406 MHz EPIRB False Alerts

Cause and Prevention of False Alerts

EPIRB False Alerts Study

Study was research project by:

Larry Yarbrough, Capt, USCG (Ret)

USCG District 7 (dpi)

Newton Anderson,

USCG Auxiliary

Greg Johnson

USCG Sector Charleston SC

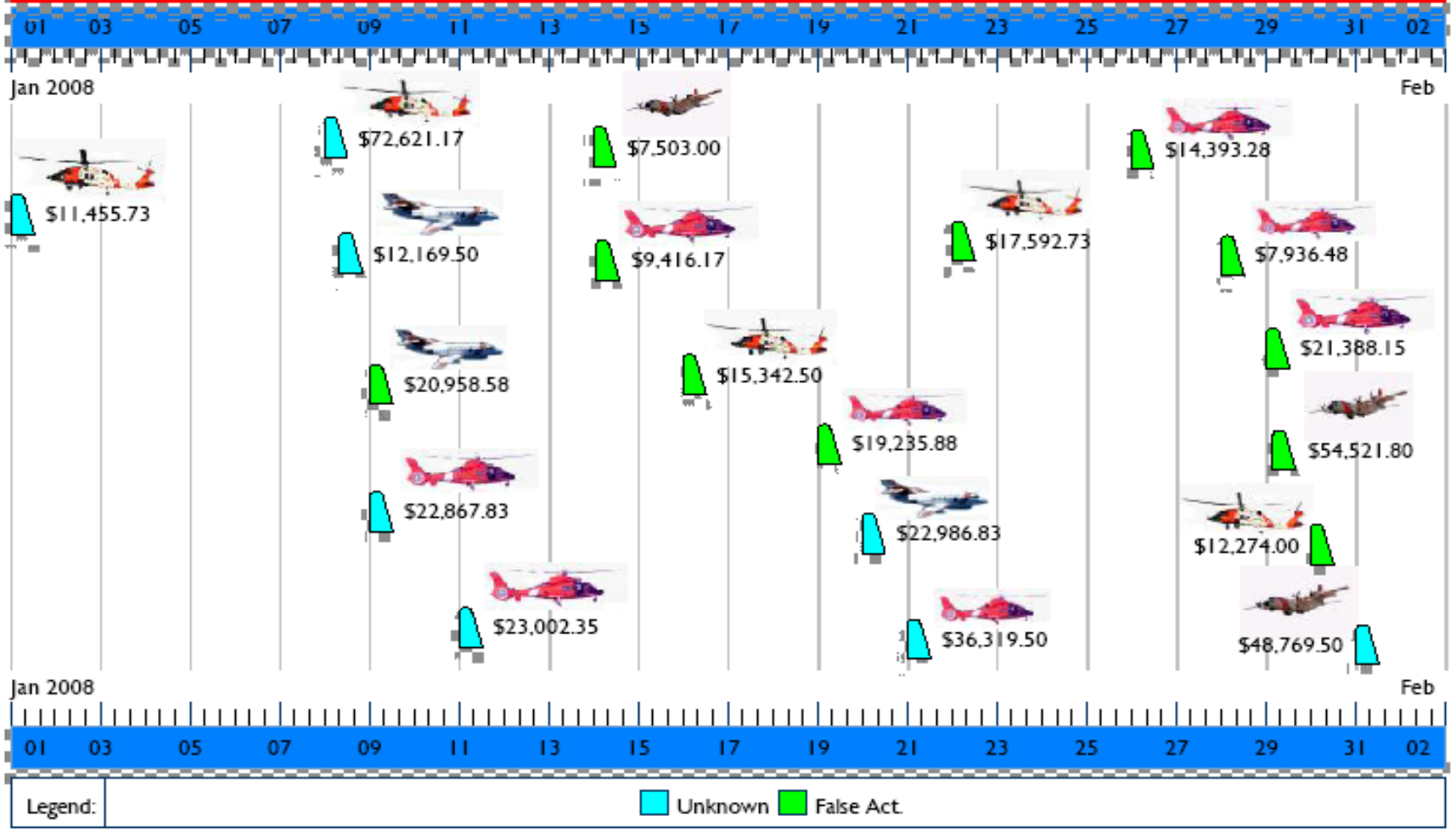
Why does US Coast Guard care about EPIRB False Alerts?

