Canadian Mission Control Center
Canadian Beacon Registry

Beacon Manufacturers Workshop
Major Kelly Freitag
Outline

• Canada’s Area of Response
• Canada’s Alerts
• Select 406 Issues
• What CMCC / CBR is doing
• What we are proposing
• Contact Information and Questions
Canada’s SAR Region
Canadian Coded Beacons
Registered

- **EPIRB** - 8967
- **ELT** - 8242
- **PLB** - 4339

**TOTAL = 21,548 + 2000 Military**
Canada’s Alerts

- **2009 registration rate** seen at the desk at CMCC:
  - ELT 52.3%
  - EPIRB 69.9%
  - PLB 78.8%

- **2010 registration rate** seen at the desk at CMCC:
  - ELT 65.4%
  - EPIRB 72.1%
  - PLB 75.8%
Canada’s Alerts

• 2009 Registration Rate
  – based on inverted frame sync
  – ELT 71.7%
  – EPIRB 87.4%
  – PLB 93.9%
• Total: 76.1%

• 2010 Registration Rate
  – Based on inverted frame sync
  – ELT 85.3%
  – EPIRB 87.4%
  – PLB 95.9%
• Total: 86.4%

• Current registered (approximate): 22,000
• Current estimated beacon population: 25,500
Canada’s Alerts

2009 Total: 832

2010 Total: 825
Canada’s Alerts
2009 & 2010 by Beacon and Alert Type (# and %)

Within each graph and beacon type, left column is 2009 and right column is 2010.
Select 406 Issues

• Unregistered Beacons
  – Gives Undetermined Alerts

• Secondary data
  – 24 Bit address
  – MMSI
  – TAC Number

• Without mandatory registration, we require secondary data
• In Canada, ELT’s require 24 Bit
  – When unregistered, we CMCC can trace = less undetermined.
• EPIRBS – serialized; only some have MMSI
• PLB’s – most have no secondary data = significant undetermined
Select 406 issues

Resources spent (hours) and Alerts (2009 / 2010 combined)

- **Unregistered** - FA / Undetermined consume valuable hours at huge cost = unacceptable

- **Registered** - False Alarms are solved with a phone call = acceptable
### False and Undetermined Alarms

<table>
<thead>
<tr>
<th>Calendar year</th>
<th>False Alarms</th>
<th>Total Alerts reported</th>
<th>% FA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2008</td>
<td>2009</td>
<td>2010</td>
</tr>
<tr>
<td>EPIRBs</td>
<td>52</td>
<td>162</td>
<td>136</td>
</tr>
<tr>
<td>ELTs</td>
<td>237</td>
<td>537</td>
<td>419</td>
</tr>
<tr>
<td>PLBs</td>
<td>11</td>
<td>35</td>
<td>26</td>
</tr>
</tbody>
</table>

Note 2008 – Doppler only

The significance indicates the value of placing a GPS on every beacon.
### False Alert Rate
Percentage of beacon population that result in false alerts

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>False Alert rate EPIRBs *</td>
<td>0.59%</td>
<td>1.53%</td>
<td>1.13%</td>
</tr>
<tr>
<td>False Alert rate ELTs  *</td>
<td>1.95%</td>
<td>6.01%</td>
<td>4.97%</td>
</tr>
<tr>
<td>False Alert rate PLBs   *</td>
<td>0.27%</td>
<td>0.83%</td>
<td>0.66%</td>
</tr>
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</table>
SAR RESPONSE

- Approx 50% of alerts are detect only (no Doppler)
- Unregistered beacons means limited response until location is received (average 1 hr)
- “one-hit wonder” – can’t respond
- CMCC will decode and find registry ELT only
- CBR will attempt to contact manufacturer for EPIRB and PLB – business hours only
MEOSAR – False Alarm Effect
Victim of our own success?

- IMO and ICAO dictate RCC/SPOCs treat all alerts received as distress
- MEOSAR will create a location on every burst
- What will SPOC/JRCCs do with unregistered alerts and a location? “one hit wonders”?
- Two options
  1) launch on every instance – expensive with (90% of alerts false)
  2) treat as false until proven other wise – Concordia

- Registration must be mandatory!
CMCC and CBR understand importance of registration

- Working towards our goal of 100% registration – 1yr update
- All unregistered beacons from alerts and beacon test advisories are passed to the CBR for follow-up and registration
- Any lead that gives possible location of beacons are researched to ensure registration
What CMCC and CBR are doing

• **Use of inverted frame:**
  – We are prototyping software that takes all Canadian coded inverted frame detections from our GEOLUTs and compares them to the beacon registry.
  – All unregistered are passed to the CBR for follow-up and registration
  – Highlights problem beacons
  – This follow-up is very labor intensive
What CMCC and CBR are doing (ELT)

A78DF00E40802CD
  ↓ Decode to 24 bit ICAO address
C12345
  ↓ Decode from ICAO table
C-FLEX

CBR Registry

TC Registry

List of unregistered beacons with TC contact Info

CBR searches for miscoded beacons

66 discovered

CBR contacts owners asking to register
What we are proposing

• Expanding and automating our use of the prototype software using inverted frame transmissions to enhance registration

• Supply an automated verification within this tool
What we are proposing

- Registration rate report
- Automatic end to end verification
- User verifies beacon functions, is properly coded and is properly registered
- User gains confidence
What can Manufactures do?

• These tools are help to overcome current unregistered beacons but we need to ensure better registration of future beacons

• Our proposed solution:
  – Have all manufacturers send Canadian Hex Ids to CBR once coded along with the Distributor/Reseller they are sold to
  – Resellers to send same information when sold to end user
  – Supply CBR with owners of Beacons – serial number
Costly to ensure registration?

- Manufactures currently benefit from:
  - Free space segment
  - Free ground segment
  - Free alert and distribution centre
  - Free rescue service
  - Free registry service
Other

• Regulating bodies – add CBR to change of registration checklist

• Promote proper disposal

• Non Detection of ELTs – 70% detection rate
• Last two years 57 ELTs (real distress) and 29 non detections
Contact Information

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