Australian Government
Australian Maritime Safety Authority

Beacons Now and the Future

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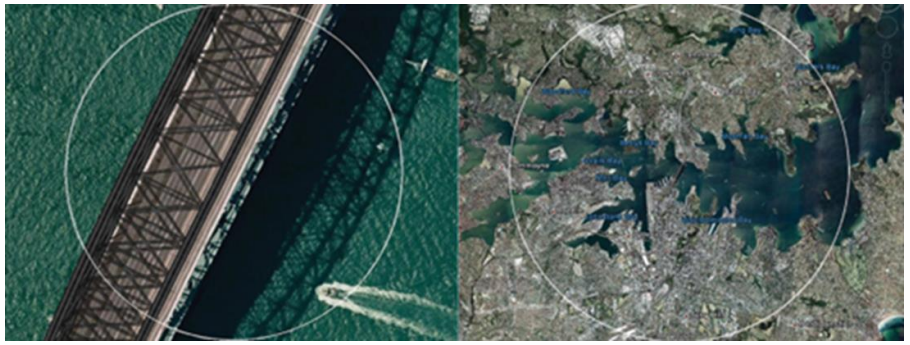
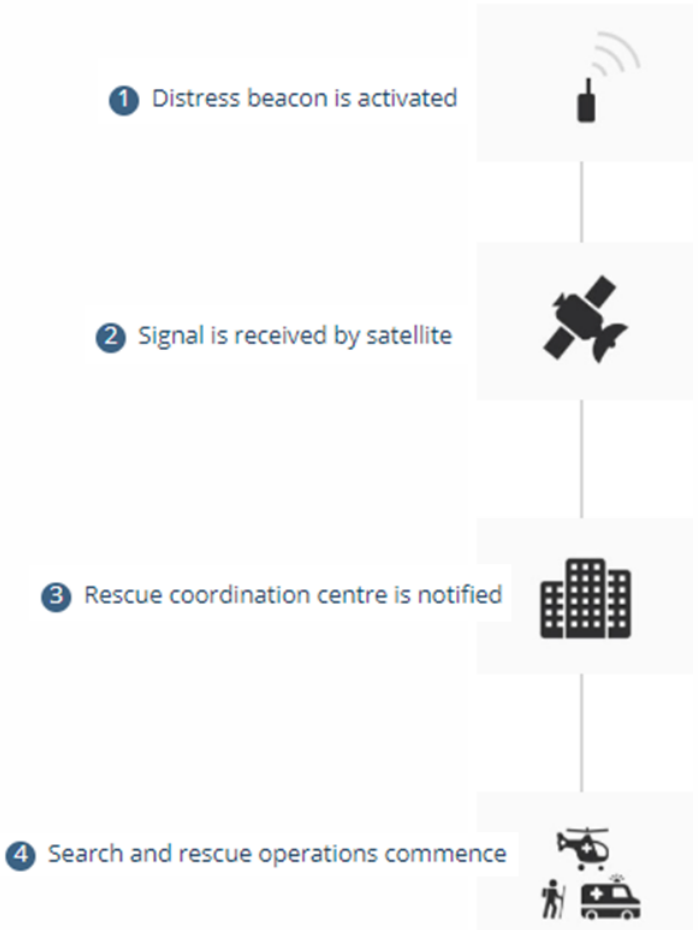
Advisor Communication Systems