- 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

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

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



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

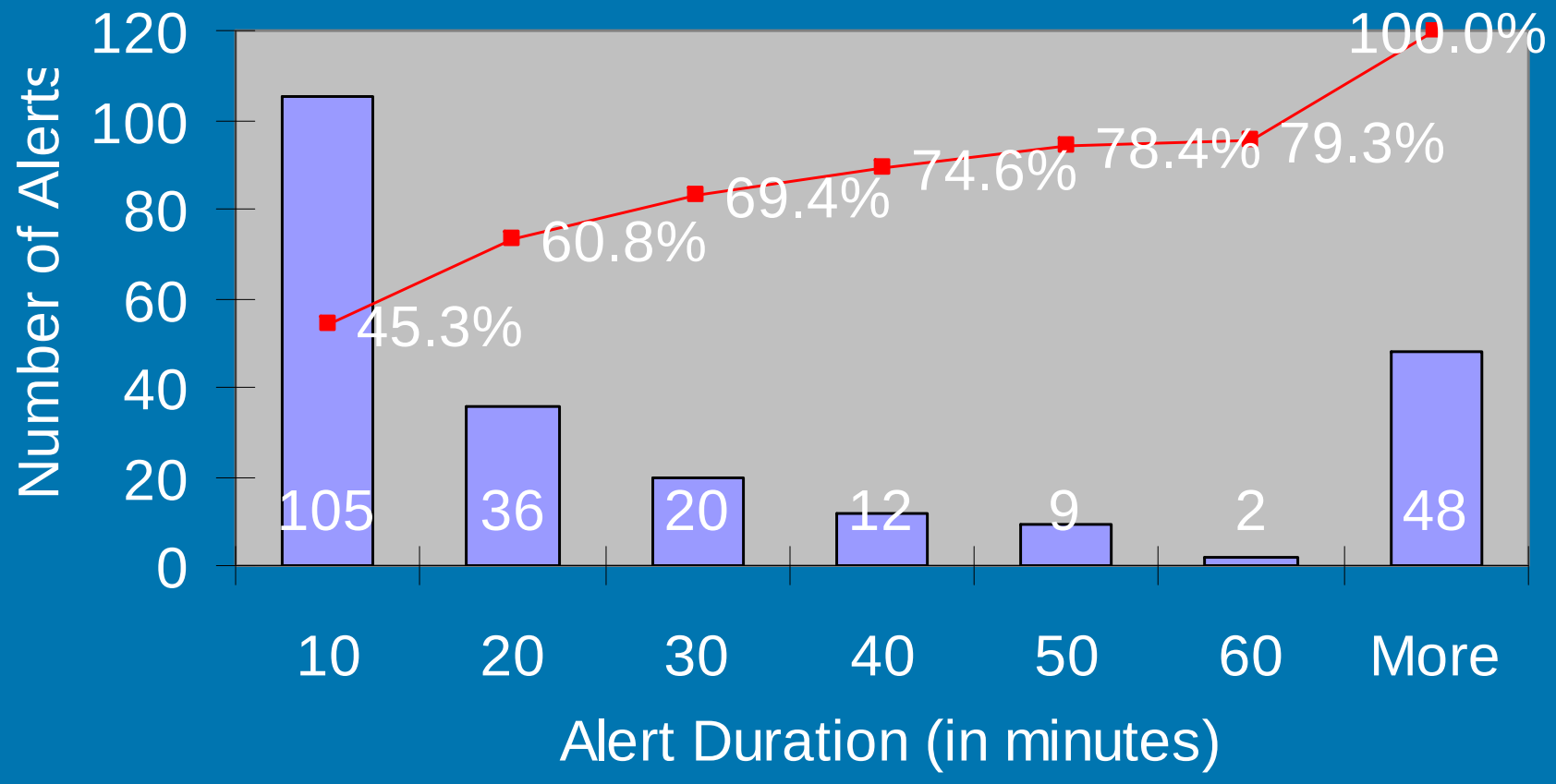
EPIRB False Alerts

- 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 Alerts Last?



