

SARSAT Beacon Manufacturers Workshop

May 1, 2014

Beacon Use & Issues

Presented by:

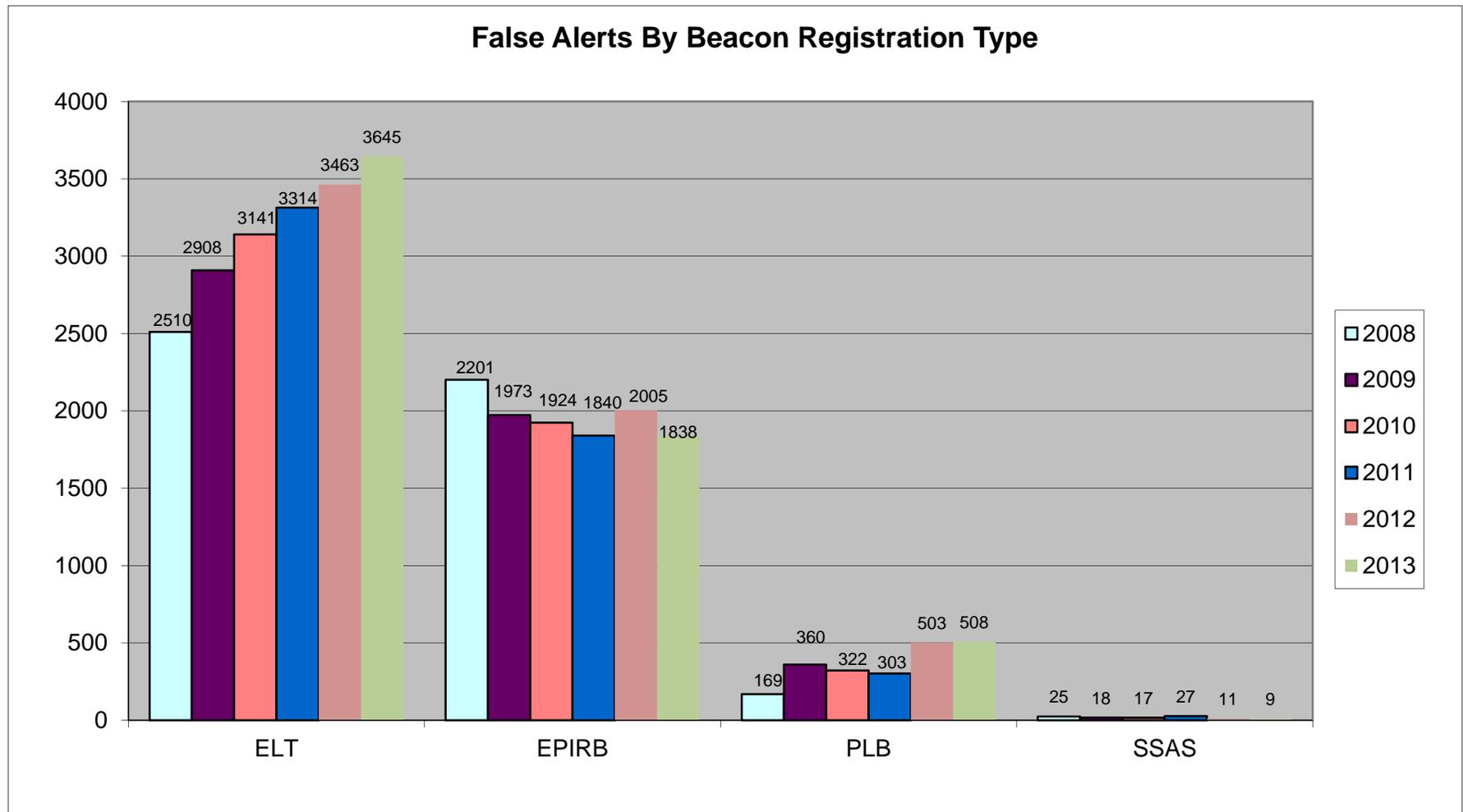
Mr. Eric Foster, ERT, Inc.