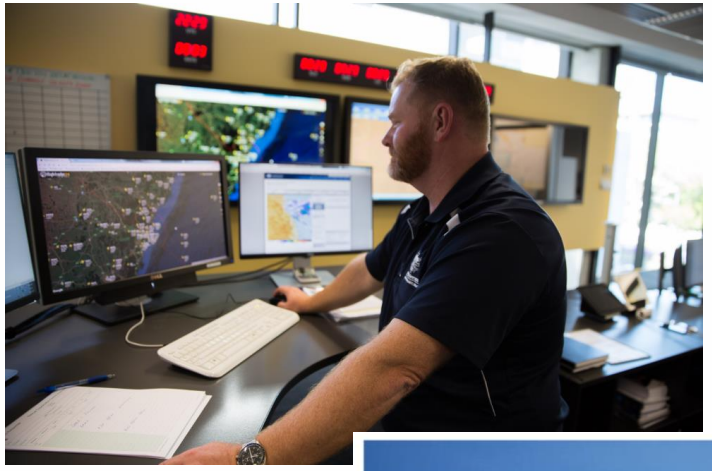
New Distress Beacon technology

- Return Link Service (RLS)
- AIS
- Two-Way Communication (TWC)
- Second Generation Beacons



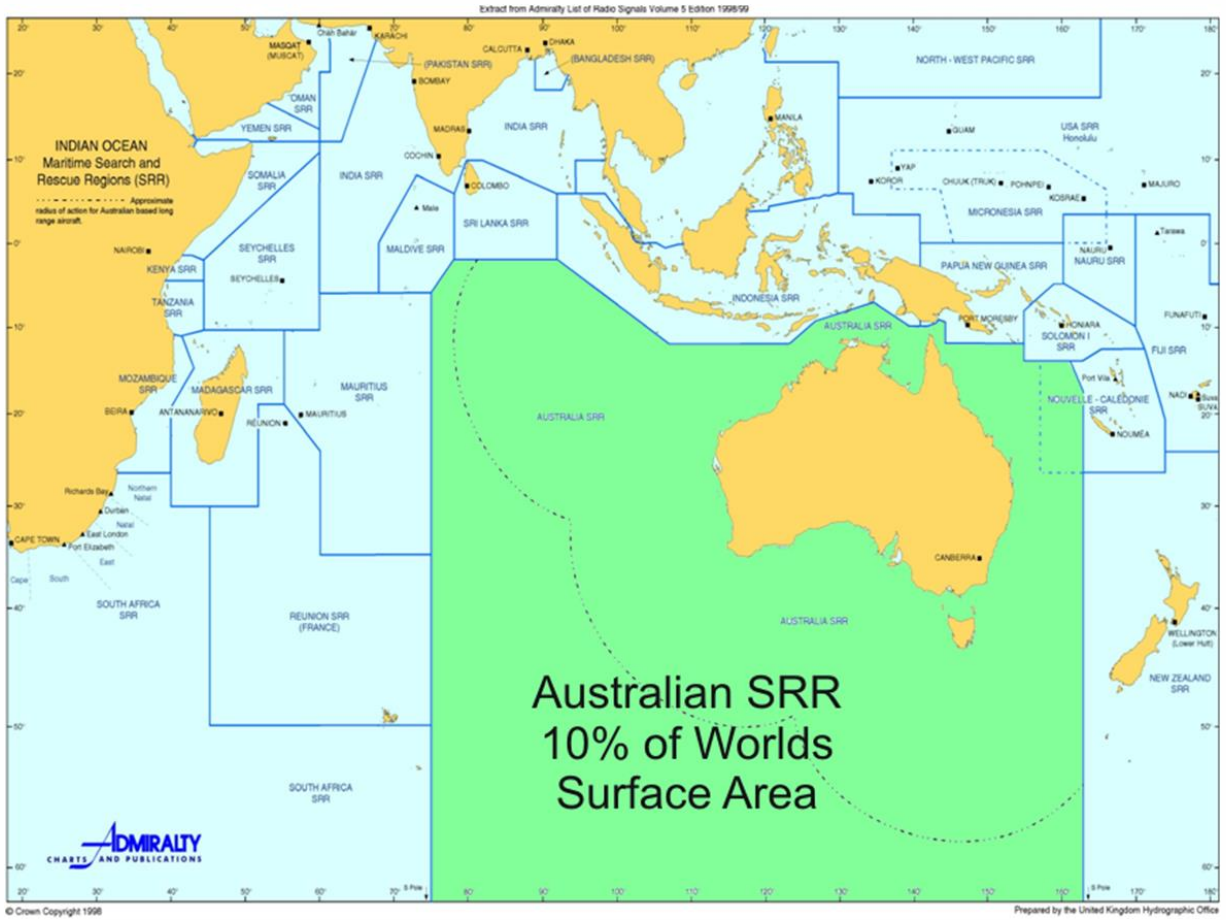


AMSA Response Centre



- AMSA Response Centre (ARC)
  - Search and Rescue service for Australia
  - Operates 24/7 from Canberra
  - ARC can be alerted to a distress situation by:
    - 406 MHz distress beacon alert
    - Satellite emergency notification device
    - Communication through the global maritime distress and safety system
    - Notification of a missing civil aviation aircraft alerted by Airservices Australia
    - Radiotelephone (HF)
    - Phone call
  - Intelligence gathering; location, platform type, number of people, medical information.
  - Determine what resources are required to take action immediately:
    - Coordination of a SAR operation with assistance from organisations as appropriate
    - Providing assistance to other search and rescue organisations
    - Transferring coordination to the appropriate State or Territory police organisation
- AMSA manages the Australian 406 MHz beacon register (EPIRBs, PLBs & ELTs)
  - Registration details are displayed to search and rescue officers

Australia's Search and Rescue Region