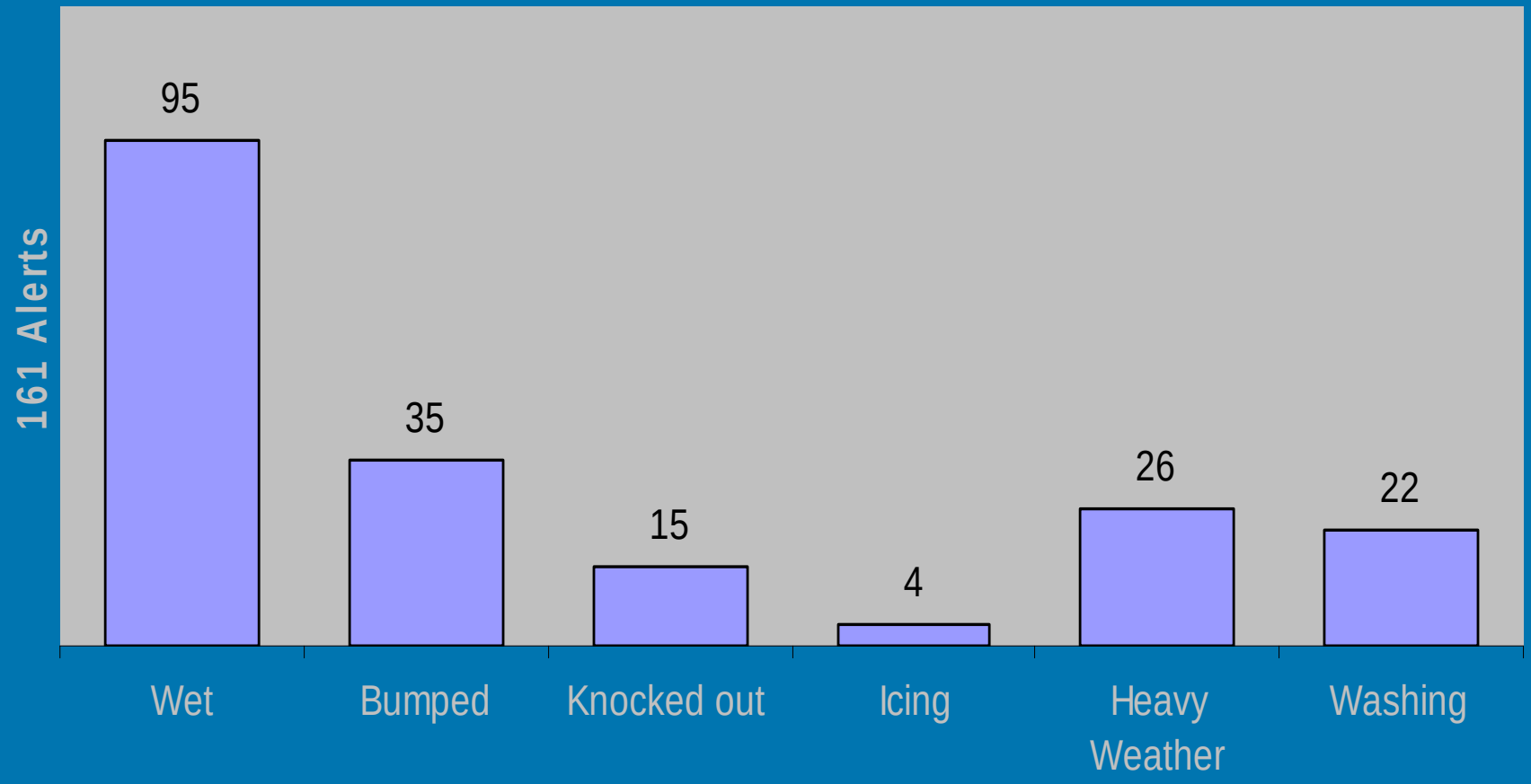
EPIRB False Alerts

- **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

False Alert and EPIRB in Bracket



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

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 manufactures recommendations

RTCM Standard 11000.2 2.3.1.1

"The satellite EPIRB should **not** be accidentally activated or deactivated by conditions normally encountered in the maritime environment."

RTCM Standard 11000.2 2.3.1.2

"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."

EPIRB Operational Requirements

Not be activated or deactivated by conditions encountered in maritime environment

69% Of
False Alerts

Bracket
Interface Failure

Prevention of Inadvertent Activation

- Must be fitted with means to prevent inadvertent activation and deactivation.
- Not automatically activate when water washes over while in bracket.
- Most EPIRBs use bracket with magnet to disable activation circuit.

What to Look For

- Mounting Locations – will it float free?

What to Look For (Cont.)

- Mounting Locations –
  - Vertically – Upright
  - Horizontal – Flat on Deck

  - Not On Side
  - Not Upside-down
  - Not hanging from overhead

What to Look For (Cont.)

HRU's – Hydrostatic Release Unit.

- CG Approved (160.062)
- Replace 2 years after purchase
- Installed as designed

Testing for the Magnets

It takes just a few seconds to verify the magnet is properly installed in the bracket. The test device – an inexpensive magnetic compass. The bracket magnet will cause the compass needle to swing and point at the bracket instead of pointing at the magnetic north pole. The following slides show this occurring for several of the most frequently encountered marine EPIRBs.

