406 MHz EPIRB False Alerts Study
EPIRB False Alerts Study

Study was research project by:

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L. T. Yabrough, USCG, D7(dpi)
Why does US Coast Guard care about EPIRB False Alerts?

• 96% 406 MHz EPIRB Alerts are false
• 85% Resolved by RCCs with registration and good detective work
• Projected increase in EPIRB population will bring increase in number of false alerts

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Why does US Coast Guard care about EPIRB False Alerts?

- $3.6 million in A/C time and fuel on 406 MHz EPIRB false alerts in 2007
- SAR crews put at risk
- SAR assets less available for actual distress
- Fatigues and dulls the SAR system

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Cost of Coast Guard A/C Sorties Searching for False 406 EPIRB Activations for the Month of January 2008 - $427,889.15

Legend:
- Unknown
- False Act.
EPIRB False Alerts Study

- Study data limited to:
  - US Registered 406 MHz EPIRBs
  - transmitting a 406 MHz False Alert
  - where secondary data collection was accomplished, through RCC telephone interview of vessels owner or operator at the time of the alert

- Study Population came from all USMCC alerts passed to US Coast Guard RCCs
EPIRB False Alerts

- 1 May - 31 Dec 2007
- USMCC received 1577 406 MHz EPIRB alerts
- 5% (83) were Distress Alerts
- 1494 False Alerts (non-distress and ceased/undetermined alerts)
EPIRB False Alerts

- **1494** False Alerts (non-distress and ceased/undetermined alerts)
- **15%** - (232) Were False Alerts with enough data collected to develop evidence of circumstances causing alert transmission
How Long does a False Alert Last?

Alert Duration (in minutes)

Number of Alerts

105 36 20 12 9 2 48

45.3% 60.8% 69.4% 74.6% 78.4% 79.3% 100.0%

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EPIRB False Alerts

• **232** - False Alerts with enough data collected to develop evidence of circumstances causing alert transmission
Operator Induced False Alerts

- 10% (24) were attributed to Testing without following manufactures instructions, or other deliberate non-emergency activations
- 6% (13) were EPIRBs deliberately taken out of bracket and naked of any control of the wet sensor

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False Alert and EPIRB in Bracket

- Wet: 95
- Bumped: 35
- Knocked out: 15
- Icing: 4
- Heavy Weather: 26
- Washing: 22

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EPIRB False Alerts

69% (161) Caused by Failure of “The bracket decoupling function” to control the EPIRB

– Observed with Category I and II
– Manufactures, makes and models in the US registration data base were proportionally represented by False Alerts
EPIRB False Alerts

69% (161) Activated when bracket should have prevented activation

Failure of “The bracket decoupling function” to control the EPIRB

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Bracket problems observed in field by Coast Guard personnel

- Loose straps or mechanical holding device
- Missing pads or guides to hold beacons in place
- Missing or corroded magnets
Bracket problems observed in field by Coast Guard personal (continued)

- Beacons being placed improperly in brackets by users
- Brackets not mounted in accordance with manufacturers recommendations
“The satellite EPIRB should not be accidentally activated or deactivated by conditions normally encountered in the maritime environment.”

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“The **bracket decoupling function will** guard against false alarms should the water-activation mechanism malfunction to an “on” mode. It will also **prevent inadvertent activation** due to the water activation mechanism becoming wet due to heavy seas or rain. ... Both Category 1 and Category 2 satellite EPIRBs should have these features.”

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EPIRB Operational Requirements

Not be activated or deactivated by conditions encountered in maritime environment

69% Of False Alerts

Bracket Interface Failure

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Bracket Decoupling Function

The current RTCM standard is adequate for describing the functional requirement for the design and construction of EPIRBs

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Bracket Decoupling Function

The testing requirements in Appendix A need to be examined for adequacy for testing the Bracket Decoupling Function and Ergonomic design of an EPIRB

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EPIRB as a System

Current Shore Based Maintenance for EPIRBs does not routinely examine the Bracket, (IMO MSC/Circ.1039) Require or at least encourage the bracket to be included in an EPIRB service
EPIRB Testing

IMO MSC/Circ.1040, Guidelines on Annual Testing of 406 MHz Satellite EPIRBs, and manufacture’s self test guidelines should be reassessed for detection of bracket failure

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Naked EPIRBs

Recreational mariners are buying EPIRBs and putting them in their “ditch bags” without brackets that provide protection for the wet activation circuit.

Develop a design standard that incorporates the bracket decoupling function for this type of EPIRB user.
Feedback

• Improve feedback mechanism to Beacon manufactures that provides as much detail as possible about:
  – exactly which Beacons have generated a False Alert. And
  – circumstances surrounding the event.
  – Consider providing IHDB access, or a limited and redacted version that excludes protected personal data.
False Alerts

False Alerts are a drain on the health of the EPIRB Distress Alerting System

There is no one cause of EPIRB False Alerts, and there is no one fix for the problem. However …

Several small corrective steps will make a positive difference in this problem

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Questions?