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Non-Distress Beacon Counts 2013





Beacon False Alert Rate for 2013

Based on Estimated Beacon Population

EPIRB	0.97 %
ELT	4.46 %
PLB	0.47 %
SSAS	2.87 %
Overall	1.31 %



False Alert Rate By Beacon Type vs. Registrations By Beacon Type

	ELTs					
	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>
% of Total False Alerts	53%	56%	53%	54%	52%	57%
% of Total Beacons Registered Which are ELTs	13%	16%	17%	17%	18%	18%
	EPIRBs					
	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>
% of Total False Alerts	43%	36%	29%	26%	27%	25%
% of Total Beacons Registered Which are EPIRBs	68%	62%	58%	55%	51%	49%
	PLBs					
	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>
% of Total False Alerts	4%	8%	18%	20%	21%	18%
% of Total Beacons Registered Which are PLRBs	19%	22%	25%	28%	31%	33%



National Use Beacons

- When a US Government Agency orders beacons, request the buyer contact NOAA to insure that:
 - Special coding and processing is 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:
 - Battery replacement and disposal
 - Beacon replacement and disposal



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- Beacons on unmanned vehicles
 - ELT Survivability Working Group

Emergency Beacons on RPA/UAV/UAS/Drones Etc.



- The ITU and FCC Tables of Frequency Allocation reserves the 406.0-406.1 MHz band for satellite emergency and distress alerting and is strictly limited to transmission of life saving distress and safety communications
- Coordination with FAA Flight Standards and UAS Systems office have verified they have no requirement for Unmanned Aircraft Systems (UAS) to be equipped with emergency beacons
- There are other systems available for the tracking and retrieval of UAS equipment
- **Therefore, the use of a 406 MHz distress beacon on a UAS/RPA/UAV/Drone etc. is an inappropriate use of the life saving frequency and equipment**
- The SARSAT program would like to solicit your support, should you be approached , in ensuing that life saving devices are not installed on unmanned systems
- NSARC has convened an Unmanned Aerial Systems Working Group
 - TOR developed and they are working to find another Co-chair
 - Desire to influence UAS National Policy of UAS development including their use in SAR operations



ELT Survivability Working Group

- March 2013 – USAF/ACC and NASA LaRC - Senior leader cross talks
 - Looking for partnership opportunities on issues affecting both agencies
 - Global Hawk RQ-4 Icing Test flights
 - Updated crash and ELT survivability data
- April 2013 ELT Survivability Working Group Chartered
 - ACC/A5R
 - NASA Langley
 - NASA Goddard
 - AFRCC
 - FAA
 - NTSB
 - USCG

ELT Survivability WG Goals and Objectives



- Goal 1: To deliver recommendations to the FAA, Specification development agencies, beacon manufacturers, and airframe manufacturers on ways to increase ELT survivability.
 - Objective 1: Research historical ELT failures in general aviation (light aircraft) accidents, and gather data to determine reasons for low beacon system survivability. – End of FY14
 - Objective 2: Study data, perform failure modes analysis, and develop new procedures/processes for beacon system design (beacon, antennae, cabling), installation, etc. as findings dictate.
 - Objective 3: Test these procedures on a system level, including use of the LaRC test crash site to crash a plane and analyze results.
 - Objective 4: Develop recommendations based on comprehensive test results.
- Goal 2: To improve ELT survivability on a global level through coordination and information transfer with COSPAS-SARSAT.
 - Including coordination with RTCA/EUROCAE on MOPS Update



How can you help?

- NASA looking for any data on failure modes you might have
- NASA Langley requesting hardware samples to be used in test program
- Looking for a representative selection of makes and models of AF type beacons and their associated mounting trays, cabling and antennas
- Several vendors have supplied equipment
- Invitation to attend tests
- Invitation to join Working Group.



NASA Langley POCs

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Back-up Slides



False Alerts by Beacon Manufacturer and Model

- The next four slides show false alerts by Beacon Manufacturer and Model
 - Manufacturers are only identified by a “Model Number” (Manufacturers may contact RGDB lead for information concerning their beacons)
 - The false alert percentage is calculated based on number of false alerts and estimated beacon population. The estimated beacon population is based on the number of registered beacons activated and total beacons activated.