Category 1 ACR Satellite$_2$ 406 MHz

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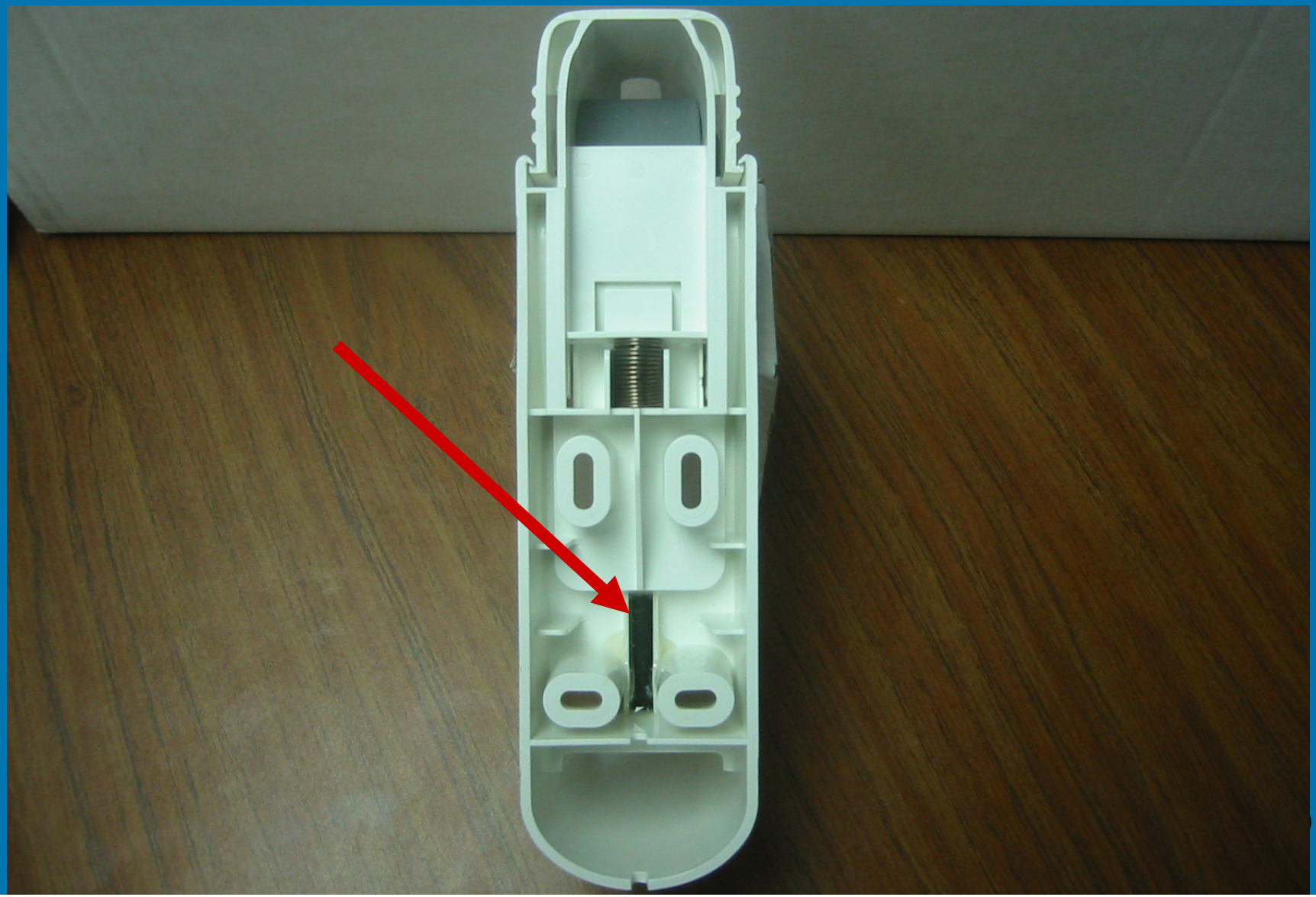
Category 2 ACR Satellite$_2$ 406 MHz

