider putting beacon IDs bar codes (Code 128) on the beacon label and registration form – NOAA uses bar code readers for beacon ID entry accuracy.

- Verify NOAA decal/registration currency and remind the owner, if appropriate, to update the beacon's registration with NOAA.

- If you must return a different beacon to an owner, ensure they are aware that the new beacon ID must be registered (the old registration is invalid).

RGDB Website Improvements (1 of 2)

- The revised RGDB user interface, unveiled on May 9, 2016 included these improvements:
  - Challenge question-and-answer sequence for owners to gain access more easily
  - Real-time entry checks to highlight data inconsistencies and errors
  - Pending registration status for the transfer of a beacon from one owner to another (the new owner's registration information is stored until NOAA confirms the transfer of ownership)

RGDB Website Improvements (2 of 2)

- More specific and instructive emails and letters to owners

- More online information on testing and proper disposal of beacons, to prevent false alerts

NOAA Beacon Decal Format Improvement

- In March 2017, RGDB implemented a long-planned improvement for beacon decals–they are now printed directly on registration correspondence (confirmation letters and letters responding to requests for replacement decals). This process improvement results in:
  - A huge time savings for RGDB staff members, who used to print decals on a separate label-specific printer, ensure the decal matched the letter, hand-staple the decal and a protective coating sheet to the letter, then fold and stuff the letters by hand.
  - Enhanced equipment usage, since the entire process is now performed on a generic laser printer (cost-effective to maintain since it's not specialized), and the letters can be folded and stuffed into envelopes by machine.
- The next page shows a sample replacement decal letter.

Sample of New Decal Form Letter

2DCC5 55555 FFBFF

www.beaconregistration.noaa.gov
Exp.: 03/23/2019

2DCC5 55555 FFBFF

Vessel:
SARSAT BEACON2

SARSAT Beacon Registration
NOAA/SARSAT
NSOF, E/SPO53
1315 East West Hwy
Silver Spring, MD 20910

Beacon ID:
2DCC5 55555 FFBFF

BEACON REGISTRATION DATABASE
1315 EAST WEST HIGHWAY
SILVER SPRING, MD 20911

Registration Expiration:
March 23, 2019

May 05, 2017
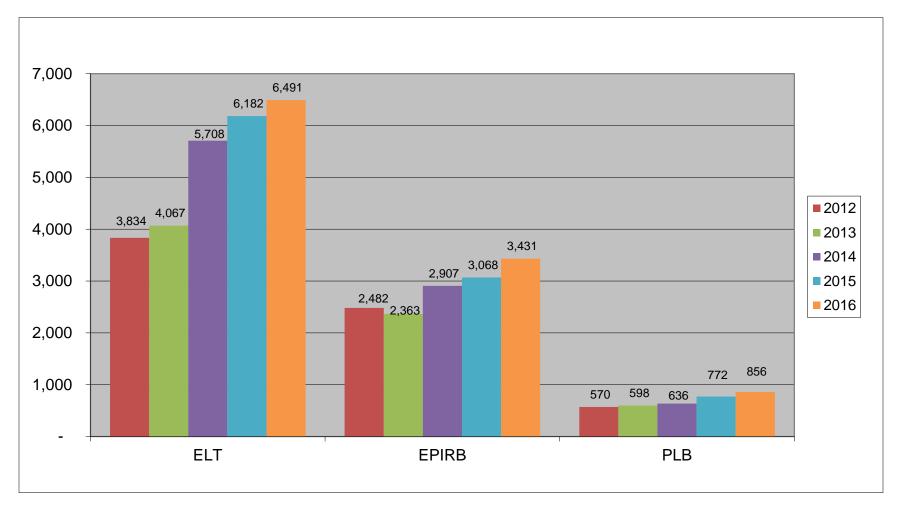
Dear Beacon Owner/Operator:

Thank you for requesting a replacement decal for your 406 MHz emergency beacon. Please take a few moments now to verify your beacon ID, check/update your registration information, and attach your registration decal to your beacon.