Distress Beacon Statistics

- Australia is the 2nd largest distress beacon register in the world.
- Australia has the largest beacon population per head of capita in the world. This is driven by:
    - Maritime legislation (State and National)
    - Aviation legislation
    - Recreational activities on land eg. Bushwalking, 4WD
    - OHS – employees working in remote locations

- As of 1st July, the following beacons were registered with AMSA.

EPIRB	572,642 (67%)
PLB	274,749 (32%
ELT	12,489 (1%)
Total	859,880

    - Estimate 20% Beacons sold are unregistered

- AMSA register on average 4,000 to 5,000 beacons per month or up to **60,000 beacons per year**.

Beacon Detections 2023

ALERT CLASSIFICATION	EPIRB	ELT*	ELT (DT)	PLB	Sub-Total	Total
Distress Alerts	133	14	0	177		**324**
False Alerts						**1327**
Unfiltered Processing Anomalies					0	
Operational False Alerts (Beacon Activations)						
Beacon Mishandling	292	241	1	280	814	
Beacon Malfunction	111	62	0	62	235	
Mounting/Avionic-Interface Failure	15	0	0	0	15	
Environmental Conditions	72	2	0	4	78	
Maintenance Activations	10	49	0	52	111	
Voluntary (non-maintenance) Activations	7	1	0	20	28	
Unknown	28	1	0	17	46	
Undetermined	588	81	0	311		**980**
TOTAL	**1256**	**451**	**1**	**923**		**2631**