Category 2 Pains Wessex 406 MHz



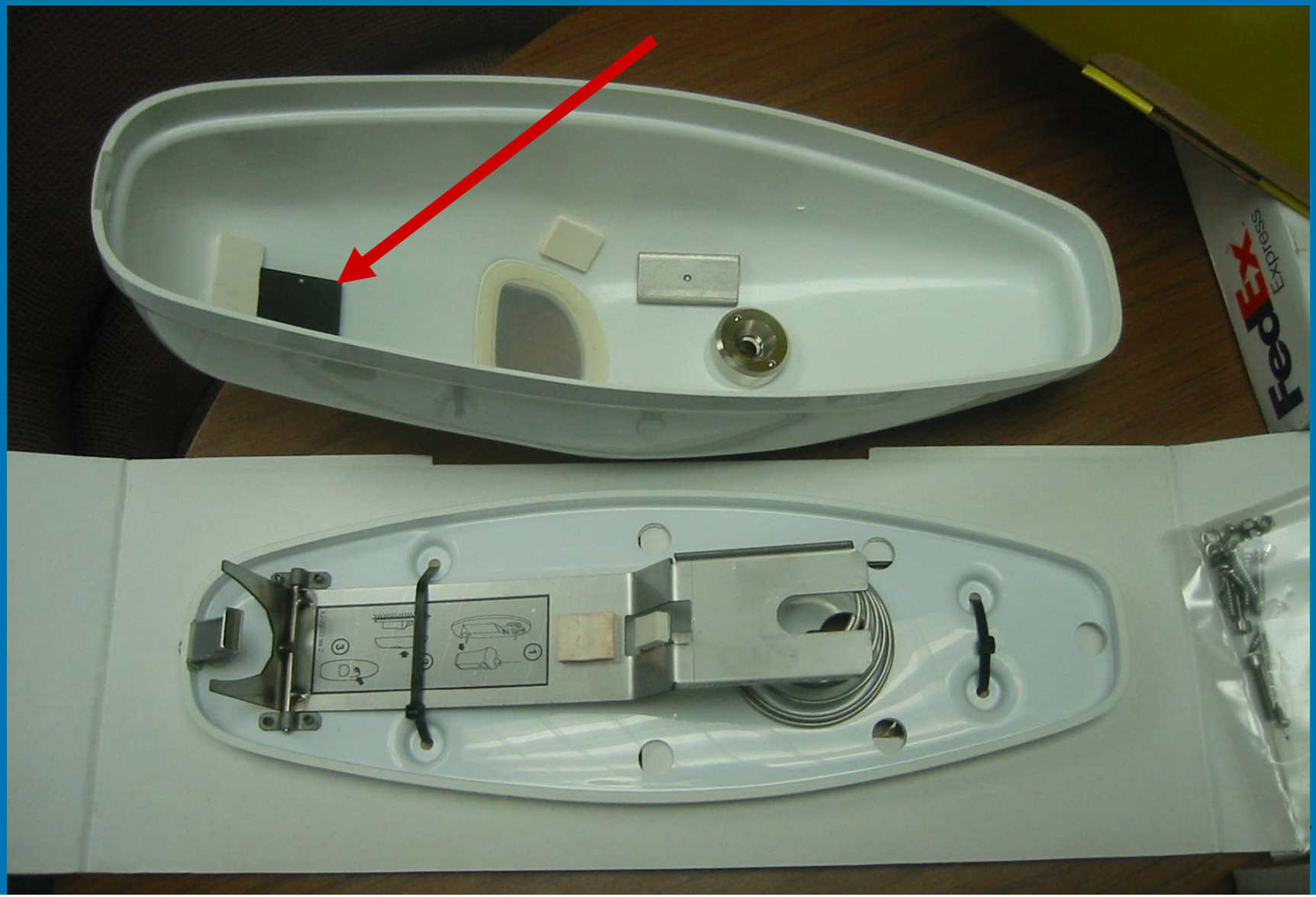
Category 2 ACR Satellite$_2$ 406 MHz

Category 1 McMurdo 406 GPS

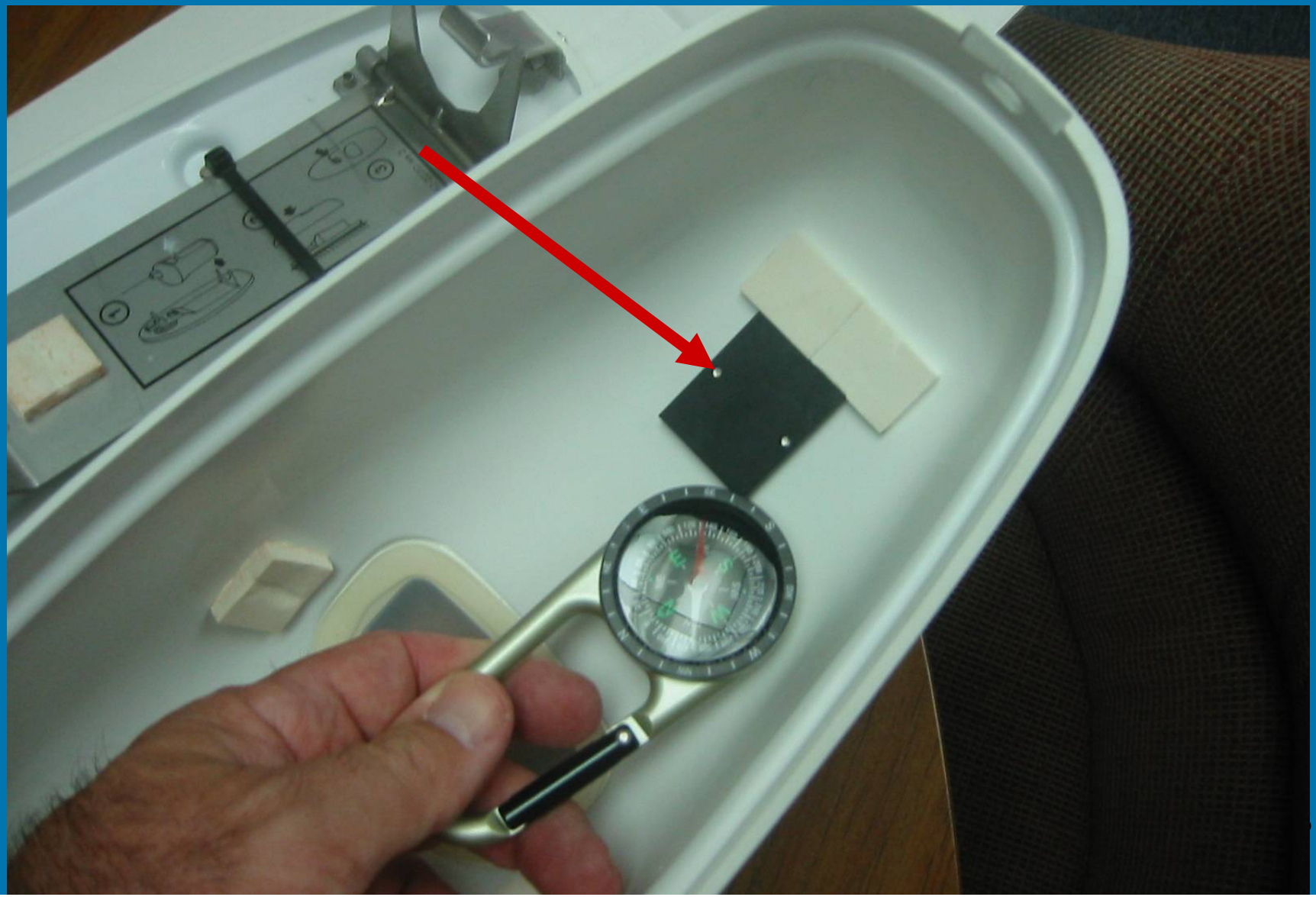
Note: The magnet is positioned under the EPIRB and is not visible until the EPIRB is removed.