FALSE ALERTS

False Alerts:
Non-Distress Beacon Counts

False Alert Rate by Beacon Type vs. Registrations by Beacon Type 2016

ELTs

% of Total False Alerts	60%
% of Total Beacons Registered that are ELTs	18%

EPIRBs

% of Total False Alerts	32%
% of Total Beacons Registered that are EPIRBs	45%

PLBs

% of Total False Alerts	8%
% of Total Beacons Registered that are PLBs	39%

What's the Problem with False Alerts?

- False Alerts:
    - Waste SAR resources and funds
    - Frustrate SAR personnel
    - Adversely affect SAR personnel's ability to respond to actual distress

- Each activation is treated as a distress by the appropriate RCC until it can be confirmed as "distress" or "non-distress."

- The USMCC detected 6,749 ELT activations in 2016:
  84 of those ELT activations were due to distress,
  which means 6,665 activations were due to human error or beacon malfunction.

- Where the activation reason was provided, 91.8% (2,344 of 2,553) of ELT activations were reported as being due to mishandling.

Reasons for ELT False Alerts

Based on discussions with aircraft operators, aircraft mechanics, aircraft owner associations, and ELT manufacturers, the main cause of ELT false alerts is testing. It appears that ELTs are improperly activated in *operational* mode rather than in *self-test* mode, and that test conductors follow inappropriate test procedures because they do not know which ELT model they are testing or model-specific instructions are unavailable when ELTs are tested.

So let's all help the public and make it easy for them to understand how to test their ELTs!

Quick Guide Project for ELT Testing

Step 1:

ELT manufacturers help us create quick guides that are easy to read and understand—correct and concise.

Step 2:

The new quick guides undergo testing with the public at the Experimental Aircraft Association (EAA) AirVenture show in Oshkosh, Wisconsin (July 24-30, 2017).

Step 3:

Beacon manufacturers and NOAA SARSAT create ELT testing pages with pictures of ELTs, quick guides, and manuals for ELTs to help personnel identify and utilize proper steps for testing their ELTs.

All ELT Manufacturers are encouraged to participate in this project.
Contact LTjg Nate Gilman:
OPS.SARSAT@NOAA.GOV
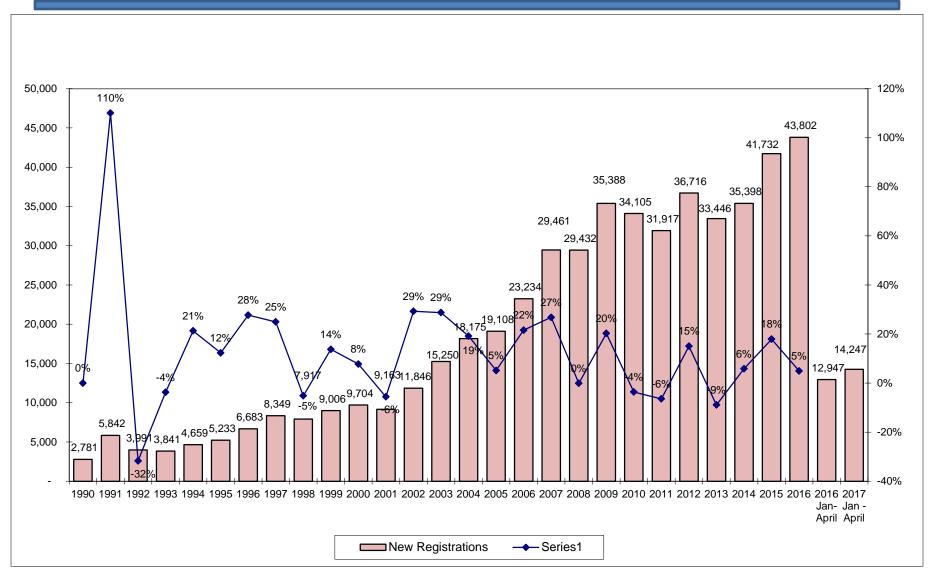301-817-4757 (office)
541-270-9334 (cell)