False Alert Rate= False Alerts/Beacon Population by Manufacturer and Model (1 of 4)

Beacon Type	Model Number	2009	2010	2011	2012	2013
ELT	Model 74	28.05%	27.07%	30.13%	43.83%	28.98%
ELT	Model 95				19.29%	11.20%
ELT	Model 61	6.82%	8.50%	9.18%	7.41%	8.65%
EPIRB	Model 79	0.99%	0.81%	1.35%	3.88%	6.38%
ELT	Model 69	5.34%	3.96%	3.90%	7.59%	6.35%
ELT	Model 68	6.13%	4.73%	3.35%	6.48%	6.14%
ELT	Model 31	11.00%	8.16%	4.51%	7.66%	6.13%
ELT	Model 53	6.08%	7.31%	10.03%	4.16%	5.64%
ELT	Model 78	18.68%	14.43%	6.47%	6.48%	5.56%
ELT	Model 87			5.91%	5.75%	5.02%
ELT	Model 1	7.91%	5.11%	4.07%	5.71%	5.01%
ELT	Model 76	4.58%	5.34%	4.83%	9.70%	4.73%
EPIRB	Model 64	1.46%	1.28%	1.25%	3.82%	4.35%
ELT	Model 88			10.00%	6.75%	4.14%
ELT	Model 3	5.55%	5.04%	5.05%	4.43%	4.06%
EPIRB	Model 10	1.65%	1.81%	1.98%	2.45%	3.61%
EPIRB	Model 6	1.74%	1.89%	1.45%	4.03%	3.61%
ELT	Model 54	1.44%	1.64%	2.38%	4.36%	3.54%
ELT	Model 93				4.67%	3.46%
ELT	Model 2	4.01%	5.77%	3.64%	6.93%	3.39%
ELT	Model 77	2.90%	6.36%	7.88%	4.86%	3.19%
EPIRB	Model 36	0.76%	0.39%	0.76%	0.94%	3.04%
ELT	Model 65	3.81%	3.66%	4.56%	1.58%	2.96%
ELT	Model 75	4.65%	3.81%	2.87%	2.50%	2.64%
EPIRB	Model 16	0.59%	0.34%	0.44%	1.29%	2.58%
ELT	Model 51	2.93%	2.36%	2.28%	2.38%	2.54%
EPIRB	Model 26	2.07%	2.06%	0.99%	1.58%	2.34%
ELT	Model 70	4.16%	4.23%	1.88%	1.25%	2.26%
EPIRB	Model 13	3.33%	2.52%	3.60%	2.71%	2.05%
EPIRB	Model 19	1.14%	1.19%	1.14%	2.57%	1.99%



False Alert Rate=False Alerts/Beacon Population by Manufacturer and Model (2 of 4)

Beacon Type	Model Number	2009	2010	2011	2012	2013
EPIRB	Model 43	0.00%	0.78%	1.18%	0.45%	1.95%
EPIRB	Model 91			0.99%	0.77%	1.94%
EPIRB	Model 7	1.37%	1.20%	0.96%	2.43%	1.87%
EPIRB	Model 24	2.00%	0.74%	1.24%	0.25%	1.71%
ELT	Model 94				0.00%	1.71%
EPIRB	Model 27	1.38%	1.21%	1.54%	1.28%	1.23%
EPIRB	Model 98				0.00%	1.14%
EPIRB	Model 33	1.44%	1.41%	1.26%	1.76%	1.05%
PLB	Model 41	0.42%	0.25%	0.12%	0.35%	0.97%
EPIRB	Model 20	0.78%	0.79%	0.71%	0.92%	0.96%
PLB	Model 100				0.37%	0.91%
ELT	Model 30	3.20%	3.91%	3.85%	8.50%	0.91%
EPIRB	Model 32	0.90%	0.88%	0.89%	1.58%	0.87%
EPIRB	Model 5	1.53%	1.68%	1.10%	1.51%	0.84%
EPIRB	Model 90			0.50%	1.10%	0.84%
PLB	Model 46	0.83%	0.76%	0.93%	1.02%	0.81%
PLB	Model 92			0.81%	0.90%	0.79%
ELT	Model 4	3.02%	1.90%	1.21%	2.76%	0.74%
ELT	Model 52	0.23%	0.40%	0.42%	0.40%	0.70%
PLB	Model 58	0.58%	0.42%	0.53%	1.06%	0.64%
EPIRB	Model 34	1.11%	0.74%	0.51%	2.84%	0.63%
EPIRB	Model 8	1.32%	0.71%	0.30%	0.65%	0.63%
EPIRB	Model 25	0.47%	0.23%	0.39%	0.08%	0.54%
EPIRB	Model 18	0.16%	0.67%	0.49%	0.38%	0.53%
EPIRB	Model 23	0.25%	0.49%	0.25%	0.50%	0.48%
EPIRB	Model 89			0.22%	0.21%	0.47%
EPIRB	Model 28	0.57%	0.41%	0.49%	0.55%	0.46%
PLB	Model 103					0.45%
EPIRB	Model 11	0.91%	1.17%	0.71%	0.49%	0.44%
PLB	Model 47	0.00%	0.10%	0.20%	0.09%	0.41%