Category 1 McMurdo 406 GPS

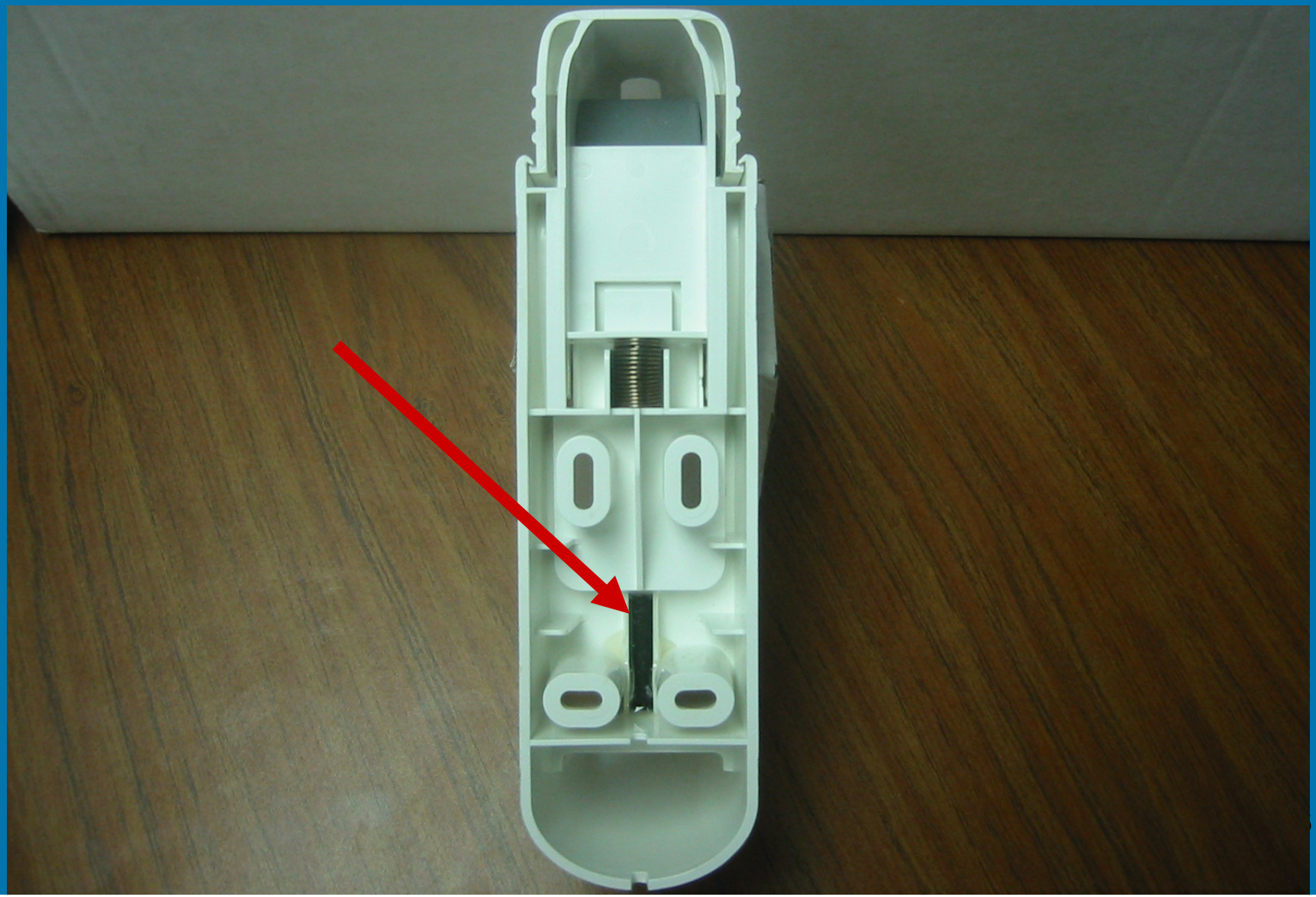
Category 1 Pains Wessex 406 MHz



Category 1 Pains Wessex 406 MHz



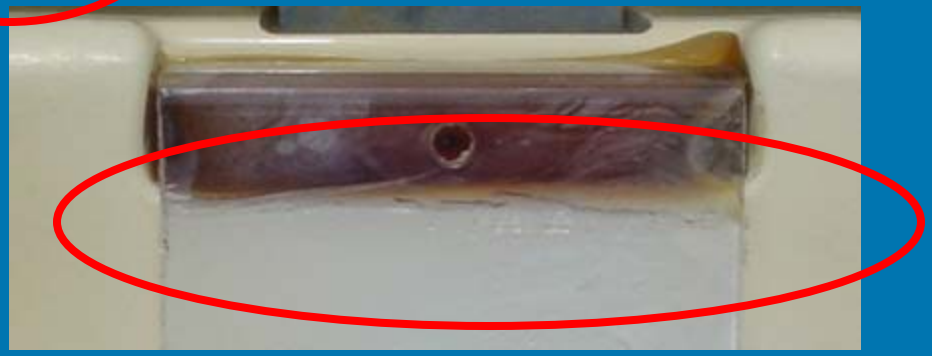
Category 2 Pains Wessex 406 MHz



Category 2 Pains Wessex 406 MHz