RGDB STATISTICS

Statistics on Registration Renewals
April 2016 to April 2017

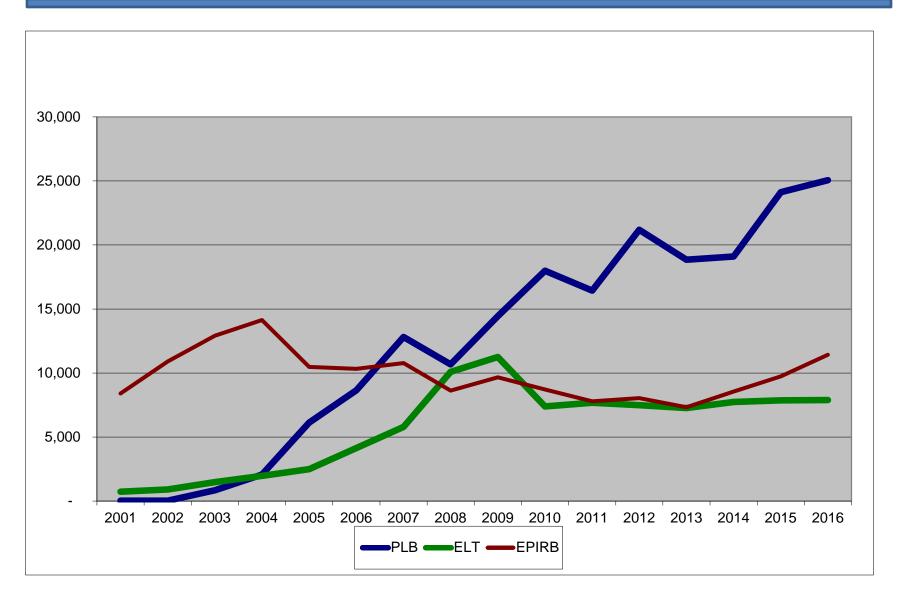| Mon-Yr	Updated by Owners Through Website	Updated by NOAA	Total Registration Renewals	Percentage Updated by Owners Through Website	Percentage Updated by NOAA
Apr-16	12,035	4,386	16,421	73%	27%
May-16	27,710	9,854	37,564	74%	26%
Jun-16	66,821	24,310	91,131	73%	27%
Jul-16	49,227	11,882	61,109	81%	19%
Aug-16	43,169	18,230	61,399	70%	30%
Sep-16	63,949	26,469	90,418	71%	29%
Oct-16	60,507	11,942	72,449	84%	16%
Nov-16	32,871	7,352	40,223	82%	18%
Dec-16	36,324	9,277	45,601	80%	20%
Jan-17	53,449	17,063	70,512	76%	24%
Feb-17	35,081	9,565	44,646	79%	21%
Mar-17	36,032	7,995	44,027	82%	18%
Apr-17	39,900	11,062	50,962	78%	22%

New Registrations by Year as of April 2017

New Beacon Registrations 2001 - 2016

Distribution of Registered Beacons by Beacon Type as of April 2017

181,414 PLB
37.34%

88,399 ELT
18.20%

263 SSAS
0.05%

215,757 EPIRB
44.41%

Registration Statistics Available on the SARSAT Website

- Registration statistics are updated on a monthly basis on the NOAA SARSAT website (www.sarsat.noaa.gov) under "Other Resources"/"SARSAT Statistics" (www.sarsat.noaa.gov/statistics.html)
  - New Beacon Registrations by Type
    - This is a table of first-time registrations of beacons, listed by type, for each month from January 2010 through the most recent month

RGDB Contact Information

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301-817-4542