False Alert Rate= False Alerts/Beacon Population by Manufacturer and Model (3 of 4)

Beacon Type	Model Number	2009	2010	2011	2012	2013
EPIRB	Model 96				0.20%	0.40%
PLB	Model 42	0.95%	1.93%	1.42%	1.36%	0.40%
EPIRB	Model 60	0.62%	0.56%	0.55%	0.48%	0.39%
EPIRB	Model 97				3.31%	0.38%
EPIRB	Model 17	0.79%	0.65%	0.66%	0.42%	0.37%
ELT	Model 39	0.48%	1.25%	5.35%	0.39%	0.36%
EPIRB	Model 82		0.51%	0.41%	0.65%	0.35%
EPIRB	Model 66	0.08%	0.30%	0.38%	0.34%	0.34%
PLB	Model 99				0.13%	0.30%
EPIRB	Model 37	1.14%	0.20%	0.13%	0.47%	0.29%
PLB	Model 12	0.43%	0.24%	0.42%	0.09%	0.27%
EPIRB	Model 9	1.08%	0.53%	0.54%	0.41%	0.26%
PLB	Model 86		0.72%	0.06%	0.27%	0.25%
ELT	Model 40	0.14%	0.14%	0.23%	0.24%	0.24%
EPIRB	Model 22	0.45%	0.22%	0.11%	0.22%	0.22%
PLB	Model 102				0.00%	0.20%
PLB	Model 81	0.10%	0.60%	0.36%	0.16%	0.17%
PLB	Model 80	0.14%	0.12%	0.09%	0.33%	0.17%
PLB	Model 63	0.05%	0.09%	0.00%	0.09%	0.16%
EPIRB	Model 15	1.13%	0.74%	0.75%	0.38%	0.12%
PLB	Model 85		0.55%	0.26%	0.26%	0.11%
ELT	Model 67	0.46%	0.00%	0.00%	0.12%	0.11%
PLB	Model 71	0.10%	0.49%	0.14%	0.09%	0.11%
ELT	Model 48	0.51%	0.38%	0.25%	0.23%	0.10%
EPIRB	Model 29	0.10%	0.07%	0.08%	0.04%	0.03%
ELT	Model 50	0.35%	0.12%	0.15%	0.17%	0.02%
EPIRB	Model 44	0.00%	0.47%	0.00%	0.48%	0.00%
EPIRB	Model 59	0.00%	0.00%	0.00%	0.00%	0.00%
EPIRB	Model 14	0.00%	0.00%	0.85%	0.00%	0.00%
EPIRB	Model 38	0.00%	0.00%	0.00%	0.00%	0.00%



False Alert Rate= False Alerts/Beacon Population by Manufacturer and Model (4 of 4)

Beacon Type	Model Number	2009	2010	2011	2012	2013
EPIRB	Model 49	0.00%	0.00%	0.00%	0.00%	0.00%
PLB	Model 104					0.00%
PLB	Model 101				0.00%	0.00%
EPIRB	Model 62	0.12%	0.00%	0.00%	0.00%	0.00%
PLB	Model 56	0.00%	0.00%	0.00%	0.76%	0.00%
PLB	Model 45	0.00%	0.00%	0.00%	0.00%	0.00%
PLB	Model 57	0.00%	0.82%	0.00%	0.00%	0.00%
PLB	Model 35	0.00%	0.00%	0.00%	0.00%	0.00%
EPIRB	Model 21	2.48%	0.61%	0.62%	0.00%	0.00%
EPIRB	Model 84		0.00%	0.00%	0.00%	0.00%
PLB	Model 72	0.00%	0.60%	0.26%	0.00%	0.00%
ELT	Model 55	2.71%	2.69%	3.30%	0.40%	0.00%
PLB	Model 73	5.55%	0.57%	0.05%	0.00%	0.00%
EPIRB	Model 83		0.00%	0.00%		



Contact Information

- Please contact Sam.Baker@noaa.gov to receive your company's model numbers referenced on these statistics.