What to Look For (Cont.)

- Magnet on bracket in good condition?



What to Look For (Cont.)

- Bracket
  - Straps – tight
  - Pads and retainers
  - Held firmly

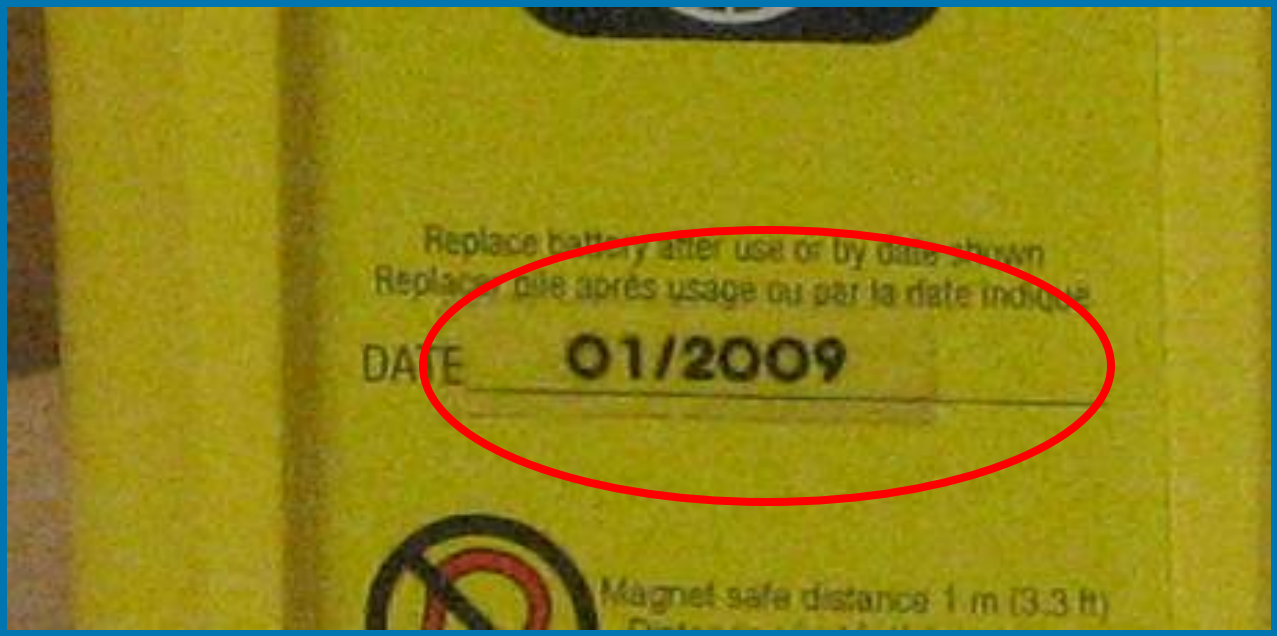
  - Less than 1/8” out of place may result in False Alert