- **13%** Real distress alerts
- **87%** False Alerts

- 29% - Recreational vessel/Yacht

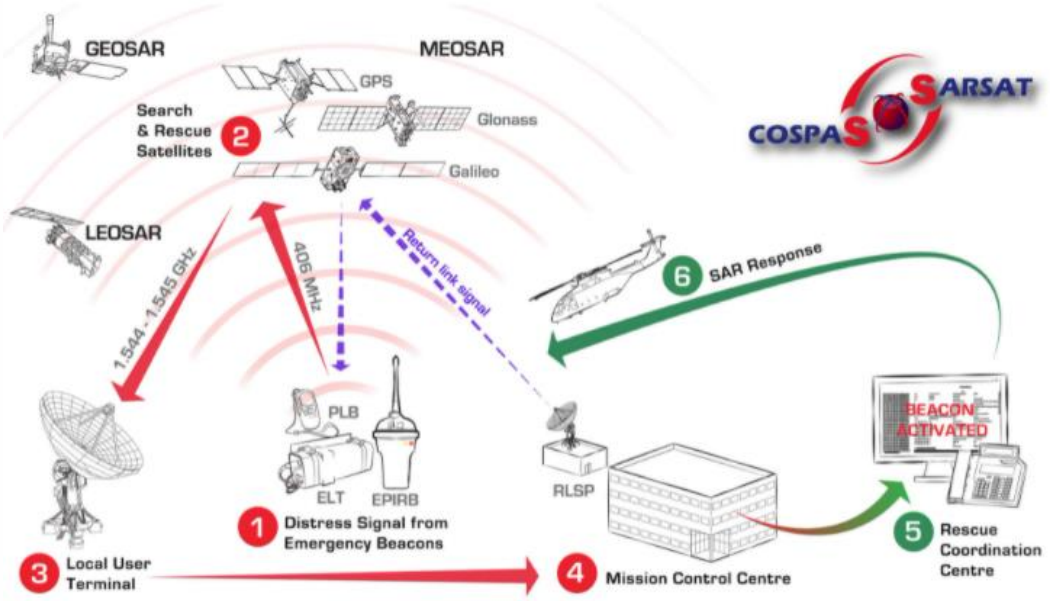
- **2023** - 680 people were assisted and 597 rescued in Australian incidents involving activation of a 406 MHz beacon

Considerations when purchasing a beacon

- All 406 MHz distress beacons meet international Cospas-Sarsat technical specifications
- **EPIRB** AS/NZS 4280.1 and **PLB** AS/NZS 4280.2
- Australian country coded ‘503’

Specifications	Considerations
Detected by international Cospas-Sarsat satellite system on 406 MHz	Useability
121.5 MHz homing frequency (aviation distress frequency)	Size
Transmission period - PLB 24hrs, EPIRB 48hrs	Shape
Strobe light	Weight
GNSS equipped 120 metres accuracy	Battery life 5-10 years
New - Optional Return Link Service, message acknowledgement	Registration free
New - Optional Automatic Identification System (AIS) – maritime use	

Return Link Service (RLS)

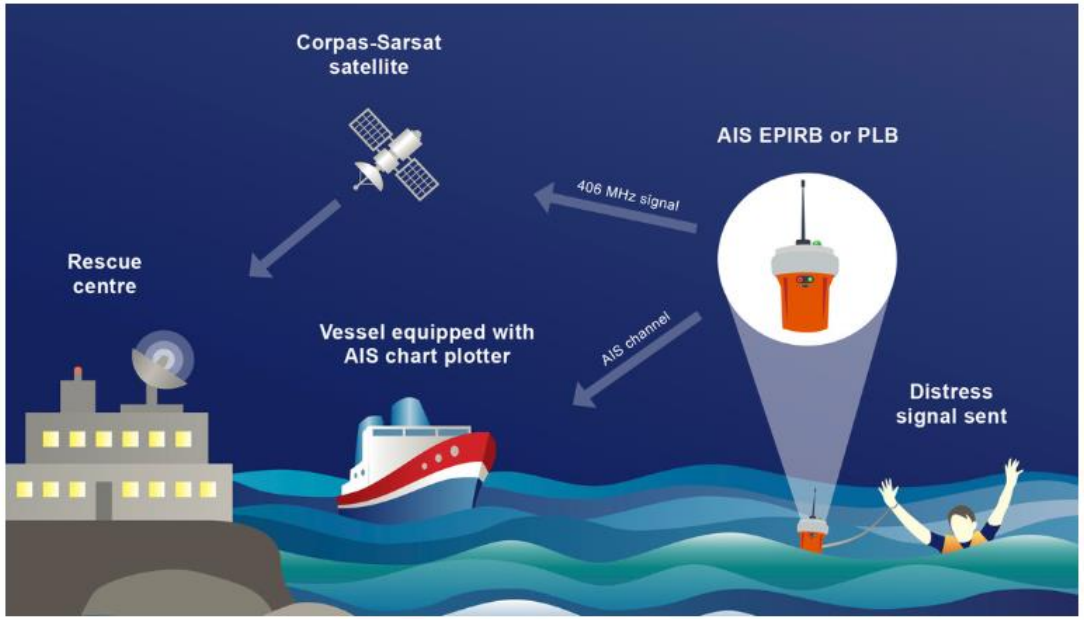


RLS equipped EPIRBs and PLBs;

- Flashing light (blue) or text displayed on PLB to confirm MCC received the distress message.
- Provides reassurance distress message and location received.
- RLS ACK <30mins
- Note: does not mean SAR has been tasked, maintain survivability and do not turn beacon off.