What to Look For (Cont.)

- Antenna –
- In apparent good working order?
  - Most manufactures will replace free if contacted directly.

What to Look For (Cont.)

- Battery Exp Date – not expired



What to Look For (Cont.)

- Lanyard
  - ready to deploy
  - Not dry rotted.

What to Look For (Cont.)

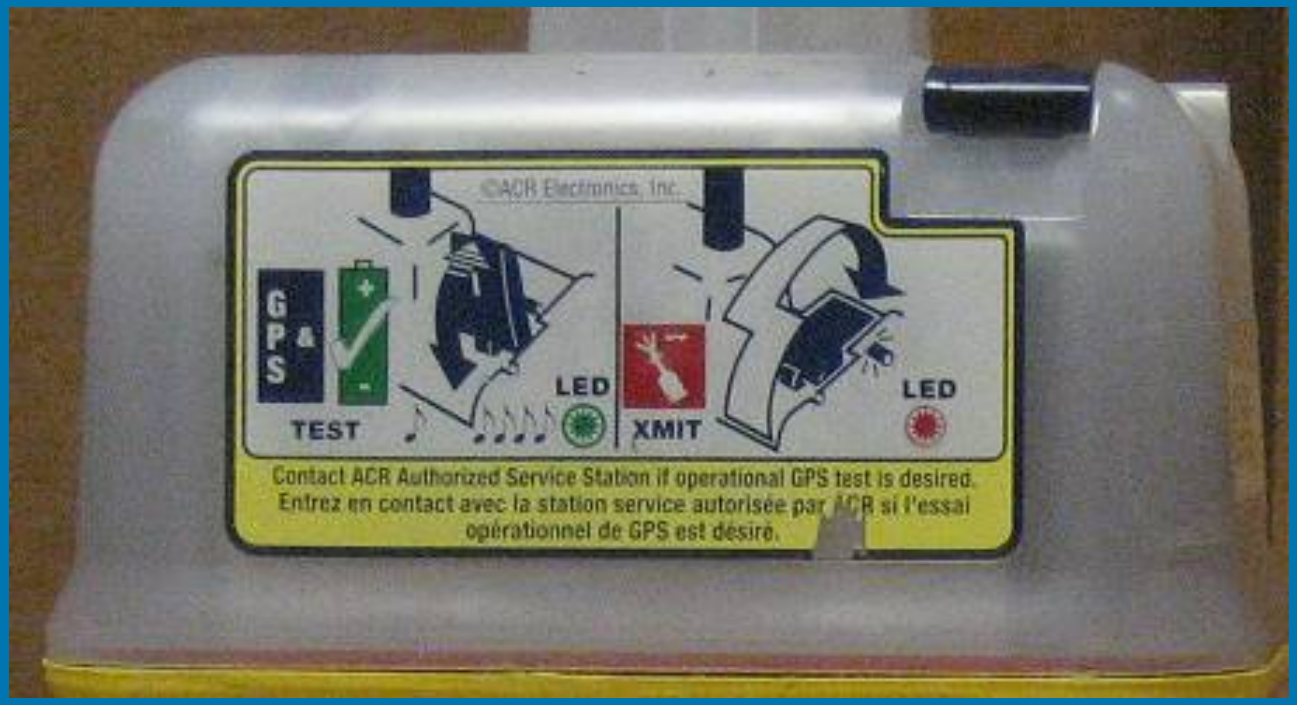
FULL FUNCTIONAL SELF-TEST: this feature found on 406 MHz EPIRBs, tests

– battery for voltage, creates a test message, sends the message, fires the strobe, and, if

– equipped with it, confirms the GPS is operational by conducting a GPS Circuitry Test.

What to Look For (Cont.)

Have master conduct self test of beacon.
The instructions are on the beacon.



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

Questions?