AIS Beacons

- Local alerting and response via AIS, reducing search time and potential reduction in requirement for tasking of assets or resources.
- Transmit on 406 MHz, **AIS** and 121.5 MHz (homing)
- AIS transmission interleaves with 121.5 MHz
- EPIRB AIS User ID format is **974xxyyyy**. PLB AIS User ID format is **972xxyyyy**. Manufacturer pre-programs each beacon with an AIS User ID.
- Register the AIS User ID alongside HEX ID.
- **Note**: AIS User ID formats 974xxyyyy and 972xxyyyy are NOT the MMSI for vessels DSC or AIS.



AIS Beacons

- ⊗ AIS symbol displayed red circle with cross. Same symbol for AIS SART, AIS MOB and AIS EPIRB/PLB.
- The EPIRB 15 HEX ID is broadcast over AIS as a Message 14 safety related broadcast to tie identities together.
- Read associated text to identify device in ACTIVE or TEST mode.

Two-Way Communication Beacons

- Two-way messaging between the beacon and RCC
  - Return Link Service
  - Critical information, more effective and efficient SAR
  - Predefined initial questions and answers displayed on activated beacon, e.g. number of persons, nature of distress, false alert.
  - RCC/SAR responder may send follow-on questions or instructions.
  - Pilot phase test 2025
  - Availability 2026/2027

First Generation Beacon (FGB) - Current

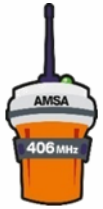
- HEX ID – 15 characters (A to F and 0 to 9)
- Australian HEX ID will commence with BE or 3E. Other characters indicate foreign coded.
- Non-GPS HEX ID commences with BE
- GPS HEX ID commences with 3E
- 406 MHz burst every 50 seconds
- 121.5 MHz continuous transmission for homing purposes
- Non-GPS accuracy 5kms, GPS accuracy 120mtrs

Second Generation Beacons (SGB)

- Improved location accuracy and detection time
- First burst transmission within **5 seconds** of activation
- 23 HEX ID
- Front loaded distress transmissions - more transmissions in the crucial minutes after activation and then reducing transmissions over time
- provide first responders with more robust data due to rotating transmission schedule.
- Improve beacon battery life
- Beacon activation cancellation function
- RLS, AIS and two-way communication features available
- Australian EPIRB and PLB standards updated
- Australian ground segment updated to process SGB
- Cospas-Sarsat approval 2025, product availability 2026.

SAR team members and Johnson survival and rescue systems engineers conduct pool testing of Angel beacons.
NASA

Beacon Safety Messaging Summary



Prepare your beacon

- ❑ Buy a **GPS 406 MHz distress beacon**
- ❑ **Register** with AMSA
- ❑ Carry **proof of registration**
  - ➢ SMS
  - ➢ Email
  - ➢ Print
  - ➢ Online
- ❑ Keep your **registration details up-to-date**
- ❑ Test and Check **beacon battery expiry date**
- ❑ Know **how to use** beacon

In an emergency situation

- ❑ Activate beacon in a **life-threatening situation**
- ❑ Deploy **away from any obstructions** that may interfere with the beacon detection process
- ❑ **Prepare to survive** until help arrives

Maintenance

- ❑ **Dispose** of your beacon **responsibly**
- ❑ Service your beacon with a **certified servicing company**
- ❑ **Store** your beacon **correctly**

For more information on beacons or to register, please visit **www.amsa.gov.au/beacons**

Thank-you

Any Questions?